Information Technology Career Bridge: Semester 2 Reading & Writing Lesson Plans

> Developed by Stephanie Sommers A collaborative project between City Colleges of Chicago and Women Employed

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Why Bridge Programs?

Adult education programs have long been the places adults come to earn their High School Equivalency/GED or to improve their basic English, reading, writing, and numeracy skills. However, adult education programs are rarely viewed as stepping stones to a pathway that allows adults to attain the post-secondary education and credentials needed to secure employment with family-sustaining wages.

National research on adult education participation show that a student who attends 100 or more hours in an adult education program with support tend to earn their High School Equivalency at a higher rate (36% versus 16% for students with fewer hours) and after several years these students earn a premium of \$10,000 more a year in salary. (Source: <u>http://sites.ed.gov/octae/2015/03/27/impact-data-on-adult-ed-program-participation/#more-2580</u>.)

Prior to the introduction of City Colleges of Chicago Bridge and Gateway programs, less than four percent of students transitioned to the post-secondary level. Bridge students transition to college credit at a rate of 63 percent, and Gateway students earned 282 certificates and degrees between 2011 and Spring 2015.

Research from the Community College Research Center has shown that there is an added value to teaching adult learners using contextualized instruction related to students' industry sector of choice. In 2012, City Colleges of Chicago (CCC) developed the Bridge program to provide an accelerated pathway for students to meet their goals, earn their high school equivalency (HSE), improve their workforce outcomes, and/or increase their language skills. The CCC Information Technology (IT) Bridge is designed for these students.

Introduction to Daily Lesson Plans

Welcome to the IT Career Bridge Semester 2 Reading and Writing lessons! These lessons are designed to improve the basic reading and writing skills of High Adult Secondary Education (ASE) students who enter City Colleges of Chicago (CCC) at ninth- to twelfth-grade literacy level, while exposing those students to key issues that are relevant to their lives and the IT field. This intensive sixteen-week course will prepare students to:

- Complete the twelfth-grade or ASE reading level as measured by the Tests of Adult Basic Education (TABE).
- Meet Illinois ABE/ASE Content Standards for Reading; Social Studies; Science; Writing; Language, Vocabulary, and Usage; and Speaking and Listening for the National Reporting System (NRS) Levels 5 & 6. All skills for this level are correlated with GED and High School Equivalency (HSE) skills.
- Pass the Reading and Writing portions of an HSE test which is a prerequisite for financial aid for college-level courses.

These ASE lesson plans were created through a collaborative project between CCC and Women Employed.

Defining Bridge Programs

The Illinois Community College Board (ICCB) defines bridge programs as those that prepare adults with limited academic or limited English skills to enter and succeed in credit-bearing post-secondary education and training leading to career-path employment in high-demand middle- and high-skilled occupations. The

goal of bridge programs is to sequentially bridge the gap between the initial skills of individuals and what they need to enter and succeed in post-secondary education and career-path employment. Bridge programs must include three core elements:

- **Contextualized instruction** that integrates basic reading, math, and language skills and industry/occupation knowledge.
- **Career development** that includes career exploration, career planning, and understanding the world of work.
- **Transition services** that provide students with information and assistance to successfully navigate the process of moving to credit or occupational programs. Services may include academic advising, tutoring, study skills, coaching, and referrals to individual support services.

Bridge Program Student Qualifications

The IT Career Bridge Semester 2 is designed for:

- ASE students who score at the 9.0 to 12.9 level on the TABE in reading and math.
- English as a Second Language (ESL) students in high intermediate ESL or above who score approximately 9.0 to 12.9 on the TABE or who score into the Advanced ESL level or Exit Criteria on the CASAS. Note that valid TABE pre-tests (and post-tests) for the fiscal year are required in the bridge, even for ESL students.
- Highly motivated students who are interested in entering or advancing in an IT career and are able to devote 18-22 hours per week plus homework time for the duration of the program. Since the Bridge Semester 2 level includes an embedded college-level course along with a built-in support course or tutoring, students must be prepared to complete more homework that required in lower levels of the bridge.

Before enrollment, City Colleges of Chicago transition specialists or other trained staff members should have talked to students about any life situations that would interfere with their ability to succeed in a bridge program, such as work schedule, lack of child care, or lack of time to study and do homework outside of class. Other potential barriers include the need to pass background checks for IT jobs and discharge current debt to the college before entering this course. Should any of these issues arise after classes begin, students should be referred to a transition specialist or trained staff member who can help.

Expectations of Bridge Program Students

Through the recruitment and orientation process, students are made aware of and agree to meet the following expectations:

- Attend all classes. If a student must be absent, they must notify the instructor and request missed work.
- Arrive to class on time and stay until class ends.
- Respect instructor, classmates, and self.
- Complete all assigned work; ask questions when unsure.
- Meet with a transition specialist and college advisor and prepare to eventually transfer into a credit/career program.

Bridge Program Benefits to Students and to CCC

During this Bridge Semester 2 Reading and Writing course, students will:

- Develop reading and writing skills for HSE attainment and college readiness using materials related to the IT industry.
- Engage in interactive learning, including group activities, giving and getting peer feedback, and utilizing evaluation and editing to rewrite rough drafts. Because these lessons do not call on the instructor to lecture from the front of the class, students may need time to become comfortable with the active learning activities and contextualized nature of these lessons.
- Gain experience with computers, as a number of classes will take place in a computer lab.
- Learn the skills employers want, such as communication, teamwork, dependability, problem-solving, and technology skills.

After IT Career Bridge Semester 2 or another short-term ASE Level class, students should be able to pass the Reading and Writing portions of the 2014 GED or HSE test, which is a prerequisite for financial aid for college-level courses. In addition, these courses provide relevant learning experiences using Social Studies and Science materials that are also covered by GED or HSE test. After IT Career Bridge Semester 2, students should also be able to score high enough on the college entrance test to enter college-level courses and earn credit toward degrees or certificates.

Additional resources available for bridge program students include:

- Free tutoring.
- Transition specialists who will meet with students to work through challenges and make future plans.
- Academic, financial aid, and/or career advisors who will help students enroll in college occupational programs and learn about available jobs in their chosen occupations.

Sample IT Bridge Program Structure

The graphic below represents one of several configurations for the full IT Career Bridge program; actual configuration will vary based on the cohort start date and the campus where the program is delivered.

INFORMATION TECHNOLOGY: FALL AND SPRING BRIDGE STRUCTURE

Bridge Semester 1- High Intermediate Adult Basic Education*

First 8 Weeks		Second 8 Week	S	
Language Arts- Lesson Set #1 Career Exploration Computer Skills Course Microsoft Office and Career Exploration		Language Arts- Lesson Set #2 Internet of Things; Artificial Intelligence Test-Taking Skills Course Take TABE Test/ Take Practice HSE Test		Fall Computer Skills and Test-Taking courses Certifications
Math Decimals, Fractions, Percent/ Functions			and/or Terminology	
ridge Semester 2- Adult Secondary Education** First 8 Weeks Second 8 Weeks			Spring 4-week HSE 	
	Language Arts B Big Data; Net	ridge-Lesson Set #3 work Security		preparation blocks College credit
HSE Prep (4 weeks): Reading	HSE Prep (4 weeks): Writing Math	HSE Prep (4 weeks): Social Studies	HSE Prep (4weeks): Science HSE Prep:	course offered, whenever possible
Geometry and Measurement/ Algebra + Math COMPUTER INFORMATION SYSTEMS 101			*ABE: TABE of 6.0- 8.9 in Reading and 5.0- 8.9 in Math **ASE: TABE of 9.0- 12 in Reading and 8- 12.0 in Math	

IT Career Bridge Semester 2 Correlation with State and National Standards

To ensure that these Bridge lessons meet state and national learning standards, curriculum designers compared the *Illinois ABE/ASE Content Standards*¹ in Reading; Social Studies; Science; Writing; Language, Vocabulary, and Usage; and Speaking and Listening with the NRS (National Reporting System)² descriptors for the ASE level (sometimes referred to as Levels 5 & 6). This comparison was then condensed into a document called the Condensed Standards for NRS Levels 5 & 6, which is contained within these lessons. These condensed standards can be used to:

- Understand the relationship between each lesson and the required standards. To do this, this curriculum document lists associated standards at the beginning of each lesson.
- Connect classroom activities and assignments to formal standards that describe the skills students are learning.
- Understand the relationship between Bridge Semester 2 skill-building standards and GED or HSE skill requirements.

Principles for Lesson Plans

The principles that these lessons are based on include:

- All work must be grounded in students' experiences, decisions, and goals.
- Teachers must ask, not tell. Teachers should avoid having the answers. They should instead set up situations where students can pose questions, find their own answers, and propose ways to discover

¹ The *Illinois ABE/ASE Content Standards* were created to ensure students receive the same level of preparation that high schools are expected to deliver, and that they are ready for a GED test and for college-level work.

² As a state and federally funded program, CCC must use the NRS to classify instructional levels and student performance and to demonstrate student progress in its adult education programs.

additional information. This will help students develop the critical skills needed to do well on the GED or HSE test and in college-level courses.

- Classrooms must incorporate visual, auditory, and kinesthetic techniques in each activity or set of activities to make sure all students can be tuned in.
- Activities must encourage students with varying skill levels to bring their thoughts and experience to the table as equals.
- Students must work in pairs and groups to hear, see, and engage with material before they present considered answers to the class.
- Students can teach and learn from each other through pair and group work.
- Writing first drafts must be free of worry. Work on penmanship, spelling, and grammar must be part of the rewriting process, not the initial drafting process.
- Grammar is best learned in the context of a writing project in which students are invested in communicating something important to them.

Strategies for Building Contextualized Themes

The strategies for building contextualized themes for these ASE lessons, chosen with a focus on key 2014 GED and HSE requirements include:

- Selected Science and Social Studies topics that have been customized to IT.
- Primary and secondary sources as the basis for students' own thinking and writing.
- Online articles, videos, graphics, and political cartoons to help students become good readers in science and social studies.
- Test-taking skills developed through targeted HSE test materials that are relevant to the science, social studies, and language areas studied.
- Activities that use the Khan Academy for lectures on a range of HSE-relevant topics.
- Activities that show students how to write multiple persuasive and informative essays, both formally and in the 45-minute format.
- A variety of reading strategies to help students work with more difficult readings such as: reading for a purpose, highlighting, small group and class analysis of readings in a broader context, and developing vocabulary skills through reading.
- Comparison of issues and points of view between readings.
- Internet as a research tool to answer questions and find information for presentations.
- Group presentation, preparation, delivery, and evaluation processes to improve teamwork, problem-solving, and public speaking skills.
- Note-taking on class discussions, readings, and video presentations in preparation for college-level courses.
- Clear evaluation tools so that students become good editors and evaluators of each other's work.

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High ASE Lesson Plan Outline Contextualized for Information Technology

THEME	PURPOSES	READING	WRITING	PRESENTATION
Week 1-2: Introducing Big Data	 Establish course goals. Define Big Data. Understand plagiarism and set rules for citing sources. Look at two examples of Big Data: personalized marketing and predictive policing. 	 Watch videos that define Big Data and plagiarism. Read about Big Data in personalized marketing and predictive policing. 	 Take organized notes on readings and videos. Write an in-class essay that defines Big Data, gives examples, and reflects on how Big Data could impact your life. 	
Week 3-4: Benefits of Big Data	 Investigate the impact of Big Data on the Obama, Clinton, and Trump campaigns. Identify a range of other benefits of Big Data. 	 Read and watch videos on recent campaigns and the benefits of Big Data focusing on The Human Face of Big Data series. 	• Write an in-class essay on the benefits of Big Data, some important examples, and how students think Big Data will improve society.	 Report in groups on Big Data benefits from videos watched.
Week 5-6: Big Data Issues: Machine Bias	 Look more deeply into predictive policing and research that shows that machines have their own dangerous biases. 	 Read and watch videos on different types of machine bias used by corporations and in the judicial system. 	 Write an in-class essay on the issues around Big Data, students' concerns, and their recommendations for addressing the issues they raise. 	 Report in groups on homework readings and videos.
Week 7-8: Big Data Issues: Government	 Look closely into the case of Edward Snowden to understand how government is using Big Data and to reflect on what our attitude towards whistle-blowers should be. 	 Read and watch videos on the story of Edward Snowden, his point of view, and the problem of whistle- blowers. 	 Write an in-class essay on the Edward Snowden story, what he revealed about government surveillance, and what our policy should be about whistle-blowers. 	• Do research and report on Edward Snowden.

THEME	PURPOSES	READING	WRITING	PRESENTATION
Week 9-10: Cybersecurity: The Problems and Opportunities	 Identify the size of the problem of cybersecurity. Look at careers in cybersecurity. 	 Read articles and watch videos on the facts concerning cybersecurity and the number of high- paying jobs available in the field. 	• Write an in-class essay on the importance and scope of cybersecurity and the upside of this crisis for IT professionals.	 Report in groups on homework readings and classroom videos.
Week 11-12: National Cybersecurity Issues	 Understand citizens constitutional right to privacy. Look at examples of national level cybersecurity breaches. 	 Carefully analyze a reading on our constitutional rights to privacy. Read about the cyber breaches into the DNC and its impacts on politics. 	 Write an in-class essay that summarizes citizens' privacy rights, how technology threatens these rights, and recommendations for dealing with the problem. 	 Report in groups on homework readings and classroom videos.
Week 13-14: International Cybersecurity Issues	 Understand the scope of international cyberattacks. Look at the Stuxnet worm that the US used against the Iranians to focus a discussion about the dangers of cyber war. 	 Read articles and watch videos on scope of international cyberattacks, Snowden and Obama's different approaches to the problem, and the case of the Stuxnet virus. 	 Create an outline for an in-class essay on international cyberattacks, different opinions on the best approach to the issue, and students' opinions on the best way to move forward. 	 Report in groups on homework readings and classroom videos.
Week 15-16: Final Cybersecurity Essay and Presentation	 Complete a final essay. Present the essay. 		 Write and finalize an in- class essay on international cybersecurity issues. 	• Prepare and present the final essay.

Recommendations for Program Delivery

The lesson plan activity instructions contain full descriptions of the activities down to what questions teachers can ask and what information should be recorded on the board. These instructions are intended to help the teacher understand the intent and flow of the activity. However, they are not intended to be a script and in fact have more detail than can be brought into the classroom. To adapt the lesson plans to a useable outline, we suggest that teachers use the following process for preparing for each day:

- Familiarize yourself with the materials and issues in whole units before teaching them.
- Read all assigned material; view all videos; and work through all charts and graphs so that you understand all that is to be presented.
- Go through all the activities to make sure you can answer any study questions or would feel comfortable leading any of the activities presented.
- Highlight the specific portions of the activity that will help you remember the full flow of the activity.
- Make adjustments to the size or emphasis of each activity to best fit the needs of your class.
- Bring a highlighted outline or create a separate outline that can remind you how to implement the activity and will be simple for you to follow.
- Prepare all handouts and projection materials before class so each activity can go smoothly.

Although suggested time durations for each activity are included, the time devoted to any given activity in the daily lesson plans may vary. Teachers must decide how to adapt the activities to meet the needs of the actual students they have. The following guidelines should help teachers make decisions about how to customize the curriculum for their own classrooms:

- Select and use grammar materials as needed to support student essay editing processes in the writing weeks.
- Include short vocabulary quizzes as needed to ensure that students learn new words they select from the readings. Some classes will need more work on vocabulary than others.
- Use these materials in the order they are presented. The activities in this curriculum build on one another and lead to subsequent discussions, readings, and writing assignments. Because the lesson plans have a cumulative structure, it is important for teachers to familiarize themselves with the materials and issues in whole units before teaching them.
- Make decisions to modify, eliminate, or change lessons carefully. While teachers can adapt these lessons for their own students, they should do so with caution because of the cumulative structure of these lessons. Decisions to modify one activity could result in students being unprepared for later activities. Therefore, it is important for teachers to familiarize themselves with the materials and issues in whole units before teaching them and before modifying a lesson or activity.

This document begins with the condensed standards for reference. Each section that follows presents the full curriculum for each week, including the standards the week covers and daily lesson plans that include activities and worksheets.

Those with questions about the design of the bridge program or customization of the lessons should contact Christina Warden, Senior Program Manager, Women Employed at (312) 782-3902 ext. 228, cwarden@womenemployed.org or Lauren Hooberman, Bridge Director, City Colleges of Chicago, at lhooberman@ccc.edu. Page Intentionally Blank

CONDENSED READING STANDARDS FOR NRS LEVELS 5 & 6

KEY IDEAS AND DETAILS

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

2. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas.

a. Comprehend explicit details and main ideas in text.

b. Summarize details and ideas in text.

c. Make sentence level inferences about details that support main ideas.

d. Infer implied main ideas in paragraphs or whole texts.

e. Determine which detail(s) support(s) a main idea.

f. Identify a theme, or identify which element(s) in a text support a theme.

g. Make evidence-based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations.

h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

3. Analyze how individuals, events, and ideas develop and interact over the course of a text.

a. Order sequences of events in texts.

b. Make inferences about plot/sequence of events, characters/people, settings, or ideas in texts. c. Analyze relationships within texts, including how events are important in relation to plot or conflict; how people, ideas, or events are connected, developed, or distinguished; how events contribute to theme or

relate to key ideas; or how a setting or context shapes structure and meaning.

d. Infer relationships between ideas in a text (e.g., an implicit cause and effect, parallel, or contrasting relationship).

e. Analyze the roles that details play in complex literary or informational texts.

CRAFT AND STRUCTURE

4. Interpret words and phrases that appear frequently in texts from a wide variety of disciplines, including determining connotative and figurative meanings from context and analyzing how specific word choices shape meaning or tone.

a. Determine the meaning of words and phrases as they are used in a text, including determining connotative and figurative meanings from context.

b. Analyze how meaning or tone is affected when one word is replaced with another.

c. Analyze the impact of specific words, phrases, or figurative language in text, with a focus on an author's intent to convey information or construct an argument.

5. Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole.

a. Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas.

b. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another).

c. Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, and otherwise) and determine how they refine meaning, emphasize certain ideas, or reinforce an author's purpose.

d. Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose.

6. Determine an author's purpose or point of view in a text and explain how it is conveyed and shapes the content and style of a text.

a. Determine an author's point of view or purpose of a text.

b. Analyze how the author distinguishes his or her position from that of others or how an author acknowledges and responds to conflicting evidence or viewpoints.

c. Infer an author's implicit as well as explicit purposes based on details in text.

d. Analyze how an author uses rhetorical techniques to advance his or her point of view or achieve a specific purpose (e.g., analogies, enumerations, repetition and parallelism, juxtaposition of opposites, or qualifying statements).

INTEGRATION OF KNOWLEDGE AND IDEAS

7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

a. Analyze how data or quantitative and/or visual information extends, clarifies, or contradicts information in text, or determines how data supports an author's argument.

b. Compare two passages that present related ideas or themes in different genres or formats (e.g., a feature article and an online FAQ or fact sheet) in order to evaluate differences in scope, purpose, emphasis, intended audience, or overall impact when comparing.

c. Compare two passages that present related ideas or themes in different genres or formats in order to synthesize details, draw conclusions, or apply information to new situations.

8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

a. Delineate the specific steps of an argument the author puts forward, including how the argument's claims build on one another. Identify specific pieces of evidence an author uses in support of claims or conclusions. b. Evaluate the relevance and sufficiency of evidence offered in support of a claim.

c. Distinguish claims that are supported by reasons and evidence from claims that are not.

d. Assess whether the reasoning is valid; identify fallacious reasoning in an argument and evaluate its impact.

e. Identify an underlying premise or assumption in an argument and evaluate the logical support and evidence provided.

9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

a. Draw specific comparisons between two texts that address similar themes or topics or between information presented in different formats (e.g., between information presented in text and information or data summarized in a table or timeline).

b. Compare two passages in similar or closely related grenres that share ideas or themes, focusing on similarities and/or differences in perspective, tone, style, structure, purpose, or overall impact.

c. Compare two argumentative passages on the same topic that present opposing claims (either main or supporting claims) and analyze how each text emphasizes different evidence or advances a different interpretation of facts.

CONDENSED SOCIAL STUDIES STANDARDS FOR NRS LEVELS 5 & 6

1. Draw conclusions and make inferences.

a. Determine the details of what is explicitly stated in primary and secondary sources and make logical inferences or valid claims based on evidence.

b. Cite or identify specific evidence to support inferences or analyses of primary and secondary sources, attending to the precise details of explanations or descriptions of a process, event, or concept.

2. Analyze events and ideas.

a. Identify the chronological structure of a historical narrative and sequence steps in a process.

b. Analyze in detail how events, processes, and ideas develop and interact in a written document; determine whether earlier events caused later ones or simply preceded them.

c. Analyze cause-and-effect relationships and multiple causation, including action by individuals, natural and societal processes, and the influence of ideas.

d. Compare differing sets of ideas related to political, historical, economic, geographic, or societal contexts; evaluate the assumptions and implications inherent in differing positions.

3. Read and interpret graphs, charts, and other data representation.

a. Interpret, use, and create graphs (e.g., scatterplot, line, bar, circle) including proper labeling. Predict reasonable trends based on the data (e.g., do not extend trend beyond a reasonable limit).

b. Represent data on two variables (dependent and independent) on a graph; analyze and communicate how the variables are related.

c. Distinguish between correlation and causation.

4. Measure the center of a statistical dataset.

a. Calculate the mean, median, mode, and range of a dataset.

5. Interpret meaning of symbols, words, and phrases.

a. Determine the meaning of words and phrases as they are used in context, including vocabulary that describes historical, political, social, geographic, and economic aspects of social studies.

6. Analyze purpose and point of view.

a. Identify aspects of a historical document that reveal an author's point of view or purpose (e.g., loaded language, inclusion, or avoidance of particular facts).

b. Identify instances of bias or propagandizing.

c. Analyze how a historical context shapes an author's point of view.

d. Evaluate the credibility of an author in historical and contemporary political discourse.

e. Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence.

7. Integrate content presented in different ways.

a. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.

b. Analyze information presented in a variety of maps, graphic organizers, tables, and charts; and in a variety of visual sources such as artifacts, photographs, and political cartoons.

c. Translate quantitative information expressed in words in a text into visual form (e.g., table or chart); translate information expressed visually or mathematically into words.

8. Evaluate reasoning and evidence.

a. Distinguish among fact, opinion, and reasoned judgment in a primary or secondary source document.

b. Distinguish between unsupported claims and informed hypotheses grounded in social studies evidence.

9. Analyze relationships between texts.

a. Compare treatments of the same social studies topic in various primary and secondary sources, noting discrepancies between and among the sources.

CONDENSED SCIENCE STANDARDS FOR NRS LEVELS 5 & 6

1. Determine details and make inferences.

a. Cite specific textual evidence to support inferences, conclusions, or analyses of technical texts, attending to the precise details of explanations or descriptions of a process, event, phenomenon, or concept.

b. Understand and explain the basic features of a scientific hypothesis or investigation and verify claims made based on evidence provided.

2. Determine central ideas, hypotheses, and conclusions.

a. Determine the central ideas or conclusions of a stimulus.

b. Identify the hypotheses, conclusions, and data in a technical text, verifying the evidence and data when possible and corroborating or challenging conclusions with other sources of information.

c. Provide an accurate summary of the stimulus.

d. Develop valid (testable, objective) questions, evaluate whether questions are testable and objective, and refine hypotheses.

e. Make evidence-based generalizations based on data and results.

f. Draw conclusions based on scientific evidence, and indicate whether further information is needed to support a specific conclusion or to discriminate among several possible conclusions.

3. Analyze events and ideas.

a. Determine which explanation best accords with evidence.

b. Analyze in detail a series of events or results described in a stimulus; determine whether earlier events/results caused later ones or are simply correlated with later events/results.

c. Understand and analyze basic processes, methods, and tools in scientific concepts, theories, and designs of simple scientific experiments and investigations.

d. Analyze key issues and assumptions in scientific models, theories, or experiments.

4. Interpret meaning of symbols and terms.

a. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific technical context.

b. Identify and interpret independent and dependent variables in investigations that have controls.c. Interpret and apply scientific terms and concepts, formulas, and other symbolic representations of data based on research provided.

5. Analyze structures.

a. Analyze the structure of the relationships among concepts in a stimulus, including relationships among key terms and concepts (e.g. force, friction, reaction force, energy).

b. Determine how the value of one variable changes as the value of another variable changes in a complex data presentation.

c. Predict the results of an additional trial or measurement in an experiment.

d. Predict the future state of a model or system based on given information.

6. Integrate content presented in diverse ways.

a. Integrate quantitative or technical information expressed in words in a stimulus with a version of that information expressed visually (e.g. in a flowchart, diagram, model, graph, or table).

b. Translate quantitative or technical information expressed in words in a stimulus into visual form (e.g. a table or chart) and translate information expressed visually or mathematically (e.g. in an equation) into words.

c. Use numerical data to describe and compare experimental processes and results that are described in stimulus.

d. Record and organize information in tables and graphs to communicate given scientific information, and identify relationships they reveal.

7. Evaluate reasoning and evidence.

a. Distinguish among facts, reasoned judgment based on research findings, and speculation in a stimulus.

b. Assess the extent to which the reasoning and evidence in a stimulus support the author's claim or recommendation for solving a technical problem.

c. Identify discrepant results and identify possible sources of error or uncontrolled conditions.

d. Evaluate whether information (data, model) supports or contradicts a hypothesis, prediction, or conclusion, and why.

e. Design an experiment to test a given hypothesis.

f. Define, predict, analyze, and alter experimental designs to reduce sources of error.

8. Analyze relationships between sources.

a. Compare findings presented in a stimulus to those from other sources, noting when the findings support or contradict other explanations or accounts.

b. Identify strengths and weaknesses among one or more models or experiments.

c. Identify similarities and differences between models and experiments.

d. Determine which models or experiments would be supported or weakened by new data or evidence.

9. Read and interpret graphs, charts, and other data representations.

a. Interpret, use, and create graphs (e.g. scatterplot, line, bar, circle) including proper labeling. Predict reasonable trends based on the data (e.g. do not extend trend beyond a reasonable limit).

b. Represent data on two variables (dependent and independent) on a graph. Analyze and communicate how the variables are related.

c. Describe patterns in a dataset such as clustering, outliers, positive/negative association, and linear/nonlinear association and describe their implications.

d. Distinguish between correlation and causation (i.e. correlation does not imply causation)

10. Measure the center of a statistical dataset.

a. Calculate the mean, median, mode, and range of a dataset.

b. Calculate the average, given the frequency counts of all the data values.

c. Calculate a weighted average and understand the effect of outliers.

11. Determine sample space and use probability models to interpret data.

a. Use counting techniques to solve problems and determine combinations and permutations.

b. Determine the probability of simple and compound events.

c. Recognize and explain probability in context.

d. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

e. Determine the probability of mutually exclusive, dependent, and independent events.

f. Predict changes in probability based on changes in context.

12. Understand and apply the appropriate tools, techniques, and units in scientific investigations.

a. Identify and use proper measurement tools for each type of measurement.

b. Identify, use, and describe proper units for each type of measurement (e.g. centimeters for length).

c. Convert between metric units and between metric and non-metric systems of measure given data and conversion factors.

CONDENSED WRITING STANDARDS FOR NRS LEVELS 5 & 6

TYPES AND PURPOSES

1. Write arguments from a prompt in a formatted manner of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

a. Introduce precise, knowledgeable claims; establish the significance of the claims; distinguish the claims from alternate or opposing claims; and create an organization that logically sequences claims, counterclaims, reasons, and evidence.

b. Develop claims and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases.

c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text; create cohesion; and clarify the relationships between claims and reasons, between reasons and evidence, and between claims and counterclaims.

d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

e. Provide a concluding statement or section that follows from and supports the argument presented.

2. Write informative/explanatory texts from a prompt in a formatted manner to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

a. Introduce a topic; organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.

c. Use appropriate and varied transitions and syntax to link the major sections of the text; create cohesion; and clarify the relationships among complex ideas and concepts.

d. Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic.

e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).

3. Write narratives from a prompt in a formatted manner to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

a. Engage and orient the reader by setting out a problem, situation, or observation and its significance, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events.

b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.

c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole and build toward a particular tone and outcome (e.g., a sense of mystery, suspense, growth, or resolution).

d. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.

e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.

PRODUCTION AND DISTRIBUTION OF WRITING

4. Produce clear, varied, coherent, consistent, and engaging writing in which the development, organization, style, tone, and voice are appropriate to task, purpose, and audience. Write an analysis based on a given prompt.

a. Differentiate between example and reason when given a writing prompt.

b. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or evaluating and trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

5. Write internal and external business correspondence that conveys and/or obtains information effectively in order to communicate with other employees to clarify objectives and to communicate with customers and employees to foster positive relationships.

6. Use technology, including the Internet, to research, produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

RESEARCH TO BUILD AND PRESENT KNOWLEDGE

7. Conduct short as well as more sustained research projects to answer a question (including a selfgenerated question) or solve a problem.

a. Narrow or broaden the inquiry when appropriate.

b. Synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

c. Gather relevant information from multiple authoritative print and digital sources using advanced searches effectively.

d. Assess the strengths and limitations of each source, in terms of task, purpose, and audience.

e. Integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.

f. Draw evidence from literary or informational texts to support analysis, reflection, and research.

8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

RANGE OF WRITING

10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific, purposes, and audiences.

CONDENSED LANGUAGE, VOCABULARY, AND USAGE STANDARDS FOR NRS LEVELS 5 & 6

CONVENTIONS OF STANDARD ENGLISH

1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

a. Edit to correct errors involving frequently confused words and homonyms, including contractions (passed, past; two, too, to; there, their, they're; knew, new; it's its).

b. Edit to correct errors in straightforward subject-verb agreement.

c. Edit to correct errors in pronoun usage, including pronoun-antecedent agreement, unclear pronoun references, and pronoun case.

d. Edit to eliminate non-standard or informal usage (e.g., correctly use "try to win the game" instead of "try and win the game").

e. Edit to eliminate dangling or misplaced modifiers or illogical word order (e.g., correctly use "to meet almost all requirements" instead of "to almost meet all requirements").

f. Edit to ensure parallelism and proper subordination and coordination.

g. Edit to correct errors in subject-verb or pronoun antecedent agreement in more complicated situations (e.g., with compound subjects, interceding phrases, or collective nouns).

h. Edit to eliminate wordiness or awkward sentence construction.

i. Edit to ensure effective use of transitional words, conjunctive adverbs, and other words and phrases that support logic and clarity.

2. Demonstrate command of the conventions of standard English capitalization and punctuation when writing.

a. Edit to ensure correct use of capitalization (e.g., proper nouns, titles, and beginnings of sentences).

b. Edit to eliminate run-on sentences, fused sentences, or sentence fragments.

c. Edit to ensure correct use of apostrophes with possessive nouns.

d. Edit to ensure correct use of punctuation (e.g., commas in a series or in appositives and other nonessential elements, end marks, and appropriate punctuation for clause separation).

KNOWLEDGE OF LANGUAGE

3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style.

a. Vary syntax for effect, consulting references for guidance as needed.

b. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

VOCABULARY USAGE

4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11-12 reading and content, choosing flexibly from a range of strategies.

a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.

b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable).

c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage.

d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

a. Interpret figures of speech (e.g., hyperbole, paradox) in context and analyze their role in the text. b. Analyze nuances in the meaning of words with similar denotations. 6. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

a. Demonstrate use of content, technical concepts, and vocabulary when analyzing information and following directions.

CONDENSED SPEAKING AND LISTENING STANDARDS FOR NRS LEVELS 5 & 6

COMPREHENSION AND COLLABORATION

1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

b. Work with peers to promote civil, democratic discussions and decision-making; set clear goals and deadlines; and establish individual roles as needed.

c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.

d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.

2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.

3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.

4. Demonstrate active listening skills.

a. Interpret verbal and non-verbal cues and behaviors to enhance communication.

5. Comprehend key elements of oral information for:

- a. Cause and effect
- b. Comparison/contrast
- c. Conclusion
- d. Context
- e. Purpose
- f. Charts, tables, and graph
- g. Evaluation/critiques
- h. Moo
- i. Persuasive text
- j. Sequence
- k. Summaries
- I. Technical subject matte

6. Identify and evaluate oral information for:

- a. Conclusions/solutions
- b. Fact/opinion
- c. Assumption
- d. Propaganda
- e. Relevancy
- f. Accuracy/sufficiency
- g. Appropriateness/clarity
- h. Validity
- i. Relationships of ideas

7. Predict potential outcomes and/or solutions based on oral information regarding trends.

PRESENTATION OF KNOWLEDGE AND IDEAS

8. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning; alternative or opposing perspectives are addressed; and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

9. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

10. Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.

a. Present formal and informal speeches including discussion, information requests, interpretation, and persuasion.

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ASE Standards Covered for Week 1, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES	STANDARD CATEGORY	STANDARD	
Introduce the IT Semester 2 course and identify goals.	SPEAKING AND LISTENING	 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively. a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well- reasoned exchange of ideas. b. Work with peers to promote civil, democratic discussions and decision- making, set clear goals and deadlines, and establish individual roles as needed. c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives. d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the tack 	
Define Big Data and introduce the writing assignment for this unit.	READING	 7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words. a. Analyze how data or quantitative and/or visual information extends, clarifies, or contradicts information in text, or determine how data supports an author's argument. b. Compare two passages that present related ideas or themes in different genre or formats (e.g., a feature article and an online FAQ or fact sheet) in order to evaluate differences in scope, purpose, emphasis, intended audience, or overall impact when comparing. c. Compare two passages that present related ideas or themes in different genre or formats in order to evaluate differences in scope, purpose, emphasis, intended audience, or overall impact when comparing. c. Compare two passages that present related ideas or themes in different genre or formats in order to synthesize details, draw conclusions, or apply information to new situations. 	
 Reading homework. 	KEADING	 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. 	

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Week 1, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

THEME: Introducing Big Data

OBJECTIVES

- Introduce the IT Semester 2 course and identify goals.
- Define Big Data and introduce the writing assignment for this unit.

MATERIALS

Activity #1:

- Handout (attached): Make one copy for each student.
 Information Technology Career Bridge Semester 2 Reading and Writing: Goals and Course Features
- Handout (attached): Make one copy for each student. Self-Assessment for Information Technology Bridge Semester 2

Activity #2:

- Video: What is Big Data? https://www.youtube.com/watch?v=mhe5kX10CR4 (running time: 02:05)
- Video: What is Big Data and How Does It Work? <u>https://www.youtube.com/watch?v=TzxmjbL-i4Y</u> (running time: 01:33)
- Video: Big Data Will Change Our World <u>https://www.youtube.com/watch?v=2D8oji5EKbM</u> (running time: 03:29)

<u>Homework</u>:

- Handout (attached): Make one copy for each student. The Impact of Big Data on the Digital Advertising Industry <u>https://www.qubole.com/blog/big-data/big-data-advertising-case-study/</u>
- Handout (attached): Make one copy for each student. The Pros and Cons of Personalized Marketing <u>http://www.mainstreethost.com/blog/the-pros-and-cons-of-personalized-marketing/</u>

ACTIVITY #1: Introduce the IT Semester 2 Course and Identify Goals – 60 minutes.

Identify student goals:

- Welcome students to the Information Technology Bridge Semester 2 Reading and Writing Course and tell them the course will be focused on Big Data for the first eight weeks and on National and International Cybersecurity issues for the last eight weeks. The course will require a lot of reading, note taking, and writing of informational and persuasive essays to develop and lay out students' ideas concerning class topics. This class will require seven in-class essays that are based on class notes and outlines prepared beforehand, and a final presentation. The critical thinking skills they use throughout these reading and writing projects are key to success on both the HiSET exam and in college.
- Introduce yourself and explain how and why you are a strong and supportive teacher.
- Write the following questions on the board:
 - What did you achieve in Semester 1 of the IT Bridge?
 - What did you most enjoy?
 - What did you least enjoy?
 - What do you want to achieve in Bridge Semester 2?
 - Academic goals? Career goals? Personal goals?
- Set up the board to record student goals in three categories: academic, career, and personal goals.

- Put students into pairs and have them take turns answering the questions above as they prepare to introduce each other to the class. They can:
 - \circ Use the questions to interview each other.
 - Ask additional questions to better understand the details.
- Have students introduce their partner by answering the three questions on the board. Write students' goals in the appropriate categories. If a goal is stated more than once, make checks next to it for each student that has that goal.
- After each person has been introduced, ask students if they have thought of other goals they would like to add to the lists. Add these to the appropriate categories on the board.
- Ask the class if there are any general statements they can make about the goals of the students in this class.

Compare student goals with course goals:

- Tell students they are now going to compare the goals they have identified on the board with the formal written goals of the course.
- Pass out the Information Technology Career Bridge Semester 2 Reading and Writing: Goals and Course Features attached to this lesson.
- Go round-robin and have a different student read a course goal aloud: loud, clear, and with feeling!
- After each course goal is read aloud, ask:
 - \circ Is this item already on the list of student goals on the board?
 - If yes, put a star next to the item on the board.
 - If no, ask, "What category does this item go in?" and write the item in the appropriate category.
- When all the course goals have been reviewed, ask:
 - How do the course goals compare to class goals?
 - How do you think this course will help you meet your goals?

Revisit the Self-Assessment and choose goals:

- Pass out the Self-Assessment for Information Technology Bridge Semester 2. Tell students that you want to use these self-assessments for Bridge Semester 2 like they did in semester 1. Then, ask:
 - What were the rules we made for semester 1 regarding:
 - Punctuality?
 - Attendance?
 - Homework completion?
 - Teamwork?
 - Write these rules on the board.
 - Were these rules fair and useful or do we want to amend them for this class?
 - Get students' comments and recommendations.
 - Amend the rules by consensus.
 - What student support strategies did we use in IT Bridge Semester 1?
 - Were these successful?
 - What might we do differently in this class to make sure as many students as possible are successful?
 - Which kinds of goals did you have for yourselves in the IT Bridge Semester 1? Write these on the board.
 - Which goals did you meet?
 - Which goals helped you be successful in this class?
 - Highlight these.
- Have students fill in the goal section of the Self-Assessment for Information Technology Bridge Semester 2 with goals that will have an impact on their success. Students should make sure that the goals are specific.
- Go round-robin to have each student read two goals that they think will make them successful. Encourage students to predict how many HiSET tests they think they will pass by the end of the semester. Help students make their goals as specific as needed.

ACTIVITY #2: Define Big Data and Introduce the Writing Assignment for this Unit – 60 minutes.

Set-up:

- Tell students they will begin their work on Big Data. First, we are going to put together the categories they will need to take notes on for their first writing assignment. Second, we will talk about what we already know about Big Data. Finally, we will look at some videos that will help to understand the concepts better.
- Write these questions on the board:
 - What is Big Data and why is it important?
 - What are some significant examples of Big Data?
 - How do you think Big Data could impact your life?
- Tell students these are the three questions they must take notes on. Their notes will help them prepare for the 45-minute in-class essay next week.
 - This in-class essay will help them become comfortable with taking timed writing exams like the one they will take for the HiSET Writing Test-Part 2. But they are not to worry. They will have the opportunity to re-write all of the in-class essays they need to write for this course.
- To prepare for the exam, it is recommended that they:
 - \circ $\;$ Get out a fresh piece of paper for each reading or video they will watch.
 - Write name of the article or video source.
 - \circ $\;$ Write the three questions on the page with space between each question for notes.
- Tell students they will have time later to organize the most important notes to prepare for their in-class essay.
- Have students write down the three questions on a fresh page in their notebooks.

Opening:

- Write the first question on the board in two columns, using the following headings:
 - What is Big Data?
 - \circ Why is it important?
- Put students in pairs to answer these questions by thinking about:
 - What do we already know from studying the Internet of Things?
 - What do we already know from studying Artificial Intelligence?
- Have students take down notes on their conversations in their notebooks.
- Go from pair to pair to find one thing they know about Big Data. Then, repeat for "Why is it important?"
 - Take notes on students' contributions on the board.
 - Tell students to write these notes down in their notes.

Take notes on video #1: What is Big Data?

- Tell students they will watch a short video called (write this on the board):
 - What is Big Data?
- Students should write this title in their notebooks and take notes on anything missing from our definition.
- Watch the video.
- Have pairs meet briefly to talk about their responses.
- Have a brief discussion based on this question:
 - What did we learn from the video that we could add to our definition of Big Data on the board?
 - \circ $\;$ Add student answers to the notes on the board.

Take notes on video #2 (What is Big Data and How Does It Work?) and video #3 (Big Data Will Change Our World)

- Put two more columns on the board next to the two you already have. Use the following headings:
 - What are the facts about Big Data?

- What are some examples?
- Have students get out a clean sheet of paper and write down the name of the video they will be watching at the top: What is Big Data and How Does It Work?
- Have them take notes on the two newest questions on the board:
 - What are the facts about Big Data?
 - What are some examples?
- Have students write down the questions under the video's title in a simple chart that looks like this:

What is Big Data and How Does It Work?		
What are the facts about Big Data?	What are some examples?	

- Tell students to leave lots of space for taking notes under these questions in this chart.
- Watch the video.
- Tell pairs to talk together to list their facts and examples and add these to their notes.
- Share their findings with the class.
- Repeat this process for the video: Big Data Will Change Our World.

HOMEWORK

READ: Have students read two short articles on The Impact of Big Data on the Digital Advertising Industry and The Pros and Cons of Personalized Marketing. These articles will help them answer the second question for their in-class essay: What are some significant examples of Big Data? While reading the articles, instruct students to:

- For The Impact of Big Data on the Digital Advertising Industry, highlight important parts of the essay that explain how Big Data is impacting digital advertising and define the following words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:
 - o Chaotic
 - Non-intrusive
 - Hyper-localized
 - In-context
 - \circ Incentives
 - o Relevancy
 - Backlash
- For The Pros and Cons of Personalized Marketing, highlight the facts about personalized advertising and how the author feels about personalized advertising. Also, define:
 - Faux pas
 - o Big Brother-esque

TEACHER NOTE #1: Remind students to bring both the articles and their journals to class for the next lesson.

TEACHER NOTE #2: In preparation for the next class, consider creating a Word Wall in your classroom. You will need a number of flip chart pages put up on the wall and a list of the vocabulary words and their definition for the various readings in this course. This Word Wall will help students remember the words they have learned and use them in new contexts as their understanding of the IT field grows. First, do the classroom vocabulary exercises on the board until the words have been clearly determined, and then build the Word Wall based on those definitions, so that all the definitions are familiar to the students.

Information Technology Career Bridge Semester 2: Goals and Course Features

ACADEMIC GOALS:

Become College Ready:

- Read longer and more complex articles to build knowledge relevant to the IT field.
- Continue to use journal writing to connect ideas from readings to your own ideas.
- Use the Internet as a research tool to answer specific questions.
- Learn to take organized notes on class readings, in-class videos, and Internet research.
- Learn to cite and quote sources that support your own ideas.
- Take your first college-credit course while working toward your GED/HiSET exam.

Begin Passing HiSET tests:

- Improve critical thinking skills in reading, writing, and related social studies as preparation for the HiSET test.
- Relate class readings to class writing assignments.
- Practice persuasive writing.
- Practice the 45-minute in-class essay every other week to prepare for the HiSET.

CAREER GOALS:

- Explore topics that are relevant to IT careers.
- Improve teamwork skills through class team and group work that are critical to good performance in the workplace.
- Learn more about jobs with growth opportunities in Big Data and Cybersecurity; understand why IT is at the center of where the world is moving.

ADDITIONAL COURSE DESCRIPTORS:

- There are seven essay assignments and a final presentation for this class.
- The themes for this class are organized into two parts:
 - <u>Part 1</u> focuses on reading and writing in social studies that covers:
 - Benefits of Big Data.
 - Corporate and government issues around Big Data.
 - Solutions that are needed as Big Data expands.
 - **Part 2** focuses on the reading and writing in social studies that covers:
 - The problem of Cybersecurity.
 - National Cybersecurity issues.
 - International Cybersecurity issues.

RECOMMENDATIONS FOR SUCCESS:

- All reading assignments should be organized and kept in a notebook/folder/binder; this way, you can go review them and use them in your final projects.
- Take careful notes on readings and videos to use for essay writing projects. You will receive practice and assistance with on note-taking. These notes can be used to support ideas on class topics.

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The Impact of Big Data on the Digital Advertising Industry

Adapted and paraphrased from original source: <u>https://www.qubole.com/blog/big-data/big-data-advertising-case-study/</u>

Original author: Nate Philip

March 14, 2014

The digital advertising industry is evolving like never before. The ability to capture and analyze massive amounts of data is helping digital advertisers to discover new relationships between people and things, spot emerging trends and patterns, and gain useful insights that make companies more competitive. As a result, traditional advertising is shifting rapidly to personalized and highly targeted online and mobile



ads—which we call data driven marketing. Big Data is now having a big impact on the digital advertising industry, and here are some reasons why.

Finding order among chaos

Successful digital advertising depends upon the ability to collect and analyze data from many sources. The challenge lies in the fact that 80% of that data is unstructured or <u>"chaotic</u>". This is data from sources such as photos, videos and social media posts—data that says so much about us—but cannot be analyzed using traditional methods. By using Big Data analytics platforms, companies are now able to capture, store and analyze all collected data. As a result, digital advertisers can gain fresh and relevant insights from raw chaotic data. The new insights from this data analysis now inform marketing decisions and strategies.

More personalized and targeted ads

Big Data allows digital advertisers to better target users with more personalized ads that they most likely want to see. Google, and now Facebook—the dominant players in digital advertising—have gotten very good at creating and delivering more appealing ads in <u>non-intrusive</u> ways. Ads featuring products and services we might actually want and use to better our lives.

And these more personalized and targeted ads are all based on massive amounts of personal data we constantly provide about what we're doing, saying, liking, sharing—and now thanks to our mobile devices—where we're going. Which brings us to...

Hyper-localized advertising

The huge increase in the use of mobile devices, primarily smartphones, has created a major opportunity for digital advertisers to deliver mobile specific ads to the right people at the right time—in <u>context</u>. Through the combination of social data and location data, stores that shoppers are near and might be interested in can send out ads offering discounts or other <u>incentives</u>— delivered to the shopper's location in real time—to get them to walk through their doors. This kind of advertising has been shown to increase customer engagement and get them to spend more money at targeted locations.

However, there is potential for backlash as some customers may get a creepy feeling upon realizing that advertisers actually know where they are in real-time. As a result, advertisers will need to make some tradeoffs in order to keep their ads effective.

The Pros and Cons of Personalized Marketing

Adapted and paraphrased from original source: <u>http://www.mainstreethost.com/blog/the-pros-and-cons-of-personalized-marketing/</u>

Original author: Olivia Roat

August 30, 2012

I committed a serious <u>faux pas</u> yesterday by willingly giving my money to the coffee chain that is Starbucks. I would much rather buy a coffee at a local coffee shop, where the money I spend stays in my community, but I was in a time crunch, so I shelled out something like \$2.38 for a tall iced coffee at the place that seems to have taken over the entire world by making the process of ordering a caffeinated beverage both exotic and confusing. (My mom refuses to speak the Starbucks lingo, and insists upon ordering a "medium iced vanilla latte" rather than a "grande". It's her own personal form of protest against the "elitist" coffee culture of Starbucks. I don't think the baristas like her.)

For those of you who don't frequent Starbucks (I applaud you. You're stronger than I am), whenever you order a drink, the barista writes your first name on your cup. It's an obvious marketing ploy designed to give coffee drinkers a personalized experience. The problem is baristas usually spell people's names wrong, and when I'm trying to make a quick stop for coffee in the morning, I don't want to take the time to tell someone how to spell my name. A lot can be said for instilling a feeling of familiarity in customers, but I don't think it's necessary at Starbucks. It feels superficial, phony, and inauthentic.

Starbucks and the World

The attempt to give people personalized experiences is not unique unto Starbucks. Personalized marketing is alive and well. Marketers and advertisers try to target people by appealing to their unique needs and desires. Netflix does this. Genius on iTunes does this. I think there are pros and cons to offering people a tailor-made, individualized experience, and my Starbucks experience inspired me to conduct an in-depth investigation on personalized marketing: who's using it and whether or not it's successful.

Take It Personally

HubSpot recently posted on personalized marketing and said this:

Never forget that the key to great marketing is having an in-depth understanding of users. No matter how much technology changes, that never does.

Marketers have been offering consumers individual, custom-made, and relevant products and experiences for decades. The only thing that has changed is the means through which consumers receive these offers. Once upon a time, personalized experiences came primarily through the mail.

Now, personalization comes in many forms. Some marketers use what I think are "softer" tactics, such as trying to capture people's attention by using their first names in emails.

This is a simple approach, but it's smart. Names are the most fundamental part of our identity, so when someone addresses me by my first name, I feel more like an individual and less like just a face in the crowd. Also, emails that are personally addressed to me don't feel as generic. Last month, I

listened in on a webinar featuring Dan Zarrella, who reported that when emails use people's first names, they receive higher click-through rates. Perhaps people *want* to feel like others are talking directly to them (even when they're really not); maybe they appreciate those personable, amiable greetings when so much of our inboxes are filled with a mass of impersonal emails.

Social media sites also use personalized marketing strategies. They try to appeal to my unique tastes and interests. They try to give me a customized experience. I have the option of using "tailored Trends" on Twitter, just in case those trending topics devoted to the ardent worship of Demi Lovato, One Direction, or the Biebs aren't relevant to me. (They aren't.)

I would characterize Facebook advertising as much more aggressive than the email marketing strategy of addressing me by name. With Facebook ads, people collect information on me, gather data on my likes and dislikes, and then serve up ads catered to my unique, individual tastes. Facebook's sponsored stories are akin to the targeted ads that appear when I'm perusing various websites. I do a lot of online shopping, so advertisers have me down cold: ads for clothes and shoes are sprinkled throughout the sites I frequent.

Evidence That Personalization Works

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Aaron Corson, VP of MarketPath: personalization of marketing materials can increase response rates by 36%, response time by 34%, and repeat orders by 46%.

Evidence That Personalization Is Not Preferable

- Pew Research published in March 2012 that people are not a fan of targeted ads: 68% of Internet users view online targeted advertising negatively; they're averse to targeted ads because they don't like having their online behavior tracked and analyzed.
- Pew also reports that the majority of *every demographic group* says they are averse to online targeted ads.
- Additional research confirms that the majority of people are against targeted ads: 69% of American adults feel there should be a law that gives people the right to know everything that a website knows about them.
- Research points out that 92% say there should be a law that requires "websites and advertising companies to delete all stored information about an individual, if requested to do so".

I think there is a fundamental problem when it comes to personalized ads: I think we would be hard pressed to find someone who doesn't want to see ads that are relevant to them. Yet, people don't like the <u>Big Brother-esque</u> way in which websites and ad companies gather personal information in order to generate these ads. To most people, it screams violation of privacy. People may like the end product, but they don't like the process that produces this end product. This is an instance where the ends don't justify the means. I'm torn when it comes to targeted ads and personalized marketing. I like when things are relevant to me. If I have to watch an ad before an SNL clip, I would rather have the ad be related to an interest of mine. But, I'm still annoyed that I'm forced to watch an ad, and if the ads seem to know me a little *too* well, it feels eerily disconcerting, because I never explicitly turned over any personal information. People, including myself, want it both ways: we want <u>relevancy</u>, but we don't want others keeping tabs on us.

ASE Standards Covered for Week 1, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES	STANDARD CATEGORY	STANDARD
 Learn to quote and paraphrase documents. Quote and paraphrase from homework articles. Reading homework. 	READING	 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. Comprehend explicit details and main ideas in text. Summarize details and ideas in text. Make sentence level inferences about details that support main ideas. Infer implied main ideas in paragraphs or whole texts. Determine which detail(s) support(s) a main idea. Identify a theme, or identify which element(s) in a text support a theme. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

THEME: Introducing Big Data

OBJECTIVES

- Learn to quote and paraphrase documents.
- Quote and paraphrase from homework articles.

MATERIALS

Activity #1:

- Video: Plagiarism: How to Avoid It <u>https://www.youtube.com/watch?v=2q0NIWcTq1Y</u> (running time: 02:50)
- Video: Plagiarism Rap (Cite Your Sources) <u>https://www.youtube.com/watch?v=bT6S4ERI0o8</u> (running time: 01:03)
- Video: Melania Trump and Michelle Obama Side-by-Side Comparison <u>https://www.youtube.com/watch?v=RcbiGsDMmCM</u> (running time: 01:42)
- Handout (attached): Make one copy for each student. Simple Citation Template

Activity #2:

- Handout (attached to Week 1, Lesson 1): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 The Impact of Big Data on the Digital Advertising Industry
 https://www.gubole.com/blog/big-data/big-data-advertising-case-study/
- Handout (attached to Week 1, Lesson 1): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand. The Pros and Cons of Personalized Marketing <u>http://www.mainstreethost.com/blog/the-pros-and-cons-of-personalized-marketing/</u>
- Student Work: Students should bring hard copies of their homework assignment.

Homework:

 Handout (attached): Make one copy for each student. LAPD Uses Big Data to Target Criminals <u>http://www.cbsnews.com/news/lapd-uses-big-data-to-target-criminals/</u>

ACTIVITY #1: Learn to Quote and Paraphrase Documents – 60 minutes.

Describe plagiarism and how to avoid it:

- Tell students they will look at the problem of plagiarism and how to avoid it when writing essays based on readings focused on a topic of importance.
 - Put two columns on the board and write the following two questions as headings:
 - What is plagiarism?
 - What is required to avoid plagiarism?
- Go over each question and write students' answers in the appropriate column.
- Have students get out a fresh sheet of paper and put the two questions on the page with space in between for their notes. Tell students to:
 - Write down the name of the video: Plagiarism: How to Avoid It
 - \circ Take notes on new information that is not listed on the board.

- Play the first video: Plagiarism: How to Avoid It
- Ask students each of the questions and take notes on their responses on the board.
- If students need fuller answers, watch the video a second time and ask them to add new information to each of the questions on the board.

Quiz each other on plagiarism:

- Put students in pairs and ask that they:
 - \circ $\;$ Come up with four true statements about plagiarism and how to avoid it.
 - \circ $\;$ Come up with four false statements about plagiarism and how to avoid it.
 - Ask a student to start. The student is to:
 - Read their statement.
 - \circ Other students can raise their hands to answer whether the statement is true or false.
 - They are to choose one of the students to give their answer.
 - If the student is right, that student will read a new statement.
 - If the student is wrong, the first student will call on another student.
- Watch the second video: Plagiarism Rap (Cite Your Sources) to underscore the overall point.

Apply the idea of plagiarism to a real-life incident:

- Tell students they are now going to look at plagiarism in real life.
- Write the following questions on the board:
 - Why is this issue of plagiarism so important?
 - Do you know of any famous incidents of plagiarism?
- Talk to a partner about the answers to their questions and listen to what they think.
- Conduct a discussion on the answers to these questions while taking notes on the board.
- Write a third question on the board:
 - Why was the incident in the video such a big deal?
- Watch the video: Melania Trump and Michelle Obama Side-by-Side Comparison
- Tell students to use their notebooks as a journal and spend five minutes answering the question.
- Conduct a discussion on the significance of Melania's plagiarism.

Set rules:

- Handout the Simple Citation Template.
- Ask students to read the two rules and the examples: loud, clear, and with feeling!
- Ask students to take the time to write one new sentence using each of the rules based on their notes.
- Ask students to read their sentences out loud, one at a time.

ACTIVITY #2: Quote and Paraphrase Homework Articles - 60 minutes.

Start with vocabulary:

- Write the vocabulary words on the board.
- Assign different words to different students.
- Tell each student to read the sentence where the word appears and then define it.
- Write students definitions on the board, then ask:
 - \circ Is this the right definition?
 - Any additions or changes?

TEACHER NOTE: For this and future vocabulary exercises, consider creating a Word Wall in your classroom. You will need a number of flip chart pages put up on the wall and a list of the vocabulary words and their definition for the various readings in this course. This Word Wall will help students remember the words they have learned and use them in new contexts as their understanding of the IT field grows. First, do the classroom vocabulary exercises on the board until the words have been clearly determined, and then build the Word Wall based on those definitions, so that all the definitions are familiar to the students.

Write summaries with citations:

- Tell students they are now going to use what they have learned about citation for this class while they revisit the homework articles in a more detailed way.
- Write the names of the two articles on the board:
 - The Impact of Big Data on the Digital Advertising Industry
 - The Pros and Cons of Personalized Marketing
- Put students in pairs and divide up the following assignments among the pairs.
 - Assignment #1: The Impact of Big Data on the Digital Advertising Industry
 - Summarize the authors' view of how Big Data is impacting digital advertising.
 - Assignment #2: The Pros and Cons of Personalized Marketing
 - Summarize the facts about personalized advertising.
 - Assignment #3: The Pros and Cons of Personalized Marketing
 - Summarize how the author feels about personalized advertising.
- Tell pairs to work together to:
 - Share what they underlined from the article on their topic.
 - Summarize each article in their own words.
 - Go back to the article and select one quote and one part to paraphrase to include in their summaries.
 - \circ $\;$ Write their summaries in their own words with one quote and one paraphrase.
- After pairs have written their summaries, give examples using the following signs:
 - Two fingers from each hand make the quotation signal when they read a quotation.
 - Index fingers from both hands make parentheses when they make a citation.
 - \circ Tap your head and wave when you make an introductory phrase.

TEACHER NOTE: These gestures are a light, fun way to make students aware when they are using sources. These are not processes that would be used, of course, in a formal college setting.

- Have pairs practice their summaries aloud using these gestures.
- Tell students to give their summaries with the gestures.
- After each summary, ask: Do you have any clarifying questions for the summarizers?

Journal writing:

- Have students to get out their journals.
- Tell students to look at the last paragraph of the "Pros and Cons" article and read the following quote (using the correct hand gesture):

"I think there is a fundamental problem when it comes to personalized ads: I think we would be hard pressed to find someone who doesn't want to see ads that are relevant to them. Yet, people don't like the <u>Big Brother-esque</u> way in which websites and ad companies gather personal information in order to generate these ads."

- Write the following on the board:
 - How do you feel about personalized marketing? Is this something that you are comfortable with or do you find it unsettling? Why or why not?

- Tell students to write for seven minutes to answer this question.
- Ask students the questions on the board to get a sampling of their standpoints and their reasons why.

HOMEWORK

READ: Have students read the article, LAPD Uses Big Data to Target Criminals, and complete the following instructions.

- Highlight those parts of the article that best:
 - Describe the LASER program.
 - Identify why some people think it is a good program.
 - Identify why some people think it is a bad program.
- Students may use different color highlighters or different ways of underlining for each topic, such as:
 - Squiggly underlines for one.
 - \circ Double underlines for another.
 - \circ Single underlines for another.

SIMPLE CITATION TEMPLATE

For this class, use one of the following each time you cite a source:

1. Include the last name of the author and the name of the article or video in parentheses after each citation. If there is no author, simply state the name of the article or video in the parentheses.

Examples:

- "Plagiarism is simply using other people's writing or ideas without giving them credit for it." (Plagiarism: How to avoid it)
- "Cite your sources like a freakin' adult! Ha-Ha-Ha!" (Plagiarism Rap)
- It is clear that Melania Trump plagiarized Michelle Obama's 2008 convention speech, because so many portions of her speech were exactly like Michelle Obama's. (Melania Trump and Michelle Obama Side-by-Side Comparison)
- 2. Use one of these phrases, before referring to an article, video, or website:
 - According to (insert name of author and/or title),
 - As indicated by (insert name of author and/or title),
 - \circ As reported by (insert name of author and/or title),
 - o In agreement with (insert name of author and/or title),

Examples:

- According to the video Plagiarism: How to avoid it, there are some very specific ways to cite your sources.
- As indicated in the video Plagiarism Rap, it is important to cite all sources you use, no matter how many.

NOTE: There are more involved ways for citing sources in your essays that are required for college research papers. However, if you get used to using this simple system, using more formal citing systems will be easy to pick up.

LAPD Uses Big Data to Target Criminals

Adapted and paraphrased from original source: <u>http://www.cbsnews.com/news/lapd-uses-big-data-to-target-criminals/</u>

Original author: Roy Brad Howell



November 14, 2014, 1:50 PM

File photo provided by Jupiter Systems, the manufacturer of the display wall processors, shows the Los Angeles Police Department's downtown command center. The LAPD is increasingly relying on technology to track and fight crime.

LOS ANGELES -- Los Angeles police are increasingly relying on technology that not only tells patrol officers where crime is most likely to occur but

also identifies and keeps track of ex-cons and other bad guys they believe are most likely to commit them. Police say the effort has already helped reduce crime in one of the city's most notorious and historically gang-ridden neighborhoods.

"This is a tremendous step forward. Without this, I couldn't do my job," said Capt. Ed Prokop, head of the Los Angeles Police Department division that watches over the grimly nicknamed "Shootin' Newton" area.

The program – part data collection, part lightning-fast computer platform, part street-level intelligencegathering – is expanding in LA with the help of a recent federal infusion of \$400,000 and has drawn interest from departments across North America.

Dubbed LASER for its ability to zero in on offenders and hotspots, it is one of many newer law enforcement tools that use data tracking and collection – such as license plate scanners and cellphone trackers – often with little public knowledge or regulation.

Privacy advocates say LASER isn't transparent, has no clear oversight and unjustly focuses on keeping exconvicts under suspicion even though they've served their time. "People who have paid their debts to society shouldn't remain stigmatized in the eyes of police," said Kade Crockford of the American Civil Liberties Union.

LASER uses technology developed by the CIA's venture capital arm to realize a post-9/11 dream that allows investigators to match up vast amounts of data from 15 separate sources to connect dots that they otherwise might miss.

Funded by federal grants, it launched in 2011 in Newton, and an expansion funded by additional money in October, brought the program to a total of eight areas throughout the city, plus the department's high-tech analysis unit and its helicopters.

More than 3,500 LAPD officers have been trained to use Palantir, a platform that was introduced initially to speed up the process of creating dossiers on chronic offenders and is now used throughout the department for a variety of investigative purposes.

Officials from New York, Nevada, Wisconsin, Washington, Texas and Canada have been briefed on LASER, said Craig Uchida, president of Justice & Security Strategies, Inc., and the program's research partner.

There has been little outside scrutiny of LASER because the nearly \$1 million used to fund it doesn't affect city budgets. Police officials, however, say it works and cite a steady drop in killings in Newton compared to other areas not using the program. There were 39 homicides a year before the program started and 14 last year, they say. And at the end of the first year, 87 of the 124 people the program identified as chronic offenders were arrested at least once for "like crimes," officials said.

Privacy advocates say those statistics alone aren't enough to determine whether the program is effective.

Under the program, police crunch historical data to determine where crimes have frequently occurred so officers can spend more time at those places. It also creates a list of people it considers more likely to commit crimes based on past behavior.

A crime intelligence unit creates the lists by reviewing interview cards officers submit after stopping people on the street. The unit pays special attention to mentions of gun-related crimes or robberies, and people with violent and lengthy criminal histories. Police say the lists, which are marked information only and include a photo and the license plate numbers of vehicles that offenders use, among other information, often become starting points in a violent crime investigation.

Supporters say LASER is different than the New York City police department's "stop and frisk" policy, an anti-street crime program that was deemed unconstitutional because officers primarily targeted minorities who hadn't broken the law. Crockford said the LAPD risks alienating minorities. "You're repackaging old biases in new technologies," she said.

ACLU lawyer Peter Bibring said the bulletins amount to intelligence files on people who may commit crimes – a violation of federal law. Once on the list, he said, "the chances of police scrutiny go up significantly, and your chances of being identified wrongly in a crime."

Bibring said it's also not clear that the program is following the department's own standards for collecting criminal intelligence. An LAPD division was shut down 30 years ago after the public learned it was compiling millions of intelligence files on 55,000 people.

LASER analysts are encouraged to purge lists to remove those who haven't committed a crime in more than six months, but there is no requirement, Uchida said.

David Carter, a former police officer and expert on criminal justice and police surveillance at Michigan State University, said he can understand the civil libertarians' concerns, but that the police are "doing their due diligence" and their actions are based on reasonable suspicion.

Jim Bueermann, the president of the nonprofit Police Foundation, said it makes sense for police to focus limited resources on troubled areas and people, but they must tread carefully because "American policing has a history of abusing this notion of domestic intelligence gathering."

There's a fine line, he said, between being smart on crime and saying that a criminal will always be a criminal. "People do change," he said.

ASE Standards Covered for Week 2, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES		STANDARD
	Analyze the homework article.	READING	 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.
• (Organize your notes for an in-class essay. Writing homework.	WRITING	 4. Produce clear, varied, coherent, consistent, and engaging writing in which the development, organization, style, tone, and voice are appropriate to task, purpose, and audience. Write an analysis based on a given prompt. a. Differentiate between example and reason when given a writing prompt. b. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or evaluating and trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Week 2, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

THEME: Introducing Big Data

Class to be held in the Technology Lab



- Analyze the homework article.
- Organize your notes for an in-class essay.

MATERIALS

Activity #1:

- Handout (attached to Week 1, Lesson 2): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 LAPD Uses Big Data to Target Criminals
 http://www.cbsnews.com/news/lapd-uses-big-data-to-target-criminals/
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

• Multiple markers.

ACTIVITY #1: Analyze Homework Article – 60 minutes.

- Tell students they will summarize the three aspects of the homework article (LAPD Uses Big Data to Target Criminals) that they analyzed. In the summaries, they will get to practice their quoting and paraphrasing skills.
- Put student into pairs and assign each pair one of the topics below. There should be, more or less, the same number of pairs working on each topic.
 - Assignment #1: Describe the LASER program.
 - Assignment #2: Identify why some people think it is a good program.
 - Assignment #3: Identify why some people think it is a bad program.
- Have pairs:
 - Share what they highlighted for this topic.
 - \circ Highlight parts of the article that their partner found and that they did not.
 - Review the article to make sure they didn't miss anything.
 - Prepare a summary on their assignment using one quote and one paraphrase.
 - Make sure that they use quotation and parentheses gestures when they present their summaries.
 - Two fingers bobbing up and down on each hand for quotations.
 - Index finders making parentheses after the quotation and the paraphrase.
 - Tap your head and wave when you make an introductory phrase.

TEACHER NOTE: These gestures are a light, fun way to make students aware when they are using sources. These are not processes that would be used, of course, in a formal college setting.

- Have pairs read out their summaries with the gestures. Their reading should be loud, clear, and with expression! Also:
 - Have all the pairs who worked on the same assignment present one right after another.
 - After each summary, ask the class: Do you have any questions, comments, or additions?
- After all the summaries, ask:
 - Does the LASER program seem necessary or useful? Why or why not?

ACTIVITY #2: Organize Your Notes for Your First In-Class Essay – 60 minutes.

- Tell students they will create a full outline of their notes so they will be prepared for their in-class essay during the next class.
- Write the in-class essay writing assignment on the board:
 - What is Big Data and why is it important?
 - What are some significant examples of Big Data?
 - How do you think these changes could impact your life?
- Create a table on the board with three rows for the three questions and six columns, but no headings on the columns.
- Have students get out their notebooks to identify the different videos and articles sources that they have watched or read so far.
- Have students call out a source.
 - Give each student who called out a different source a different marker.
 - \circ $\;$ Tell them to write the name of their source as a heading for one of the columns.
 - Repeat this process until all six columns have headings.
- Put students into six groups and assign them each a different source. If there are too few students for this, divide the class into three groups and give each two sources.
- Have pairs or groups to review their notes on their assigned source to determine:
 - How did the source define Big Data?
 - What examples of Big Data did your source offer?
 - When you have these answers, write them in note form in the appropriate column on the board.
- Once all the information is on the board, tell each group to present their notes.
- Put students back in their groups to define Big Data in their own words and explain why it is important.
- Next, have students select the examples they want to use in their essay.
- Go round-robin and ask students:
 - What examples are you selecting for your essay?
 - Why are you selecting these examples?
 - How do you think Big Data will affect your life?
- Put students in pairs to talk through their essays based on the questions on the board.
 - Listeners should ask questions to make clear what the speaker is saying.
- When students are finished, say that they should be ready to quote or paraphrase sources in their "example" paragraphs. Review with students how that would work.
- Tell students their homework is to put together an outline that will remind them of everything they want to say in each paragraph. Their outline should include:
 - What they want to say in the introductory paragraph that will answer the first question.
 - What they want to say in each of their two body paragraphs that will answer the second question.
 Use one quote and one paraphrase in your example paragraphs.
 - Use one quote and one paraphrase in your example paragraphs.
 - What they want to say in their conclusion paragraph that will answer the third question.
- Tell students their outlines must be in note form. They are NOT to write out their essay before the next class.
- To demonstrate what their outlines should look like, call on a student, and ask them:
 - What ideas are they are using to answer each of the essay questions?
 - Write these separately on the board or overhead.
 - \circ $\;$ What evidence supports each of their ideas?
 - List the supporting details in note form, indented under each of the stated ideas.
- Repeat as necessary.

HOMEWORK

WRITE: Have students write an outline of notes to remind them what they want to say in each paragraph.

ASE Standards Covered for Week 2, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

C	DBJECTIVES	STANDARD CATEGORY	STANDARD
•	Write an in- class essay.	WRITING	 Write arguments from a prompt in a formatted manner of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
			 a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence.
			b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level concerns, values, and possible bigses
			 c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
			 d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
			 Provide a concluding statement or section that follows from and supports the argument presented.
•	Conduct the	READING	5. Analyze the structure of texts, including how specific sentences or
	peer review		paragraphs relate to each other and the whole.
	process.		a. Analyze how a particular sentence, paragraph, chapter, or section
			fits into the overall structure of a text and contributes to the
			development of the ideas.
			b. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another).
			c. Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, otherwise) and determine how they refine meaning, emphasize certain ideas, or reinforce an author's purpose.
			 Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose.
			6. Determine an author's purpose or point of view in a text and explain how it is conveyed and shapes the content and style of a text.
			a. Determine an author's point of view or purpose of a text.
			 Analyze how the author distinguishes his or her position from that of others or how an author acknowledges and responds to conflicting evidence or viewpoints
			 c. Infer an author's implicit as well as explicit purposes based on details in text.
			d. Analyze how an author uses rhetorical techniques to advance his or her point of view or achieve a specific purpose (e.g., analogies, enumerations, repetition and parallelism, juxtaposition of opposites, qualifying statements).

•	Reading	READING /	READING
	homework.	LANGUAGE	
			 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
			Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas.
			a. Comprehend explicit details and main ideas in text.
			b. Summarize details and ideas in text.
			 Make sentence level inferences about details that support main ideas.
			d. Infer implied main ideas in paragraphs or whole texts.
			e. Determine which detail(s) support(s) a main idea.
			theme.
			g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations.
			 h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.
			LANGUAGE
			 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies.
			 a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.
			 b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable).
			 c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a
			dictionary).
			6. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

THEME: Introducing Big Data

OBJECTIVES

- Write an in-class essay.
- Conduct the peer review process.

MATERIALS

Activity #1:

• Student Work: Students should bring hard copies of their homework outline of notes.

Activity #2:

• Handout (attached): Make two copies for each student. Audience Comment Page

Homework:

- Handout (attached): Make one copy for half of the class. The Real Story of How Big Data Analytics Helped Obama Win <u>http://www.infoworld.com/article/2613587/big-data/the-real-story-of-how-big-data-analytics-helped-obama-win.html</u>
- Handout (attached): Make one copy for half of the class. Obama Changed the Political Campaign with Big Data <u>https://datafloq.com/read/big-data-obama-campaign/516</u>

ACTIVITY #1: Write an In-Class Essay – 60 minutes.

- Tell students they will write an in-class essay. They have 45 minutes and are welcome to take the full time.
- Tell them to relax and trust that they are prepared. Also, this is a first draft and they can improve it later.
- Students should focus on their ideas and their outlines to help them explain what they have to say to a real audience.
- Have students write a timed, 45-minnute essay.

ACTIVITY #2: Conduct the Peer Review Process - 60 minutes.

- Tell students they will provide constructive feedback on each other's essays. Remind them that they are the audience that the writer is happy and comfortable with; the audience simply wants to understand the writer's ideas and offer suggestions for improvement.
- Put students into groups of three.
- Pass out two copies of the Audience Comment Page to each student. Explain that they will:
 - Read the essays written by the other two people in their group.
 - Fill out one Audience Comment Page for each of the essays they read.
 - They are NOT to comment on grammar or spelling yet. However, if they are not sure what something says, they can ask the writer for clarification.
 - They should be friendly, encouraging, and helpful. Valuable comments on their partner's work will help them when they have to rewrite their final essay.
- Have students pass their essays to the left.

- After students have evaluated the first essay, they should pass the essay they have worked on to their left and evaluate a new essay.
- After students have evaluated two essays, they should give their evaluations to the authors, and the authors should read the comments.
- Ask the class as a whole:
 - Did your evaluators say the same or different things?
 - Did your evaluators say things that gave you ideas for how to make your essay better?
 - Did your evaluators confuse you? Ask for clarification when back in your group.
- Tell students that you will also evaluate their essays so they will each have three reviews to help them with their rewrites. Have students hand in their essays along with the two evaluations from their peers.

TEACHER NOTE: Evaluate the student essays using a copy of the *Audience* Comment Page. Read both the essays and the student comments to see how perceptive the student reviewers were. Your comments can provide suggestions or offer a different way to evaluate their essays that you think would be helpful. <u>Do not correct</u> everything in the students' drafts. Only mark those errors in the text that would help the student make significant progress toward a better essay. <u>In your comments, indicate a due date for rewrites of these drafts.</u>

HOMEWORK

READ: Create two groups and assign each group one of the two homework articles. Have students highlight facts that will help them explain the most important elements of the article to other students.

- For The Real Story of How Big Data Analytics Helped Obama Win, also have students define these words from the context of the sentence, if possible:
 - Statistical wizard
 - o Polls
 - Punditry
 - o Electorate
 - o Implemented
 - o Buy-in
- For Obama Changed the Political Campaign with Big Data, also have students define these words from the context of the sentence, if possible:
 - Swing state
 - Inconsistent voter
 - o Persuadable
 - Positive feedback loop

AUDIENCE COMMENT PAGE

WRITER_____ READER_____

1. What about this essay do you think worked well?

2. What topic(s) do you want to hear more about? What kinds of new information would make the essay more interesting?

3. What other questions do you have for the writer (think of two or three)?

The Real Story of How Big Data Analytics Helped Obama Win

Adapted and paraphrased from original source: <u>http://www.infoworld.com/article/2613587/big-data/the-real-story-of-how-big-data-analytics-helped-obama-win.html</u>

Original author: Andrew Lampitt

You may have heard how <u>statistical wizard</u> Nate Silver predicted the electoral votes for each state in the 2012 presidential election, showing that raw data crunching of <u>polls</u> is much more reliable than traditional <u>punditry</u>. What you probably haven't heard is how the Obama campaign built a 100-strong analytics staff to churn through dozens of terabytes of data with a combination of the HP Vertica MPP (massively parallel processing) analytic database and predictive models with R and Stata to gain a competitive edge.

Credit for the Big Data approach goes to Obama campaign manager Jim Messina, who decided to dive headfirst into an analytics-driven campaign. Messina commented, "We were going to demand data on everything, we were going to measure everything...we were going to put an analytics team inside of us to study us the entire time to make sure we were being smart about things." To ensure everything was measured, staff were evaluated on whether they entered data. The mantra became: "If you didn't enter the data, you didn't do the work."

Boots on the ground

Of the 100 analytics staffers, 50 worked in a dedicated analytics department, 20 analysts were spread throughout the campaign's various headquarters, and another 30 were in the field interpreting the data.

Chris Wegrzyn, director of data architecture for the Democratic National Committee, described the challenges, opportunities, and path to build the analytics-driven campaign. Wegrzyn noted that the key measurements centered on the data itself, modeling, and experimentation. The core data contained the facts about the <u>electorate</u> and the campaign operation. Modeling was used to understand the electorate at the individual voter level. Finally, evaluating the results of experiments helped the campaign learn how its actions actually influenced people.

Of course, the key performance indicator for the campaign was the number who planned to vote for Obama, divided by those who planned to vote overall. The campaign understood there were three ways to maximize that number: registration, persuasion, and turnout. They had to encourage their target audience of voters to register, persuade the undecided to vote for Obama, then do all they could to ensure that Obama voters would show up to vote on Election Day.

Marshaling the troops

To appreciate the challenges, it's important to understand how the campaign was organized into different teams. The field team was the personal face of the campaign: the people on the ground organizing volunteers, handling registrations, encouraging turnout, and so on. The digital team was responsible for online presence, email campaigns, online fundraising, social media, and more. The communications and media teams were responsible for Obama's personal messaging with interviews, ad buying, and so on. Finance focused on the overall campaign fundraising strategy.

In the past, all these departments had used sophisticated analytic technologies -- but had <u>implemented</u> their individual analytic approaches independently. The 2012 campaign changed all that.

The right people were important to make a unified analytics environment a reality. Executive <u>buy-in</u> from the campaign manager Messina was essential; without that authority, any ambitious initiative might have been sidestepped or dropped altogether. In addition, the core team had strong analytic experience from previous campaigns -- and highly talented analytic staff hired at well below the market rate.

Obama Changed the Political Campaign with Big Data

Adapted and paraphrased from original source: <u>https://datafloq.com/read/big-data-obama-campaign/516</u>

Original author: Mark van Rijmenam

During the 1.5 year prior to the Election Day in November 2012 in total over \$1.5 billion was collected and spent during the Obama campaign. In addition, over 1,000 paid staff worked on the campaign, 2.2 million volunteers and, in total, more than 100 data analysis who ran more than 66,000 computer simulations of potential election results every day. The objective of the campaign set out by Jim Messina was to "measure everything". The idea was to demand data on everything that happened during the campaign in order to measure everything and ensure that they were being smart about everything.

One Metric

During a webinar, organized by HP Vertica, Chris Wegrzyn – Director of Data Architecture of the <u>DNC</u>, explained that in order to do this, they had defined three major ways to influence the campaign:

- 1 Registration: Increase the number of voters who were eligible to vote;
- 2 Persuasion: Convince voters to vote for Obama;
- 3 Turnout: Increase the turnout on the actual Election Day.

Each potential <u>swing-state</u> voter would be assigned one number, ranging from 0-100. There were four different scores based on the three different ways to influence:

- The likelihood that they would support Obama;
- The likelihood that they would show up at the poll;
- The odds that an Obama supporter who was an <u>inconsistent voter</u> could be nudged to the polls;
- How <u>persuadable</u> someone was by a conversation on a particular issue;
- This metric would be at the heart of the campaign and would influence the message send to a swing-state voter.

Fragmented Data Sources

In order to effectively manage all this during the campaign they divided the campaign team in different channels:

- The Field channel (actively approach voters in the field);
- Digital channel (focusing on recruitment of staff and volunteers and fundraising);
- Media (focused on buying media time);
- Finance (fundraising).

The problem with these different channels was, however, that all data was fragmented and that an overview was difficult to achieve. That was when Big Data made its appearance in the campaign.

During the previous campaign they learned a lot regarding new technologies and use of social media. and now it was time to move forward. The new technologies used in 2008 and analytics captured during that campaign allowed them to build an <u>unprecedented</u> massive efficient measurable program that field staff could evaluate based on data entered. From the introduction of new technologies and a data focus in

2008, it was now time to move to data modeling and deep analytics. In 2012 the objective was to build an analyst- driven organization and an environment for smart people to freely pursue their (data-driven) ideas.

Three Dimensions

The DNC determined three dimensions to focus upon for the 2012 election:

- **Volume:** according to Big Data standards, the amount of raw data they had, was small. They had under 10 TB to start with, but because they let their analysts pursue their data-driven ideas, they were able to gather tenfold more raw data in a very short timeframe.
- **Variety:** The team collected many sources of data; much of it new to the DNC. Because of the short time span, they did not have time to build ETL processes to bring it all together nicely.
- **Velocity**: The data analysts, staff and volunteers created new data at high-speed and that needed to be taken care of.

MPP Database

In order to cope with all this they decided to use a MPP Database, a Massively Parallel Processing database built by HP Vertica. They used this because of familiarity and simplicity. It has a high-speed performance, it is stable and it is very scalable, meaning it could easily grow with the needs of the DNC.

On top of this they had built a <u>positive feedback loop</u>, so that the engineers could build on top of each other. This proved to be a powerful tool and it led to unexpected innovations. For example, with the new system, volunteers who came to the door of potential voters could provide them with tailored news information on a phone on a topic they had said they were interested in. They could also, instantly, follow-up with a personal e-mail that was sent by the local field agent, to keep things personal. All this was done automatically.

Just as Obama did in 2008, the campaign changed the playing field and raised the bar for future campaigns. What will happen to the massive amounts of data collected is yet unclear. The Washington Post reported earlier that other Democratic candidates are eager to use that data for their own campaigns, however it is unclear whether the DNC has sufficient resource (financial and technological) to manage and maintain all data produced.

ASE Standards Covered for Week 3, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Create and present homework article summaries.	SPEAKING AND LISTENING	8. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
	Learn more about Obama's election and Big Data.	READING	 7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words. a. Analyze how data or quantitative and/or visual information extends, clarifies, or contradicts information in text, or determine how data supports an author's argument. b. Compare two passages that present related ideas or themes in different genre or formats (e.g., a feature article and an online FAQ or fact sheet) in order to evaluate differences in scope, purpose, emphasis, intended audience, or overall impact when comparing. c. Compare two passages that present related ideas or themes in different genre or formats in order to synthesize details, draw conclusions, or apply information to new situations. 9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take. a. Draw specific comparisons between two texts that address similar themes or topics or between information presented in differents (e.g., between information presented in a table or timeline). b. Compare two passages in similar or closely related genre that share ideas or themes, focusing on similarities and/or differences in perspective, tone, style, structure, purpose, or overall impact. c. Compare two argumentative passages on the same topic that present opposing claims (either main or supporting claims) and analyze how each text emphasizes different evidence or advances a different interpretation of facts.

• Reading homework.	READING	 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
		 Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. Comprehend explicit details and main ideas in text. Summarize details and ideas in text. Make sentence level inferences about details that support main ideas. Infer implied main ideas in paragraphs or whole texts. Determine which detail(s) support(s) a main idea. Identify a theme, or identify which element(s) in a text support a theme. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

THEME: Benefits of Big Data

OBJECTIVES

- Create and present homework article summaries.
- Learn more about the relationship between Obama's election and Big Data.

MATERIALS

Activity #1:

- Classroom Resource: Flip chart paper and markers.
- Handout (attached to Week 2, Lesson 2): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand. The Real Story of How Big Data Analytics Helped Obama Win <u>http://www.infoworld.com/article/2613587/big-data/the-real-story-of-how-big-data-analytics-helped-obama-win.html</u>
- Handout (attached to Week 2, Lesson 2): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 Obama Changed the Political Campaign with Big Data https://dataflog.com/read/big-data-obama-campaign/516
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

- Video: Obama Campaign Manager Jim Messina Talks Big Data <u>https://www.youtube.com/watch?v=mZmcyHpG31A</u> (running time: 10:57)
- Video: How Did Big Data Help Obama Campaign? <u>http://www.bloomberg.com/news/videos/b/78661fa3-93fc-41dd-a1a0-28dc7ac685e5</u> (running time: 04:57)

<u>Homework:</u>

 Handout (attached): Make one copy for each student. Trump's Big Data Gamble <u>http://www.wsj.com/articles/trumps-big-data-gamble-1469395312</u>

ACTIVITY #1: Create and Present Homework Article Summaries – 60 minutes.

Introduction

- Tell students they will spend the next two weeks looking at the benefits of Big Data. They will need to take notes on homework and in-class materials to answer the following three questions for the in-class essay. Suggest that students write these questions down in their notebooks:
 - What are the overall benefits of Big Data?
 - What are two examples of how Big Data can be used to improve people's lives?
 - Again, one quote and one paraphrase are required for these body paragraphs.
 - How do you think society will be improved by this use of Big Data?
- Tell students they need to write down all sources in their notes, and put their notes on the source under the title in their notebooks. If they have done an in-class exercise that helps them understand a homework article better, they should write down the name of the article they are working on and take notes on the work they do with other students in their notebooks. They should also write down the article title and notes about that article

when they are listening to presentations from other groups. In other words, they can use information from any activity for their in-class essay. So be alert! Take good notes! Copy things off the board! Pay attention! By being organized and alert in this way, preparing for the in-class essay will be much easier.

- Tell students that we will start with the benefit of Big Data to Barack Obama's two election campaigns.
- First, have a short discussion on campaigns in general.
- Write the following two questions on the board:
 - In general, what do people have to do to get elected for public office?
 - Leave out the use of Big Data for now.
 - What things, people, and activities are needed?
- Put students in pairs to talk through their answers to these questions and write a list of all the things people need to do to get elected.
- Put one column on the board with the heading: "In general, people need to do the following to get elected:"
- Go from pair to pair to get one thing that people need to do to get elected and write it on the board.
 - \circ Keep going from pair to pair until you have everything on students' lists.

Create article summaries:

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- Write the following on the board:
 - Article #1: The Real Story of How Big Data Analytics Helped Obama Win
 - Article #2: Obama Changed the Political Campaign with Big Data
- Ask which students read which article for homework and put their names next to the articles title.
- Put students in groups of 2-3 to:
 - Make a master list of facts that they got from the article.
 - Highlight the most important facts on their list.
 - \circ Come up with a plan to teach the other group the most important facts from the article.
 - \circ $\;$ Include one quote and one paraphrase in their presentation.
 - Be sure to use the gestures for quotation marks and parenthesis in their teaching.
 - Use flip chart paper and markers as the group chooses.
 - \circ $\;$ Give each member in the group a role to play in the teaching summary.
- Have groups give their summaries:
 - Tell students to listen and take notes on what they learn.

ACTIVITY #2: Learn More About the Relationship Between Obama's Election and Big Data – 60 minutes.

- Tell students they will watch two videos to see if they can get any more information about how Obama won the elections in 2008 and 2012.
- Create two columns on the board and in notebooks. Have students write the names of the following two sources as headings:
 - Video #1: Obama Campaign Manager Jim Messina Talks Big Data
 - o Video #2: How Did Big Data Help Obama Campaign?
- Have students write down the name of the first source in their notebooks and to leave space below for notes.
- Tell students to write down any facts from the videos they did not get from the articles.
- Watch the first video: Obama Campaign Manager Jim Messina Talks Big Data.
- Go round-robin for new facts and record them on the board in the appropriate columns.
- Repeat this process for the second video: How Did Big Data Help Obama Campaign?
- After they have watch both videos, ask:
 - How did the Obama campaign use Big Data to win the elections in 2008 and 2012?
 - \circ What did those campaigns do that no other campaign had done before?
 - \circ Do you think that the use of Big Data is a step forward for the election process or not?
 - o Why?

HOMEWORK

READ: Have students read the article, *Trump's Big Data Gamble*, and complete the following instructions.

• Define the following words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:

- Unorthodoxies
- Tailored messages
- Pandering
- Libertarian
- Resonate
- Correlation
- Highlight those parts of the article that best:
 - Describe how Obama used Big Data.
 - Describe how Clinton uses Big Data.
 - How Trump plans to use Big Data and/or social media.
- Students may use different color highlighters or different ways of underlining for each topic, such as:
 - \circ Squiggly underlines for one.
 - \circ Double underlines for another.
 - \circ Single underlines for another.
Trump's Big Data Gamble

Adapted and paraphrased from original source: <u>http://www.wsj.com/articles/trumps-big-data-gamble-1469395312</u>

Original author: L. Gordon Crovitz

While he tweets to the masses, Hillary will be precisely targeting persuadable voters.

July 24, 2016 5:21 p.m. ET

Among Donald Trump's <u>unorthodoxies</u> is his campaign's refusal to use Big Data. "I've always felt it was overrated," Mr. Trump said in May. "Obama got the votes much more so than his data-processing machine. And I think the same is true with me."

David Plouffe, who ran Barack Obama's campaign in 2008, tweeted: "Trump now wants to ban data and modeling from his campaign. Agree with him that Obama got the votes not data. But flying blind is nuts."

They have reason to laugh. Campaign professionals in both parties agree the Democrats have a large lead in information about voters—and that smart use of data can make the difference, at least in close elections. When she officially becomes the party's nominee this week, Hillary Clinton will inherit the database Mr. Obama's team built over two campaigns.

In 2008, the Obama campaign gathered so much information that it was "confident it knew the name of every one of the 69,456,897 Americans" who voted for him, according to journalist Sasha Issenberg. The 2012 campaign built a fully merged database Republicans have yet to match.

"We are going to measure every single thing in this campaign," Obama campaign manager Jim Messina said in 2011. His team built a database connecting personal data from traditional sources, such as reports from field workers and pollsters, with voters' social-media posts and other online behavior, plus commercial consumer data of the sort that online retailers and credit agencies use.

That allowed precise targeting of the most "persuadable" voters. "We knew who these people were going to vote for before they decided," an Obama data scientist told Mr. Issenberg. Voters were hit with <u>tailored messages</u>. In one case, the campaign sent seven different customized email invitations to one fundraising dinner in New York.

Mitt Romney 's smaller data team started out behind and never caught up. After the Democrats' 2012 victory, they created the Project Legacy database, which Mrs. Clinton inherits this week. Now Mr. Trump, behind in data by two election cycles, doesn't think he needs to worry about the data he lacks—a known unknown for his campaign.

As a celebrity-politician, Mr. Trump uses social media brilliantly. By one estimate the free publicity he has drawn is the equivalent of \$2 billion in advertising. But that's very different from how analytical marketers target and persuade prospects, whether for orange juice or presidential candidates.

It may be <u>pandering</u>, but the Obama campaigns proved it works. Democrats are updating the existing database with voter profiles based on how they voted in local elections, which magazines they read, their bank balances and the health topics they search online. Republicans using the #NeverTrump hashtag should expect to be targeted by the Clinton campaign with custom messages on the virtues of voting <u>Libertarian</u> or staying home. Other messages will highlight Mr. Trump's negatives while minimizing Mrs. Clinton's.

Reports say her hundreds of data scientists are working especially closely with Facebook to leverage each voter's social network. The campaign is testing which messages <u>resonate</u> best with each prospective voter. It will also use Facebook to remind Mrs. Clinton's supporters to urge likeminded friends and relatives to go to the polls.

A Pew Research Center study last week uncovered a new way the Clinton campaign is using Facebook to gather more information about voters. It found that 80% of the links on the campaign's Facebook account link to pages on the campaign's website, where more user data can be captured. In contrast, 78% of the links on the Trump Facebook account take users to news articles on media sites, where his campaign has no ability to track users or mine their data.

Campaign strategists say Big Data is especially valuable in close presidential races, in which some votes matter more than others. In 2012 Mr. Obama's data scientists ran more than 60,000 election simulations every night to figure out in which states to allocate resources, and which counties in those states were the most promising sources of votes.

The Trump campaign might hope this is the year voters resent how their information is used to market to them. But consumers seem to have gotten used to being targeted by commercial marketers, so Mr. Trump probably can't count on outrage over Democrats' making smarter use of data.

Mr. Trump may not like it, but data from past presidential elections finds an undeniable <u>correlation</u>: The candidate with the best data is the winner.

ASE Standards Covered for Week 3, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Analyze the homework articles.	READING	 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require eventations in ferminications.
•	Watch a video on the history of science and Big Data. Watch two videos on the benefits of Big Data.	WRITING	 7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in a. Analyze how data or quantitative and/or visual information extends, clarifies, or contradicts information in text, or determine how data supports an author's argument. b. Compare two passages that present related ideas or themes in different genre or formats (e.g., a feature article and an online FAQ or fact sheet) in order to evaluate differences in scope, purpose, emphasis, intended audience, or overall impact when comparing. c. Compare two passages that present related ideas or themes in different genre or formats in order to evaluate differences in scope, purpose, emphasis, intended audience, or overall impact when comparing. c. Compare two passages that present related ideas or themes in different genre or formats in order to synthesize details, draw conclusions, or apply information to new situations.

		 9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take. a. Draw specific comparisons between two texts that address similar themes or topics or between information presented in different formats (e.g., between information presented in text and information or data summarized in a table or timeline). b. Compare two passages in similar or closely related genre that share ideas or themes, focusing on similarities and/or differences in perspective, tone, style, structure, purpose, or overall impact.
• Writing homework.	WRITING	 4. Produce clear, varied, coherent, consistent, and engaging writing in which the development, organization, style, tone, and voice are appropriate to task, purpose, and audience. Write an analysis based on a given prompt. a. Differentiate between example and reason when given a writing prompt. b. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or evaluating and trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

THEME: Benefits of Big Data

OBJECTIVES

- Analyze the homework articles.
- Watch a video on the history of science and Big Data.
- Watch two videos on the benefits of Big Data.

MATERIALS

Activity #1:

- Handout (attached to Week 3, Lesson 1): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand. Trump's Big Data Gamble http://www.wsj.com/articles/trumps-big-data-gamble-1469395312
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

- Handout (attached): Make one copy for each student. Note Taking Questions for Video #1
- Video: The Human Face of Big Data/Under the Data Microscope http://www.pbslearningmedia.org/resource/bigdata_stem_data_microscope/ the-human-face-of-big-data-under-the-data-microscope/ (running time: 02:37)

<u>Activity #3</u>:

- Handout (attached): Make one copy for each student. Note Taking Questions for Video #2 and Video #3
- Video: The Human Face of Big Data/Prison Geography <u>http://www.pbslearningmedia.org/resource/bigdata_stem_million_dollar_blocks/the-human-face-of-big-data-prison-geography/</u> (running time: 03:07)
- Video: The Human Face of Big Data/Monitoring Health <u>http://www.pbslearningmedia.org/resource/bigdata_stem_health/the-human-face-of-big-data-monitoring-health/</u> (running time: 02:43)

ACTIVITY #1: Analyze the Homework Articles – 40 minutes.

- Tell students they will look at how the 2016 candidates used Big Data and if it had any impact on the election outcome.
- Ask:
 - Did the author of this article make the right prediction?
- Tell students now they are going to analyze the use of Big Data in the Obama, Clinton, and Trump campaigns.
- Have students write down the source in their notebooks: *Trump's Big Data Gamble*, and prepare to take notes on student summaries.
- Have students count off by three, put them in three groups, and give each one of the following assignments:
 - Group #1: Barack Obama
 - Group #2: Hilary Clinton
 - Group #3: Donald Trump

• Have each group:

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- Make a master list of facts in the article about their candidate.
- \circ Fashion a summary of those facts using one quote and one paraphrase.
 - Remember to incorporate the gestures for quotations and paraphrases.
 - Plan how to deliver their summary.
- Have the groups deliver their summaries.
- After the summaries, ask:
 - Did Big Data play an important role in the outcome of the election?
 - Why or why not?
 - Is Big Data a benefit for the politicians? The electorate? Both? None?

ACTIVITY #2: Watch a Video for on the History of Science and Big Data – 30 minutes.

- Tell students they are now going to watch a short video that places Big Data in the history of science.
- Pass out Note Taking Questions for One Video.
- Have different students read the questions: loud, clear, and with expression!
- Watch the video: The Human Face of Big Data/Under the Data Microscope.
- Ask if students want to watch the video again so they can glean more information.
- Put students in pairs to talk over their answers.
- Answer the questions as a class.

ACTIVITY #3: Watch Two Videos on the Benefits of Big Data – 50 minutes.

- Tell students they will watch two more videos, each that presents a possible benefit of Big Data.
- Pass out Note Taking Questions for Two Videos.
- Prepare to watch the first video by:
 - Having students read the questions out loud for the first video: loud, clear, and with feeling!
- Watch the first video: The Human Face of Big Data/Prison Geography, and have students take notes.
- Put students in pairs to discuss their answers to the questions.
- Go over the questions as a class.
- Repeat this process for the second video: The Human Face of Big Data/Monitoring Health.

HOMEWORK

WRITE: Have students write a summary of a benefit of Big Data using one of the examples we worked on today. Choose one of the following questions to answer:

- How will Big Data be able to inform prison policy?
- How will Big Data be able to inform healthcare policy?

Make sure their summary fully explains what kind of information is being collected, what the data are telling us, and how this new information could inform what we do as a society.

NOTE TAKING QUESTIONS FOR VIDEO #1: The Human Face of Big Data/Under the Data Microscope

1. What did Copernicus figure out?

2. What have microscopes helped us explore?

3. How is Big Data a new kind of microscope?

4. Why has the "Search" button on your computer caused such a revolution?

5. What does the commentator mean when he says that "we are in the first minute of the first inning of the game"?

NOTE TAKING QUESTIONS FOR VIDEO #2: The Human Face of Big Data/Prison Geography

1. What did Big Data show about the where people returned after prison?

2. What are million dollar blocks?

3. What change does the data suggest is needed?

NOTE TAKING QUESTIONS FOR VIDEO #3: The Human Face of Big Data/Monitoring Health

- 1. What kinds of health information could we be tracking?
- 2. What kinds of information can be found when Big Data tracks hundreds of thousands of people's personal data?
- 3. How could this information impact our society?

ASE Standards Covered for Week 4, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJE	CTIVES	STANDARD CATEGORY	STANDARD
Conduration review summer	uct a peer w of aries.	READING	 5. Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole. a. Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas. b. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another). c. Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, otherwise) and determine how they refine meaning, emphasize certain ideas, or reinforce an author's purpose. d. Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose. 6. Determine an author's purpose or point of view in a text and explain how it is conveyed and shapes the content
 Watc video Data health Repor learna assign the classing 	h assigned s on Big and ncare. rt what you ed in your ned video to ass.	SPEAKING AND LISTENING	 and style of a text. a. Determine an author's point of view or purpose of a text. b. Analyze how the author distinguishes his or her position from that of others or how an author acknowledges and responds to conflicting evidence or viewpoints. c. Infer an author's implicit as well as explicit purposes based on details in text. d. Analyze how an author uses rhetorical techniques to advance his or her point of view or achieve a specific purpose (e.g., analogies, enumerations, repetition and parallelism, juxtaposition of opposites, qualifying statements). 8. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

• Writing WRITING homework.	 4. Produce clear, varied, coherent, consistent, and engaging writing in which the development, organization, style, tone, and voice are appropriate to task, purpose, and audience. Write an analysis based on a given prompt. a. Differentiate between example and reason when given a writing prompt. b. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or evaluating and trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
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Week 4, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

THEME: Benefits of Big Data

Class to be held in the Technology Lab



OBJECTIVES

- Conduct a peer review of summaries.
- Watch assigned videos on Big Data and healthcare.
- Report what you learned in your assigned video to the class.

MATERIALS

<u>Activity #1:</u>

- Handout (attached to Week 2, Lesson 2): Make two copies for each student. Audience Comment Page
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

- Handout (attached): Make one copy for each student. Note Taking Questions for Big Data and Healthcare
- Video: The Human Face of Big Data/Malaria Disaster <u>www.pbslearningmedia.org/resource/bigdata_stem_malaria/the-human-face-of-big-data-malaria-disaster</u> (running time: 04:56)
- Video: The Human Face of Big Data/Personalized Medicine www.pbslearningmedia.org/resource/bigdata_stem_medicine/the-human-face-of-big-data-personalizedmedicine (running time: 03:43)
- Video: The Human Face of Big Data/The Smallest Heartbeat www.pbslearningmedia.org/resource/bigdata stem babies health/the-human-face-of-big-data-the-smallestheartbeat (running time: 03:41)
- Video: The Human Face of Big Data/Google Predicts the Flu <u>www.pbslearningmedia.org/resource/bigdata stem flu patterns/the-human-face-of-big-data-google-predicts-the-flu</u> (running time: 02:15)

ACTIVITY #1: Conduct a Peer Review of Summaries – 40 minutes.

- Tell students they will provide constructive feedback on each other's summaries. Remind them that they are the audience that the writer is happy and comfortable with, and the audience simply wants to understand the author's ideas and provide suggestions for making the written work more interesting.
- Ask:
 - What are our criteria for good summaries?
 - Put the criteria that students remember on the board.
 - Why must we always keep our audience in mind?
 - Who is our audience?
 - Someone who has not been in our class, not watched this video, and may not know very much about Big Data.
 - What does our audience need from us when we write summaries?
 - Summaries have to be clear, in ordinary language, and easy to follow.
- Put students into groups of three.

- Have students take out their summaries.
 - Pass out two copies of the Audience Comment Page to each student. Explain that they will:
 - Read the paragraph written by the other two people in their group.
 - Fill out one Audience Comment Page for each of the essays they read.
 - They are NOT to comment on grammar or spelling yet. However, if they are not sure what something says, they can ask the writer for clarification.
 - They are to be friendly, encouraging, and helpful. Good comments on their partner's work will help them when they have to rewrite their paragraphs.
- Have students pass their summary to the left.
- After students have evaluated the summary, they should pass it to their left and evaluate a new summary.
- After students have evaluated two summaries from two partners, they should give their evaluations to the writers, and the writers should read the comments.
- Collect student summaries along with the reviews. Tell students you will be giving your own review, turn them back to the student, and, at that time, you will give them a due date for a final summary.

ACTIVITY #2: Watch Assigned Videos on Big Data and Health Care – 40 minutes.

- Tell students they will watch four additional videos about the human face of Big Data, so they can identify more benefits of Big Data for their in-class essays.
- Pass out Note Taking Questions for Big Data and Healthcare.
- Divide up the class into four groups and give each group a different assignment:
 - Assignment #1: The Human Face of Big Data/Malaria Disaster
 - Assignment #2: The Human Face of Big Data/Personalized Medicine
 - Assignment #3: The Human Face of Big Data/The Smallest Heartbeat
 - Assignment #4: The Human Face of Big Data/Google Predicts the Flu
- Have a representative from each group read the question for their video: loud, clear, and with expression!
- Have students:
 - Write the source in their notebooks and the three questions, leaving room between questions for notes.
 - \circ Watch their assigned video and take notes on the questions in their notebooks.
 - \circ $\;$ Watch the video a second time to get information they may have missed.
 - Meet as a group and prepare to:
 - Report on the benefits of Big Data they discovered in their video.
 - Give the answers to the questions they were assigned.
 - Make sure their explanations are detailed so that students can learn from their report.

ACTIVITY #3: Report What You Learned in Your Assigned Video to the Class - 40 minutes.

- Tell students they will give reports on their assigned videos. For each report, listeners are to:
 - Write down the name of the video in their notebooks.
 - Write down the three questions below the title, leaving room between the questions for their notes.
- Have each group give their report.
- After each report, ask:
 - Does anyone have any questions for this group?
 - o Is there anything that will make your notes clearer and more complete?
- After the reports have been given, tell students they are free to view the rest of the videos. They are excellent and give a detailed view of how Big Data can make a big difference in the delivery of healthcare.

HOMEWORK

WRITE: Based on their notes, have students put together an outline that will help them write an in-class essay that answers the following questions:

- What are the overall benefits of Big Data?
 - \circ This is your introduction.
- What are two examples of how Big Data can be used to improve people's lives?
 These are two paragraphs in your body.
- How do you think society will be improved by this use of Big Data?
 - This is your conclusion.

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NOTE TAKING QUESTIONS FOR VIDEOS ON BIG DATA AND HEALTHCARE

Assignment #1: The Human Face of Big Data/Malaria Disaster

http://www.pbslearningmedia.org/resource/bigdata_stem_malaria/the-human-face-of-big-data-malariadisaster/ (running time: 04:56)

- 1. How is Big Data helping poor countries reduce the numbers of malaria cases?
- 2. How can Big Data help people get the aid they need after a disaster?
- 3. What are the examples?

Assignment #2: The Human Face of Big Data/Personalized Medicine

<u>http://www.pbslearningmedia.org/resource/bigdata_stem_medicine/the-human-face-of-big-data-personalized-medicine/</u> (running time: 03:45)

- 1. What is a genome?
- 2. What was the example of the use of a genome in the video?
- 3. How can Big Data prevent diseases using your genome?

Assignment #3: The Human Face of Big Data/The Smallest Heartbeat

<u>http://www.pbslearningmedia.org/resource/bigdata_stem_babies_health/the-human-face-of-big-data-the-smallest-heartbeat/</u> (running time: 03:38)

- 1. Why is infection so serious for premature babies?
- 2. What is the problem with the way premature babies are treated now?
- 3. How can Big Data prevent infections in premature babies?

Assignment #4: The Human Face of Big Data/Google Predicts the Flu

http://www.pbslearningmedia.org/resource/bigdata_stem_flu_patterns/the-human-face-of-big-data-googlepredicts-the-flu/ (running time: 02:14)

- 1. How were flu epidemics reported in the past?
- 2. How can Big Data help predict flu epidemics?
- 3. How can changes in search patterns make Big Data researchers come to the wrong conclusions?

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ASE Standards Covered for Week 4, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES	STANDARD CATEGORY	STANDARD
Rehearse and write an in- class essay.	WRITING	 Write informative/explanatory texts from a prompt in a formatted manner to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. a. Introduce a topic; organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use appropriate and varied transitions and syntax to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).
Conduct the peer review process.	READING	 5. Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole. a. Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas. b. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another). c. Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, otherwise) and determine how they refine meaning, emphasize certain ideas, or reinforce an author's purpose. d. Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose. 6. Determine an author's purpose or point of view in a text and explain how it is conveyed and shapes the content and style of a text. a. Determine an author distinguishes his or her position from that of others or how an author acknowledges and responds to conflicting evidence or viewpoints.

		 c. Infer an author's implicit as well as explicit purposes based on details in text. d. Analyze how an author uses rhetorical techniques to advance his or her point of view or achieve a specific purpose (e.g., analogies, enumerations, repetition and parallelism, juxtaposition of opposites, qualifying statements).
• Reading homework.	LANGUAGE/ READING	 LANGUAGE Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
		 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text.
		 c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

Week 4, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

THEME: Benefits of Big Data

Class to be held in the Technology Lab



OBJECTIVES

- Rehearse and write an in-class essay.
- Conduct the peer review process.

MATERIALS

Activity #1:

• Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

 Handout (attached to Week 2, Lesson 2): Make two copies for each student. Audience Comment Page

Homework:

 Handout (attached): Make one copy for each student.
 'Predictive Policing' Isn't in Science Fiction, It's in Sacramento www.csmonitor.com/USA/Justice/2016/0802/Predictive-policing-isn-t-in-science-fiction-it-s-in-Sacramento

ACTIVITY #1: Write an In-Class Essay – 70 minutes.

Do a quick rehearsal:

- Tell students they will write an in-class essay. They are welcome to take the full 45 minutes.
- But first they are going to have the opportunity to rehearse their essay out loud with a partner.
- Put students in pairs to talk through their essays, using their outlines for assistance. For each reading:
 - The listener should ask questions for clarification.
 - The reader is free to make adjustments to their outline to make what they want to say clearer.

Write the in-class essay:

- Tell students to relax and trust that they are prepared.
- This is a first draft that they can improve later. It is not necessary that this essay come out perfectly.
- Students should focus on their ideas and their outlines to help them explain what they have to say to a real audience.
- Have students write a timed, 45-minnute essay.

ACTIVITY #2: Conduct the Peer Review Process - 50 minutes.

- Tell students they will provide constructive feedback on each other's essays. Remind them that they are the audience that the writer is happy and comfortable with; the audience simply wants to understand the writer's ideas and offer suggestions for improvement.
- Put students into groups of three.
- Have students take out their 45-minnute essays.

- Pass out two copies of the Audience Comment Page to each student. Explain that they will:
 - \circ Read the essays written by the other two people in their group.
 - Fill out one Audience Comment Page for each of the essays they read.
 - They are NOT to comment on grammar or spelling yet. However, if they are not sure what something says, they can ask the writer for clarification.
 - They are to be friendly, encouraging, and helpful. Good comments on their partner's work will help them when they have to rewrite their final essay.
- Have students pass their essays to the left.
- After students have evaluated the first essay, they should pass the essay they have worked on to their left and evaluate a new essay.
- After students have evaluated two essays, they should give their evaluations to the authors, and the authors should read the comments.
- Ask the class as a whole:
 - Did your evaluators say the same or different things?
 - \circ Did your evaluators say things that gave you ideas for how to make your essay better?
 - Did your evaluators confuse you? Ask for clarification when back in your group.
- Tell students that you will also evaluate their essays so they will each have three reviews to help them with their rewrites. Have students hand in their essays along with the two evaluations from their peers.

TEACHER NOTE: Evaluate the student essays using a copy of the Audience Comment Page. Read both the essays and the student comments to see how perceptive the student reviewers were. Your comments can provide suggestions or offer a different way to evaluate their essays that you think would be helpful. Do not correct everything in the students' drafts. Only mark those errors in the text that would help the student make significant progress toward a better essay. In your comments, indicate a due date for rewrites of these drafts.

HOMEWORK

READ: Have students start to focus on the issues and concerns regarding Big Data by reading the article, 'Predictive Policing' Isn't in Science Fiction, It's in Sacramento, and completing the following instructions:

- Define the following underlined words before reading the article and write down their definitions:
 - Consolidating
 - Accountability
 - Transparency
 - Complainants
 - Advocates
 - Predictive policing
 - Surveillance
 - o Regulate
 - o Implement
- Highlight or underline parts of the article that will help them answer the following questions:
 - How does the police department collect their data? (Use straight lines.)
 - Why does the police department think the new system is an improvement? (Use a double line.)
 - What are the concerns of the predictive policing system's critics? (Use a wavy line.)

TEACHER PREPARATION NOTE: Before the next lesson, create index cards, one each with the vocabulary words listed above printed on them.

'Predictive Policing' Isn't in Science Fiction, It's in Sacramento

Adapted and paraphrased from original source:

http://www.csmonitor.com/USA/Justice/2016/0802/Predictive-policing-isn-t-in-science-fiction-it-sin-Sacramento

Original author: Jessica Mendoza

SACRAMENTO, Calif. – Officer Matt McPhail happened to be at his desk when the first alert went off.

A Nissan sedan had crossed the intersection of San Juan and Truxel where the Sacramento police had just placed one of two custom-built surveillance cameras. The system ID'd the vehicle as stolen.



"I said, 'Hey, if anybody's in the area, you know, keep an eye out for this car,' " recalls Mr. McPhail, a public information officer for the department. "And a helicopter was in the area and some officers went by and found it."

That was 2014. The city has since installed 32 police observation devices, or PODs. Now Sacramento – like New York, Houston, Miami, St. Louis, and other cities before it – is looking at the next step: the launch in October of a "real-time crime center," a central location from which officers could monitor all their existing surveillance technologies, PODs included.

The idea is that <u>consolidating</u> information about criminal activity – from stalking complaints to potential lone wolf terrorist attacks – would make law enforcement more effective at investigating and perhaps preventing some incidents. The process would also promote <u>accountability</u> and <u>transparency</u> at a time of rising tension between police and the black community, providing evidence of both police and suspect behavior during tense encounters, proponents say.

But the technology raises big privacy issues. Already concerned about PODs, privacy advocates are troubled by the prospect of centralizing law-enforcement data, especially in a post-9/11 world where data is being shared more widely across federal, state, and local lines. The technology is already causing a backlash.

"The theory of policing has changed," says Rebecca Lonergan, a University of Southern California law professor who spent 16 years prosecuting public corruption and national security cases for the United States Attorney's Office in Los Angeles. "There's an understanding now that we really need to centralize all of our information."

Protection for large gatherings

McPhail is usually off on Fridays, but he clocked in the day after Micah Xavier Johnson shot and killed five police officers in Dallas last month.

That same day, McPhail explained how the city's new crime center would help prevent future tragedies in large public gatherings. The department is planning to install 10 new cameras at the city's Golden 1 Center arena. The crime center itself will have banks of state-of-the-art screens showing live, high-definition video feeds of major traffic and transportation sites, as well as trained personnel who can provide real-time information to officers in the field and use data analysis tools to interpret any data being collected.

"It's not a replacement for old-fashioned police work," McPhail says. But "this is kind of like a natural progression ... of how we do business, the questions we would ask. It's like the first bread crumb along a trail where at least our investigators know where to start looking."

A custom-built police observation device, or POD, sits on a traffic light above the intersection of Fruitridge Road and Franklin Boulevard in Sacramento, Calif. The three cameras feed live video of license plates to computers at the Sacramento Police Department.

It's called predictive policing, and law enforcement agencies in other cities are already making it happen. In New York City, home to the oldest and arguably most sophisticated real-time crime center in the country, police can use surveillance and data analysis technology to identify suspected criminals or terrorists based on anything from a birthmark to a limp.

The idea is that people who have a record get their identifying marks loaded into a database. So if police need to identify someone they see, they can type in the visible characteristics and then get that person's name and information.

With terrorism, "it's so hard to find those few [radicals] that really are serious about it," says Professor Lonergan at USC. "The only way you find them is by doing the kind of data collection and data mining that we're talking about."

The technology can also be used for more routine policing, such as addressing stalking claims. If <u>complainants</u> have a license plate number and are able to give at least three places where they might have seen the stalker, the POD system can ask the computer to see if the vehicle was there, McPhail says.

"Now I can more easily support a stalking claim in advance of something potentially much more serious happening to our victim," he says. "And it has been used to that effect."

More policing not the answer?

For some privacy and civil liberties <u>advocates</u>, such predictive strategies in routine police work is a problem, not a solution.

"There's a shift in the primary way of policing. We are not just using old investigating methods, but now we are using <u>predictive policing</u> based on hunches," says Hamid Khan, a coordinator with the Stop LAPD Spying Coalition, an alliance of community groups that aims to prevent undue <u>surveillance</u> of poor communities in Los Angeles. "It's become part of a larger system of surveillance."

He and other critics say that sort of predictive policing reinforces racial profiling and violates civil liberties, with little accountability on the part of the officers who employ such methods. Worse, the strategy fails to address the underlying reasons that make people commit crimes.

"[T]he deepest flaw in the logic of predictive policing is the assumption that ... what the model predicts is the need for policing, as opposed to the need for different approaches to deal with the trauma of economic distress, family dislocation, mental illness, environmental stress and racial discrimination," writes Aderson Francois, a professor of law at Howard University in Washington, in an op-ed for The New York Times.

Law enforcement should stay out of the surveillance and data collection business, critics say – at least, until lawmakers are able to develop clear policies that <u>regulate</u> their use.

"Technology can be liberating or it can be a tool for control," notes Shahid Buttar, director of grassroots advocacy at the Electronic Frontier Foundation (EFF), a civil liberties nonprofit based in San Francisco. Carefully developing and <u>implementing</u> policy to govern that technology and its use, he says, could spell the difference between the two.

ASE Standards Covered for Week 5, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES STANDARD		STANDARD
• Analyze the homework reading.	LANGUAGE/ READING	 LANGUAGE Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. 2. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in paragraphs or whole texts. c. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizatio

•	Take sides on the issue of Big Data and predictive policing.	SPEAKING AND LISTENING	8. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
•	Reading homework.	LANGUAGE/ READING	 LANGUAGE Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
			 READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
			 Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

Week 5, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

THEME: Big Data Issues: Machine Bias

Class to be held in the Technology Lab

OBJECTIVES

- Analyze the homework reading.
- Take sides on the issue of Big Data and predictive policing.

MATERIALS

Activity #1:

- Put the following words on individual index cards:
 - Consolidating
 - Accountability
 - Transparency
 - Complainants
 - Advocates
 - Predictive policing
 - Surveillance
 - Regulate
 - Implement
- Classroom Resource: Flip chart paper and markers.
- Handout (attached to Week 4, Lesson 2): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 'Predictive Policing' Isn't in Science Fiction, It's in Sacramento
 www.csmonitor.com/USA/Justice/2016/0802/Predictive-policing-isn-t-in-science-fiction-it-s-in-Sacramento
- Student Work: Students should bring hard copies of their homework assignment.

Homework:

 Handout (attached): Make one copy for each student. Machine Bias https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing

ACTIVITY #1: Analyze the Homework Reading – 60 minutes.

Introduction

- Tell students they are now turning from the benefits of Big Data to the issues around Big Data. Their work on issues with Big Data will be in two sections. First, they will look at what is called "machine bias" as it applies to predictive policing and Facebook, Amazon, Orbitz, and Google practices. Second, they will look at the case of Edward Snowden's revelation about the use of Big Data in government spying.
- Tell students you want them to know the questions for the in-class essay that they will be taking next week, so they can be thinking about them as we learn about a variety of examples of machine bias.
- Write the in-class essay questions on the board:
 - Why is it important to understand the positive and negative aspects of Big Data?
 - What is machine bias and what issue concerns you most?
 - What are your reasons for this concern?
 - What kinds of recommendations would you make to solve the issue that concerns you?
- Tell students they will start with more work on predictive policing.

Vocabulary

- Put students in pairs, and have each pair pick an index cards. Keep going from pair to pair until all the cards have been picked. Likely, some pairs may have more than others.
- Have pairs:
 - Find the sentence with the word in it in the 'Predictive Policing' Isn't in Science Fiction, It's in Sacramento article.
 - \circ Review their definitions of the word.
 - Choose the definition that best fits the sentence and write it down.
- Pairs are to prepare a presentation using the following process:
 - Read the sentence with the word in it: loud, clear and with feeling!
 - \circ $\;$ Provide their definition of the word and write it on the board.
 - \circ $\;$ Read the sentence again to check to see if the definition makes sense.
 - Involve both people in the pair equally in the presentation.
- While pairs are working, write the list of words on the board.
- Before the presentations, tell students they are to:
 - Record the title of the article they are working on in their notebooks.
 - Write down where it was published. Students may need to check the original hyperlink to find out where an article was published.
 - \circ $\;$ List the words and definitions as they are presented.
- After each presentation, ask:
 - Is this the right definition of the word?
 - Does anyone have anything they want to add or change?

Article Analysis

- Tell students they are going to get into the content of the article.
- Write these questions on the board:
 - How does the police department collect their data?
 - Why does the police department think the new system is an improvement?
 - What are critics' concerns about predictive policing?
- Put students into three groups and assign them each one of these questions with the following instructions:
 - Each person should read aloud parts of the article they underlined to answer this question. List the words and definitions as they are presented.
 - Summarize their findings in your own words.
 - Identify one quote.
 - Put their notes on a flip chart paper to stick on the wall and present:
 - \circ Include one quote.
 - Summarize in their own words.
 - Involve each group member in the presentation.
- During each presentation, have listeners:
 - \circ Write down the question that is being answered in their notebook.
 - Take notes on the presentation under that question.
- After each presentation, ask:
 - Do you have any questions for this group?
 - Does anyone have anything they would like to add or comment on?

ACTIVITY #2: Take Sides on the Issue of Big Data and Predictive Policing - 60 minutes.

- Tell students they are now to talk about their response to predictive policing that is taking place in many cities, including Sacramento.
- Draw the following continuum on the board:

Big Data will improve policing.

Big Data will help and hurt policing.

Big Data is very dangerous policing.

- Go round-robin to ask each student:
 - Which statement do you most agree with?
 - \circ $\;$ Where should I put your opinion on the continuum?
 - Put a line on the continuum and write their name where they indicate they think their opinion is.
 - What are your reasons for your opinion?
 - Encourage students to use examples from the article to support their position.
 - Make three groups by putting students with the most similar positions together.
- Have each group:

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- Talk through the reasons for their positions.
- Quote or paraphrase evidence from the article to support each reason.
- Come up with one sentence that states the position of people in the group clearly.
 - This will go first in their presentation.
- Make sure that each person in the group has different reason they will present to the class and can refer to the article as needed.
- Before the presentations, tell listeners to:
 - Write down the position/thesis statements for each group.
 - Note the different reasons for the different arguments.
 - Take notes on what the presenters say that you would like to address during their own presentation.
- After each presentation, ask:
 - Do you have any questions or comments for the presenters that will help make their position clearer?
- After all the presentations, ask:
 - In general, what does this class think about predictive policing?
 - Are there any solutions to the issues raised about predictive policing?
 - What might they be?

HOMEWORK

READ: Have students read the article Machine Bias and complete the following instructions.

- Define the following words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:
 - Rehabilitation
 - o Bias
 - Undermine
 - Disparity
 - Defendant
 - Recidivism
 - Methodology
 - Incarcerated
 - o Plea deal
 - Controversial
 - \circ Ineligible

- Underline parts of the article that will help them answer the following questions:
 - What are the examples of Machine Bias in the article?
 - What are the problems with the risk assessments?
 - How can risk assessments impact sentencing?

TEACHER PREPARATION NOTE: Before the next lesson, create index cards, one each with the vocabulary words listed above printed on them.

Machine Bias

Adapted and paraphrased from original source: <u>https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing</u>

Original authors: Julia Angwin, Jeff Larson, Surya Mattu, Lauren Kirchner

There's software used across the country to predict future criminals. And it's biased against blacks.

A Good Example of the Problem

On a spring afternoon in 2014, Brisha Borden was running late to pick up her god-sister from school when she spotted an unlocked kid's blue Huffy bicycle and a silver Razor scooter. Borden and a friend grabbed the bike and scooter and tried to ride them down the street in the Fort Lauderdale suburb of Coral Springs.

Just as the 18-year-old girls were realizing they were too big for the tiny bikes — which belonged to a 6-year-old boy — a woman came running after them saying, "That's my kid's stuff." Borden and her friend immediately dropped the bike and scooter and walked away.

But it was too late—a neighbor who witnessed the heist had already called the police. Borden and her friend were arrested and charged with burglary and petty theft for the items, which were valued at a total of \$80.

Compare their crime with a similar one: The previous summer, 41-year-old Vernon Prater was picked up for shoplifting \$86.35 worth of tools from a nearby Home Depot store. Prater was the more seasoned criminal. He had already been convicted of armed robbery and attempted armed robbery, for which he served five years in prison, in addition to another armed robbery charge. Borden had a record, too, but it was for misdemeanors committed when she was a juvenile.

Yet something odd happened when Borden and Prater were booked into jail: A computer program spat out a score predicting the likelihood of each committing a future crime. Borden — who is black — was rated a high risk. Prater — who is white — was rated a low risk.

Two years later, we know the computer algorithm got it exactly backward. Borden has not been charged with any new crimes. Prater is serving an eight-year prison term for subsequently breaking into a warehouse and stealing thousands of dollars' worth of electronics.

Two Petty Theft Arrests



VERNON PRATER Rated 3- Low Risk 2 armed robberies 1 attempted armed robbery 1 grand theft



BRISHA BORDEN Rated 8- High Risk 4 juvenile misdemeanors

Borden was rated high risk (8) for future crime after she and a friend took a kid's bike and scooter that were sitting outside. She did not reoffend.

Risk Assessments - Are They Fair?

Scores like this — known as risk assessments — are increasingly common in courtrooms across the nation. They are used to inform decisions about who can be set free at every stage of the criminal justice system, from assigning bond amounts — as is the case in Fort Lauderdale — to even more fundamental decisions about defendants' freedom. In Arizona, Colorado, Delaware, Kentucky, Louisiana, Oklahoma, Virginia, Washington and Wisconsin, the results of such assessments are given to judges during criminal sentencing.

Rating a defendant's risk of future crime is often done along with an evaluation of a defendant's <u>rehabilitation</u> needs. The Justice Department's National Institute of Corrections now encourages the use of such combined assessments at every stage of the criminal justice process. And a landmark sentencing reform bill currently pending in Congress would require the use of such assessments in federal prisons.

In 2014, then U.S. Attorney General Eric Holder warned that the risk scores might be injecting <u>bias</u> into the courts. He called for the U.S. Sentencing Commission to study their use. "Although these measures were crafted with the best of intentions, I am concerned that they <u>undermine</u> our efforts to ensure individualized and equal justice." he said.

The sentencing commission did not, however, launch a study of risk scores. So ProPublica did, as part of a larger examination of the powerful, largely hidden effect of algorithms in American life.

We obtained the risk scores assigned to more than 7,000 people arrested in Broward County, Florida, in 2013 and 2014 and checked to see how many were charged with new crimes over the next two years, the same benchmark used by the creators of the algorithm. The score proved remarkably unreliable in forecasting violent crime: Only 20 percent of the people predicted to commit violent crimes actually went on to do so.

When a full range of crimes were taken into account — including misdemeanors such as driving with an expired license — the algorithm was somewhat more accurate than a coin flip. Of those deemed likely to reoffend, 61 percent were arrested for any subsequent crimes within two years.

We also turned up significant racial <u>disparities</u>, just as Holder feared. In forecasting who would re-offend, the algorithm made mistakes with black and white defendants at roughly the same rate but in very different ways.

- The formula was particularly likely to falsely flag black defendants as future criminals, wrongly labeling them this way at almost twice the rate as white defendants.
- White defendants were mislabeled as low risk more often than black defendants.

Could this <u>disparity</u> be explained by <u>defendants</u>' prior crimes or the type of crimes they were arrested for? No. We ran a statistical test that isolated the effect of race from criminal history and <u>recidivism</u>, as well as from defendants' age and gender. Black defendants were still 77 percent more likely to be pegged as at higher risk of committing a future violent crime and 45 percent more likely to be predicted to commit a future crime of any kind.

Northpointe and Risk Assessments

The algorithm used to create the Florida risk scores is a product of a for-profit company, Northpointe. The company disputes our analysis.

In a letter, it criticized ProPublica's <u>methodology</u> and defended the accuracy of its test:

"Northpointe does not agree that the results of your analysis, or the claims being made based upon that analysis, are correct or that they accurately reflect the outcomes from the application of the model."

Northpointe's software is among the most widely used assessment tools in the country. The company does not publicly reveal the calculations used to arrive at defendants' risk scores, so it is not possible for either defendants or the public to see what might be driving the disparity. (On Sunday, Northpointe gave ProPublica the basics of its future-crime formula — which includes factors such as education levels, and whether a defendant has a job. It did not share the specific calculations, which it said are theirs alone.)

Northpointe's core product is a set of scores derived from 137 questions that are either answered by defendants or pulled from criminal records. Race is not one of the questions. The survey asks defendants such things as: "Was one of your parents ever sent to jail or prison?" "How many of your friends/acquaintances are taking drugs illegally?" and "How often did you get in fights while at school?" The questionnaire also asks people to agree or disagree with statements such as "A hungry person has a right to steal" and "If people make me angry or lose my temper, I can be dangerous."

The appeal of risk scores is obvious: The United States locks up far more people than any other country, the greatest percentage of which are black. For more than two centuries, the key decisions in the legal process, from pre-trial release to sentencing to parole, have been in the hands of human beings guided by their instincts and personal biases.

If computers could accurately predict which defendants were likely to commit new crimes, the criminal justice system could be fairer and more selective about who is <u>incarcerated</u> and for how long. The trick, of course, is to make sure the computer gets it right. If it's wrong in one direction, a dangerous criminal could go free. If it's wrong in another direction, it could result in someone unfairly receiving a harsher sentence or waiting longer for parole than is appropriate.

The Case of Paul Zilly

The first time Paul Zilly heard of his score — and realized how much was riding on it — was during his sentencing hearing on Feb. 15, 2013, in court in Barron County, Wisconsin. Zilly had been convicted of stealing a push lawnmower and some tools. The prosecutor recommended a year in county jail and follow-up supervision that could help Zilly with "staying on the right path." His lawyer agreed to a <u>plea deal</u>.

But Judge James Babler had seen Zilly's scores. Northpointe's software had rated Zilly as a high risk for future violent crime and a medium risk for general recidivism. "When I look at the risk assessment," Babler said in court, "it is about as bad as it could be."

Then Babler overturned the plea deal that had been agreed on by the prosecution and defense and imposed two years in state prison and three years of supervision.

Two Drug Possession Arrests



DYLAN FUGETTERated 3- Low-RiskF1 attempted burglaryN3 drug possessions11 resisting arrest without violence



BERNARD PARKER Rated 10- High-Risk No Offenses

Fugett was rated low risk after being arrested with cocaine and marijuana. He was arrested three times on drug charges after that.

Conclusion

The increasing use of risk scores is <u>controversial</u> and has attracted media coverage, including articles by the Associated Press, and the Marshall Project and FiveThirtyEight last year.

Most modern risk tools were originally designed to provide judges with insight into the types of treatment that an individual might need — from drug treatment to mental health counseling.

"What it tells the judge is that if I put you on probation, I'm going to need to give you a lot of services or you're probably going to fail," said Edward Latessa, a University of Cincinnati professor who is the author of a risk assessment tool that is used in Ohio and several other states.

But being judged <u>ineligible</u> for alternative treatment — particularly during a sentencing hearing — can translate into incarceration. Defendants rarely have an opportunity to challenge their assessments. The results are usually shared with the defendant's attorney, but the calculations that transformed the data into a score are rarely revealed.

"Risk assessments should not be allowed in court unless both parties get to see all the data that go into them," said Christopher Slobogin, director of the criminal justice program at Vanderbilt Law School. "It should be an open, full-court proceeding."

Prediction Fails Differently for Black Defendants

	WHITE	AFRICAN AMERICAN
Labeled Higher Risk, But Didn't Re-Offend	23.5%	44.9%
Labeled Lower Risk, Yet Did Re-Offend	47.7%	28.0%

Overall, Northpointe's assessment tool correctly predicts recidivism 61 percent of the time. But blacks are almost twice as likely as whites to be labeled a higher risk but not actually re-offend. It makes the opposite mistake among whites: They are much more likely than blacks to be labeled lower risk but go on to commit other crimes. (Source: ProPublica analysis of data from Broward County, Fla.)

ASE Standards Covered for Week 5, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES	STANDARD CATEGORY	STANDARD
• Analyze the homework article.	LANGUAGE/ READING	 LANGUAGE Determine or clarify the meaning of unknown and multiple- meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
		 READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
		 Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

Watch three	READING	7. Integrate and evaluate content presented in diverse formats and
short videos on corporations and machine bias.		 media, including visually and quantitatively, as well as in words. a. Analyze how data or quantitative and/or visual information extends, clarifies, or contradicts information in text, or determine how data supports an author's argument. b. Compare two passages that present related ideas or themes in different genre or formats (e.g., a feature article and an online FAQ or fact sheet) in order to evaluate differences in scope, purpose, emphasis, intended audience, or overall impact when comparing. c. Compare two passages that present related ideas or themes in different genre or formats in order to synthesize details, draw conclusions, or apply information to new situations.
		 9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take. a. Draw specific comparisons between two texts that address similar themes or topics or between information presented in different formats (e.g., between information presented in text and information or data summarized in a table or timeline). b. Compare two passages in similar or closely related genre that share ideas or themes, focusing on similarities and/or differences in perspective, tone, style, structure, purpose, or overall impact. c. Compare two argumentative passages on the same topic that present opposing claims (either main or supporting claims) and analyze how each text emphasizes different evidence or advances a different interpretation of facts.
Writing homework.	WRITING	 Write arguments from a prompt in a formatted manner of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from and supports the argument presented.

Week 5, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

THEME: Big Data Issues: Machine Bias

Class to be held in the Technology Lab

OBJECTIVES

- Analyze the homework article.
- Watch three short videos on corporations and machine bias.

MATERIALS

Activity #1:

- Put the following words on individual index cards:
 - Rehabilitation
 - o Bias
 - \circ Undermine
 - Disparity
 - Defendant
 - o Recidivism
 - o Methodology
 - o Incarcerated
 - o Plea deal
 - Controversial
 - o Ineligible
- Teacher Resource (attached): Be prepared to project these two charts in class. A copy of the charts has been attached for use if needed.
 Black Defendants' Risk Scores and White Defendants' Risk Scores

https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing

- Classroom Resource: Flip chart paper and markers.
- Handout (attached to Week 5, Lesson 1): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand. Machine Bias
 https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing

Student Work: Students should bring hard copies of their homework assignment.

<u>Activity #2:</u>

- Videos: Breaking the Black Box https://www.propublica.org/article/breaking-the-black-box-what-facebook-knows-about-you
 - Episode #1: Facebook (running time: 02:20)
 - Episode #2: Prices (running time: 01:28)
 - Episode #3: Machine Learning (running time: 01:45)
- Handout (attached): Make one copy for each student. Breaking the Black Box Video Questions

ACTIVITY #1: Analyze the Homework Article – 60 minutes.

Vocabulary:

• Tell students they will look more deeply into predictive policing being used throughout the country.

- Put students in pairs, and have each pair pick an index card. Move from pair to pair until all the cards have been picked.
- Have pairs:
 - \circ $\;$ Find the sentence with the underlined word in the Machine Bias article.
 - Review their definitions of the word.
 - Choose the definition that best fits the sentence and write it down.
- Have pairs prepare a presentation using the following process:
 - Read the sentence with the word in it out loud.
 - \circ Provide their definition of the word and write it on the board.
 - \circ Read the sentence again to see if the definition makes sense.
 - \circ $\;$ Involve both people in the pair equally in the presentation.
- While pairs are working, write the list of words on the board.
- Before the presentations, tell students they are to:
 - \circ Record the title of the article they are working on in their notebooks.
 - Write down where it was published. Students may need to check the original hyperlink to find out where an article was published.
 - List the words and definitions as they are presented.
- After each presentation, ask:
 - Is this the right definition of the word?
 - Does anyone have anything they want to add or change?

Article Analysis:

- Tell students they are going to get into the content of the article.
- Write these questions on the board:
 - What are examples of machine bias in the article?
 - What are the problems with the risk assessments?
 - How can risk assessments impact sentencing?
- Put students into three groups and assign them each a question with the following instructions:
 - Each person should read aloud parts of the article they underlined to answer this question.
 - Summarize their findings in their own words.
 - \circ Identify one quote that supports their position or findings.
 - Put their notes on a flip chart paper to stick on the wall and present, involving each group member.
 - \circ Include one quote.
 - Summarize in their own words.
- During each presentation, the audience should:
 - Write down the question that is being answered in their notebook.
 - Take notes on the presentation under that question.
- After each presentation, ask:
 - Do you have any questions for this group?
 - Does anyone have anything they would like to add or comment on?
- After all the presentations, click on the link for the article and project the two Risk Score charts overhead: Black Defendants' Risk Scores and White Defendants' Risk Scores.
- Ask:
 - What does the first chart tell us about Black Defendants' risk scores?
 - What about the chart for White Defendants?
 - What is your opinion of ProPublica's research findings about machine bias in risk assessments?
 - Why do you think this happens? What makes machines discriminate?
ACTIVITY #2: Watch Three Short Videos on Corporations and Machine Bias – 60 minutes.

- Tell students that there are other ways that machines discriminate. We will look at three short videos that show how machine bias is already involved in our lives.
- Pass out Breaking the Black Box Video Questions.
- For each of the videos:
 - Have students use their phones to find definitions for the vocabulary words.
 - Write these words and the definition on the board.
 - \circ $\;$ Have students read aloud the questions for the video $\;$
 - \circ $\;$ Have students take notes while they watch the video.
 - Allow students to elect to watch the video again, if needed.
 - \circ $\;$ Put students in pairs to discuss their responses.
 - Discuss the questions and responses as a class.
- After all the videos, ask:
 - Are there things in these videos that worry you?
 - Why?

HOMEWORK

JOURNAL WRITING: Have students write answer to each of these questions in their journals as a way to prepare for the in-class essay:

- Why is it important to understand the positive and negative aspects of Big Data?
- What is machine bias and what issue concerns you most?
- What are your reasons for this concern?
- What kinds of recommendations would you make to solve the problem that concerns you?

When writing, students should:

- Write the first question in their notebooks.
- Write down everything that comes to mind without stopping until they feel finished.
- Repeat this process for each question.

This process will give them a rough draft of their own ideas in preparation for the in-class essay.

Black Defendants' Risk Scores and White Defendants' Risk Scores

Adapted and paraphrased from original source: <u>https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing</u>

Original authors: Julia Angwin, Jeff Larson, Surya Mattu, Lauren Kirchner



Black Defendants' Risk Scores





(Source: ProPublica analysis of data from Broward County, Fla.)

BREAKING THE BLACK BOX VIDEO QUESTIONS

EPISODE #1:

Vocabulary words:

- Optimize
- Monetize
- 1. What is a black box?

2. What kinds of things does Facebook know about you?

3. Why does Facebook buy more data?

4. Class question: What does it mean that: "They say it is the Optimization of your Facebook experience, but it is really the Monetization of your behavior"?

EPISODE #2:

Vocabulary words:

- European Union
- 1. What are examples of machine bias for:

Amazon?

Orbitz?

Staples?

The Princeton Review?

2. Class Question: What is the difference between how the European Union and the US deals with pricing issues?

EPISODE #3:

1. What is an example of how Google discriminates?

2. Class Question: How could this affect an individual's online searches?

ASE Standards Covered for Week 6, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Choose your thesis statement and review your notes for an outline.	READING	 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.
•	Outline and rehearse the in-class essay. Writing homework.	WRITING	 4. Produce clear, varied, coherent, consistent, and engaging writing in which the development, organization, style, tone, and voice are appropriate to task, purpose, and audience. Write an analysis based on a given prompt. a. Differentiate between example and reason when given a writing prompt. b. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or evaluating and trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

THEME: Big Data Issues: Machine Bias

OBJECTIVES

- Create your thesis statement and review notes to create an outline.
- Outline and rehearse the in-class essay.

MATERIALS

Activity #1:

- Classroom Resource: Flip chart paper and markers.
- Student Work: Students should bring hard copies of their homework assignment.

ACTIVITY #1: Choose a Thesis Statement and Review Notes to Create an Outline – 60 minutes.

Present your ideas from your draft:

- Students will use this class period to prepare for their in-class essay.
- Have students get out their journal draft of their in-class essay. They should:
 - Read over the draft.
 - Underline (double line) or write the statement that states their concern about machine bias clearly.
 - Underline (single line) the reasons for their concern.
 - Underline (squiggly line) their recommendations.
- Give each person a flip chart paper and markers. Students will:
 - Write their thesis statement at the top.
 - \circ $\;$ List their reasons that support the thesis below.
 - Include their recommendations.
- Give each student 2-3 minutes to present these outlines for their in-class essays.

ACTIVITY #2: Outline and Rehearse the In-Class Essay – 60 minutes.

Outline your in-class essay:

- Students are going to create a more formal outline for their in-class essay and review it with a partner.
- Write the following on the board:
 - Why is it important to understand the positive and negative aspects of Big Data?
 - What is machine bias and what issue concerns you most?
 - Questions 1 and 2 are the two parts of their introduction. This introduction can be one or two paragraphs.
 - What are your reasons for this concern?
 - \circ Each paragraph should focus on one of your reasons.
 - There should be at least two references to readings or videos on machine bias.
 - What kinds of recommendations would you make to solve the issue that concerns you?
 - This is your concluding paragraph.
- Have students make a formal outline of their essay by doing the following:
 - \circ Reviewing their notes.
 - Write down the first question and outline the points they want to make to that question. Students should use indented bullet points under each question.
 - \circ $\;$ Continue this process for each of the questions.

- Demonstrate the outline using one of the students' flip chart presentations. Ask:
 - \circ What is the primary thing you want to say in the first paragraph?
 - Write their statement on the board.
 - How are you going to explain your statement further?
 - Indent and take notes on what the student wants to say under their statement.
 - \circ Do a number of paragraphs on the board so students can see what their outlines should look like.
- Assist students as they work through their outlines.
- When students finish, put them in pairs to talk through their outlines. For each reading:
 - \circ The listener should ask questions for clarification.
 - \circ The reader can offer adjustments for their outlines to make clearer the ideas.

HOMEWORK

WRITE: Complete a full outline for the in-class essay.

ASE Standards Covered for Week 6, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJ	ECTIVES	STANDARD CATEGORY	STANDARD	
• W in- ess	rite your -class say.	WRITING	 Write arguments from a prompt in a formatted manner of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from and supports the argument presented. 	
• Cope	onduct a eer review.	READING	 5. Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole. a. Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas. b. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another). c. Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, otherwise) and determine how they refine meaning, emphasize certain ideas, or reinforce an author's purpose. d. Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose. 6. Determine an author's purpose or point of view in a text and explain how it is conveyed and shapes the content and style of a text. a. Determine an author distinguishes his or her position from that of others or how an author acknowledges and responds to conflicting evidence or viewpoints. c. Infer an author's implicit as well as explicit purposes based on details in text. d. Analyze how an author uses rhetorical techniques to advance his or her point of view or achieve a specific purpose (e.g., analogies, enumerations, repetition and parallelism, juxtaposition of opposites, qualifying statements). 	

Reading	LANGUAGE/	LANGUAGE
home work.	READING	 4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
		 READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text logyers matter uncertain
		 2. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

THEME: Big Data Issues: Machine Bias

OBJECTIVES

- Write your in-class essay.
- Conduct a peer review.

MATERIALS

Activity #1:

• Student Work: Students should bring hard copies of their homework assignment.

<u>Activity #2:</u>

Handout: Make two copies for each student.
 Audience Comment Page (attached to Week 2, Lesson 2)

Homework:

 Handout (attached): Make one copy for each student. What We Don't Know About Spying on Citizens: Scarier Than What We Know <u>http://www.theatlantic.com/politics/archive/2013/06/what-we-dont-know-about-spying-on-citizens-scarier-than-what-we-know/276607/</u>

ACTIVITY #1: Write Your In-Class Essay – 60 minutes.

- Tell students this is an open book essay.
- This is a draft that they can improve later. It is not necessary that this essay come out perfectly.
- Students should focus on their ideas and outlines to explain and support their ideas.

ACTIVITY #2: Conduct the Peer Review Process - 60 minutes.

- Tell students that they will now provide constructive feedback on each other's essays. They should offer good suggestions for making the essay more interesting or easier to understand.
- Put students into groups of three.
- Have students take out their 45-minute essays.
- Pass out two copies of the Audience Comment Page to each student. They should:
 - Read the essays written by the other two people in their group.
 - Fill out one Audience Comment Page for each of the essays they read.
 - They are NOT to comment on grammar or spelling yet. However, if they are not sure what something means, they can ask for clarification.
 - They should be friendly, encouraging, and helpful. Good comments on their partner's work will help them when they have to rewrite their final essay.
- Have students pass their essays to the left.
- After students have evaluated the first essay, they should evaluate a new essay.
- After students have evaluated two essays, they should give their evaluations to the authors for review.
- Ask the class:
 - Did your evaluators say the same or different things?

- \circ Did your evaluators say things that gave you ideas for how to make your essay better?
- \circ Did your evaluators confuse you? Ask for clarification when back in your group.
- Tell students that you will also evaluate their essays so they will each have three reviews to help them with their rewrites. Have students hand in their essays along with the two evaluations from their peers.

TEACHER NOTE: Evaluate the student essays using a copy of the Audience Comment Page. Read both the essays and the student comments to see how perceptive the student reviewers were. Your comments can provide suggestions or offer a different way to evaluate their essays that you think would be helpful. Do not correct everything in the students' drafts. Only mark those errors in the text that would help the student make significant progress toward a better essay. In your comments, indicate a due date for rewrites of these drafts.

HOMEWORK

READ: Have students begin looking at how government is using Big Data in ways that are questionable by reading What We Don't Know About Spying on Citizens: Scarier Than What We Know, and defining the following underlined words:

- Revelation
- Whistle-blower
- Warrant
- Intercept
- Conceal
- Binge
- Police state
- Leaking information
- Intimidation
- Domestic
- Monitor
- Also have students highlight or underline parts of the article that will help them answer the following questions:
 What does the author think is the problem?
 - What does the author think is the solution?

TEACHER PREPARATION NOTE: Before the next lesson, create index cards, one each with the vocabulary words listed above printed on them.

What We Don't Know About Spying on Citizens: Scarier Than What We Know

Adapted and paraphrased from original source: http://www.theatlantic.com/politics/archive/2013/06/what-we-dont-know-about-spying-on-citizensscarier-than-what-we-know/276607/

Original author: Bruce Schneier

JUN 6, 2013

The NSA's surveillance of cell-phone calls shows how badly we need to protect the whistle-blowers who provide transparency and accountability.

Yesterday, we learned that the National Security Administration (or NSA) received all calling records from Verizon customers for a three-month period starting in April. That's everything except the voice content: who called who, where they were, how long the call lasted -- for millions of people, both Americans and foreigners. This "meta-data" allows the government to track the movements of everyone during that period, and build a detailed picture of who talks to whom.

The Guardian delivered this <u>revelation</u> after receiving a copy of a secret memo about this -- presumably from a <u>whistle-blower</u>. We don't know if the other phone companies handed data to the NSA too.

We don't know a lot about how the government spies on us, but we know some things. We know the FBI has issued tens of thousands of ultra-secret National Security Letters to collect all sorts of data on people -- we believe on millions of people -- and has been abusing them to spy on cloud-computer users. We know it can collect a wide array of personal data from the Internet without a <u>warrant</u>. We also know that the FBI has been <u>intercepting</u> cell-phone data, all but voice content, for the past 20 years without a warrant, and can use the microphone on some powered-off cell phones as a room bug -- presumably only with a warrant.

We know that the NSA has many domestic-surveillance and data-mining programs with codenames like Trailblazer, Stellar Wind, and Ragtime -- using different code names for similar programs to dodge oversight and <u>conceal</u> what's really going on. We know that the NSA is building an enormous computer facility in Utah to store all this data, as well as faster computer networks to process it all. We know the U.S. Cyber Command employs 4,000 people.

We know that the Department of Human Services is also collecting a massive amount of data on people, and that local police departments are collecting and analyzing this data, and covering up its failures.

Remember in 2003, when Congress defunded the decidedly creepy 'Total Information Awareness" program? It didn't die; it just changed names and split into many smaller programs. We also know that corporations are doing an enormous amount of spying on behalf of the government: all parts.

And that's wrong.

The U.S. government is on a secrecy <u>binge</u>. It over-classifies more information than ever. And we learn, again and again, that our government regularly classifies things not because they need to be secret, but because their release would be embarrassing.

Knowing how the government spies on us is important. Not only because so much of it is illegal, and because we have a right to know. Democracy requires an informed citizenry in order to function properly, and transparency and accountability are essential parts of that. That means knowing what our government is doing to us, in our name. That means knowing that the government is operating within the the law. Otherwise, we're living in a <u>police state</u>.

We need whistle-blowers.

Even though <u>leaking information</u> is very dangerous. The Obama Administration going to war with whistleblowers, pursuing them -- both legally and through <u>intimidation</u> -- further than any previous administration has done.

But whistle-blowing is vital, even more broadly than in government spying. It's necessary for good government, and to protect us from abuse of power.

We need details on the full extent of the FBI's spying capabilities. We don't know what information it routinely collects on American citizens, what extra information it collects on those on various watch lists, and what legal justifications it invokes for its actions. We don't know its plans for future data collection. We don't know what scandals and illegal actions -- either past or present -- are currently being covered up.

We also need information about what data the NSA gathers, either <u>domestically</u> or internationally. We don't know how much it collects secretly, and how much it relies on other companies. We don't know how much it uses password cracking to get at data, and how much it take advantage of weaknesses in the existing system.

And we need details about the sorts of analysis the organizations perform. We don't know what data they take out quickly when they first get it, and what they store for later analysis -- and how long they store it.

We don't know how big the U.S. surveillance system is today, either in terms of money and people or in terms of how many people are monitored or how much data is collected. Modern technology makes it possible to <u>monitor</u> vastly more people -- yesterday's NSA revelations demonstrate that they could easily surveil *everyone* -- than could ever be done manually.

Whistle-blowing is the moral response to immoral activity by those in power. What's important here are government programs and methods, not data about individuals. I understand I am asking for people to engage in illegal and dangerous behavior. Do it carefully and do it safely, but -- and I am talking directly to you, person working on one of these secret and probably illegal programs -- do it.

If you see something, say something. There are many people in the U.S. that will appreciate and admire you.

For the rest of us, we can help by protesting this war on whistle-blowers. We need to force our politicians not to punish them -- to investigate the abuses and not the messengers -- and to ensure that those unjustly accused can protect themselves.

Our government is putting its own self-interest ahead of the interests of the country. That needs to change.

ASE Standards Covered for Week 7, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES	STANDARD	STANDARD
Analyze the homework article.	LANGUAGE/ READING	 LANGUAGE Determine or clarify the meaning of unknown and multiplemeaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
		READING
		 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
		 Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

• Do research on Edward Snowden.	WRITING	4. Use technology, including the Internet, to research, produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
• Reading homework.	READING	 LANGUAGE 9. Determine or clarify the meaning of unknown and multiplemeaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). C. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruse), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. 2. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and paragraphs or whole texts. c. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generali

Week 7, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

THEME: Big Data Issues: Government

Class to be held in the Technology Lab

OBJECTIVES

- Analyze the homework article.
- Conduct research on Edward Snowden.

MATERIALS

Activity #1:

- Put the following words on individual index cards:
 - Revelation
 - Whistle-blower
 - Warrant
 - o Intercept
 - o Conceal
 - o Binge
 - o Police state
 - Leaking information
 - o Intimidation
 - Domestic
 - Monitor
- Classroom Resource: Flip chart paper and markers.
- Handout (attached to Week 6, Lesson 2): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 What We Don't Know About Spying on Citizens: Scarier Than What We Know http://www.theatlantic.com/politics/archive/2013/06/what-we-dont-know-about-spying-on-citizens-scarier-than-what-we-know/276607/
- Student Work: Students should bring hard copies of their homework assignment.

Homework:

 Handout (attached): Make one copy for each student. Edward Snowden: How the Spy Story of the Age Leaked Out https://www.theguardian.com/world/2013/jun/11/edward-snowden-nsa-whistleblower-profile

ACTIVITY #1: Analyze the Homework Article – 60 minutes.

Introduction

- Tell students that they will look more deeply at the issues surrounding government surveillance and the revelations of Edward Snowden.
- Write the following questions on the board and tell students that these are the questions for their next in-class essay. They can write these questions down in their notebooks:
 - Who is Edward Snowden and why is he important?
 - What did Edward Snowden reveal about government spying on citizens using Big Data?
 - Do you think he did the right thing by leaking secret documents that proved the NSA's surveillance programs? What are your reasons?
 - What are your recommendations for dealing with government whistle-blowers in the future?

Vocabulary

- Put students in pairs, and go from pair to pair having each pair to pick an index card. Keep going from pair to pair until all the cards have been picked. Likely, some pairs may have more than others.
- Have pairs:
 - Find the sentence with the word in it in the Machine Bias article.
 - Review their definitions of the word.
 - Choose the definition that best fits the sentence and write it down.
- Pairs will prepare a presentation using the following process:
 - Read the sentence with the word in it: loud, clear and with feeling!
 - \circ Provide their definition of the word and write it on the board.
 - \circ Read the sentence again to check to see if the definition makes sense.
 - \circ $\;$ Involve both people in the pair equally in the presentation.
- While pairs are working, write the list of words on the board.
- Before the presentations, tell students to:
 - Record the title of the article they are working on in their notebooks.
 - Write down where it was published. Students may need to check the original hyperlink to find out where an article was published.
 - \circ List the words and definitions as they are presented.
- After each presentation, ask:
 - Is this the right definition of the word?
 - Does anyone have anything they want to add or change?

Article Analysis:

- Write the following two questions on the board:
 - What does the author think is the problem?
 - What does the author think is the solution?
- Put students into three groups and assign them each one of these questions with the following instructions:
 - Each person should read aloud parts of the article they underlined to answer this question. List the words and definitions as they are presented.
 - Summarize their findings in your own words.
 - o Identify one quote.
 - Put their notes on a flip chart paper to stick on the wall and present:
 - Include one quote.
 - \circ Summarize in their own words.
 - \circ Involve each group member in the presentation.
- During each presentation, have listeners:
 - Write down the question that is being answered in their notebook.
 - \circ $\;$ Take notes on the presentation under that question.
- After each presentation, ask:
 - Do you have any questions for this group?
 - Does anyone have anything they would like to add or comment on?

ACTIVITY #2: Conduct Research on Edward Snowden – 60 minute.

- Tell students that the article they just read came out right before Edward Snowden stepped forward as the whistle-blower that would give much more insight into government spying on citizens using Big Data.
- Their task is to go online to:

- Find articles that will provide facts on Edward Snowden, e.g., who he is, what he did, what he revealed about government spying.
- Students should use the following process:
 - Use search statements about Edward Snowden. For example, they might search for:
 - Facts on Edward Snowden
 - The Story of Edward Snowden
 - Edward Snowden and Government Spying
 - Find articles they want to read.
 - Write down the name of the article, author, or website.
 - \circ $\;$ Read the article and take notes on the facts under the reference.
- They should use at least two articles.

HOMEWORK

READ: Have students read the article, *Edward Snowden:* How the Spy Story of the Age Leaked Out, underline new facts from the story that will help them tell the whole story, and define the underlined words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:

- Fugitive
- o Breach
- Denounce
- Defector
- o Treason
- Extradite
- Retribution
- Anti-establishment
- Encrypted
- Higher echelons
- Anonymous
- Mystify

TEACHER PREPARATION NOTE: Before the next lesson, create index cards, one each with the vocabulary words listed above printed on them.

Edward Snowden: How the Spy Story of the Age Leaked Out

Adapted and paraphrased from original source:

https://www.theguardian.com/world/2013/jun/11/edward-snowden-nsa-whistleblowerprofile

Original author: Ewen MacAskill

12 June 2013

As he pulled a small black suitcase and carried a selection of laptop bags over his shoulders, no one would have paid much attention to Ed Snowden as he arrived at Hong Kong International Airport. But Snowden was not your average tourist or businessman. In all, he was carrying four computers that enabled him to gain access to some of the US government's most highly-classified secrets.

Today, just over three weeks later, he is the world's most famous spy, whistleblower and <u>fugitive</u>, responsible for the biggest intelligence <u>breach</u> in recent US history. News organizations around the globe have described him as "America's Most Wanted". Members of Congress have <u>denounced</u> him as a "<u>defector</u>" whose actions amount to <u>treason</u> and have demanded he be punished to the fullest extent of the law.

His supporters argue that his actions have opened up a much-needed debate on the balance between security and privacy in the modern world.

So is he whistleblower or traitor? That debate is still raging.

Snowden, aged 29, had flown to Hong Kong from Hawaii, where he had been working for the defense contractor Booz Allen Hamilton at the National Security Agency, the biggest spy surveillance organization in the world. Since Monday morning, he has gone underground. Hong Kong-based journalists, joined by the international press, have been hunting for him. At the height of the search, reporters recruited Twitter followers to see if they could successfully identify the lighting and other hotel furnishings shown in the video in which he went public. They did: the \$330-a-night Mira Hotel, on Nathan Road, the busy main shopping drag in Kowloon district.

Knowing it was only a matter of time before he was found, Snowden checked out at lunchtime on Monday. It is thought he is now in a safe house.

What happens now? The US is on the verge of pressing criminal charges against him and that would lead to <u>extradition</u> proceedings, with a view to bringing him back to the US for trial and eventually jail.

If America is planning to jail for life Bradley Manning, who was behind the 2010 WikiLeaks_release of tens of thousands of state department memos, what <u>retribution</u> lies in store for Snowden, who is guilty of leaking on a much bigger scale? The documents Manning released were merely "classified". Snowden's were not only "Top Secret", but their circulation was extremely limited.

For an American, the traditional home for the kind of story Snowden was planning to reveal would have been the New York Times. But during extensive interviews last week with a Guardian team, he recalled how dismayed he had been to discover the Times had a great scoop in election year 2004 – that the Bush administration, post 9/11, allowed the NSA to snoop on US citizens without warrants

- but had sat on it for a year before publishing.

Snowden said this was a turning point for him, confirming his belief that traditional media outlets could not be trusted. He looked around for alternative journalists, those who were both <u>anti-establishment</u> and at home with blogging and other social media. The member of this generation that he most trusted was the Guardian commentator Glenn Greenwald.



In January, Snowden reached out to a documentary filmmaker and journalist, Laura Poitras, and they began to

Glenn Greenwald. Photograph: Vincent Yu

correspond. In mid-February, he sent an email to Greenwald, who lives in Brazil, suggesting he might want to set up a method for receiving and sending <u>encrypted</u> emails. He even made a YouTube video for Greenwald, to take him step-by-step through the process of encryption. Greenwald did not know the identity of the person offering the leaks and was unsure if they were genuine. He took no action. In March, in New York, he received a call from Poitras, who convinced him that he needed to take this more seriously.

Greenwald and Snowden set up a secure communications system and the first of the documents arrived, dealing with the NSA's secret Prism program, which gathers up information from the world's leading technology companies.

Greenwald flew to New York to talk to Guardian editors on 31 May; the next day, he and Poitras flew to Hong Kong. (I met the two for the first time in the New York office, accompanied them to Hong Kong and joined them in interviewing Snowden over the best part of a week, and writing articles based on the leaked documents and the interviews).

Neither Greenwald nor Poitras even knew what Snowden looked like. "He had some elaborate scheme to meet," Greenwald said. Snowden told him to go to a specific location on the third floor of the hotel and ask loudly for directions to a restaurant. Greenwald assumed Snowden was lurking in the background, listening in.

They went to a room that, Greenwald recalled, contained a large fake alligator. Snowden made himself known. He had told Greenwald that "I would know it was him because he would be carrying a Rubik's Cube".

Both Greenwald and Poitras were shocked the first time they saw the 29-year-old. Greenwald said:

I had expected a 60-year-old grizzled veteran, someone in the <u>higher echelons</u> of the intelligence service. <i>I thought: 'This is going to be a wasted trip.'

After an hour of listening to Snowden, Greenwald changed his mind. "I completely believed him," he said.

The interviews were conducted in Snowden's room, which overlooked Kowloon Park. Snowden and the journalists, complete with camera equipment, crammed into the tiny space. He had been there for two weeks, having meals sent up. He did not have much with him: some clothes, a book, four computers, that Rubik's Cube. He was becoming worried about the costs and especially the chance that his credit cards would be blocked.

Even though he was very knowledgeable about surveillance techniques, he would not have been hard to find – having signed in under his own name, using his own credit cards.

The interviews, combined with the leaked documents, provided the Guardian with four scoops on right after another, from the court order showing that the US government had forced the telecoms giant Verizon to hand over the phone records of millions of Americans, to the previously secret program, Prism.

The Prism story was also published independently by the Washington Post after Poitras, a freelance journalist, had earlier approached the reporter Barton Gellman, who took the story to the paper. Once on the ground in Hong Kong, however, Poitras began working with the Guardian team.

On Sunday, the story shifted from the leaks to the leaker. Snowden had from the start decided against <u>anonymity</u> and Poitras filmed him being interviewed by Greenwald for a video that would announce his ideas and whereabouts.

Snowden's decision to go public has <u>mystified</u> many. Why come out? He had, he said, seen at first hand the impact on colleagues of leak inquiries involving anonymous sources and he did not want to put his colleagues through any more trouble.

So what are the options available to him now? In the interviews, he praised Hong Kong as a place with a strong tradition of free speech and a working judicial system. But these courts, judging by examples of past extradition cases, tend to lean towards being helpful towards the US.



Snowden would likely argue he is not guilty of a crime and claim the charges are politically motivated.

On Sunday night, Snowden gave the last of what had been almost a week's worth of interviews. It was his final night in that hotel room: the final night before his old life gave way to a new and uncertain one. He sat on his bed, arms folded, television news on without the sound, and spoke about the debate he had started, homing in on a comment Obama had made on Friday, in response to the leaks.

ASE Standards Covered for Week 7, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

 Rehearse and write an in-class essay. WRITING Produce clear, varied, coherent, consistent, and engagin writing in which the development, organization, style, tone, and voice are appropriate to task, purpose, and audience. Write an analysis based on a given prompt. a. Differentiate between example and reason when give a writing prompt. b. Develop and strengthen writing as needed by plannin revising, editing, rewriting, or evaluating and trying c new approach, focusing on addressing what is most significant for a specific purpose and audience. Conduct the peer review process. READING Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole. Analyze how a particular sentence, paragraph, chapt or section fits into the overall structure of a text and contributes to the development of the ideas. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another). C. Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, otherwise) and determine 	OBJECTIVES
 Conduct the peer review process. READING Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole. Analyze how a particular sentence, paragraph, chapt or section fits into the overall structure of a text and contributes to the development of the ideas. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another). Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, otherwise) and determine 	• Rehearse and write an in-class essay.
 how they refine meaning, emphasize certain ideas, or reinforce an author's purpose. d. Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose. 6. Determine an author's purpose or point of view in a tex and explain how it is conveyed and shapes the content and style of a text. a. Determine an author's point of view or purpose of a text. b. Analyze how the author distinguishes his or her positio from that of others or how an author acknowledges an responds to conflicting evidence or viewpoints. c. Infer an author's implicit as well as explicit purposes based on details in text. d. Analyze how an author uses rhetorical techniques to advance his or her point of view or achieve a specific purpose (e.g., analogies, enumerations, repetition and parallelism, juxtaposition of opposites, qualifying statements). 	Conduct the peer review process.

•	Writing homework.	WRITING	1. Write arguments from a prompt in a formatted manner of substantive topics or texts, using valid reasoning and
			 relevant and sufficient evidence. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from and supports the argument presented.

THEME: Big Data Issues: Government

OBJECTIVES

- Report on Edward Snowden.
- Watch video of Edward Snowden's point of view.

MATERIALS

Activity #1:

- Put the following words on individual index cards:
 - Fugitive
 - o Breach
 - o Denounce
 - Defector
 - o Treason
 - Extradite
 - Retribution
 - Anti-establishment
 - Encrypted
 - Higher echelons
 - Anonymous
 - o Mystify
- Classroom Resource: Flip chart paper and markers.
- Handout (attached to Week 7, Lesson 1): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 Edward Snowden: How the Spy Story of the Age Leaked Out https://www.theguardian.com/world/2013/jun/11/edward-snowden-nsa-whistleblower-profile
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

 Video: "You're Being Watched": Edward Snowden Emerges as Source Behind Explosive Revelations of NSA Spying

https://www.youtube.com/watch?v=wB4Gn0u4DSE (running time: 15:26)

ACTIVITY #1: Report on Edward Snowden – 80 minutes.

• Tell students they will utilize their research and homework reading to tell a story about Edward Snowden. But first, vocabulary.

Vocabulary

- Put students in pairs, and go from pair to pair with each pair picking an index card. Keep going from pair to pair until all the cards have been picked. Likely, some pairs may have more than others.
- Have pairs:
 - Find the sentence with the word in it in the Edward Snowden: How the Spy Story of the Age Leaked Out article.
 - Review their definitions of the word.
 - \circ Choose the definition that best fits the sentence and write it down.

- Pairs are to prepare a presentation using the following process:
 - Read the sentence with the word in it: loud, clear and with feeling!
 - \circ $\;$ Provide their definition of the word and write it on the board.
 - \circ Read the sentence again to check to see if the definition makes sense.
 - \circ $\;$ Involve both people in the pair equally in the presentation.
- While pairs are working, write the list of words on the board.
- Before the presentations, tell students they are to:
 - Record the title of the article they are working on in their notebooks.
 - Write down where it was published. Students may need to check the original hyperlink to find out where an article was published.
 - \circ List the words and definitions as they are presented.
- After each presentation, ask:
 - Is this the right definition of the word?
 - Does anyone have anything they want to add or change?

Report on Edward Snowden

- Put students in pairs and have them:
 - Write down the name of the homework source at the top of a flip chart paper.
 - Tell each other the facts that the source revealed.
 - Take turns telling each other what they learned from their research sources.
 - Write the rest of their sources on the flip chart paper.
 - \circ Decide who should tell what part of the story and in what order.
- Tell students that when they give their presentations, they are to point to the source where they got their information while they are telling the story.
- Have each pair give their stories based on their references.
- Ask:
 - How are these stories different?
 - How can different articles steer your stories?
 - Do we learn more hearing multiple stories?
 - What does this say about how good research is done?

ACTIVITY #2: Watch Video of Edward Snowden's Point of View – 40 minutes.

- Tell students they are now going to hear about Edward Snowden from Edward Snowden. What we are looking for here is not the story about Edward Snowden, but why he did what he did.
- Have students watch the video and take notes on new facts and on Edward Snowden's point of view.
- Play the video: "You're Being Watched": Edward Snowden Emerges as Source Behind Explosive Revelations of NSA Spying.
- Put students in pairs to review their notes.
- Talk about new items they learned from watching the video, including:
 - The facts from the story.
 - Edward Snowden's point of view.
- After the discussion, ask:
 - Was Edward Snowden's argument for why he did what he did convincing to you?
 - Do you think Edward Snowden did the right thing by being a whistle-blower?
 - \circ Do you think the government should have the right to run secret programs? Why or why not?

HOMEWORK

JOURNAL WRITING: Have students write answers in their journals for each question below which will help them prepare for their in-class essay:

- Who is Edward Snowden and why is he important?
- What did Edward Snowden reveal about government spying on citizens using Big Data?
- Do you think he did the right thing by leaking secret documents that proved the NSA's surveillance programs? What are your reasons?
- What are your recommendations for dealing with government whistle-blowers in the future?*
- Students should:
 - Write the first question in their notebooks.
 - Write down everything that comes to mind without stopping until they feel finished.
 - Repeat this process for each of the questions.
- This process will give students a rough draft of their own ideas to use for the in-class essay.

TEACHER NOTE: Students will have to think about their own future recommendations several times before writing their essay. It is okay if they aren't sure what they have to say yet, but it is good to get the question in their heads to start to think about.

ASE Standards Covered for Week 8, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Choose a thesis statement and review notes to create an outline. Outline and rehearse the in-class essay. Writing homework.	WRITING	 4. Produce clear, varied, coherent, consistent, and engaging writing in which the development, organization, style, tone, and voice are appropriate to task, purpose, and audience. Write an analysis based on a given prompt. a. Differentiate between example and reason when given a writing prompt. b. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or evaluating and trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

THEME: Big Data Issues: Government

OBJECTIVES

- Choose a thesis statement and review notes to create an outline.
- Outline and rehearse the in-class essay.

MATERIALS

Activity #1:

- Classroom Resource: Flip chart paper and markers.
- Student Work: Students should bring hard copies of their homework assignment.

ACTIVITY #1: Choose a Thesis Statement and Review Notes to Create an Outline – 60 minutes.

- Tell students they will use this class period to prepare for an in-class essay.
 - Have students get out their journal draft of their in-class essay. They are to:
 - Read over their draft.
 - Underline (double line) or write the statement that says whether or not they think Edward Snowden did the right thing or not.
 - \circ Underline (single line) the different reasons for their concern.
 - Underline (squiggly line) their recommendations.
- Give each person a flip chart paper and markers. Students need to:
 - Write their thesis statement at the top.
 - List their reasons below that.
 - Include their recommendations.
- Give each student 2-3 minutes to present their outlines for their in-class essays.

ACTIVITY #2: Outline and Rehearse the In-Class Essay – 60 minutes.

- Tell students they will put together a more formal outline for their in-class essay and rehearse it with a partner.
- Write the following on the board:
 - Who is Edward Snowden and why is he important?
 - What did Edward Snowden reveal about government spying on citizens using Big Data?
 - The answers to these two questions are your introduction that can be written as one or two paragraphs.
 - Do you think he did the right thing by leaking secret documents that proved the NSA's surveillance programs? What are your reasons?
 - This question is the body of your essay. You need to have a different paragraph for each of your reasons that refer to your sources as needed.
 - \circ $\;$ What are your recommendations for dealing with government whistle-blowers in the future?
 - This is your conclusion.
- Tell students to make a formal outline of their essay by doing the following:
 - Reviewing their notes.
 - \circ $\;$ Underlining those notes that will help them with their essay.

- Write down the first question and outline the points they want to make in response to that question.
- \circ Continue this process for each of the questions.
- Do a demonstration of the first question using one of the students' flip chart presentations. Ask:
 - What is the primary thing you want to say in the first paragraph?
 - Write their statement on the board.
 - How are you going to explain your statement further?
 - Indent and take notes on what the student wants to say under their statement.
 - Do a number of paragraphs on the board in this way so students can see what their outlines should look like.
- Walk around and help students as they work through their outlines.
- When students finish, put them in pairs to talk through their outlines. For each reading:
 - \circ $\;$ The listener should ask questions for clarification.
 - \circ The reader can offer adjustments for their outlines to make clearer the ideas.

HOMEWORK

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WRITE: Prepare a full outline for the in-class essay.
ASE Standards Covered for Week 8, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES	STANDARD	STANDARD
	CATEGORY	
 Write your 	WRITING	1. Write arguments from a prompt in a formatted manner of substantive
in-class essay.		topics or texts, using valid reasoning and relevant and sufficient
		evidence.
		 a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from and supports the argument presented.
• Conduct a peer review.	READING	 Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole. Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another). Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, otherwise) and determine how they refine meaning, emphasize certain ideas, or reinforce an author's purpose. Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose. Determine an author's point of view in a text and explain how it is conveyed and shapes the content and style of a text. Determine an author distinguishes his or her position from that of others or how an author acknowledges and responds to conflicting evidence or viewpoints. Infer an author's implicit as well as explicit purposes based on details in text. Analyze how an author uses rhetorical techniques to advance his or her point of view or achieve a specific purpose (e.g., analogies, enumerations, repetition and parallelism, juxtaposition of opposites, qualifying statements).

•	Reading	LANGUAGE/	LANGUAGE
	homework	READING	
			4. Determine or clarify the meaning of unknown and multiple-meaning
			words and phrases based on grades 11–12 reading and content, choosing
			flexibly from a range of strategies.
			a. Use context (e.g., the overall meaning of a sentence, paragraph, or
			text; a word's position or function in a sentence) as a clue to the
			meaning of a word or phrase.
			b. Identify and correctly use patterns of word changes that indicate
			different meanings or parts of speech (e.g., conceive, conception, conceivable).
			c. Consult general and specialized reference materials (e.g., dictionaries,
			glossaries, thesauruses), both print and digital, to find the
			pronunciation of a word or determine or clarify its precise meaning, its
			part of speech, its etymology, or its standard usage.
			d. Verity the preliminary determination of the meaning of a word or
			phrase (e.g., by checking the interred meaning in context or in a
			alctionary).
			READING
			 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
			a. Cite strong and thorough textual evidence to support analysis of what
			the text says explicitly as well as inferences drawn from the text,
			including determining where the text leaves matters uncertain.
			2. Determine central ideas or themes of texts and analyze their
			development; summarize the key supporting details and ideas.
			a. Comprehend explicit details and main ideas in text.
			b. Summarize details and ideas in text.
			c. Make sentence level interences about details that support main ideas.
			a. Inter implied main ideas in paragraphs or whole texts.
			f Identify a theme, or identify which element(s) in a text support a
			theme.
			g. Make evidence based generalizations or hypotheses based on details
			in text, including claritications, extensions, or applications of main
			Ideas to new situations.
			n. Draw conclusions or make generalizations that require synthesis of
			momple main laeas in text.

THEME: Big Data Issues: Government

OBJECTIVES

- Write your in-class essay.
- Conduct a peer review.

MATERIALS

Activity #1:

• Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

Handout: Make two copies for each student.
 Audience Comment Page (attached to Week 2, Lesson 2)

Homework:

 Handout (attached): Make one copy for each student. Nine Alarming Cyber Security Facts that Threaten Your Data <u>https://heimdalsecurity.com/blog/10-surprising-cyber-security-facts-that-may-affect-your-online-safety/</u>

ACTIVITY #1: Write Your In-Class Essay – 60 minutes.

- Tell students they will write an in-class essay. They have 45 minutes and are welcome to take the full time.
- Tell them to relax and trust that they are prepared. Also, this is a first draft and they can improve it later.
- Students should focus on their ideas and their outlines to help them explain what they have to say to a real audience.
- Have students write a timed, 45-minnute essay.

ACTIVITY #2: Conduct the Peer Review Process – 60 minutes.

- Tell students they will provide constructive feedback on each other's essays. Remind them that they are the audience that the writer is happy and comfortable with; the audience simply wants to understand the writer's ideas and offer suggestions for improvement.
- Put students into groups of three.
- Have students take out their 45-minnute essays.
- Pass out two copies of the Audience Comment Page to each student. Explain that they will:
 - \circ Read the essays written by the other two people in their group.
 - Fill out one Audience Comment Page for each of the essays they read.
 - They are NOT to comment on grammar or spelling yet. However, if they are not sure what something says, they can ask the writer for clarification.
 - They are to be friendly, encouraging, and helpful. Good comments on their partner's work will help them when they have to rewrite their final essay.
- Have students pass their essays to the left.

- After students have evaluated the first essay, they should pass the essay they have worked on to their left and evaluate a new essay.
- After students have evaluated two essays, they should give their evaluations to the authors, and the authors should read the comments.
- Ask the class as a whole:
 - Did your evaluators say the same or different things?
 - Did your evaluators say things that gave you ideas for how to make your essay better?
 - \circ Did your evaluators confuse you? Ask for clarification when back in your group.
- Tell students that you will also evaluate their essays so they will each have three reviews to help them with their rewrites. Have students hand in their essays along with the two evaluations from their peers.

TEACHER NOTE: Evaluate the student essays using a copy of the Audience Comment Page. Read both the essays and the student comments to see how perceptive the student reviewers were. Your comments can provide suggestions or offer a different way to evaluate their essays that you think would be helpful. <u>Do not correct everything in the students' drafts</u>. Only mark those errors in the text that would help the student make significant progress toward a better essay. <u>In your comments, indicate a due date for rewrites of these drafts</u>.

HOMEWORK

READ: Tell students the next unit will be on cybersecurity, a huge topic in the IT world that has some strong career opportunities as well. Have students read *Nine Alarming Cyber Security Facts that Threaten Your Data,* which outlines some of the biggest cybersecurity concerns. Have them define the following underlined words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:

- Racketeering
- Malicious
- Confidential
- Modified
- Compelling
- Inadvertently
- Morphs
- Proactive
- Fraudulent
- Vulnerabilities
- Automation
- Exploited
- Manipulate
- Espionage
- Annual
- Subversive
- Political Agenda

Also, ask students to underline all the significant facts and create a list of ten questions about the facts that are the most important to them.

TEACHER PREPARATION NOTE: Before the next lesson, create index cards, one each with the vocabulary words listed above printed on them.

Nine Alarming Cyber Security Facts that Threaten Your Data [Updated]

Adapted and paraphrased from original source: <u>https://heimdalsecurity.com/blog/10-surprising-cyber-security-facts-that-may-affect-your-online-safety/</u>

Original author: Anda Zaharia

This may sound like a movie plot, but it's not.

The cyber security industry is growing as you're reading this. More specialists join the ranks, **more malware is being launched every day** than ever before: **230,000 new malware samples/day** according to the latest statistics. Naturally, more resources are being deployed to counter cyberattacks. That's why I thought it would be helpful to sum up **9 cyber security facts that define the current information security landscape**.

One of these essential facts is **the estimated annual cost for cyber crime** committed globally which has added up to **100 billion dollars**! And don't think that all that money comes from hackers targeting corporations, banks or wealthy celebrities. Individual users like you and me are also targets.



Source: 2015 Cost of Cyber Crime Study: Global by Ponemon

As long as you're connected to the Internet, you can become a victim of cyberattacks. So that's why we wanted to walk you through some of the most **shocking cyber security facts** that you maybe wish you'd known until the present moment.

These will give you a much more accurate idea of how dangerous it really is to go online without proper protection.

Figure 1. Total cost of cyber crime in seven countries Cost expressed in US dollars (000,000), n = 252 separate companies

1. The most wanted cyber criminals in the world

On FBI's Most Wanted List for cyber criminals you will currently find 19 individuals, each being responsible

for consumer losses ranging from \$350,000 to more than \$100 million. They are from all over the world and huge rewards are offered for their capture.

For example, **FBI's most wanted cyber criminals** at this moment are the JABBERZEUS subjects, a group of individuals involved in a wide-ranging <u>racketeering</u> enterprise and scheme that installed, without authorization, <u>malicious</u> software known as Zeus on victims' computers. This type of financial malware was used to capture bank account numbers, passwords, personal identification numbers, and other <u>confidential</u> information necessary to log into online banking accounts.



Starting in September of 2011, the FBI began investigating a <u>modified</u> version of the Zeus Trojan, known as **GameOver Zeus (GOZ)**, which we covered in depth. Thousands of corporations were infected with GameOver Zeus and as many as **1.2 million computers were infected** prior to the take down of Zeus. It is believed GameOver Zeus is responsible for financial losses of **more than \$100 million USD**.

2. The most expensive computer virus of all times

Ever wondered how much damage a computer virus can do? Let us give you a compelling example through this next cyber security fact. MyDoom is considered to be **the most expensive virus in the world** and in cyber security history, having caused an estimated financial damage of **\$38.5 billion**!

MyDoom was first spotted in January 2004 and it became **the fastest-spreading email worm ever**, exceeding all previous records. The virus's origins are believed to be in Russia, but its author was never discovered.

Mydoom was mainly transmitted by email, disguised as spam email. A user might <u>inadvertently</u> open the attachment in the email and the worm would re-send itself to every address it could find. The original version contained a payload that did two things: it opened a backdoor into the user's computer, allowing remote control of it, while also conducting a DDoS attack (Direct Denial Of Service) against SCO group's website.

3. Social media - a hacker's favorite target

Currently, according to **in depth statistics**, there are **more than 1.6 billion social network users** worldwide with more than **64% of internet users accessing social media services online**. Moreover, social networking is one of the most popular ways for online users to spend their time, and a preferred way to stay in contact with friends and families.

This is precisely why **cyberattackers love social media** as well! Users that spend a lot of time on social networks are very likely to click links posted by trusted friends, which hackers use to their advantage. Here are some of the most popular types of cyberattacks directed at social media platforms:

- **Like-jacking**: occurs when criminals post fake Facebook "like" buttons to webpages. Users who click the button don't "like" the page, but instead download malware.
- Link-jacking: this is a practice used to redirect one website's links to another which hackers use to redirect users from trusted websites to malware infected websites that hide drive-by downloads or other types of infections.
- **Phishing**: the attempt to acquire sensitive information such as usernames, passwords, and credit card details (and sometimes, indirectly, money) by disguising itself as a trustworthy entity in a

Facebook message or Tweet.

• **Social spam**: is unwanted spam content appearing on social networks and any website with usergenerated content (comments, chat, etc.). It can appear in many forms, including bulk messages, profanity, insults, hate speech, malicious links, <u>fraudulent</u> reviews, fake friends, and personally identifiable information.

Why are cyberattacks on social media so frequent? Because social media users usually trust their circles of online friends. The result: **more than 600.000 Facebook accounts are compromised every single day**! Also, 1 in 10 social media users said they've been a victim of a cyberattack and the numbers are on the rise. Now this is a cyber security statistic which we don't want you to become part of.

4. 99% of computers are vulnerable to exploit kits

Cyber security fact: **Oracle Java, Adobe Reader or Adobe Flash is present on 99% of computers**. That means that **99% of computer users are vulnerable to exploit kits** (software vulnerabilities).

Why? Because the <u>vulnerabilities</u> that these types of software often present are **extremely critical**: all it takes is one click on an infected advertising banner to give a hacker full access to your computer.

Adobe Flash has **a huge number of vulnerabilities**, so cyber criminals target it in the majority of their attacks. By using these security holes in Flash, attackers can infect your computer with ransomware, such as various **CryptoLocker variants** or **Teslacrypt** and **CTB-Locker**.

The **rise of exploit kits-as-a-service** and the increasing use of <u>automation</u> has led to more sophisticated and aggressive attacks. Without **adequately protecting your browsers** and your entire system, you'll leave yourself vulnerable to a huge range of cyber threats.

5. Security warning: inside jobs

Maybe you'll be surprised to find out that a shocking **59% of employees steal proprietary corporate data** when they quit or are fired. But there are more types of insider threats to get protection against:

- **Malicious insiders** are the least frequent, but have the potential to cause significant damage due to their level of access. Administrators with privileged identities are especially risky. According to the **Ponemon Institute**, "data breaches that result from malicious attacks are most costly."
- **Exploited** insiders may be "tricked" by external parties into providing data or passwords they shouldn't.
- **Careless insiders** may simply press the wrong key and accidentally delete or modify critical information.

These types of security risks are being acknowledged by companies everywhere, and strategies are put together to mitigate them:

"Almost half of European organizations believe that insider threats are now more difficult to detect, with senior IT managers being very worried about the things their own users can do with corporate data" **said Andrew Kellett**, principal analyst at Ovum.

6. Social engineering – cyber criminals' favorite way to <u>manipulate</u> victims

People are the weakest link when it comes to cyber security, which is why psychological manipulation of cyberattack victims is so common.



According to the definition, **social engineering**, in the context of information security, refers to psychological manipulation of people into performing actions or giving away confidential information. This is a type of confidence trick for the purpose of information gathering, fraud, or system access, and the first type of attack of this kind known in history is the Trojan horse itself (not the computer virus, but the Greek mythical event).

For example, **in a recent attack**, an international cyber crime ring based out of Eastern Europe managed to steal **\$1 billion in 2 years from 100 different banks** in nearly 30 countries using **spear phishing** emails targeting bank employees. The spear phishing technique is, by far, the most successful on the internet today, accounting for 91% of attacks!

7. Attacks on the US

You might notice that the U.S. is one of the favorite targets for cyber criminals. For example, Chinese attackers alone caused more than **\$100 million worth of damage** to **U.S. Department of Defense networks** according to leaked documents from Edward Snowden. **Back in 2012**, the same department used to suffer more than **10 million cyberattacks per day**, and, given the evolution of cyber criminals, we can assume that these figures have climbed dramatically since then. For example, **the U.S. Navy**, which receives **110.000 cyberattacks every hour**.

8. Hacktivism is the main motivation that drives cyberattacks

Hacktivism accounts for **half of the cyberattacks** launched in the world. **The term** represents a <u>subversive</u> use of computers and computer networks to promote a <u>political agenda</u>. With roots in hacker culture and hacker ethics, its ends are often related to issues like free speech, human rights, or freedom of information.

Although it may seems like the terms has a positive spin, it really depends on who is using the term. Hacktivism can be **a politically motivated technology hack**, **a constructive form of civil disobedience**. It can signal political protest; it can include anti-spam activists, security experts, or open source advocate.

Hacktivists use **code**, **website mirroring**, **geo-bombing and anonymous blogging** to achieve their objectives, the oldest events of this type dating back to 1989. Anonymous may be the most widely known hacktivist group in the world, but there are many others that carry on cyberattacks of this kind.

9. 68% of funds lost as a result of a cyberattack were declared unrecoverable

Cyber crime is not only costly, but poses other problems as well for organizations worldwide.

It's becoming increasingly difficult to detect cyberattacks and resolve the security issues created by them: the **average time to detect a malicious or criminal attack** by a global study sample of organizations was **170 days** (according to a research conducted by the **Ponemon Institute**). Moreover, **no industry is safe**: all business sectors are affected to a higher or lower degree.

The same research conducted by the Ponemon Institute found the average <u>annua</u>l cost of cyber crime to a sample of U.S. organizations was **\$12.7 million**, representing a **96% increase** since the study was initiated 5 years ago.

As a result, organizations experienced a **176% increase in the number of cyberattacks**, with an average of 138 successful attacks per week, compared to 50 attacks per week when the study was conducted in 2010.

And what's more worrisome is that **68% of all these funds** that were lost as a result of a cyberattack were never recovered and will probably never be.

ASE Standards Covered for Week 9, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES	STANDARD CATEGORY	STANDARD	
Analyze the homework article.	LANGUAGE/ READING	 LANGUAGE 4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). READING 1. Read closely to determine what the text says explicitly and to mak logical inferences from it; cite specific textual evidence when writin or speaking to support conclusions drawn from the text 	
		 logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. 2. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text. 	

 Watch a video on more bad news. 	READING	 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts.
		 e. Determine which defail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.
Reading homework.	READING	 LANGUAGE Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. i. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

2. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas.
j. Comprehend explicit details and main ideas in text.
k. Summarize details and ideas in text.
 Make sentence level inferences about details that support main ideas.
m. Infer implied main ideas in paragraphs or whole texts.
n. Determine which detail(s) support(s) a main idea.
 o. Identify a theme, or identify which element(s) in a text support a theme.
p. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations.
 q. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

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THEME: Cybersecurity: The Problems and Opportunities

OBJECTIVES

- Analyze the homework article.
- Watch a video on more bad news.

MATERIALS

Activity #1:

- Put the following words on individual index cards:
 - Racketeering
 - Malicious
 - Confidential
 - Modified
 - Compelling
 - Inadvertently
 - Morphs
 - Proactive
 - Fraudulent
 - Vulnerabilities
 - Automation
 - Exploited
 - Manipulate
 - Espionage
 - o Annual
 - Subversive
 - Political Agenda
- Handout (attached to Week 8, Lesson 2): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand. Nine Alarming Cyber Security Facts that Threaten Your Data https://heimdalsecurity.com/blog/10-surprising-cyber-security-facts-that-may-affect-your-online-
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

safety/

 Video: Swimming with Sharks: Security in the Internet of Things <u>https://www.youtube.com/watch?v=rZ6xoAtdF3o</u> (running time: 18:00)

Homework:

 Handout (attached): Make one copy for each student. Cybersecurity Job Market to Suffer Severe Workforce Shortage <u>http://www.csoonline.com/article/2953258/it-careers/cybersecurity-job-market-figures-2015-to-</u> <u>2019-indicate-severe-workforce-shortage.html</u>

ACTIVITY #1: Analyze the Homework Article – 60 minutes.

- Tell students that this unit will be focused on cybersecurity, personal, national, and international. They will also examine understand there are so many outstanding jobs out there in cybersecurity.
- Tell students that they must keep track of their sources and taking notes in their notebooks that are important for the next in-class essay they need to write.
- Write the following in-class essay prompt on the board for them to copy into their notebooks:
 - Why is cybersecurity such a big issue in our world?
 - What are some of the most significant statistics and trends that describe the problem?
 - What are the up-sides of this crisis for IT professionals?

Vocabulary:

- Put students in pairs having each pair pick an index card. Keep going from pair to pair until all the cards have been picked. Likely, some pairs may have more than others.
- Have pairs:
 - Find the sentence with the word in it in the Nine Alarming Cyber Security Facts that Threaten Your Data article.
 - Review definitions of the word.
 - Choose the definition that best fits the sentence and write it down.
- Pairs are to prepare a presentation using the following process:
 - Read the sentence with the word in it: loud, clear and with feeling!
 - Provide their definition of the word and write it on the board.
 - Read the sentence again to check to see if the definition makes sense.
 - Involve both people in the pair equally in the presentation.
 - While pairs are working, write the list of words on the board.
- Before the presentations, tell students they are to:
 - Record the title of the article they are using in their notebooks.
 - Write down where it was published. Students may need to check the original hyperlink to find out where an article was published.
 - List the words and definitions as they are presented.
- After each presentation, ask:
 - Is this the right definition of the word?
 - Does anyone have anything they want to add or change?

Question Game:

- Have students write down the name of the source they are using, complete with title, author, and website address.
- Tell students they will write down answers to questions that are asked in their notes. You will write down the correct answers on the board to assist with this note taking process.
- Put students into pairs to:
 - Review their facts and questions.
 - Take notes on what their partner got and they missed.
 - Choose 15 questions for the question game.
- Ask: Who wants to be the first lead? Then instruct students to follow this pattern:
 - The lead asks a question.
 - \circ Those who know the answer raise their hands.
 - \circ The lead chooses someone to answer the question.
 - If the answer is correct, that person becomes the new lead and repeats this process.
 - If the answer is incorrect, the lead chooses a new student to answer the question until someone has the correct answer.
- Repeat this pattern until students are out of questions.

ACTIVITY #2: Watch a Video on More Bad News – 60 minutes.

- Tell students that, while the article is full of bad news about Internet security, they will watch a video from a man who is terrified of the cybersecurity implications for the Internet of Things.
- Ask: Based on what you already know about cybersecurity, what do you think are the security concerns regarding the Internet of Things? Write students' predictions on the board.
- Write the following words on the board:
 - Adversaries
 - Ideology
 - Pandora's Box
 - Apex predator
- Assign pairs to look up these words and put them in a sentence that shows they understand the definition. Write the definitions on the board.
- Write the following discussion questions on the board:
 - What does Anonymous mean?
 - What examples does the speaker give of exposed systems in the Internet of Things?
 - What is the speaker doing to try to fix the problem? What does he recommend?
 - Why does the speaker think a shark is a good image for talking about the Internet?
- Have students watch the video and take notes.
- Put students into pairs to discuss the questions and add to their notes.
- Discuss the questions as a class.

HOMEWORK

READ: Have students read the article, Cybersecurity Job Market to Suffer Severe Workforce Shortage, and complete the following instructions:

- Define the following underlined words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:
 - Inadequate
 - Internal resources
 - Stratosphere
 - Aligns
- Underline all the significant facts.
- Make a list of ten questions about the facts that are the most important to you.

TEACHER PREPARATION NOTE: Before the next lesson, create index cards, one each with the vocabulary words listed above printed on them.

Additionally, create eight index cards, one each with the questions listed in the next lesson:

- What is ethical hacking and what is criminal hacking?
- What does an ethical hacker do?
- How can a Barbie doll go wrong?
- How did Matt Jakobowski get into hacking?
- What is a "bug bounty"?
- How can ethical hackers get into trouble with companies?
- How did the door handle company respond to having their doors hacked?
- What role will hackers play in the future?

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Cybersecurity Job Market to Suffer Severe Workforce Shortage

Adapted and paraphrased from original source: http://www.csoonline.com/article/2953258/it-careers/cybersecurity-job-market-figures-2015-to-2019-indicate-severe-workforce-shortage.html

Original author: Steve Morgan

Jul 28, 2015

An analysis of the cybersecurity job market looking back at 2014, the first half of 2015, and projecting out to 2019, reveals some interesting figures. For instance, the top paying cybersecurity job is a security software engineer with an average annual salary of \$233,333, according to a recent report from the job board Dice. That tops the salary for a CSO which is \$225,000.

But the big story in the cybersecurity labor market is a severe workforce shortage. "The demand for the (cybersecurity) workforce is expected to rise to 6 million (globally) by 2019, with a projected shortfall of 1.5 million," stated Michael Brown, CEO at Symantec, the world's largest security software vendor. Not long before Brown's statement, the Cisco 2014 Annual Security Report warned that the worldwide shortage of information security professionals is at 1 million openings, even as cyberattacks and data breaches increase each year.

The shortage of experienced cybersecurity talent may explain why a cybersecurity software engineer earns more than a CSO.

According to a 451 Research recent study, based on responses from more than 1,000 IT professionals, primarily in North America and EMEA, security managers reported significant obstacles in implementing desired security projects due to lack of staff expertise (34.5%) and <u>inadequate</u> staffing (26.4%). Given this challenge, only 24% of enterprises have 24×7 monitoring in place using <u>internal resources</u>.

The need for more cyber-workers also explains why info-security is considered one of the best jobs out there – for the next seven years. U.S. News and World Report ranked a career in information security analysis eighth on its list of the 100 best jobs for 2015. They state the profession is growing at a rate of 36.5 percent through 2022.

Don't feel bad for the CSOs who might have engineers underneath them earning more than they do. IDC predicts that "by 2018, fully 75% of chief security officers (CSO) and chief information security officers (CISOs) will report directly to the CEO, not the CIO". This will arguably push those positions higher up in to the salary <u>stratosphere</u>.

Checking in with an experienced executive recruiter in the cybersecurity field <u>aligns</u> the market analysis and forecasts with what search firms, employers, and candidates are

seeing. "The cybersecurity job market is on fire" says Veronica Mollica, founder and executive information security recruiter at Indigo Partners. "Our candidates are facing competing offers from multiple companies with salary increases averaging over 30%. Current employers are scrambling to retain talent with counter offers including 10% and higher salary increases for information security team members to remain on board."

The U.S. government numbers line up to the IT analyst and research firm statistics. More than 209,000 cybersecurity jobs in the U.S. are unfilled, and postings are up 74% over the past five years, according to a Peninsula Press (a project of the Stanford University Journalism Program) analysis of numbers from the Bureau of Labor Statistics. The demand for information security professionals is expected to grow by 53 percent through 2018.

A workforce shortage means healthy salaries for experienced cyber people. The Dice report states that the top five IT security salaries are: No. 1 – lead software security engineer at \$233,333; No. 2 – chief security officer at \$225,000; No. 3 – global information security director at \$200,000; No. 4 – chief information security officer at \$192,500; and No. 5 – director of security at \$178,333.

Sometimes a declining market will balance the job figures when there's a labor shortage. But that won't happen anytime soon in the fast-growing cybersecurity space. The worldwide cybersecurity market is defined by market sizing estimates that range from \$77 billion in 2015 to \$170 billion by 2020.

The U.S. will have to fill its hundreds-of-thousands of cybersecurity positions over the next decade. The options are cross-training our IT workforce and getting more young people in to cybersecurity school – or outsourcing those jobs to other countries.

ASE Standards Covered for Week 9, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES		STANDARD
• Analyze the homework article.	LANGUAGE/ READING	 LANGUAGE Determine or clarify the meaning of unknown and multiplemeaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruse), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). READING Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and incina ideas in text. c. Make sentence level inferences about details that support an ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including cl

•	Watch three	READING	7. Integrate and evaluate content presented in diverse formats and
•	vv alch miee		media, including visually and quantitativaly as well as in words
			a Analyze how data or quantitative and/or visual information
	additional		a. Analyze now data of quantitative ana/of visual information in text, or determine
	information.		how data supports an author's argument
			how data supports an author s argument.
			b. Compare two passages that present related ideas or memes in
			different genre or formats (e.g., a feature article and an online
			FAQ or fact sneet) in order to evaluate differences in scope,
			purpose, emphasis, intended audience, or overall impact when
			comparing.
			c. Compare two passages that present related ideas or themes in
			different genre or formats in order to synthesize details, draw
			conclusions, or apply information to new situations.
			9. Analyze how two or more texts address similar themes or topics in
			order to build knowledge or to compare the approaches the
			a Draw specific comparisons between two texts that address similar
			themes or topics or between information presented in different
			formats (e.g., between information presented in text and
			information or data summarized in a table or timeline)
			b Compare two passages in similar or closely related genre that
			share ideas or themes focusing on similarities and /or differences
			in perspective tope style structure purpose or everall impact
			Compare two groumentative passages on the same tonic that
			c. Compare two argumentative passages on the same topic that
			present opposing claims (either main or supporting claims) and
			analyze now each text emphasizes affected to a solution of facto
			davances a airrerent interpretation of facts.
•	Writing	WRITING	2. Write informative/explanatory texts from a prompt in a formatted
	homework.		manner to examine and convey complex ideas, concepts, and
			information clearly and accurately through the effective selection,
			organization, and analysis of content.
			a. Infroduce a fopic; organize complex ideas, concepts, and
			information so that each new element builds on that which
			precedes if to create a unified whole; include formatting (e.g.,
			headings), graphics (e.g., figures, fables), and multimedia when
			useful to aiding comprehension.
			b. Develop the topic thoroughly by selecting the most significant and
			relevant tacts, extended definitions, concrete details, quotations,
			or other information and examples appropriate to the audience's
			knowledge of the topic.
			c. Use appropriate and varied transitions and syntax to link the
			major sections of the text, create cohesion, and clarity the
			relationships among complex ideas and concepts.
			d. Use precise language, domain-specific vocabulary, and
			techniques such as metaphor, simile, and analogy to manage the
			complexity of the topic.
			e. Establish and maintain a formal style and objective tone while
			attending to the norms and conventions of the discipline in which
			they are writing.
			f. Provide a concluding statement or section that follows from and
			supports the information or explanation presented (e.g.,
			articulating implications or the significance of the topic).
1		1	

THEME: Cybersecurity: The Problems and Opportunities

OBJECTIVES

- Analyze the homework article.
- Watch three videos for additional information.

MATERIALS

Activity #1:

- Put the following words on individual index cards:
 - o Inadequate
 - o Internal resources
 - Stratosphere
 - o Aligns
- Handout (attached to Week 9, Lesson 1): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 - Cybersecurity Job Market to Suffer Severe Workforce Shortage <u>http://www.csoonline.com/article/2953258/it-careers/cybersecurity-job-market-figures-2015-to-</u> <u>2019-indicate-severe-workforce-shortage.html</u>
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

- Video: Careers in Cyber Security <u>www.youtube.com/watch?v=Ehlp3b8iGm4</u> (running time: 08:52)
- Video: Hot Jobs: Cyber Security Analysts Fight Crime/Science Matters <u>www.pbslearningmedia.org/resource/pbslearningmedia.orgresourcecybersecurityanalyst/hot-jobs-</u> <u>cyber-security-analysts-fight-crime</u> (running time: 02:03)
- Video: How Hackers Are Making the World Safer <u>www.pbslearningmedia.org/resource/25-good-stuff-hackers/how-hackers-are-making-the-world-safer-the-good-stuff</u> (running time: 12:42)
- Eight index cards that each have one of the of the following questions written on them:
 - What is ethical hacking and what is criminal hacking?
 - What does an ethical hacker do?
 - How can a Barbie doll go wrong?
 - How did Matt Jakobowski get into hacking?
 - What is a "bug bounty"?
 - How can ethical hackers get into trouble with companies?
 - How did the door handle company respond to having their doors hacked?
 - What role will hackers play in the future?

ACTIVITY #1: Analyze Homework Article – 60 minutes.

• Tell students they will look at the good news in cybersecurity, namely all the excellent jobs that are available in the field.

Vocabulary:

- Put students in pairs and have each pair pick an index card. Keep going from pair to pair until all the cards have been picked. Likely, some pairs may have more than others.
- Have pairs:
 - Find the sentence with the word in it in the Cybersecurity Job Market to Suffer Severe Workforce Shortage article.
 - Review their definitions of the word.
 - \circ $\;$ Choose the definition that best fits the sentence and write it down.
- Pairs are to prepare a presentation using the following process:
 - Read the sentence with the word in it: loud, clear and with feeling!
 - \circ Provide their definition of the word and write it on the board.
 - \circ Read the sentence again to check to see if the definition makes sense.
 - \circ $\;$ Involve both people in the pair equally in the presentation.
- While pairs are working, write the list of words on the board.
- Before the presentations, tell students they are to:
 - Record the title of the article they are working on in their notebooks.
 - Write down where it was published. Students may need to check the original hyperlink to find out where an article was published.
 - \circ List the words and definitions as they are presented.
- After each presentation, ask:
 - Is this the right definition of the word?
 - Does anyone have anything they want to add or change?

Question Game:

- Have students write down the name of the source they are using, complete with title, author, and website address.
- Tell students they will write down answers to questions that are asked in their notes. You will write down the correct answers on the board to assist with this note taking process.
- Put students into pairs to:
 - Review their facts and questions.
 - Take notes on what their partner got and they missed.
 - Choose 15 questions for the question game.
- Ask: Who wants to be the first lead? Then instruct students to follow this pattern:
 - \circ The lead asks a question.
 - Those who know the answer raise their hands.
 - \circ The lead chooses someone to answer the question.
 - If the answer is correct, that person becomes the new lead and repeats this process.
 - If the answer is incorrect, the lead chooses a new student to answer the question until someone has the correct answer.
- Repeat this pattern until students are out of questions.

ACTIVITY #2: Watch Three Videos for Additional Information – 60 minutes.

- Tell students that they will watch three videos about the cybersecurity field. They should write the name of the video and take notes below each.
- Write down the names of the videos on the board.
 - Careers in Cyber Security
 - Hot Jobs: Cyber Security Analysts Fight Crime/Science Matters
 - How Hackers Are Making the World Safer
- <u>For the first video,</u> Careers in Cyber Security:

- Write the following questions on the board:
 - What was his career path into the industry?
 - What skills do you need to get into and stay in the security industry?
 - What are your recommendations for getting into the industry?
 - Have students count off by four and put students in four groups.
- Assign each group a person in the first video:
 - Jaime Blasco
 - Nick Percoco
 - John Bradshaw
 - Dan Ford
- \circ $\;$ Groups can decide who will take notes on each.
- After the first video, groups should:

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- \circ Discuss their answers to make sure they are detailed.
- \circ $\;$ Have different students report to the class on their question.
- For the second video, Hot Jobs: Cyber Security Analysts Fight Crime/Science Matters:
 - Put students into pairs.
 - Write the following questions on the board:
 - What is Sara Demaria's job?
 - How secure is her office?
 - What is her employment background?
 - What are the skills needed for this job?
 - Tell students to take notes on these questions.
 - Have pairs discuss their answers.
 - Have a brief class discussion on students' answers to the questions.
 - For the third video, How Hackers Are Making the World Safer:
 - Put students into pairs and have them pick one index card (or more depending on class size).
 - Tell students they are to watch the video and take notes to answer the pair question(s).
 - Have pairs meet to go over their answers.
 - \circ Tell pairs to report their assigned questions and answers to the class.

HOMEWORK

WRITE: Have students to write full paragraphs in response to the prompt questions:

- What is your interest level in a cybersecurity job?
- What from the articles and videos is most interesting to you?
- What are your reasons for or against going into this field?

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ASE Standards Covered for Week 10, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Conduct a peer review of the written work.	READING	 5. Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole. a. Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas. b. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another). c. Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, otherwise) and determine how they refine meaning, emphasize certain ideas, or reinforce an author's purpose. d. Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose.
			 6. Determine an author's purpose or point of view in a text and explain how it is conveyed and shapes the content and style of a text. a. Determine an author's point of view or purpose of a text. b. Analyze how the author distinguishes his or her position from that of others or how an author acknowledges and responds to conflicting evidence or viewpoints. c. Infer an author's implicit as well as explicit purposes based on details in text. d. Analyze how an author uses rhetorical techniques to advance his or her point of view or achieve a specific purpose (e.g., analogies, enumerations, repetition and parallelism, juxtaposition of opposites, qualifying statements).

•	Watch videos to	WRITING	7. Integrate and evaluate content presented in diverse formats and
	hetter		media, including visually and avantitatively, as well as in
	understand the		a. Analyze how data or auantitative and/or visual information
	issues of		extends, clarifies, or contradicts information in text, or determine
	cybersecurity		how data supports an author's graument.
	cyberseconiy.		b Compare two passages that present related ideas or themes in
			different genre or formats (e.g., a feature article and an online
			EAO or fact short) in order to evaluate differences in scene
			nucleon amplication interned and audience or everall impact when
			purpose, emphasis, intended dudience, or overall impact when
			comparing.
			c. Compare two passages that present related ideas or themes in
			different genre or formats in order to synthesize defails, draw
			conclusions, or apply information to new situations.
			 Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.
			a. Draw specific comparisons between two texts that address similar
			themes or topics or between information presented in different
			formats (e.g., between information presented in text and
			information or data summarized in a table or timeline)
			b. Compare two passages in similar or closely related genre that
			share ideas or themes focusing on similarities and /or differences
			in perspective tone style structure purpose or overall impact
			Compare two graumentative passages on the same tonic that
			c. Compare two digomentative passages on the same topic that
			analyze how each text emphasizes different evidence or
			advances a different interpretation of facts
		WEITING	
•	Writing	WKITING	2. Write informative/explanatory texts from a prompt in a formatica
	homework.		
			information clearly and accurately through the offective selection
			information clearly and accurately through the effective selection,
			information clearly and accurately through the effective selection, organization, and analysis of content.
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THEME: Cybersecurity: The Problems and Opportunities continued

OBJECTIVES

- Conduct a peer review of the written work.
- Watch videos to better understand the issues of cybersecurity.

MATERIALS

<u>Activity #1</u>:

- Handout (attached to Week 2, Lesson 2): Make two copies for each student. Audience Comment Page
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

- Video: Cybersecurity 101 www.pbslearningmedia.org/resource/nvcy-sci-cyber101/cybersecurity-101/ (running time: 03:38)
- Video: Cyber Codes <u>www.pbslearningmedia.org/resource/nvcy-sci-cybercodes/cyber-codes/</u> (running time: 03:25)
- Video: A Cyber Privacy Parable <u>www.pbslearningmedia.org/resource/nvcy-sci-parable/a-cyber-privacy-parable</u> (running time: 03:18)

ACTIVITY #1: Conduct a Peer Review of the Written Work – 60 minutes.

- Tell students they will provide constructive feedback on each other's essays. Remind them that they are the audience that the writer is happy and comfortable with; the audience simply wants to understand the writer's ideas and offer suggestions for improvement to make the essay more interesting.
- Ask:
 - What are our criteria for good written work we created last time?
 - \circ Put these on the board.
- Put students into groups of three.
- Have students take out their written work.
 - Pass out two copies of the Audience Comment Page to each student. Explain that they will:
 - Read the essays written by the other two people in their group.
 - Fill out one Audience Comment Page for each of the essays they read.
 - They are NOT to comment on grammar or spelling yet. However, if they are not sure what something says, they can ask the writer for clarification.
 - They are to be friendly, encouraging, and helpful. Good comments on their partner's work will help them when they have to rewrite their final essay.
- Have students pass their essays to the left.
- After students have evaluated the first essay, they should pass the essay they have worked on to their left and evaluate a new essay.
- After students have evaluated two essays, they should give their evaluations to the authors, and the authors should read the comments.
- Ask the class as a whole:
 - Did your evaluators say the same or different things?
 - Did your evaluators say things that gave you ideas for how to make your essay better?
 - Did your evaluators confuse you? Ask for clarification when back in your group.

- Put students back in their groups to talk through differences and to get clarification.
- Tell students when rewrites of their written work are due. These rewritten materials should be treated as final papers, and you should provide full commentary/feedback to students on what worked in the piece and anything more you think might be useful to think about in future writing projects.

ACTIVITY #2: Watch Videos to Better Understand the Issue of Cybersecurity – 60 minutes.

- Tell students they will be looking at three videos that give good clear explanations about: why the Internet is not safe; why messages need to be encrypted; and what is the worst case scenario for having your Internet information used against you.
- Write the names of the three videos on the board and tell students to write down each source before they take notes on that source. The video titles are:
 - Cybersecurity 101
 - Cyber Codes
 - A Cyber Privacy Parable
- For the first video, Cybersecurity 101:
 - Write the following two questions on the board:
 - Why is the Internet difficult to secure?
 - What are the problems with making the Internet completely secure?
 - Watch the video.
 - Allow students to independently prepare for the questions.
 - Conduct a class discussion. Ask for as many details for each answer as possible.
 - Take notes on students' answers on the board.
- For the second video, Cyber Codes:
 - Write the following questions on the board:
 - How were codes used in history?
 - How does encryption work?
 - What is encrypted and what is not?
 - What can you do to protect your privacy?
 - \circ Put students into four groups and give them each a question to take notes on.
 - Watch the video.
 - Allow the groups to talk through their answers.
 - \circ Conduct a class discussion on the question. As students for as many details as possible.
- <u>For the third video, A Cyber Privacy Parable</u>:
 - Write the following two questions on the board:
 - What happened to Tim?
 - What are the recommendations to protect your online information?
 - Watch the video.
 - Allow students to independently prepare for the questions.
 - Conduct a class discussion. Ask for as many details for each answer as possible.
 - Take notes on students' answers on the board.

HOMEWORK

WRITE: Have students prepare a full outline for an in-class essay that responds to the following prompts:

- Why is Cybersecurity such a big issue in our world?
- What are some of the most significant statistics and trends that describe the problem?
 Include your quotations and paraphrases in your outline.
- What are the upsides of this crisis for IT professionals?

ASE Standards Covered for Week 10, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES	STANDARD CATEGORY	STANDARD
• Write an in- class essay.	WRITING	 Write informative/explanatory texts from a prompt in a formatted manner to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. a. Introduce a topic; organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use appropriate and varied transitions and syntax to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).
• Conduct α peer review.	READING	 5. Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole. a. Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas. b. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another). c. Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, otherwise) and determine how they refine meaning, emphasize certain ideas, or reinforce an author's purpose. d. Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose.

 others or how an author acknowledges and responds to conflicting evidence or viewpoints. c. Infer an author's implicit as well as explicit purposes based on deta in text. d. Analyze how an author uses rhetorical techniques to advance his on her point of view or achieve a specific purpose (e.g., analogies, enumerations, repetition and parallelism, juxtaposition of opposite qualifying statements). 	details his or s, psites,
 Reading homework. LANGUAGE/ READING LANGUAGE Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choos flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, o text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find pronunciation of a word or determine or clarify its precise meaning its part of speech, its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). READING Read closely to determine what the text says explicitly and to make logical inferences from it; cit specific textual evidence when writing speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of w the text says sexplicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and ideas in text. b. Summarize details and ideas in text. d. Determine which detail(is) support(s) a main idea. infer implied main ideas in paragraphs or hobe texts. Determine which details (support(s) a main idea. identify a theme, or identify which element(s) in a text support a theme. Make evidence based generalization	ning noosing oh, or e ate on, find the aning, d or a make iting or of what ext, n ideas.

THEME: Cybersecurity: The Problems and Opportunities continued

OBJECTIVES

- Write an in-class essay.
- Conduct a peer review.

MATERIALS

Activity #1:

• Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

• Handout (attached to Week 2, Lesson 2): Make two copies for each student. Audience Comment Page

Homework:

 Handout (attached): Make one copy for each student. Right to Privacy: Constitutional Rights and Privacy Laws <u>http://www.livescience.com/37398-right-to-privacy.html</u>

ACTIVITY #1: Write Your In-Class Essay – 60 minutes.

- Tell students they will write an in-class essay. They have 45 minutes and are welcome to take the full time.
- Tell them to relax and trust that they are prepared. This is a first draft and they can improve it later.
- Students should focus on their ideas and their outlines to help them explain what they have to say to a real audience.
- Have students write a timed, 45-minnute essay.

ACTIVITY #2: Conduct the Peer Review Process - 60 minutes.

- Tell students they will provide constructive feedback on each other's essays. Remind them that they are the audience that the writer is happy and comfortable with; the audience simply wants to understand the writer's ideas and offer suggestions for improvement.
- Put students into groups of three.
- Have students take out their 45-minnute essays.
- Pass out two copies of the Audience Comment Page to each student. Explain that they will:
 - \circ Read the essays written by the other two people in their group.
 - Fill out one Audience Comment Page for each of the essays they read.
 - They are NOT to comment on grammar or spelling yet. However, if they are not sure what something says, they can ask the writer for clarification.
 - They are to be friendly, encouraging, and helpful. Good comments on their partner's work will help them when they have to rewrite their final essay.
- Have students pass their essays to the left.
- After students have evaluated the first essay, they should pass the essay they have worked on to their left and evaluate a new essay.

- After students have evaluated two essays, they should give their evaluations to the authors, and the authors should read the comments.
- Ask the class as a whole:
 - Did your evaluators say the same or different things?
 - Did your evaluators say things that gave you ideas for how to make your essay better?
 - Did your evaluators confuse you? Ask for clarification when back in your group.
- Tell students that you will also evaluate their essays so they will each have three reviews to help them with their rewrites. Have students hand in their essays along with the two evaluations from their peers.

TEACHER NOTE: Evaluate the student essays using a copy of the Audience Comment Page. Read both the essays and the student comments to see how perceptive the student reviewers were. Your comments can provide suggestions or offer a different way to evaluate their essays that you think would be helpful. Do not correct everything in the students' drafts. Only mark those errors in the text that would help the student make significant progress toward a better essay. In your comments, indicate a due date for rewrites of these drafts.

HOMEWORK

READ: Have students read the article, *Right to Privacy: Constitutional Rights and Privacy Laws,* and complete the following instructions.

- Assign different students responsibility for different underlined vocabulary words on this list:
 - Scrutiny
 - Explicitly
 - Statutory law
 - Promotion
 - Autonomy
 - Enumeration
 - Construed
 - Disparage
 - Retrained
 - Abridge
 - o Immunities
 - o Jurisdiction
 - Viability
 - Interference
 - Petitioners
 - Demean
 - Deceptive
 - o Disclosure
 - Tracking cookies
 - Opt-out
 - Appropriation
- Underline those parts of the article that help answer the following questions:
 - What are your privacy rights?
 - What are some of the significant Supreme Court ruling regarding privacy?
 - What are the additional laws that support privacy?

TEACHER PREPARATION NOTE: Before the next lesson, create index cards, one each with the vocabulary words listed above printed on them.

Right to Privacy: Constitutional Rights & Privacy Laws

Adapted and paraphrased from original source: <u>http://www.livescience.com/37398-right-to-privacy.html</u>

Original author: Tim Sharp

June 12, 2013



The right to privacy includes the right to be left alone. *Credit: Russell Watkins Shutterstock*

The right to privacy refers to the concept that one's personal information is protected from public <u>scrutiny</u>. U.S. Justice Louis Brandeis called it "the right to be left alone." While not <u>explicitly</u> stated in the U.S. Constitution, some amendments provide some protections. The right to privacy most often is protected by <u>statutory law</u>. For example, the Health Information Portability and Accountability Act (HIPAA) protects a person's health information, and the Federal Trade Commission (FTC) enforces the right to privacy in various privacy policies and privacy statements.

The right to privacy often must be balanced against the state's compelling interests, including the <u>promotion</u> of public safety and improving the quality of life. Seat-belt laws and motorcycle helmet requirements are examples of such laws. And while many Americans are quite aware that the government collects personal information, most say that government surveillance is acceptable.

Constitutional rights

The right to privacy often means the right to personal <u>autonomy</u>, or the right to choose whether or not to engage in certain acts or have certain experiences. Several amendments to the U.S. Constitution have been used in varying degrees of success in determining a right to personal autonomy:

- The First Amendment protects the privacy of beliefs
- The Third Amendment protects the privacy of the home against the use of it for housing soldiers
- The Fourth Amendment protects privacy against unreasonable searches
- The Fifth Amendment protects against self-incrimination, which in turn protects the privacy of personal information

(1) The Ninth Amendment says that the "<u>enumeration</u> in the Constitution of certain rights shall not be <u>construed</u> to deny or <u>disparage</u> other rights retained by the people." This has been

interpreted as justification for broadly reading the Bill of Rights to protect privacy in ways not specifically provided in the first eight amendments.

The right to privacy is most often cited in the Due Process Clause of the 14th Amendment, which states:

(2) No state shall make or enforce any law which shall <u>abridge</u> the privileges or <u>immunities</u> of citizens of the United States; nor shall any state deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its <u>jurisdiction</u> the equal protection of the laws.

However, the protections have been narrowly defined and usually only pertain to family, marriage, motherhood, procreation and child rearing.

(3) For example, the Supreme Court first recognized that the various Bill of Rights guarantees creates a "zone of privacy" in *Griswold v. Connecticut*, a 1965 ruling that upheld marital privacy and struck down bans on contraception.

(4) The court ruled in 1969 that the right to privacy protected a person's right to possess and view pornography in his own home. Justice Thurgood Marshall wrote in *Stanley v. Georgia* that, " If the First Amendment means anything, it means that a State has no business telling a man, sitting alone in his own house, what books he may read or what films he may watch."

(5) The controversial case *Roe v. Wade* in 1972 firmly established the right to privacy as fundamental, and required that any governmental infringement of that right to be justified by a compelling state interest. In *Roe*, the court ruled that the state's compelling interest in preventing abortion and protecting the life of the mother outweighs a mother's personal autonomy only after <u>viability</u>. Before viability, the mother's right to privacy limits state <u>interference</u> due to the lack of a compelling state interest.

(6) In 2003, the court, in *Lawrence v. Texas*, overturned an earlier ruling and found that Texas had violated the rights of two gay men when it enforced a law prohibiting sodomy.

Justice Anthony Kennedy wrote, "The <u>petitioners</u> are entitled to respect for their private lives. The State cannot <u>demean</u> their existence or control their destiny by making their private sexual conduct a crime. Their right to liberty under the Due Process Clause gives them the full right to engage in their conduct without intervention of the government."

Access to personal information

A person has the right to determine what sort of information about them is collected and how that information is used. In the marketplace, the FTC enforces this right through laws intended to prevent <u>deceptive</u> practices and unfair competition.

(7) The Privacy Act of 1974 prevents unauthorized <u>disclosure</u> of personal information held by the federal government. A person has the right to review their own personal information, ask for corrections and be informed of any disclosures.

(8) The Financial Monetization Act of 1999 requires financial institutions to provide customers

with a privacy policy that explains what kind of information is being collected and how it is being used. Financial institutions are also required to have safeguards that protect the information they collect from customers.

(9) The Fair Credit Reporting Act protects personal financial information collected by credit reporting agencies. The act puts limits on who can access such information and requires agencies to have simple processes by which consumers can get their information, review it and make corrections.

Online privacy

Internet users can protect their privacy by taking actions that prevent the collection of information. Most people who use the Internet are familiar with <u>tracking cookies</u>. These small stores of data keep a log of your online activities and reports back to the tracker host. The information is usually for marketing purposes. To many Internet users, this is an invasion of privacy. But there are several ways to avoid tracking cookies.

Browsers and social media platforms, such as Facebook and Twitter, allow users to choose levels of privacy settings, from share everything to only share with friends to share only the minimum, such as your name, gender and profile picture. Protecting personally identifiable information is important for preventing identity theft.

(10) The Children's Online Privacy Protection Act (COPPA) enforces a parent's right to control what information websites collect about their children. Websites that target children younger than 13 or knowingly collect information from children must post privacy policies, get parental consent before collecting information from children, allow parents to decide how such information is used and provide an <u>opt-out</u> option for future collection of a child's information.

Right of publicity

Just as a person has the right to keep personal information private, he or she also has the right to control the use of his or her identity for commercial promotion. Unauthorized use of one's name or likeness is recognized as an invasion of privacy.

(11) There are four types of invasion of privacy: intrusion, <u>appropriation</u> of name or likeness, unreasonable publicity and false light. If a company uses a person's photo in an ad claiming that the person endorses a certain product, the person could file a lawsuit claiming misappropriation.

Movable boundaries

The Supreme Court approaches the right to privacy and personal autonomy on a case-by-case basis. As public opinion changes regarding relationships and activities, and the boundaries of personal privacy change, largely due to social media and an atmosphere of "sharing," the definition of the right to privacy is ever-changing.

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ASE Standards Covered for Week 11, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES	STANDARD	STANDARD
	CATEGORY	
 Go over vocabulary words for the homework reading and paraphrase key passages. 	LANGUAGE/ READING	 LANGUAGE 4. Determine or clarify the meaning of unknown and multiple- meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary)
		 READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
		 Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

•	Apply the constitutional rulings to different aspects of Big Data and come up with policy recommendations.	SPEAKING AND LISTENING	 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively. a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well- reasoned exchange of ideas. b. Work with peers to promote civil, democratic discussions and decision- making, set clear goals and deadlines, and establish individual roles as needed. c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives. d. Respond thoughtfully to diverse perspectives; synthesize
			comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.
•	Reading homework.	READING	LANGUAGE
			 4. Determine or clarify the meaning of unknown and multiplemeaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
			 READING Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
			a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

2. De	etermine central ideas or themes of texts and analyze their
de	evelopment; summarize the key supporting details and
id	eas.
а.	Comprehend explicit details and main ideas in text.
b.	Summarize details and ideas in text.
c.	Make sentence level inferences about details that support main ideas.
d.	Infer implied main ideas in paragraphs or whole texts.
e.	Determine which detail(s) support(s) a main idea.
f.	Identify a theme, or identify which element(s) in a text support a theme.
g.	Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations.
h.	Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

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THEME: National Cybersecurity Issues

OBJECTIVES

- Go over vocabulary words for the homework reading and paraphrase key passages.
- Apply the constitutional rulings to different aspects of Big Data and come up with policy recommendations.

MATERIALS

Activity #1:

- Put the following words on individual index cards:
 - Scrutiny
 - Explicitly
 - Statutory law
 - Promotion
 - Autonomy
 - Enumeration
 - Construed
 - Disparage
 - Retrained
 - Abridge
 - Immunities
 - Jurisdiction
 - Viability
 - o Interference
 - Petitioners
 - o Demean
 - Deceptive
 - Disclosure
 - Tracking cookies
 - Opt-out
 - Appropriation
- Handout (attached to Week 10, Lesson 2): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 Right to Privacy: Constitutional Rights and Privacy Laws
 http://www.livescience.com/37398-right-to-privacy.html
- Student Work: Students should bring hard copies of their homework assignment.

Homework:

- Handout (attached): Make one copy for each student. DNC Hack: What You Need to Know http://www.cnn.com/2016/06/21/politics/dnc-hack-russians-guccifer-claims/index.html
- Handout (attached): Make one copy for each student. How the DNC Hack is Boosting Anti-US Sentiment in Russia <u>http://www.csmonitor.com/World/Passcode/2016/0824/How-the-DNC-hack-is-boosting-anti-US-sentiment-in-Russia</u>

ACTIVITY #1: Go Over Vocabulary Words from the Homework Reading and Paraphrase Key Passages – 70 minutes.

- Tell students they will discuss with the issue of privacy rights and technology.
 - Write the questions for the next in-class essay on the board:
 - What are our rights to privacy as citizens?
 - How important do you think our privacy rights are and why?
 - Describe some significant ways your privacy rights have been threatened or breached by technology.
 - What are your recommendations for the government and/or the Supreme Court for protecting your privacy rights in the future?
- Ask: Which question will the homework article help you answer?

Vocabulary:

- Put students in pairs and have each pair pick an index card. Keep going from pair to pair until all the cards have been picked. Likely, some pairs may have more than others.
- Have pairs:
 - Find the sentence with the word in the Right to Privacy: Constitutional Rights and Privacy Laws article.
 - Review their definitions of the word.
 - Choose the definition that best fits the sentence and write it down.
- Pairs are to prepare a presentation using the following process:
 - Read the sentence with the word in it: loud, clear and with feeling!
 - \circ Provide their definition of the word and write it on the board.
 - \circ Read the sentence again to check to see if the definition makes sense.
 - \circ $\;$ Involve both people in the pair equally in the presentation.
- While pairs are working, write the list of words on the board.
- Before the presentations, tell students they are to:
 - Record the title of the article they are working on in their notebooks.
 - Write down where it was published. Students may need to check the original hyperlink to find out where an article was published.
 - List the words and definitions as they are presented.
- After each presentation, ask:
 - Is this the right definition of the word?
 - Does anyone have anything they want to add or change?

Paraphrase key passages:

- Tell students that they will use paraphrasing to understand their constitutional privacy rights.
- Project the article overhead:
 - Read the paragraph marked (1).
 - Go line by line and have students say that line in as simple and straightforward language as
 possible. In necessary to provide more context you might have students explain a few
 sentences at one time.
 - Go line by line through the paragraph marked (2) as a second example using the same process.
 - Write in the definitions from the board over the underlined words so that the meaning can be clearer.
- Divide the class into four groups and assign each group two of the remaining eight numbered paragraphs to paraphrase. Groups are to:
 - Read the numbered paragraph out loud.
 - \circ Put in the definitions of underlined words.
 - \circ Paraphrase each sentence into a sentence that is easy to understand.

- Project each of the numbered paragraphs overhead. Tell each group to:
 - Read the paragraph as written. 0
 - Provide a paraphrase for each sentence, then ask: What is this paragraph trying to 0 communicate?
- After each paragraph, ask:
 - Did this group capture the meaning in the paragraph?
 - 0 Anyone have anything to add or change?
- Put the final paragraph on the overhead and read it aloud:
 - Can you paraphrase this last paragraph?
 - What is it trying to say?
 - Are our rights to privacy set in stone or are they subject to change over time?

ACTIVITY #2: Apply the Constitutional Rulings to Different Aspects of Big Data and Come Up with Policy Recommendations – 50 minutes.

- Tell students they will try to apply their knowledge of our rights to privacy to the issues around Big Data to see if they can come up with some recommendations.
- Put the following continuum on the board:

The more privacy the better.

Compromise on privacy based on the situation.

Privacy is not so important.

- Go round-robin and ask students:
 - Where would you put yourself on this continuum?
 - What are your reasons for putting yourself there?
- Record where each student falls on the continuum.
- Put students in three groups according to where they are on the continuum.
- Then instruct each group to make a list of the privacy issues that we have talked about in the Bridge thus far, including privacy issues as they pertain to:
 - The Internet of Things
 - Big Data
 - Cybersecurity
- Go from group to group asking each to give you one issue until the class believes they have named them all.
 - Take notes on all these issues on the board.
- Then, ask groups to answer the following questions:
 - What would you recommend that the Supreme Court do when deciding issues of privacy 0 concerning Big Data in the future?
 - To what degree should our private information be protected?
 - How should companies be dealt with who want to sell you things?
 - What standards should the government enforce?
 - Conduct an open discussion about these issues with students with different ideas about privacy.
 - Take notes on all their ideas.
 - Encourage students to write down those ideas they think are particularly strong.

HOMEWORK

READ: Have students read the article, DNC Hack: What You Need to Know, and complete the following instructions.

- Define the following underlined words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:
 - Breach
 - Perpetrators
 - Espionage
 - Adversaries
 - Verify
 - Prominent
 - Authenticity
 - Veracity
 - Alleged
- Underline the facts one needs to know to understand the DNC hack.
- Come up with ten questions that they know the answers to that you can use them to quiz classmates.

READ: Have students read the article, How the DNC Hack is Boosting Anti-US Sentiment in Russia, and complete the following instructions.

- Define the following underlined words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:
 - o Recession
 - o Turmoil
 - Emboldened
 - Conspiracy
 - o Legitimates
 - Deteriorating
- Underline those parts of the article that help answer the following questions:
 - What is it like in Russia now?
 - Why would Vladimir Putin want to hack the DNC?
 - What is the response of the Russian people? Why?

DNC Hack: What You Need to Know

Adapted and paraphrased from original source:

http://www.cnn.com/2016/06/21/politics/dnc-hack-russians-guccifer-claims/index.html

Original author: Tal Kopan

After the Democratic National Committee discovered it had been hacked, it made the unusual move of quickly revealing the <u>breach</u> to the public -- including that the <u>perpetrators</u> were believed to be linked to the Russian government.

Since initially making the cyberattack public last week, an online personality has surfaced, claiming to have documents from the DNC files and having no connection to the Russians. But the claims made by the "Guccifer 2.0" individual are viewed with a dose of skepticism by experts who have analyzed the events.

Here's an explanation of what we know about the hack.

So what happened?

The DNC and the cybersecurity firm that investigated the hack announced last week that it had been breached by two separate cyberespionage groups. One set of these hackers had been in the system about a year and had been monitoring internal communications, including email.

The other group of hackers had only been in the system a few months and had one target: The DNC's opposition research on Donald Trump. That research file was the only data that researchers could definitively say had been taken by the hackers.

Both groups were linked to the Russian military-intelligence world by cybersecurity firm CrowdStrike, though they did not appear to even be aware of each others' presence in the DNC system. Given the divided nature of the Russian power structure, it's not uncommon to see hacking groups working for different branches of the Russian military and intelligence agencies without overall coordination, CrowdStrike co-founder and Chief Technology Officer Dmitri Alperovitch said.

Researchers could not definitively find how the groups got into the system, but the typical way in for the groups is through carefully crafted deceptive emails, called "spearphishing," that trick recipients into clicking malicious links.

The hackers were kicked out of the system the weekend before the DNC went public, and CrowdStrike continues to monitor for attempts to break in again.

Why do they believe it's the Russians?

High-level cyber<u>espionage</u> groups are skilled units of hackers, who work like digital thieves to break into chosen targets and take information.

Each of these groups has certain distinct signatures, from the way they get in, to the specially crafted malicious software they use, to the type of information that is taken and how it is transmitted out.

The cybersecurity firms that respond to breaches and monitor organizations' networks see these hackers regularly, and investigate them. They put together databases and files on the distinct

groups, often giving them names for easy reference.

CrowdStrike names Russian-linked groups it researches "bears." It identified the hackers that took Trump's oppo file and got in this spring as "Fancy Bear," and the group that got in last year to monitor communications as "Cozy Bear."

Both "bears" have a long history of targeting organizations with strategic importance to Russia that CrowdStrike has monitored, and "Cozy Bear" has also been credited with hacking into the networks of the White House, State Department and Joint Chiefs of Staff.

"We've had lots of experience with both of these actors attempting to target our customers in the past and know them well," wrote Alperovitch in a blog post detailing their technical findings. "In fact, our team considers them some of the best <u>adversaries</u> out of all the numerous nation-state, criminal and hacktivist/terrorist groups we encounter on a daily basis."

And it isn't just CrowdStrike -- other cybersecurity firms have since backed up their findings. Fidelis wrote in a post that it had analyzed the samples of the software and technical findings from the breach and also found Cozy Bear (aka APT 29 and CozyDuke, depending on firm's naming systems) and Fancy Bear (aka APT 28, Sofacy and Strontium) to be responsible. Two other companies, Mandiant and ThreatConnect, also told The Washington Post they had verified the findings.

Why would the Russians even hack the DNC?

Many governments worldwide have high-level cyberespionage groups working for them, who may target secrets from other governments, intelligence agencies, government contractors, think tanks and academics.

Just like in traditional espionage, the goal of digital spying is to vacuum up information that could be useful to the motherland. That could be anything from secret engineering plans for fighter jets to classified state secrets to insight into political figures' motivations and behavior.

There is keen interest overseas in the U.S. presidential election, and understanding the candidates would be important to other nations that would have to deal with their potential administration.

And Trump's file may be of special interest, as he has one of the shortest political resumes of any modern presidential candidate. With his relative newness to the scene, insight and research into his history is valuable.

What about this other claim?

The person claiming to be Guccifer 2.0 posted several documents on the Internet and sent them to media outlets including Gawker, portraying the documents as coming from the hack of the DNC's files. The documents included a file about Trump and what looked like memos about DNC operations.

But there is no way to <u>verify</u> the identity of this Guccifer 2.0 individual. The name is a reference to a Romanian hacker who pleaded guilty to hacking several <u>prominent</u> politicians and figures, including Presidents George W. Bush and George H.W. Bush, who went online by Guccifer.

There is also no way to verify the <u>authenticity</u> of the documents. The DNC would not comment on their <u>veracity</u> and the <u>alleged</u> hacker offered no proof that they were what they purported to be.

How the DNC Hack is Boosting Anti-US Sentiment in Russia

Adapted and paraphrased from original source: http://www.csmonitor.com/World/Passcode/2016/0824/How-the-DNC-hack-is-boosting-anti-US-sentiment-in-Russia

Original author: Jack Detsch

With US and Russian tensions flaring around the world, anti-American sentiment has been rising in Moscow for some time.

And the recent Democratic National Committee email leaks that many experts and US officials have blamed on the Kremlin appear to be further hardening anti-Western attitudes and benefiting Russian President Vladimir Putin's standing at home ahead of his September reelection bid.

"The anti-Western narrative does seem to be one of the most effective narratives that the Russians are able to use," says Robert Orttung, assistant director at the Institute for European, Russian, and Eurasian Studies at the George Washington University. "The main idea is simply to distract the Russian public from the problems they face at home," he says. "Putin is using that as a way of maintaining his power."

Mr. Orttung says the Russian government uses its control over dozens of media outlets to deliver that message. After the DNC hack, for instance, Russian TV reporters attempted to embarrass Democratic presidential nominee Hillary Clinton and emphasize corruption in the US electoral process, including reports that connected the former Secretary of State to murders of political figures.

Experts say that Mr. Putin can benefit from the anti-Western messages even though he's the likely winner of this fall's vote. Protesters overshadowed presidential election in the 2011. Now, with Russia's economy stuck in <u>recession</u> for the past six quarters, experts say that concerns of electoral <u>turmoil</u> have e<u>mboldened</u> efforts to use the DNC hack as a distraction.

"The [DNC] hack has been framed in a broader narrative of a broader western <u>conspiracy</u> against Russia," says Alina Polyakova of the Atlantic Council, a Washington think tank. "This idea that everything is corrupt, that everything is rotten, that there's no such thing as a real democracy – this kind of sentiment <u>legitimates</u> what President Putin has grown in Russia which is this rigid conservative political system. It makes it seem like it's OK."

The Kremlin's control over the country's television media is also a powerful megaphone for the government. A 2015 poll from the independent Russian Levada Center found that about half of the Russian population found television reporting to be effective and useful. That's also where most Russians get their news. In June of last year, the Public Opinion Foundation found that TV is the leading source of information for 90 percent of the

country.

But observers doubt that many Russian channels have much independence. In its "Freedom of the Press 2016" report, the pro-democracy organization Freedom House rated Russia's media as "not free," noting that the promotion of the Kremlin's policies "became especially important amid growing economic hardship in Russia, and Kremlin-friendly media attempted to direct public discontent toward the United States and Europe," in regards to the <u>deteriorating</u> currency and the conflict in Syria.

Several important Kremlin figures, including Foreign Minister Sergei Lavrov have issued colorful denials of the DNC hack, leading Russia Today to remark that "US media and politicians keep crying 'wolf' – or Russia – over the DNC email hack without providing any proof."

Dr. Polyakova of the Atlantic Council said the media's job is to repackage Moscow's potential involvement in the hack as a Western attack on Russia.

"The US is portrayed as a horrible dirty political campaign, unlike the Russian case where the elections are supposed to be civilized," Maria Snegovaya, a New York-based columnist with the Russian business daily Vedomosti, told Passcode. "It's House of Cards on Russian TV channels."

ASE Standards Covered for Week 11, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Analyze the first homework article.	LANGUAGE/ READING	LANGUAGE
•	Analyze the second homework article.		 4. Determine or clarify the meaning of unknown and multiplemeaning words and phrases based on grades 11-12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
			 make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. 2. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas.
			 a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

 Write journal responses to in-class essay questions. Writing homework. Writing homework. Writing homework. 	v riting pice nalysis a w t for a
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THEME: National Cybersecurity Issues

OBJECTIVES

- Analyze homework articles.
- Write journal responses to in-class essay questions.

MATERIALS

Activity #1:

- Classroom Resource: Flip chart paper and markers.
- Handout (attached to Week 11, Lesson 1): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 DNC Hack: What You Need to Know
 http://www.cnn.com/2016/06/21/politics/dnc-hack-russians-guccifer-claims/index.html
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

 Handout (attached to Week 11, Lesson 1): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand. How the DNC Hack is Boosting Anti-US Sentiment in Russia
 http://www.csmonitor.com/World/Passcode/2016/0824/How-the-DNC-hack-is-boosting-anti-US-sentiment-in-Russia

ACTIVITY #1: Analyze the First Homework Article – 60 minutes.

• Tell students they will analyze the two homework articles as breaches of privacy that have originated from another country.

Vocabulary

- Put students into pairs and assign each pair a few vocabulary words.
- Have pairs:
 - Find the sentence with the word in it in the DNC Hack: What You Need to Know article.
 - \circ Review their definitions of the word.
 - \circ Choose the definition that best fits the sentence and write it down.
- Tell pairs to prepare a presentation using the following process:
 - Read the sentence with the word in it out loud
 - \circ Provide their definition of the word and write it on the board.
 - \circ Read the sentence again to check to see if the definition makes sense.
 - Involve both people in the pair equally in the presentation.
- While pairs are working, write the list of words on the board:.
 - o Breach
 - Perpetrators
 - Espionage
 - Adversaries
 - o Verify
 - Prominent
 - o Authenticity
 - Veracity
 - o Alleged

- Before the presentations, tell students they are to:
 - \circ Record the title of the article they are working on in their notebooks.
 - Write down where it was published. Students may need to check the original hyperlink to find out where an article was published.
 - List the words and definitions as they are presented.
- After each presentation, ask:
 - Is this the right definition of the word?
 - Does anyone have anything they want to add or change?

Question Game:

- Have students write down the name of the source they are using, complete with title, author, and website address.
- Tell students they will write down answers to questions that are asked in their notes. You will write down the correct answers on the board to assist with this note taking process.
- Put students into pairs to:
 - Review their facts and questions.
 - Take notes on what their partner got and they missed.
 - Choose 15 questions for the question game.
- Ask: Who wants to be the first lead? Then instruct students to follow this pattern:
 - The lead asks a question.
 - Those who know the answer raise their hands.
 - The lead chooses someone to answer the question.
 - If the answer is correct, that person becomes the new lead and repeats this process.
 - If the answer is incorrect, the lead chooses a new student to answer the question until someone has the correct answer.
- Repeat this pattern until students are out of questions.

ACTIVITY #2: Analyze the Second Homework Article - 60 minute

Vocabulary:

- Repeat the vocabulary process above for the article How the DNC Hack is Boosting Anti-US Sentiment in Russia, using the following vocabulary words:
 - Recession
 - o Turmoil
 - Emboldened
 - Conspiracy
 - Legitimates
 - \circ Deteriorating

Article Analysis:

- Write the homework questions on the board:
 - What is it like in Russia now?
 - Why would Vladimir Putin want to hack the DNC?
 - What is the response of the Russian people? Why?
- Put students in three groups and assign a different question to each group.
- Tell each group to:
 - Review the article.
 - Talk through a very detailed response.
 - > Prepare a presentation to the class to answer the question using flip chart paper and markers.
- Have each group give their presentation in the order of the questions.
- After the presentations, ask:

- What do you think about Russia's intrusion into American politics?
- What are the problems that the US needs to solve?
- Do you think countries that are having troubles inside their own countries often make troubles in other countries to change the focus?
 - Can you think of any possible examples?
- Has the US ever done this?

HOMEWORK

JOURNAL WRITING: Have students write answers to each of the following questions in their journals to prepare for their in-class essay:

- What are our rights to privacy as citizens?
- How important do you think our privacy rights are and why?
- What are some significant ways technology has threatened or breached your privacy rights?
- What are your recommendations for the government and/or the Supreme Court for protecting your privacy rights in the future?
- Have students:
 - Write the first question in their notebooks.
 - \circ Write down everything that comes to mind without stopping until they feel finished.
 - Repeat this process for each of the questions.
- Tell students this process will give them a rough draft of their own ideas to work with in building up to their in-class essay.

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ASE Standards Covered for Week 12, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Choose a thesis statement and review notes to create an outline. Outline and rehearse the in-class essay. Writing homework.	WRITING	 4. Produce clear, varied, coherent, consistent, and engaging writing in which the development, organization, style, tone, and voice are appropriate to task, purpose, and audience. Write an analysis based on a given prompt. a. Differentiate between example and reason when given a writing prompt. b. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or evaluating and trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
•	Writing homework.		 Develop and strengthen writing as needed by planr revising, editing, rewriting, or evaluating and trying new approach, focusing on addressing what is most significant for a specific purpose and audience.

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THEME: National Cybersecurity Issues

OBJECTIVES

- Choose a thesis statement and review notes to create an outline.
- Outline and rehearse the in-class essay.

MATERIALS

Activity #1:

- Classroom Resource: Flip chart paper and markers.
- Student Work: Students should bring hard copies of their homework assignment.

ACTIVITY #1: Choose a Thesis Statement and Review Notes to Create an Outline – 60 minutes.

- Tell students they will use this class period to prepare for their in-class essay.
 - Have students get out the journal draft of their in-class essay. They are to:
 - Read over the draft.
 - Underline (double line) or write the statement that states their concern about cybersecurity clearly.
 - \circ Underline (single line) the different reasons for their concern.
 - Underline (squiggly line) their recommendations.
- Give each person a flip chart paper and markers. Students need to:
 - Write their thesis statement at the top.
 - List their reasons below that.
 - Include their recommendations.
- Give each student 2-3 minutes to present their outlines.

ACTIVITY #2: Outline and Rehearse the In-Class Essay – 60 minutes.

- Tell students that they will create a formal outline for their in-class essay and rehearse it with a partner.
- Write the following on the board:
 - What are our rights to privacy as citizens? (Cite as needed)
 - How important do you think our privacy rights are and why?
 - Describe some significant ways your privacy rights have been threatened or breached by technology. (Cite as needed)
 - What are your recommendations for the government and/or the Supreme Court for protecting your privacy rights in the future?
- Have students make a formal outline of their essay by doing the following:
 - \circ $\;$ Reviewing their notes.
 - Underlining those notes that will help them with their essay.
 - Write down the first question and outline the points they want to make to that question.
 - \circ $\;$ Continue this process for each of the questions.
- Demonstrate/model the first question using one student's flip chart presentations. Ask:
 - What is the primary thing you want to say in the first paragraph?
 - Write their statement on the board.

- How are you going to explain your statement further?
 - Indent and take notes on what the student wants to say under their statement.
- Do a number of paragraphs on the board in this way so students can see what their outlines should look like.
- Walk around and help students as they work through their outlines.
 - When students finish, put them in pairs to talk through their outlines. For each reading:
 - \circ $\;$ The listener should ask questions for clarification.
 - \circ The reader can offer adjustments for their outlines to make clearer the ideas.

HOMEWORK

•

WRITE: Complete a full outline for the in-class essay.

ASE Standards Covered for Week 12, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Write your in- class essay.	WRITING	 Write arguments from a prompt in a formatted manner of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from and supports the argument presented.
•	Conduct a peer review.	READING	 Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole. Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another). Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, otherwise) and determine how they refine meaning, emphasize certain ideas, or reinforce an author's purpose. Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose. Determine an author's purpose or point of view in a text and explain how it is conveyed and shapes the content and style of a text. Analyze how the author distinguishes his or her position from that of others or how an author acknowledges and responds to conflicting evidence or viewpoints. Infer an author's implicit as well as explicit purposes based on details in text. Analyze how an author uses rhetorical techniques to advance his or her point of view or achieve a specific purpose (e.g., analogies, enumerations, repetition and parallelism, juxtaposition of opposites, qualifying statements).

•	Reading	LANGUAGE/	LANGUAGE
	homework.	READING	
			4. Determine or clarify the meaning of unknown and multiple-meaning
			words and phrases based on grades 11–12 reading and content,
			choosing flexibly from a range of strategies.
			a. Use context (e.g., the overall meaning of a sentence, paragraph, or
			text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase
			b. Identify and correctly use patterns of word changes that indicate
			different meanings or parts of speech (e.g., conceive, conception, conceivable).
			c. Consult general and specialized reference materials (e.g.,
			dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise magning
			its part of speech its etymology, or its standard usage
			d. Verify the preliminary determination of the meaning of a word or
			phrase (e.g., by checking the inferred meaning in context or in a
			dictionary).
			READING
			1. Read closely to determine what the text says explicitly and to make
			logical inferences from it; cite specific textual evidence when writing
			or speaking to support conclusions drawn from the text.
			a. Cite strong and thorough textual evidence to support analysis of
			what the text says explicitly as well as inferences drawn from the
			text, including determining where the text leaves matters uncertain.
			2. Determine central ideas or themes of texts and analyze their
			development; summarize the key supporting details and ideas.
			a. Comprehend explicit details and main ideas in text.
			b. Summarize details and ideas in text.
			c. Make sentence level inferences about details that support main
			ideas.
			d. Infer implied main ideas in paragraphs or whole texts.
			e. Determine which detail(s) support(s) a main idea.
			 Identity a theme, or identity which element(s) in a text support a theme.
			g. Make evidence based generalizations or hypotheses based on
			details in text, including clarifications, extensions, or applications of
			main ideas to new situations.
			h. Draw conclusions or make generalizations that require synthesis of
			multiple main ideas in text.

THEME: National Cybersecurity Issues

OBJECTIVES

- Write an in-class essay.
- Conduct a peer review.

MATERIALS

Activity #1:

• Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

• Handout (attached to Week 2, Lesson 2): Make two copies for each student. Audience Comment Page

Homework:

 Handout (attached): Make one copy for each student. Cyberattacks on U.S. Companies in 2014 <u>http://www.heritage.org/research/reports/2014/10/cyberattacks-on-us-companies-in-2014</u>

ACTIVITY #1: Write an In-Class Essay – 60 minutes.

- Tell students they will write an in-class essay. They have 45 minutes and are welcome to take the full time.
- Tell them to relax and trust that they are prepared. Also, this is a first draft and they can improve it later.
- Students should focus on their ideas and their outlines to help them explain what they have to say to a real audience.
- Have students write a timed, 45-minnute essay.

ACTIVITY #2: Conduct the Peer Review Process – 60 minutes.

TEACHER NOTE: Evaluate the student essays handed in using a copy of the Audience Comment Page. You will need to read both the essays and the student comments on those essays to see how perceptive the audiences for each essay were. Your comments should either reflect good suggestions or offer a different way to evaluate their essays that you think might be more helpful. Additionally, DO NOT correct everything in the students' drafts. Instead, put a line under those places in the text where students need to make grammar or spelling corrections. In your comments, indicate a due date for rewrites of these drafts.

- Tell students they will provide constructive feedback on each other's summaries. Remind them that they are the audience that the writer is happy and comfortable with, and the audience simply wants to understand the author's ideas and provide suggestions for making the written work more interesting.
- Put students into groups of three.
- Pass out two copies of the Audience Comment Page to each student. Explain that they will:
 - \circ Read the paragraph written by the other two people in their group.
 - Fill out one Audience Comment Page for each of the essays they read.

- They are NOT to comment on grammar or spelling yet. However, if they are not sure what something says, they can ask the writer for clarification.
- They are to be friendly, encouraging, and helpful. Good comments on their partner's work will help them when they have to rewrite their paragraphs.
- Have students pass their summary to the left.
- After students have evaluated the summary, they should pass it to their left and evaluate a new summary.
- After students have evaluated two summaries from two partners, they should give their evaluations to the writers, and the writers should read the comments.
- Ask the class as a whole:
 - Did your evaluators say the same or different things?
 - Did your evaluators say things that gave you ideas for how to make your essay better?
 - \circ Did your evaluators confuse you? Ask for clarification when back in your group.
- Collect student summaries along with the reviews. Tell students you will be giving your own review, turn them back to the student, and, at that time, you will give them a due date for a final summary.

HOMEWORK

READ: Have students read the article, Cyberattacks on U.S. Companies in 2014, and complete the following instructions:

- Define the following underlined words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:
 - Spate
 - Breaches
 - o Malware
 - Chronologically
 - Sophisticated
 - Compromised
 - Denial-of-service attack
 - State-sponsored
 - Disgruntled
 - Sabotage
 - Private-public
 - Regulatory backlash
 - Harnessing
- Underline those portions of the text that make the following clear:
 - The author's thesis.
 - The author's evidence.
 - The author's recommendations.
 - The author's conclusion.

TEACHER PREPARATION NOTE: Before the next lesson, create index cards, one each with the vocabulary words listed above printed on them.

Cyberattacks on U.S. Companies in 2014

Adapted and paraphrased from original source:

http://www.heritage.org/research/reports/2014/10/cyberattacks-on-us-companies-in-2014

Original author: Riley Walters

The <u>spate</u> of recent data <u>breaches</u> at big-name companies such as JPMorgan Chase, Home Depot, and Target raises questions about the effectiveness of the private sector's information security. According to FBI Director James Comey, "There are two kinds of big companies in the United States. There are those who've been hacked...and those who don't know they've been hacked.."[1]

A recent survey by the Ponemon Institute showed the average cost of cyber crime for U.S. retail stores more than doubled from 2013 to an annual average of \$8.6 million per company in 2014.[2] The annual average cost per company of successful cyberattacks increased to \$20.8 million in financial services, \$14.5 million in the technology sector, and \$12.7 million in communications industries.

This paper lists known cyberattacks on private U.S. companies since the beginning of 2014. [3] By its very nature, a list of this sort is incomplete. The scope of many attacks is not fully known. For example, in July, the U.S. Computer Emergency Readiness Team issued an advisory that more than 1,000 U.S. businesses have been affected by the Backoff <u>malware</u>, which targets place-of-sale (POS) systems used by most retail industries.[4] These attacks targeted administrative and customer data and, in some cases, financial data.

This list includes only cyberattacks that have been made known to the public. Most companies encounter multiple cyberattacks every day, many unknown to the public and many unknown to the companies themselves.

The data breaches below are listed <u>chronologically</u> by month of public notice.

January

- **Target (retail).** In January, Target announced an additional 70 million individuals' contact information was taken during the December 2013 breach, in which 40 million customer's credit and debit card information was stolen.[5]
- **Neiman Marcus (retail).** Between July and October 2013, the credit card information of 350,000 individuals was stolen, and more than 9,000 of the credit cards have been used fraudulently since the attack.[6] <u>Sophisticated</u> code written by the hackers allowed them to move through company computers, undetected by company employees for months.
- Michaels (retail). Between May 2013 and January 2014, the payment cards of 2.6 million Michaels customers were affected.[7] Attackers targeted the Michaels POS system to gain access to their systems.
- **Yahoo! Mail (communications).** The e-mail service for 273 million users was reportedly hacked in January, although the specific number of accounts affected was not released.[8]

April

- **Aaron Brothers (retail).** The credit and debit card information for roughly 400,000 customers of Aaron Brothers, a subsidiary of Michaels, was <u>compromised</u> by the same POS system malware.[9]
- **AT&T (communications).** For two weeks AT&T was hacked from the inside by personnel who accessed user information, including social security information.[10]

May

- **eBay (retail).** Cyberattacks in late February and early March led to the compromise of eBay employee log-ins, allowing access to the contact and log-in information for 233 million eBay customers.[11] eBay issued a statement asking all users to change their passwords.
- **Five Chinese hackers indicted.** Five Chinese nationals were indicted for computer hacking and economic espionage of U.S. companies between 2006 and 2014. The targeted companies included Westinghouse Electric (energy and utilities), U.S. subsidiaries of SolarWorld AG (industrial), United States Steel (industrial), Allegheny Technologies (technology), United Steel Workers Union (services), and Alcoa (industrial).[12]
- **Unnamed public works (energy and utilities).** According to the Department of Homeland Security, an unnamed public utility's control systems were accessed by hackers through a brute-force attack[13] on employee's log-in passwords.[14]

June

- **Feedly (communications).** Feedly's 15 million users were temporarily affected by three distributed <u>denial-of-service attacks.[15]</u>
- **Evernote (technology).** In the same week as the Feedly cyberattack, Evernote and its 100 million users faced a similar denial-of-service attack.[16]
- **P.F. Chang's China Bistro (restaurant).** Between September 2013 and June 2014, credit and debit card information from 33 P.F. Chang's restaurants was compromised and reportedly sold online.[17]

August

- **U.S. Investigations Services (services).** U.S. Investigations Services, a subcontractor for federal employee background checks, suffered a data breach in August, which led to the theft of employee personnel information.[18] Although no specific origin of attack was reported, the company believes the attack was <u>state-sponsored</u>.
- **Community Health Services (health care).** At Community Health Service (CHS), the personal data for 4.5 million patients were compromised between April and June.[19] CHS warns that any patient who visited any of its 206 hospital locations over the past five years may have had his or her data compromised. The sophisticated malware used in the attack reportedly originated in China. The FBI warns that other health care firms may also have been attacked.
- **UPS (services).** Between January and August, customer information from more than 60 UPS stores was compromised, including financial data,[20] reportedly as a result of the Backoff malware attacks.
- **Defense Industries (defense).** Su Bin, a 49-year-old Chinese national, was indicted for hacking defense companies such as Boeing.[21] Between 2009 and 2013, Bin reportedly worked with two other hackers in an attempt to steal manufacturing plans for defense programs, such as the F-35 and F-22 fighter jets.

September

- **Home Depot (retail).** Cyber criminals reportedly used malware to compromise the credit card information for roughly 56 million shoppers in Home Depot's 2,000 U.S. and Canadian outlets.[22]
- **Google (communications).** Reportedly, 5 million Gmail usernames and passwords were compromised.[23] About 100,000 were released on a Russian forum site.
- **Apple iCloud (technology).** Hackers reportedly used passwords hacked with brute-force tactics and third-party applications to access Apple user's online data storage, leading to the subsequent posting of celebrities' private photos online.[24] It is uncertain whether users or Apple were at fault for the attack.
- **Goodwill Industries International (retail).** Between February 2013 and August 2014, information for roughly 868,000 credit and debit cards was reportedly stolen from 330 Goodwill stores.[25] Malware infected the chain store through infected third-party vendors.
- SuperValu (retail). SuperValu was attacked between June and July, and suffered another malware

attack between late August and September.[26] The first theft included customer and payment card information from some of its Cub Foods, Farm Fresh, Shop 'n Save, and Shoppers stores. The second attack reportedly involved only payment card data.

- **Bartell Hotels (hotel).** The information for up to 55,000 customers was reportedly stolen between February and May.[27]
- **U.S. Transportation Command contractors (transportation).** A Senate report revealed that networks of the U.S. Transportation Command's contractors were successfully breached 50 times between June 2012 and May 2013.[28] At least 20 of the breaches were attributed to attacks originating from China.

October

- **J.P. Morgan Chase (financial).** An attack in June was not noticed until August.[29] The contact information for 76 million households and 7 million small businesses was compromised. The hackers may have originated in Russia and may have ties to the Russian government.
- **Dairy Queen International (restaurant).** Credit and debit card information from 395 Dairy Queen and Orange Julius stores was compromised by the Backoff malware.[30]
- **Snapsave (communications).** Reportedly, the photos of 200,000 users were hacked from Snapsave, a third-party app for saving photos from Snapchat, an instant photo-sharing app.[31]

Securing Information

As cyberattacks on retail, technology, and industrial companies increase so does the importance of cyber security. From brute-force attacks on networks to malware compromising credit card information to <u>disgruntled</u> employees <u>sabotaging</u> their companies' networks from the inside, companies and their customers need to secure their data. To improve the private sector's ability to defend itself, Congress should:

- **Create a safe legal environment for sharing information**. As the leaders of technological growth, private companies are in most ways at the front of cyber security issue. Much like government agencies, companies must share information that concerns cyber threats and attacks among themselves and with appropriate <u>private-public</u> organizations.[32] Congress needs to create a safe environment in which companies can voluntarily share information without fear of legal or <u>regulatory backlash</u>.
- Work with international partners. As with the Backoff malware attacks, attacks can affect hundreds if not thousands of individual networks. These infected networks can then infect companies outside the U.S. and vice versa. U.S. and foreign companies and governments need to work together to increase overall cybersecurity and to enable action against individual cyber criminals and known state-sponsored cyber aggressors.[33]
- **Encourage cyber insurance.** Successful cyberattacks are inevitable because no security is perfect. With the number of breaches growing daily, a cybersecurity insurance market is developing to lessen the cost of breaches. Congress and the Administration should also encourage establish of this cyber insurance system to faulty cyber practices and human error.[34]

Conclusion

The recent increases in the rate and the severity of cyberattacks on U.S. companies indicate a clear threat to businesses and customers. As businesses come to terms with the increasing threat of hackers, establishing the right policies is critical to <u>harnessing</u> the power of business. In a cyber environment with ever-changing risks and threats, the government needs to do more to support the businesses in establishing sound international cyber security, while not creating regulations that hinder businesses more than help them.

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ASE Standards Covered for Week 13, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES	STANDARD	STANDARD
• Analyze the homework article.	LANGUAGE/ READING	 LANGUAGE 4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
		 READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. 2. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

	\ A /	PEADING	7 Integrate and evaluate content presented in diverse formats and
•	watch videos on	KEADINO	modia including visually and quantitativoly as well as in
	the frequency of		Anchers have date as eventitative and for viewel information
	international		a. Analyze now data or quantitative ana/or visual information
	cyberattacks.		extends, clarifies, or contradicts information in fext, or determine
			how data supports an author's argument.
			 Compare two passages that present related ideas or themes in
			different genre or formats (e.g., a feature article and an online
			FAQ or fact sheet) in order to evaluate differences in scope,
			purpose, emphasis, intended audience, or overall impact when
			comparina.
			c Compare two passages that present related ideas or themes in
			different genre or formats in order to synthesize details draw
			conclusions, or apply information to now situations
			conclosions, or upply information to new structions.
	Lash sultas fau	WRITING	7 Conduct short as well as more sustained research projects to answer
•	LOOK ONLINE TOP	WKIIIING	7. Conduct short as well as more sostained research projects to answer
	news of attacks		a question (including a self-generated question) or solve a problem.
	since 2014.		a. Narrow or broaden the inquiry when appropriate.
			 Synthesize multiple sources on the subject, demonstrating
			understanding of the subject under investigation.
			c. Gather relevant information from multiple authoritative print and
			digital sources using advanced searches effectively.
			d. Assess the strengths and limitations of each source in terms of task,
			purpose, and audience.
			e Integrate information into the text selectively to maintain the flow
			of ideas avoiding plagigrism and overrelignce on any one source
			and following a standard format for situation
			f Draw evidence from literary or informational texts to support
			T. Draw evidence from interary or informational fexts to support
			analysis, reflection, and research.
			8. Gather relevant information from multiple print and digital sources,
			assess the credibility and accuracy of each source, and integrate the
			information while avoiding plagiarism.
			9. Draw evidence from literary or informational texts to support
			analysis, reflection, and research.
	Paadina	READING	
•	keuung		
	nomework.		A Determine or clarify the meaning of unknown and multiple-meaning
			4. Determine of claimy me meaning of onknown and momple-meaning
			words and phrases based on grades 11-12 reading and content,
			choosing flexibly from a range of strategies.
			a. Use context (e.g., the overall meaning of a sentence, paragraph, or
			text; a word's position or function in a sentence) as a clue to the
1			meaning of a word or phrase.
1			b. Identify and correctly use patterns of word changes that indicate
1			different meanings or parts of speech (e.g., conceive, conception,
1			conceivable).
			c. Consult general and specialized reference materials (e.g.,
			dictionaries alossaries thesauruses) both print and digital to find
			the pronunciation of a word or determine or elevity its precise
1			me prononciation of a word of determine of clarify its precise
			meaning, its part of speech, its etymology, or its standard usage.
			d. Verity the preliminary determination of the meaning of a word or
			phrase (e.g., by checking the inferred meaning in context or in a
			dictionary).

	READING
	 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
	 Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

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Week 13, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

THEME: International Cybersecurity Issues

Class to be held in the Technology Lab

OBJECTIVES

- Analyze the homework article.
- Watch videos on the frequency of international cyberattacks.
- Look online for news of attacks since 2014.

MATERIALS

<u>Activity #1:</u>

- Put the following words on individual index cards:
 - Spate
 - o Breaches
 - o Malware
 - Chronologically
 - Sophisticated
 - Compromised
 - Denial-of-service attack
 - State-sponsored
 - Disgruntled
 - Sabotage
 - Private-public
 - Regulatory backlash
 - Harnessing
- Classroom Resource: Flip chart paper and markers.
- Handout (attached to Week 12, Lesson 2): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 Cyberattacks on U.S. Companies in 2014
 http://www.heritage.org/research/reports/2014/10/cyberattacks-on-us-companies-in-2014
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

- Online Resource: Norse Attack Map http://map.norsecorp.com/#/
- Online Resource: FireEye Cyber Threat Map <u>https://www.fireeye.com/cyber-map/threat-map.html</u>

<u>Homework:</u>

 Handout (attached): Make one copy for each student. International Cyberattacks <u>http://www.personal.psu.edu/abc5103/IST%20432%20Portal%20Project/</u>

ACTIVITY #1: Analyze the Homework Article – 50 minutes.

- Tell students they are now going to look at international cyberattacks and the impact they are having on the way countries interact with one another. The essay prompt questions will help them find the information they will need for class work over the next four weeks.
- Write the following questions on the board:
 - What are international cyberattacks and why are thy important to our future?
 - What is Edward Snowden's opinion on international cyberattacks and what are his reasons for his opinion?
 - What was Obama's opinion on international cyberattacks?
 - What is your opinion? What are the reasons for your opinion?
 - What solutions do you think would help improve the international cyberattack situation?
- Read each of the questions on the board aloud and, after each one, ask:
 - What do we already know about this question?
 - What do we think might be some answers to this question?
 - What more do we need to know to answer it?
 - Take notes on the board as needed.
- Have students write the title of their homework article in their notebooks, leaving space for their work and notes:
 - Write the title on the board: Cyberattacks on U.S. Companies in 2014

Vocabulary:

- Put students in pairs and have each pair pick an index card. Keep going from pair to pair until all the cards have been picked. Likely, some pairs may have more than others.
- Have pairs:
 - Find the sentence with the word in it in the Cyberattacks on U.S. Companies in 2014 article.
 - Review their definitions of the word.
 - Choose the definition that best fits the sentence and write it down.
- Pairs are to prepare a presentation using the following process:
 - Read the sentence with the word in it: loud, clear and with feeling!
 - Provide their definition of the word and write it on the board.
 - \circ Read the sentence again to check to see if the definition makes sense.
 - Involve both people in the pair equally in the presentation.
- While pairs are working, write the list of words on the board.
- After each presentation, ask:
 - Is this the right definition of the word?
 - Does anyone have anything they want to add or change?

Article Analysis:

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- Tell students they will analyze the homework article by working through the main points and making sure the whole class understands the author's meaning.
- Put students into three groups and tell them to:
 - \circ $\;$ Decide what they think is the thesis of the article. They should:
 - Write or quote a statement from the article that says it clearly.
 - Have each group state their thesis to the class:
 - Write each group's statement on the board.
 - \circ $\;$ Decide on the statement that best describes the author's opinion.
- Assign each group with one of the following:
 - \circ The author's evidence.
 - The author's recommendations.
 - The author's conclusion.
- Tell each group to:
 - Decide which major points they want to put in their presentation.
 - Prepare a flip chart page that summarizes the author's points in their own words.
 - Use quotes or paraphrases as needed, using our quotation and reference gestures. (Review them as needed.)
- Have groups give their presentations in order.
 - Tell students to take notes on each presentation in their notebooks.
- After each presentation, ask:
 - Any questions for the presenters?
 - Does anyone have anything they want to add?
- After all the presentations, ask:
 - Do you know of any cyberattacks since 2014?
 - List these on the board.

ACTIVITY #2: Watch Videos on the Frequency of International Cyberattacks – 20 minutes.

- Tell students they will look at two websites that are tracking international cyberattacks that are happening right now.
- Project the Norse Attack Map and watch it for a few minutes.
- While students are watching, ask:
 - Which countries are involved in making cyberattacks?
 - Where are most of the attacks going? (See "Attack Targets" box at the bottom.)
 - Where are they coming from? (See "Attack Origins" box at the bottom.)
- Project the FireEye Cyber Threat Map.
- Watch for a few minutes, and ask while students are watching:
 - What new information can you get from this map?
 - What countries are involved in cyberattacks right now?
 - What are the top five industries being attacked recently?
 - Look at the bottom right hand corner for the "Top Five Reported Industries".
 - What are the countries making the most attacks in the past 30 days?
 - Look at the bottom left hand corner.
- After watching these two sites, ask:
 - What is your response to these web sites?
 - Any surprises?
 - Any concerns?

ACTIVITY #3: Look Online for News of International Attacks Since 2014 – 50 minutes.

- Tell students they will now go online to find examples of recent international cyberattacks.
- Tell students they are to find one article or video they want to read or watch and take notes on it. They should try to find out and report back to the class on:
 - Who made the attack.
 - Who was attacked.
 - What the damages were.
- Before students start their research, ask:
 - What search terms they use for their online searches?
 - Write down students' ideas on the board and add your own as needed.
- After about 35 minutes, go round-robin to have students report the international cyberattacks that have taken place recently, and note each on the board.

HOMEWORK

READ: Have students read the article, International Cyberattacks, and complete the following instructions:

- Define the following underline words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:
 - \circ Infrastructure
 - o Vulnerable
 - Backbone of our economy
 - o Ideological
 - \circ Intrusion
 - Exceeds
 - Malicious
 - \circ Bombard
 - Hinder
 - Exploited
 - Assess
- Underline portions of the text that answer the following questions:
 - What is the problem?
 - What are the three kinds of attacks?
 - What are the proposed solutions?

TEACHER PREPARATION NOTE: Before the next lesson, create index cards, one each with the vocabulary words listed above printed on them.

International Cyberattacks

Adapted and paraphrased from original source: http://www.personal.psu.edu/abc5103/IST%20432%20Portal%20Project/international.htm

Original authors: Albert Chen, Andrew Goodman, Alexa Kruper, Marcus Minor, Joseph Snyder

Introduction

One of the biggest fears of the new millennium is the fear of a crippling cyberattack on our country's <u>infrastructure</u>. In recent years, we have seen the possible outcomes that these attacks can have on our country, and others, and the problem seems to be growing. There has to be something in place in our world to both protect and respond to this growing threat. The only way to achieve this type of protection is from both increased awareness and international cooperation. Without them, the world's infrastructure will become increasingly <u>vulnerable</u> to cyberattacks, threatening the <u>backbone of our economy</u> and safety. In the following pages, we will discuss a number of topics describing these cyberattacks as well as both national and international strategies to combat these cyberattacks. The attacks described had numerous motives, from political to economic to <u>ideological</u>, but that is not the most important idea. The idea is that no matter what the reason for the attack, the only way to combat it is through better protection. The goal of this site is to increase awareness of the problem and to give a number of suggestions to how both the United States and international organizations can increase their efforts to better protect our infrastructure and to more quickly and efficiently respond to attacks.

Attacks

Information attacks can have several effects on the US infrastructure, and this is due to the fact the several different types of attacks can be carried out. One form of attack is known as an unauthorized <u>intrusion</u>. This type of attack is more commonly known as hacking; however the same type of attack could be carried out by an insider who has gained authorization that <u>exceeds</u> their normal access. This unauthorized access allows the attacker to carry out actions on the network they have successfully hacked.

The second type of cyberattack is a destructive virus. Several variations of <u>malicious</u> code exist which are known as worms, viruses, and Trojans. This form of attack is typically sent via e-mail or other forms of data exchange and result in damaged function of the computer or data loss [3]. Forty-three percent of Federal information technology managers say malicious code is the biggest threat [1]. On average, thirty new viruses are sent out daily and roughly fifty thousand exist in total [2]. The sheer numbers of these attacks make them dangerous. If a user is not cautious trusting files, it could be easy to miss one with malicious code attached.

The third form of attack is Denial or Service (DoS). An attack of this kind will aim to overload or <u>bombard</u> a computer with information of communications in order to effectively tie up the computer or network to <u>hinder</u> computer function and may even effectively shut them down [3].

US Response & Policies

As technology continues to grow so does the need to protect those technologies and find the vulnerabilities before they are <u>exploited</u>. In the coming years, the U.S. will have to enact new

policies and legislation governing cyber security. What is the overall plan? To implement a comprehensive global cyber security program in order to coordinate responses with other countries. Cyberattacks on networks and critical infrastructures cost the U.S. billions of dollars annually.

International Coordination

With cyber threats all across the globe on the rise, the need for an international response system is greater. There should be a world-wide international coordination, as opposed to separate systems working to protect an individual country. The reason for this need of international coordination is because the threats that are received can originate from any part of the world. With more resources, communication, and man power, threats can be prevented more efficiently.

According to the U.S. Cyber Consequences Unit (US-CCU), there is a need for international coordination in security. The US-CCU is a non-profit independent research institute in Boston that <u>assesses</u> cyberattacks for the US government. Led by Scott Borg, the US-CCU comes up with many reports on their data. They say there is an urgent need for cyber response exercises in every country in a report following the Russian hacking incidents on Georgia in August of 2008. They also analyzed the attack, step-by-step to show the vulnerabilities of the current system.

In order to allow this joint effort to happen, governments from all countries must also agree on certain terms. One way to prevent attacks is to fund experts to help with the issue.

One of the most experienced organizations in this area is the Forum of Incident Response and Security Teams, or FIRST. FIRST is an organization that brings together a number of different security and incident response teams, including people from the government, commercial, and academic fields. With security partnerships across the globe, FIRST is rapidly expanding and becoming the most well-known international security response network.

On June 28th 2009, Interpol joined forces with FIRST, making them the largest law enforcement agency to join the organization [10]. The partnership between Interpol and FIRST is a great step to international coordination against cyberattacks. Interpol provides the secure global police communication system, which connects all of FIRST's 187 member countries with each other.

By increasing the amount of funding for FIRST, countries will become securely tied together and be safely in the hands of security experts. By strengthening these partnerships, the network will be able to increase communication, coordination, provide different countries with needed advise, and allow participating partners to respond more quickly and effectively.

Conclusion

As you have seen throughout this website, there are a number of continuing problems in cyber space, as well as attempts at protecting the cyber world we have created. The biggest step we can take now is to increase awareness of the problem and to create a larger effort at both national and international cooperation. There are a number of ways that we can go about this, from actively getting our legislators to provide more funds for groups like FIRST to make sure that we take responsibility for our own computer security. Without wider support for international cooperation, cyber security will never be at the level it needs to be.

ASE Standards Covered for Week 13, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Analyze the homework article.	LANGUAGE/ READING	 LANGUAGE Determine or clarify the meaning of unknown and multiple- meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
			 READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
			 Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

Watch c and and Edward Snowder opinion.	a video Iyze n's	READING	 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
			 Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.
Reading homewo	rk.	READING	 LANGUAGE Determine or clarify the meaning of unknown and multiplemeaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

2. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas.	
a. Comprehend explicit details and main ideas in text.	
b. Summarize details and ideas in text.	
c. Make sentence level inferences about details that support main ideas.	
d. Infer implied main ideas in paragraphs or whole texts.	
e. Determine which detail(s) support(s) a main idea.	
f. Identify a theme, or identify which element(s) in a text support a theme.	
g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations.	
 h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text. 	of

THEME: International Cybersecurity Issues

OBJECTIVES

- Analyze the homework article.
- Watch a video and analyze Edward Snowden's opinion.

MATERIALS

Activity #1:

- Put the following words on individual index cards:
 - o Infrastructure
 - o Vulnerable
 - Backbone of our economy
 - o Ideological
 - o Intrusion
 - Exceeds
 - Malicious
 - Bombard
 - Hinder
 - Exploited
 - Assess
- Handout (attached): Make one copy for each student.
 - Edward Snowden on Cyberattacks: Note Taking Questions
- Classroom Resource: Flip chart paper and markers.
- Handout (attached to Week 13, Lesson 1): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand. International Cyberattacks
 http://www.personal.psu.edu/abc5103/IST%20432%20Portal%20Project/
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

 Video: Edward Snowden on Cyberattacks <u>https://www.youtube.com/watch?v=T0e46OtrQps</u> (running time: 03:53)

Homework:

- Handout (attached): Make one copy for each student. Stuxnet Virus Targets and Spread Revealed <u>http://www.bbc.com/news/technology-12465688</u>
- Handout (attached): Make one copy for each student. The Stuxnet Attack On Iran's Nuclear Plant Was 'Far More Dangerous' Than Previously Thought <u>http://www.businessinsider.com/stuxnet-was-far-more-dangerous-than-previous-thought-2013-11</u>

ACTIVITY #1: Analyze the Homework Article – 60 minutes.

Vocabulary:

• Put students in pairs and have each pair pick an index card. Keep going from pair to pair until all the cards have been picked. Likely, some pairs may have more than others.

- Have pairs:
 - Find the sentence with the word in it in the International Cyberattacks article.
 - \circ $\;$ Review their definitions of the word.
 - \circ $\;$ Choose the definition that best fits the sentence and write it down.
- Pairs are to prepare a presentation using the following process:
 - \circ $\;$ Read the sentence with the word in it: loud, clear and with feeling!
 - \circ Provide their definition of the word and write it on the board.
 - \circ $\;$ Read the sentence again to check to see if the definition makes sense.
 - $_{\odot}$ $\,$ Involve both people in the pair equally in the presentation.
- While pairs are working, write the list of words on the board.
- Before the presentations, tell students they are to:
 - Record the title of the article they are working on in their notebooks.
 - Write down where it was published. Students may need to check the original hyperlink to find out where an article was published.
 - \circ $\;$ List the words and definitions as they are presented.
- After each presentation, ask:
 - Is this the right definition of the word?
 - Does anyone have anything they want to add or change?

Article Analysis:

- Tell students they will analyze the homework article by working through the main points and making sure the whole class understands the author's meaning.
- Put students into three groups and tell them to:
 - Decide what they think is the thesis of the article.
 - \circ Write or quote a statement from the article that states the thesis clearly.
 - Have each group state their thesis to the class:
 - Write each group's statement on the board.
 - Decide on the statement that best describes the author's opinion.
 - Assign each group one of the following questions:
 - What is the problem?
 - What are the three kinds of attacks?
 - What are the proposed solutions?
- Tell each group to:
 - Decide which major points they want to include in their presentation.
 - Prepare a flip chart page that summarizes the author's points in their own words.
 - Use quotes or paraphrases as needed, using our quotation and reference gestures. (Review them as needed.)
- Have groups give their presentations in order. Tell students to take notes on each presentation in their notebooks.
- After each presentation, ask:
 - Any questions for the presenters?
 - Anything you want to add?
- After all the presentations, ask:
 - What from this article will help you with your next essay?
 - What question will it help you answer? How?

ACTIVITY #2: Watch a Video and Analyze Edward Snowden's Opinion – 60 minutes.

- Tell students they are now going to look at a video where Edward Snowden expresses his opinion on international cyberattacks.
- Ask: Which essay question will this video help you answer?
 - Write that question on the board: What is Edward Snowden's opinion on international cyberattacks and what are his reasons for his opinion?
- Pass out Edward Snowden on Cyberattacks: Note Taking Questions.
- Define the words at the beginning of the sheet by:
 - Writing them on the board:
 - Offensive/Defensive
 - Adversaries
 - Retaliate
 - Pivot
 - Asking students what each means.
 - \circ Asking them to use the words in a sentence that clearly shows the meaning of the words.
- Next, have specific students read the questions: loud, clear, and with feeling!
 - Tell students they will watch the video two times:
 - The first time to just listen.
 - The second time to take notes that will help them answer the question on the handout.
- Put student into four groups and assign each group one of the questions. Each group should:
 - Discuss their answers.
 - \circ Come up with the fullest answer to explain to the class.
- Have each group report out on their question with a full, detailed answer.
- After each question, ask students:
 - Does anyone have anything they want to add?
 - Does anyone have anything they want the presenter(s) to clarify?
 - After the presentations, ask for students' thoughts on Edward Snowden's opinion:
 - Do you think the United States should only play defense when responding to cyberattacks?
 - Why or why not?
 - Do you think there are instances when the United States should be offensive when dealing with cyberattacks?
- Draw the following continuum on the board and ask:
 - Where would you put Edward Snowden on this continuum? Why?
 - Where would you put yourself on this continuum? Why?

The US should be primarily offensive.

The US needs a mix of offense and defense.

The US should be primarily defensive.

- Mark where students put themselves on the continuum and put their name by the mark. Tell them to:
 Create a clear thesis statement of their position.
 - Write these down on the board so students can see the range in the class.
- Have students write down the thesis statements that make the most sense to them.

HOMEWORK

READ: Have students read the article, *Stuxnet Virus Targets and Spread Revealed*, and complete the following instructions:

- Define the following underlined words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:
 - Variants
 - Nation state
 - Chernobyl (look online to find facts about this incident)
 - Speculation
 - o Infiltrate
 - o Manually
 - Configuration
 - o Novelty
- Underline those portions of the text that make the facts about the Stuxnet virus clear.

READ: Have students read the article, The Stuxnet Attack On Iran's Nuclear Plant Was 'Far More Dangerous' Than Previously Thought, and complete the following instructions:

- Define the following underlined words and define the following words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:
 - $\circ \quad \textbf{Ravaged}$
 - o Blueprint
 - Self-replicate
 - Industrial control systems
- Underline those portions of the text that answer the following question:
 - What is the new information in this article that is not contained in the first article?

TEACHER PREPARATION NOTE: Before the next lesson, create index cards, one each with the vocabulary words listed above printed on them.

EDWARD SNOWDEN ON CYBERATTACKS: NOTE TAKING QUESTIONS

Words to define before watching:

- Offensive/Defensive
- Adversaries
- Retaliate
- Pivot
- 1. How does Edward Snowden use the idea of vaults to explain what the US has to lose?

2. How does Edward Snowden think the US started an international cyber war?

3. According to Snowden, what is the difference between disruptive and destructive cyberattacks? Why is one more significant than the other?

4. According to Snowden, what does Jurassic Park have to do with cyberattacks?

Stuxnet Virus Targets and Spread Revealed

Adapted and paraphrased from original source: <u>http://www.bbc.com/news/technology-12465688</u>

Original author: Jonathan Fildes

A powerful internet worm repeatedly targeted five industrial facilities in Iran over 10 months, ongoing analysis by security researchers shows.

Stuxnet, which came to light in 2010, was the first-known virus specifically designed to target real-world infrastructure, such as power stations.

Security firm Symantec has now revealed how waves of new <u>variants</u> were launched at Iranian industrial facilities.



Stuxnet may have been designed to target Iran's nuclear program.

Some versions struck their targets within 12 hours of being written.

Orla Cox of Symantec told BBC News said, "We are trying to understand how and why it spread."

Repeated attacks

The worm first grabbed headlines late last year after initial analysis showed that the sophisticated piece of malware had likely been written by a "<u>nation state</u>" to target Iran's nuclear program, including the uranium enrichment centrifuges at the Natanz facility.

Russia's Nato ambassador recently said the virus "could lead to a new <u>Chernobyl</u>," referring to the 1986 nuclear accident.

Although <u>speculation</u> surrounds which countries may have been involved in its creation, the origins of the worm still remain a mystery.

One organization was attacked three times, another was targeted twice.

Iranian officials have admitted that the worm infected staff computers. However, they have repeatedly denied that the virus caused any major delays to its nuclear power program, although its uranium enrichment program is known to have suffered setbacks.

The new research, which analyzed 12,000 infections collected by various anti-virus firms, shows that the worm targeted five "industrial processing" organizations in Iran.

"These were the seeds of all other infections," said Ms Cox.

The firm was able to identify the targets because Stuxnet collected information about each computer it infected, including its name, location and a time stamp of when it was compromised. This allowed the researchers to track the spread of the virus.

Symantec declined to name the five organizations and would not confirm whether they had links to the country's nuclear program.

However, Ms Cox, said that previous research confirmed that the worm could disrupt the centrifuges used to enrich uranium.

The five organizations were targeted repeatedly between June 2009 and April 2010, she said.

"One organization was attacked three times, another was targeted twice," she said. These waves of attacks used at least three different variants of the worm.

"We believe there was also a fourth one but we haven't seen it yet," she said.

Analysis of the different strains and the time it took between the code being written and it making its first infection suggested that the virus writers had "<u>infiltrated</u>" targeted organizations, she said.



The worm seeks out specific industrial hardware once inside an organization

The researchers drew this conclusion because Stuxnet targeted industrial systems not usually connected to the internet for security reasons. Instead, it infects Windows

machines via USB keys – commonly used to move files around and usually plugged into a computer manually.

The virus therefore had to be seeded on to the organization's internal networks by someone, either deliberately or accidentally.

The virus could have been spread between the organizations by contractors that worked for more than one of them, she said.

Big picture

Once on a corporate network, the worm is designed to seek out a specific <u>configuration</u> of industrial control software made by Siemens.

The code can then reprogram so-called PLC (programmable logic control) software to give attached industrial machinery new instructions.

Previous analysis suggests that it targeted PLCs operating at frequencies between 807 and 1210Hz, a range that includes those used to control uranium enrichment centrifuges.

Subverting PLCs requires detailed knowledge and, although security researchers had raised concerns in the past, they had not been seen before Stuxnet.

Ms Cox said the firm's analysis revealed incomplete code in Stuxnet that looked like it was intended to target another type of PLC.

"The fact that it is incomplete could tell us that [the virus writers] were successful in what they had done," she said.

The <u>novelty</u> of the virus, combined with attack mechanisms that targeted several previously unknown and unpatched vulnerabilities in Windows, have led many to describe Stuxnet as "one of the most sophisticated pieces of malware ever".

The Stuxnet Attack On Iran's Nuclear Plant Was 'Far More Dangerous' Than Previously Thought

Adapted and paraphrased from original source: <u>http://www.businessinsider.com/stuxnet-was-far-more-dangerous-than-previous-thought-2013-11</u>

Original author: Michael B. Kelley

The Stuxnet virus that <u>ravaged</u> Iran's Natanz nuclear facility "was far more dangerous than the cyberweapon that is now lodged in the public's imagination," cyber security expert Ralph Langer writes in Foreign Policy.

Stuxnet, a joint U.S.-Israel project, is known for reportedly destroying roughly a fifth of Iran's nuclear centrifuges by causing them to spin out of control.

But the exploit had a previous element that was much more complicated and "changed global military strategy in the 21st century," according to Langer.

The lesser-known initial attack was designed to secretly "draw an electrical <u>blueprint</u> of the Natanz plant" to understand how the computers control the centrifuges used to enrich uranium, Peter Sanger of The New York Times reported last June.

Langer adds that the worm — which was delivered into Natanz through a worker's thumb drive — also subtly increased the pressure on spinning centrifuges while showing the control room that everything appeared normal by replaying recordings of the plant's protection system values during the attack.

The intended effect was not destroying centrifuges, but "reducing lifetime of Iran's centrifuges and making the Iranians' fancy control systems appear beyond their understanding," Langer writes.

He notes that the coding was "so far-out, it leads one to wonder whether its creators might have been on drugs." (The worm was reportedly tested at Israel's Dimona nuclear facility.)

Only after years of undetected <u>infiltration</u> did the U.S. and Israel unleash the second variation to attack the centrifuges themselves and <u>self-replicate</u> to all sorts of computers.

And the first version of Stuxnet was only detected with the knowledge of the second.

So while the second Stuxnet is considered the first cyber act of force, the new details reveal that the impact of the first virus will be much greater.

From Foreign Policy:

The sober reality is that at a global scale, pretty much every single industrial or military facility that uses <u>industrial control systems</u> at some scale is dependent on its network of contractors, many of which are very good at narrowly defined engineering tasks, but lousy at cybersecurity.

Or as one of the architects of the Stuxnet plan told Sanger: "It turns out there is always an idiot around who doesn't think much about the thumb drive in their hand."

Given that the next attackers may not be nation-states, critical infrastructure of all kinds becomes a troubling potential target. Langer notes that most modern plants operate with a standardized industrial control system, so "if you get control of one industrial control system, you can infiltrate dozens or even hundreds of the same breed more."

ASE Standards Covered for Week 14, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

OBJECTIVES STANDAR	D STANDARD
OBJECTIVES STANDAR CATEGOR • Analyze the homework article. LANGUAG READING	 D STANDARD E/ LANGUAGE 4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11-12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. 2. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and min ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to rew situations. h. Draw conclusion

•	Watch a video for more	READING	7. Integrate and evaluate content presented in diverse formats and media, including visually and augntitatively, as well as in
	information on Stuxnet.		 a. Analyze how data or quantitative and/or visual information extends, clarifies, or contradicts information in text, or determine how data supports an author's argument. b. Compare two passages that present related ideas or themes in different genre or formats (e.g., a feature article and an online FAQ or fact sheet) in order to evaluate differences in scope, purpose, emphasis, intended audience, or overall impact when comparing. c. Compare two passages that present related ideas or themes in different genre or formats in order to synthesize details, draw conclusions, or apply information to new situations.
•	Evaluate the	SPEAKING AND	1. Initiate and participate effectively in a range of collaborative
	Stuxnet materials from Snowden's point of view.	LISTENING	 discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively. a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well- reasoned exchange of ideas. b. Work with peers to promote civil, democratic discussions and decision- making, set clear goals and deadlines, and establish individual roles as needed. c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives. d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.
•	Reading		LANGUAGE
	nomework		 4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

READING
 READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. 2. Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme or identify which element(s) in a text support a
 theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

THEME: International Cybersecurity Issues

OBJECTIVES

- Analyze the homework article.
- Watch a video for more information on Stuxnet.
- Evaluate the Stuxnet materials from Snowden's point of view.

MATERIALS

Activity #1:

- Put the following words on individual index cards:
 - o Variants
 - Nation state
 - Chernobyl
 - Speculation
 - o Infiltrate
 - Manually
 - Configuration
 - Novelty
 - Ravaged
 - Blueprint
 - Self-replicate
 - Industrial control systems
- Handout (attached to Week 13, Lesson 2): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 Stuxnet Virus Targets and Spread Revealed
 <u>http://www.bbc.com/news/technology-12465688</u>
- Handout (attached to Week 13, Lesson 2): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand. The Stuxnet Attack On Iran's Nuclear Plant Was 'Far More Dangerous' Than Previously Thought <u>http://www.businessinsider.com/stuxnet-was-far-more-dangerous-than-previous-thought-2013-11</u>
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

 Video: "60 Minutes" Investigates Cyber Warfare <u>https://www.youtube.com/watch?v=kw--zLJT3ak</u> (running time: 05:52)

Homework:

- Handout (attached): Make one copy for each student. *Is Cyberwar Coming?* <u>http://computer.howstuffworks.com/cyberwar.htm</u>
- Handout (attached): Make one copy for each student. Obama Declares Cyberattacks a 'National Emergency' <u>http://thehill.com/policy/cybersecurity/237581-obama-declares-cyberattacks-a-national-emergency</u>

ACTIVITY #1: Analyze the Homework Articles – 50 minutes.

• Tell students they will review vocabulary and analyze each article separately using the processes described below.

Vocabulary for the first article:

- Put students in pairs and have each pair pick an index card. Keep going from pair to pair until all the cards have been picked. Likely, some pairs may have more than others.
- Have pairs:
 - Find the sentence with the word in it in the Stuxnet Virus Targets and Spread Revealed article first, and then the The Stuxnet Attack On Iran's Nuclear Plant Was 'Far More Dangerous' Than Previously Thought article second.
 - Review their definitions of the word.
 - \circ $\;$ Choose the definition that best fits the sentence and write it down.
- Tell pairs to prepare a presentation using the following process:
 - Read the sentence with the word in it: loud, clear and with feeling!
 - \circ Provide their definition of the word and write it on the board.
 - \circ Read the sentence again to check to see if the definition makes sense.
 - \circ Involve both people in the pair equally in the presentation.
- While pairs are working, write the list of words on the board.
- Before the presentations, tell students they are to:
 - \circ Record the title of the article they are working on in their notebooks.
 - Write down where it was published. Students may need to check the original hyperlink to find out where an article was published.
 - \circ List the words and definitions as they are presented.
- After each presentation, ask:
 - Is this the right definition of the word?
 - Does anyone have anything they want to add or change?

Article analysis:

- Put students in pairs to make a master list of facts on Stuxnet they found in the article, Stuxnet Virus Targets and Spread Revealed.
- Go round-robin from pair to pair to get one fact from each and record these on the board until there are no additional facts from the article to collect.
- Put students in pairs to make a master list of new facts on Stuxnet they found in the article, The Stuxnet Attack On Iran's Nuclear Plant Was 'Far More Dangerous' Than Previously Thought, that were not in the first article.
- Go round-robin to get one new fact from each pair and record these on the board until there are no new facts to collect.
- When the list is complete, ask students:
 - Was the use of Stuxnet a good idea?
 - Why or why not?

ACTIVITY #2: Watch a Video for More Information on Stuxnet – 30 minutes.

- Tell the students they will watch a video on Stuxnet: "60 Minutes" Investigates Cyber Warfare. They should take notes on the new information they get from the video.
- Tell students they will watch the video two times so they can list new facts.
- After the second time watching the video, put students into pairs to: make a master list of new facts.
- Go round-robin from pair to pair for a new fact and record these on the board.

ACTIVITY #3: Evaluate the Stuxnet Materials from Snowden's Point of View - 40 minutes.

- Tell students they are now going to look at all these new facts form Edward Snowden's point of view.
- Ask:
 - When you look at the list of facts, what do you think Snowden would say?
 - Why do you think he would think that?
 - List students' ideas on the board.
- Ask students to take out their journals and respond to the following prompt:
 - Do you think Snowden's ideas about Stuxnet are correct?
 - Why or why not?
- Allow student to write for seven minutes and then conduct an open discussion on what they wrote about.

HOMEWORK

READ: Have students read the article, *Is* Cyberwar Coming?, and complete the following instructions:

- Define the following underlined words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:
 - Segregate
 - Wreak havoc
- Underline those portions of the text that help answer the following question: What does the author think is the "truth" about cyber warfare?

READ: Have students read the article, Obama Declares Cyberattacks a 'National Emergency' and complete the following instructions:

- Define the following underlined words by either looking them up or trying to figure out their meanings from how the words are used within the context of the sentences. Students should then write down a definition for each word that makes sense to them:
 - o Sanction
 - o Entities
 - Transacting
 - o Deterrent
 - o Allies
 - \circ Imposed
- Underline those portions of the text that answers the following questions:
 - What did Obama propose doing about cyberattacks?
 - What are the reasons he took these actions?

TEACHER PREPARATION NOTE: Before the next lesson, create index cards, one each with the vocabulary words listed above printed on them.

Is Cyberwar Coming?

Adapted and paraphrased from original source: http://computer.howstuffworks.com/cyberwar.htm

Original author: Jonathan Strickland

Listen up, soldier! Not every battle takes place over rugged terrain, on the open sea or even in the air. These days, you'll find some of the fiercest fighting going on between computer networks. Rather than using bullets and bombs, the warriors in these confrontations use bits and bytes. But don't think that digital weaponry doesn't result in real world consequences. Nothing could be further from the truth.

Consider all the different systems in the United States connected to the Internet:

- Emergency services
- Financial markets and bank systems
- Power grids
- Water and fuel pipelines
- Weapons systems
- Communication networks

That's just the beginning. Think about all the services and systems that we depend upon to keep society running smoothly. Most of them run on computer networks. Even if the network administrators <u>segregate</u> their computers from the rest of the Internet, they could be vulnerable to a cyberattack.

Cyber warfare is a serious concern. Unlike traditional warfare, which requires massive amounts of resources such as personnel, weapons and equipment, cyber warfare only needs someone with the right knowledge and computer equipment to <u>wreak havoc</u>. The enemy could be anywhere -- even within the victim nation's own borders. A powerful attack might only require half a dozen hackers using standard laptop computers.

Another frightening aspect of cyber warfare is that a cyberattack can come as part of a coordinated assault on a nation or it could just be a malicious hacker's idea of a joke. By the time a target figures out the nature of the attack, it may be too late. No matter what the motive, cyberattacks can cause billions of dollars in damages. And many nations are woefully unprepared to deal with cyberattacks. With that in mind, the question isn't will there be a cyberwar -- the question is when will there be one?

Some people might argue that the cyberwar is already here. In fact, based on attacks perpetrated daily against the United States and other nations, the first real cyberwar began back in the late 1990s. Let's take a look at some famous "battles" in cyber warfare over the last decade in the next section.

Obama Declares Cyberattacks as a 'National Emergency'

Adapted and paraphrased from original source:

http://thehill.com/policy/cybersecurity/237581-obama-declares-cyberattacks-a-nationalemergency

Original authors: Cory Bennett and Elise Viebeck

President Obama declared Wednesday that the rising number of cyberattacks against the United States is a national emergency and issued an executive order that would <u>sanction</u> those behind the attacks.

"Targeted sanctions, used carefully, will give us a new and powerful way to go after the worst of the worst," he said in a post on Medium.

The president's order will give the Treasury Department the authority to impose sanctions on individuals or <u>entities</u> behind cyberattacks and cyber espionage. In effect, it would freeze targets' assets when they pass through the U.S. financial system and prohibit them from <u>transacting</u> with American companies.

The move by the White House responds to mounting cyber threats to U.S. companies, government agencies and critical infrastructure.

The number of data breaches in the headlines shows the need for stronger ways to move against hackers, said White House cybersecurity coordinator Michael Daniel.

"We very much need the full range of tools in order to actually confront the cyber threats that we face," said Daniel, a special assistant to Obama, on a call with reporters.

Daniel argued that the sanctions regime will discourage hackers worldwide and those who hire them to do harm.

"Keep in mind that we want to have this tool available as a <u>deterrent</u> to some of those who would consider carrying out these activities," he said. "We would also hope that some of our <u>allies</u> would join us," raising the financial stakes for bad actors, he added.

To be targets for sanctions, an individual or entity would have to carry out significant and malicious cyber activity against the United States.

Foreign governments have been suspected in many recent high-profile hacks across the public and private sector. The FBI accused North Korea of organizing an attack on Sony Pictures in retaliation for "The Interview," which depicts the assassination of Kim Jong Un. In response, the White House <u>imposed</u> a new round of economic sanctions on North Korea,

mostly targeting weapons companies selling to the reclusive East Asian nation. The new executive order gives the Treasury Department authority to impose sanctions as needed.

Treasury Secretary Jack Lew said the executive order would allow his department to "financially isolate those who hide in the shadows of the Internet."

"This authority is a powerful new tool to help protect our security and economy against those who would exploit the free, open, and global nature of the Internet to cause harm," Lew said.

The White House said the order applies to several types of cyber crimes that have ravaged the U.S. over the last two years, though Daniels declined to give examples.

"Speculating how we would have used this tool in the past is very difficult," he said. Treasury will have the authority to impose sanctions against those who take large numbers of credit card data or sensitive information, for example.

"Our primary focus will be on cyber threats from overseas," Obama said on Medium.

Major hacks at retailers like Home Depot and Target exposed more than 100 million Americans' credit card data in the last 18 months, while a data breach at JPMorgan Chase last fall compromised 76 million households' personal information.

The administration also clarified that the order will cover cyberattacks that "significantly disrupt" the availability of a computer network.

That includes distributed denial-of-service attacks (DDOS), the calling card of hacktivist groups like Anonymous and many foreign countries like Iran and China.

Just in the last two weeks, Internet free speech activists have accused China of waging a major DDOS campaign against the popular U.S. coding site GitHub. Whether the Treasury Department will use its new authority to respond to these type of attacks remains to be seen.

"We intend to use this authority carefully against the most serious cyber threats to protect our nation's critical infrastructure," Lew said.

Wednesday's move is the next phase of the White House's 2015 cybersecurity agenda.

The administration in January unveiled a series of legislative proposals meant to enhance public-private cybersecurity information sharing. Obama traveled to Silicon Valley in February to promote his platform at an all-day cyber summit. During the event, he signed an executive order to encourage Congress to take up his proposals.

ASE Standards Covered for Week 14, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES		STANDARD
•	Analyze the	LANGUAGE/ READING	LANGUAGE
	homework articles.	READING	 4. Determine or clarify the meaning of unknown and multiplemeaning words and phrases based on grades 11-12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). READING 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. a. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
			 Determine central ideas or themes of texts and analyze their development; summarize the key supporting details and ideas. a. Comprehend explicit details and main ideas in text. b. Summarize details and ideas in text. c. Make sentence level inferences about details that support main ideas. d. Infer implied main ideas in paragraphs or whole texts. e. Determine which detail(s) support(s) a main idea. f. Identify a theme, or identify which element(s) in a text support a theme. g. Make evidence based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations. h. Draw conclusions or make generalizations that require synthesis of multiple main ideas in text.

•	Watch a short video on further US cyberattacks.	READING	 7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in a. Analyze how data or quantitative and/or visual information extends, clarifies, or contradicts information in text, or determine how data supports an author's argument. b. Compare two passages that present related ideas or themes in different genre or formats (e.g., a feature article and an online FAQ or fact sheet) in order to evaluate differences in scope, purpose, emphasis, intended audience, or overall impact when comparing. c. Compare two passages that present related ideas or themes in different genre or formats in order to synthesize details, draw conclusions, or apply information to new situations.
•	Take a stand about the best approach to international cyberattacks.	LISTENING AND SPEAKING	 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively. a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well- reasoned exchange of ideas. b. Work with peers to promote civil, democratic discussions and decision- making, set clear goals and deadlines, and establish individual roles as needed. c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives. d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.
•	Writing homework.	WRITING	 4. Produce clear, varied, coherent, consistent, and engaging writing in which the development, organization, style, tone, and voice are appropriate to task, purpose, and audience. Write an analysis based on a given prompt. a. Differentiate between example and reason when given a writing prompt. b. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or evaluating and trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

THEME: International Cybersecurity Issues

OBJECTIVES

- Analyze the homework articles.
- Watch a short video on further U.S. cyberattacks.
- Take a stand about the best approach to international cyberattacks.

MATERIALS

Activity #1:

- Put the following words on individual index cards:
 - Segregate
 - Wreak havoc
 - Sanction
 - o Entities
 - Transacting
 - Deterrent
 - o Allies
 - o Imposed
- Handout (attached to Week 14, Lesson 1): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand. Is Cyberwar Coming?

http://computer.howstuffworks.com/cyberwar.htm

- Handout (attached to Week 14, Lesson 1): Students should have brought their copy to class. However, teachers may wish to have extra copies on hand.
 Obama Declares Cyberattacks a 'National Emergency' http://thehill.com/policy/cybersecurity/237581-obama-declares-cyberattacks-a-national-emergency
- Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

 Video: President Obama Orders More Cyberattacks on Iran <u>https://www.youtube.com/watch?v=yN2Usf4tz1o</u> (running time: 01:59)

ACTIVITY #1: Analyze the Homework Articles – 45 minutes.

Vocabulary:

- Put students in pairs and have each pair pick an index card. Keep going from pair to pair until all the cards have been picked. Likely, some pairs may have more than others.
- Have pairs:
 - Find the sentence with the word in it in the articles.
 - Review their definitions of the word.
 - \circ Choose the definition that best fits the sentence and write it down.
- Tell pairs to prepare a presentation using the following process:
 - Read the sentence with the word in it: loud, clear and with feeling!
 - \circ Provide their definition of the word and write it on the board.
 - \circ Read the sentence again to check to see if the definition makes sense.
 - \circ Involve both people in the pair equally in the presentation.

- While pairs are working, write the list of words on the board and have students present their words: • Record their definitions.
 - \circ Ask other students if they have anything to ask or add for each word.

Analysis of both articles:

- Put students in groups and assign them one of the two articles to analyze.
- Write the questions for each of the articles on the board:
 - For Is Cyberwar Coming?: What does the author think is the "truth" about cyber warfare?
 - For Obama Declares Cyberattacks a 'National Emergency'"
 - What did Obama propose doing about cyberattacks?
 - What are the reasons he took these actions?
- Tell groups to talk through detailed answers to these questions. Students should take notes on the answers to their questions with the title of the article at the top of the page.
 - Have students get up and talk to two other students from the other group. They are to:
 - \circ $\;$ Write the name of the article they did NOT work on in their notebooks.
 - Take notes on the answers to the article's questions while they are talking to the other students.
- When students come together and review the questions for each article as a full class, only allow the students who did NOT read the article originally respond.
- When the questions are answered, ask:
 - How is Obama's position different from Snowden's?
 - Take notes on the differences on the board.

ACTIVITY #2: Watch a Short Video on Further U.S. Cyberattacks – 30 minutes.

- Tell students they will watch one more video on Stuxnet: President Obama Orders More Cyberattacks on Iran. They are to take notes on how Obama's position is different than Snowden's.
- Watch the video.
- Ask students:
 - What notes do you have on Obama's position that we do not have on the board yet?
 - Take notes on students' additions on the board.

ACTIVITY #3: Take a Stand on the Best Approach to International Cyberattacks – 45 minutes.

- Tell students they are to determine the opinion they will write about in their final essay on cyberattacks.
- Draw the following continuum on the board:

The US should be The US needs a mix The US should be primarily offensive. of offense and defense. primarily defensive.

- Have students get out their articles and notes and prepare to cite them to answer these questions:
 - Where does Snowden's opinion belong on this continuum?
 - What information informed your conclusion?
 - Where does Obama's belong?
 - What information informed your conclusion?
- Then ask:

- Where would you put yourself on this continuum?
- What information informs your conclusion?
- Tell students to write down a clear thesis statement that summarizes their position.
- Go round-robin and have students declare the thesis statements.

HOMEWORK

JOURNAL WRITING: Have students write in their journals, answering each of these questions as a way to prepare for the in-class essay:

- What are international cyberattacks and why are thy important to our future?
- What is Edward Snowden's opinion on international cyberattacks and what are his reasons for his opinion?
- What was Obama's opinion on international cyberattacks while he was in office?
- What is your opinion? What are the reasons for your opinion?
- What are some solutions that you think would help improve the international cyberattack situation?
- Have students:
 - \circ Write the first question in their notebooks.
 - \circ Write down everything that comes to mind without stopping until they feel finished.
 - Repeat this process for each of the questions.
- Tell students this process will give them a rough draft of their own ideas to work with during their inclass essay.
ASE Standards Covered for Week 15, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Choose a thesis statement and review notes to create an outline. Outline and rehearse the in-class essay. Writing homework.	WRITING	 4. Produce clear, varied, coherent, consistent, and engaging writing in which the development, organization, style, tone, and voice are appropriate to task, purpose, and audience. Write an analysis based on a given prompt. a. Differentiate between example and reason when given a writing prompt. b. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or evaluating and trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

THEME: Final Cybersecurity Essay and Presentation

OBJECTIVES

- Choose a thesis statement and review notes to create an outline.
- Outline and rehearse the in-class essay.

MATERIALS

Activity #1:

- Classroom Resource: Flip chart paper and markers.
- Student Work: Students should bring hard copies of their homework assignment.

ACTIVITY #1: Choose a Thesis Statement and Review Notes to Create an Outline – 60 minutes.

- Tell students they will use this class period to prepare for their in-class essay.
 - Have students get out their journal draft of their in-class essay. They are to:
 - \circ Read over the draft.
 - \circ Underline (double line) or write the statement that states their opinion on cybersecurity clearly.
 - Underline (single line) the different reasons for their concern.
 - Underline (squiggly line) their recommendations.
- Give each person a flip chart paper and markers. Students need to:
 - Write their thesis statement at the top.
 - List their reasons below that.
 - Include their recommendations.
- Give each student 2-3 minutes to present their outlines.
 - At the end of each presentation, ask:
 - Is this a clear, well-reasoned position?
 - Does it seem to be what the presenter really feels about the topic? Is it authentic?
 - (Preach: Authenticity makes for good writing!)
 - \circ $\;$ Applaud the differences in students well-reasoned ideas.

ACTIVITY #2: Outline and Rehearse the In-Class Essay – 60 minutes.

- Tell students they will put together a formal outline for their in-class essay and rehearse it with a partner.
- Write the following on the board:
 - What are international cyberattacks and why are thy important to our future?
 - What is Edward Snowden's opinion on international cyberattacks and what are his reasons for his opinion?
 - What was Obama's opinion on international cyberattacks while he was in office?
 - The first three questions are your introduction. These questions give background to your reader about why your opinion is important in a bigger picture.
 - This material can be covered in 1-3 paragraphs.
 - These questions are a good place to use quotes or references.
 - \circ $\;$ What is your opinion? What are the reasons for your opinion?

- This is the body of your essay. Explain each of your reasons for your opinion in a separate paragraph.
- What are some solutions that you think would help improve the international cyberattack situation?
 - This is your conclusion.
- Have students make a formal outline of their essay by doing the following:
 - Reviewing their notes.
 - \circ Underlining those notes that will help them with their essay.
 - \circ Write down the first question and outline the points they want to make to that question.
 - Include all quotes and references they want to include.
 - Continue this process for each of the questions.
- Remind students of basic outline structure, as needed:
 - Write out the topic of each paragraph.
 - Indent and take notes on what you want to say in each paragraph.
- Walk around and help students as they work through their outlines.
- When students finish, put them in pairs to talk through their outlines. For each reading:
 - \circ The listener should ask questions for clarification.
 - \circ The reader can offer adjustments for their outlines to make clearer the ideas.

HOMEWORK

WRITE: Complete a full outline for the in-class essay.

ASE Standards Covered for Week 15, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Write your in- class essay.	WRITING	 Write arguments from a prompt in a formatted manner of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the
			 relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from and supports the argument presented.
•	Conduct a peer review.	READING	 5. Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole. a. Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas. b. Analyze the structural relationship between adjacent sections of text (e.g., how one paragraph develops or refines a key concept or how one idea is distinguished from another). c. Analyze transitional language or signal words (words that indicate structural relationships, such as consequently, nevertheless, otherwise) and determine how they refine meaning, emphasize certain ideas, or reinforce an author's purpose. d. Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose. 6. Determine an author's purpose or point of view in a text and explain how it is conveyed and shapes the content and style of a text. a. Determine an author distinguishes his or her position from that of others or how an author distinguishes his or her position from that of others or how an author distinguishes his or her position from that of others or how an author acknowledges and responds to conflicting evidence or viewpoints. c. Infer an author's implicit as well as explicit purposes based on details in text.
			 an arriver an activer of mightain as explicit perposes based on activity in text. d. Analyze how an author uses rhetorical techniques to advance his or her point of view or achieve a specific purpose (e.g., analogies, enumerations, repetition and parallelism, juxtaposition of opposites, qualifying statements).

THEME: Final Cybersecurity Essay and Presentation

OBJECTIVES

- Write your in-class essay.
- Conduct a peer review.

MATERIALS

Activity #1:

• Student Work: Students should bring hard copies of their homework assignment.

Activity #2:

• Handout (attached to Week 2, Lesson 2): Make two copies for each student. Audience Comment Page

ACTIVITY #1: Write Your In-Class Essay – 60 minutes.

- Tell students they will write an in-class essay. They have 45 minutes and are welcome to take the full time.
- Tell them to relax and trust that they are prepared. Also, this is a first draft and they can improve it later.
- Students should focus on their ideas and their outlines to help them explain what they have to say to a real audience.
- Have students write a timed, 45-minnute essay.

ACTIVITY #2: Conduct the Peer Review Process – 60 minutes.

- Tell students they will provide constructive feedback on each other's essays. Remind them that they are the audience that the writer is happy and comfortable with; the audience simply wants to understand the writer's ideas and offer suggestions for improvement.
- Put students into groups of three.
- Have students take out their 45-minnute essays.
- Pass out two copies of the Audience Comment Page to each student. Explain that they will:
 - Read the essays written by the other two people in their group.
 - Fill out one Audience Comment Page for each of the essays they read.
 - They are NOT to comment on grammar or spelling yet. However, if they are not sure what something says, they can ask the writer for clarification.
 - They are to be friendly, encouraging, and helpful. Good comments on their partner's work will help them when they have to rewrite their final essay.
- Have students pass their essays to the left.
- After students have evaluated the first essay, they should pass the essay they have worked on to their left and evaluate a new essay.
- After students have evaluated two essays, they should give their evaluations to the authors, and the authors should read the comments.
- Ask the class as a whole:

- Did your evaluators say the same or different things?
- Did your evaluators say things that gave you ideas for how to make your essay better?
- Did your evaluators confuse you? Ask for clarification when back in your group.
- Tell students that you will also evaluate their essays so they will each have three reviews to help them with their rewrites. Have students hand in their essays along with the two evaluations from their peers.

TEACHER NOTE: Evaluate the student essays using a copy of the Audience Comment Page. Read both the essays and the student comments to see how perceptive the student reviewers were. Your comments can provide suggestions or offer a different way to evaluate their essays that you think would be helpful. Do not correct everything in the students' drafts. Only mark those errors in the text that would help the student make significant progress toward a better essay. In your comments, indicate a due date for rewrites of these drafts.

ASE Standards Covered for Week 16, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Allow students to work on rewriting their essays. Have students prepare to present their entire essay. Writing homework.	WRITING	 4. Produce clear, varied, coherent, consistent, and engaging writing in which the development, organization, style, tone, and voice are appropriate to task, purpose, and audience. Write an analysis based on a given prompt. a. Differentiate between example and reason when given a writing prompt. b. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or evaluating and trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Week 16, Lesson 1 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

THEME: Final Cybersecurity Essay and Presentation

Class to be held in the Technology Lab

OBJECTIVES

- Rewrite essays.
- Have students prepare to present their entire essay.

MATERIALS

Activity #2:

- Classroom Resource: Flip chart paper (two per student) and markers.
- Classroom Resource: Index cards.

ACTIVITY #1: Rewrite Essays – 60 minutes.

- Tell students they have the opportunity to rewrite their essays on the computer. They have three full responses to their drafts to think about.
- Write the following on the board:
 - o Introduction.
 - Body.
 - Conclusion.
- Go round-robin and ask students what kinds of changes they plan to make to different parts of their essays to make them complete and ready to be handed in.
- Allow students to work on their essays.

ACTIVITY #2: Have Students Prepare to Present their Entire Essay – 60 minutes.

- Tell students, when they are finished with their rewrites, they are to work on preparing to present their thinking for the in-class essay.
- Have students:

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- Clearly set up the essay in their introduction using quotes and references as needed.
- State their opinion and list the reasons for their opinion.
 - Prepare to give clear explanations and examples for each reason.
 - List their solutions on the second sheet.
 - Again, prepare to give explanations and/or examples for each concern on the list.
- Allow students to also use index cards to help them remember the explanations and examples they want to use in their presentations.

HOMEWORK

WRITE: Have students complete all rewrites of their final written work and prepare to present their final essay.

ASE Standards Covered for Week 16, Lesson 2 Information Technology Bridge Semester 2 Reading & Writing Lesson Plans

	OBJECTIVES	STANDARD CATEGORY	STANDARD
•	Give presentations on thoughts about international cyberattacks.	SPEAKING AND LISTENING	 Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. Demonstrate active listening skills. a. Interpret verbal and non-verbal cues and behaviors to enhance communication. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
•	Discuss what students have learned in the class.	SPEAKING AND LISTENING	 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively. a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well- reasoned exchange of ideas. b. Work with peers to promote civil, democratic discussions and decision- making, set clear goals and deadlines, and establish individual roles as needed. c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives. d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.

THEME: Final Cybersecurity Essay and Presentation

OBJECTIVES

- Give presentations on international cyberattacks.
- Discuss what students have learned in the class.

MATERIALS

<u>Activity #1:</u>

• Student Work: Students should bring hard copies of their homework assignment.

ACTIVITY #1: Give Presentations About International Cyberattacks – 60 minutes.

- Have students give their presentations.
- After each presentation, ask: Do you have any questions or comments for the presenters?
- Have an open discussion on the differences and similarities of students' ideas. Ask:
 - What did you learn from this presentation?
 - About the topic?
 - About the best ways to present so the topic is clear and interesting?

ACTIVITY #2: Discuss What Students Have Learned in the Class – 60 minutes.

- Tell students you want their feedback on this Bridge Semester 2 class.
- Write the following questions on the board:
 - What topics that we studied were most interesting to you? Why?
 - What were your favorite readings? Why?
 - What were your favorite videos? Why?
 - Do you think your reading has improved? How?
 - Do you think your writing has improved? How?
 - What have you learned that makes you feel more ready for college?
 - More ready for the High School Equivalency exam?
- Have students write down one question at a time in their notebooks and answer it until they have answered all the questions.
- Tell students to interview two students to find out what their answers were to the questions.
- Come back as a class to answer the questions together.
- Come up with some conclusions about how well the class went by asking:
 - What does the class think were the strongest parts of the class?
 - What were the parts of the class that didn't work so well?
 - What could be done differently next time to make the course more effective?