Manufacturing Bridge Semester 2 Lesson Plans for Reading & Writing

(for ASE Bridge Classrooms)

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 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 them 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) diploma, improve their workforce outcomes, and/or increase their language skills. The City Colleges of Chicago Manufacturing Bridge is designed for these students.

Introduction to Daily Lesson Plans

These lessons are designed to improve the basic reading and writing skills of Adult Secondary Education (ASE) students who enter City Colleges at the ninth-grade literacy level or above, while exposing those students to key Manufacturing issues that are relevant to their lives and the Manufacturing field. This intensive sixteen-week course will prepare students to:

- Advance to reading at the college level with progress measured by the Tests of Adult Basic Education (TABE).
- Meet Illinois ABE/ASE Content Standards for Reading, Writing, Language, and Listening and Speaking for the National Reporting System (NRS) Levels 5 & 6. All skills for this level are correlated with HSE/GED skills.
- Prepares students for the HSE/GED exam, college studies, and the college entrance test.

These lesson plans were created through a collaborative project between City Colleges of Chicago and Women Employed. The lessons are based on the Illinois Community College Board's ICCB Manufacturing Bridge Curriculum.

Defining Bridge Programs

The Illinois Community College Board (ICCB) defines bridges as programs 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 Manufacturing 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 a manufacturing career and are able to devote approximately 20 hours per week plus homework time for the duration of the program. Since the Bridge Semester 2 level includes an embedded college-level course, a built-in support course, or tutoring, students must be prepared to complete more homework than required in lower levels of the bridge.

Upon enrollment, City Colleges transition specialists or other trained staff members should have already 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 Manufacturing programs and discharge current debt to the college before entering those courses. While these lessons include activities that focus on and reinforce the importance of punctuality, good attendance, homework completion, and team work, instructors are not expected to act as advisors. Should any of these issues arise after classes begin, students should be referred to the transition specialist or a trained staff member who can help address them.

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 not sure.
- Meet with a transition specialist and college advisor and prepare to eventually transfer into a credit/career program.

Manufacturing Bridge Semester 2 Program Benefits to Students and to City Colleges of Chicago

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

- Improve their basic reading and writing skills using materials related to the Manufacturing industry.
- Engage in interactive learning, including group activities, giving and getting peer feedback, and utilizing evaluation and editing processes to turn rough drafts into improved rewritten drafts.
- Gain experience using 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.
- Learn and practice test-taking skills to prepare for future TABE tests, practice HSE tests, future HSE tests, and the college entrance exam.

Because these lessons are not lecture-based, students will need time to become comfortable with the learning activities and contextualized nature of these lessons.

At the conclusion of this course, students should be able to pass the Reading and Writing portions of the HSE exam as well as the Social Studies, Science, and Math portions of the test, which is a prerequisite for financial aid for college level courses. Students who are not able to pass all sections of the HSE test, may be eligible to enter the Gateway program where they will receive continued support.

Students should also be able to score high enough on the college entrance exam to enter college-level courses and earn credit towards degrees or certificates without needing additional remediation. This will keep students from using precious tuition and financial aid dollars for additional basic skills remediation classes.

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 to help students learn the steps to enroll in college occupational programs and learn about available jobs in their chosen occupation.

The following graphic illustrates the various components of the two-semester Manufacturing bridge model.

Semester 1:	Semester 2	
Language Arts for Manufacturing	Language Arts for Manufacturing	
Fractions & Decimals and Shop Math	Math for the GED/HiSET	
Test-Taking Skills	Reading, Writing, Social Studies and Science for the GED/HiSET	
Computer Skills	College-credit Course: Machining Processes I	
Industry Credential Earned: NIMS Material, Measurement, and Safety		

Manufacturing Bridge Semester 2 Correlation with State and National Standards

To ensure that the Bridge Semester 2 lessons meet state and national learning standards, curriculum designers compared the Illinois ABE/ASE Content Standards¹ in Reading, Writing and Language, and Speaking and Listening with the NRS² descriptors for the ASE level (sometimes referred to as Level 5 & 6). This comparison was then condensed into a document called the "Condensed NRS Level 5 & 6 Standards," which are 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 includes a listing of 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 HSE skill requirements.

Specific HSE skills are not explicitly incorporated in the Condensed NRS Level 5 & 6 Standards because these students are not yet at the adult secondary skill level. However, this framework is directly tied to HSE skills. What students learn in the Bridge Semester 1 course lays the foundation that they will need for specific HSE learning covered in Bridge Semester 2.

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 of discovering additional information. This will help students develop the critical skills they will need to do well on the HSE exam 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 with other students in the classroom.
- Students need to work in pairs and groups to hear, see, and work with material before they present considered answers to the class.
- Students can learn to 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 need to 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 that is important to them.

Strategies for Structuring the Course

The strategies for structuring these High Intermediate ABE lessons include:

- Each course includes several, multi-week thematic units.
- A variety of readings are assigned for students to analyze individually, to compare, and to use to

 $^{^{1}}$ 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 the new GED test and for college-level work.

² As a state and federally-funded program, City Colleges of Chicago's adult education programs must use the National Reporting System in classifying instructional levels and student performance and in demonstrating student progress.

draw information and form conclusions.

- Students use the writing workshop pattern of drafting, evaluating, editing, and rewriting for writing assignments. In order for students to become comfortable with writing and this process, work on penmanship, spelling, and grammar should not be part of the initial drafting process.
- Appropriate conventions of Standard English, word usage, vocabulary, and spelling are covered as needed to support the improvement of written drafts. The Bridge does not focus on grammar as a separate area of study.
- At this level, writing assignments build on each other and cover informative and explanatory writing forms.
- Technology research projects are incorporated into the lesson plans. Therefore, some lessons require access to a technology lab. Icons appear at the beginning of each lesson to identify days that should be taught in the technology lab.
- Activities are designed to ensure that students are learning presentation skills that are integrated into both reading and writing activities, as well as a PowerPoint project.
- All HSE standards work is taught in the Bridge Semester 2 course.

Teaching Strategies Embedded in the Curriculum

The approach to reading, writing, and grammar embedded in this curriculum is based on guidelines established by City Colleges of Chicago for all new adult education curricula. The Bridge Lesson Plans are structured around repeating cycles of student-centered activities that help students:

- Comprehend and analyze a variety of reading materials on a high-interest, sector-relevant topic.
- Conduct on-line research and in-class presentations to broaden each other's knowledge of the topic.
- Complete writing assignments that require that students to utilize the information they have learned as the basis for informative written work.
- Go through a peer-review, editing, and re-writing process of their written work so that students can turn in a complete paper they have had the opportunity to think through and refine based on other students' and their teacher's input.

This cycle of classroom activities in the Bridge Lesson Plans has been established to allow students to go deeply into topics that are of high interest in their chosen career field while improving their reading, research, presentation, and writing skills along the way.

Reading strategies: In *Reading Comprehension:* What Works, Fielding and Pearson write: "There is no quick or simple fix for reading difficulties. More than four decades of research have shown that reading is a complex cognitive and social practice. In building reading aptitude, there is *no* skills-only approach that can substitute for extensive reading. On the contrary, repeated studies have shown that instruction in isolated comprehension, decoding, or grammar skills may have little or no impact on students' activity while actually reading."¹³

Reading Comprehension activities are organized under four primary reading comprehension strategies:

Reading Strategy #1 - Predicting:

There are two types of predicting strategies:1) Students look at the title, author, and sources and predict what they think the text will be about; 2) Students learn to understand and identify key signal words that

^{1. &}lt;sup>3</sup> L.G. Fielding and D.P. Pearson, "Reading Comprehension: What Works," Educational Leadership, Feb. 1994, pp. 62-68

indicate a shift in the author's thinking and predict how the author's ideas might be shifting whenever these signal words occur in the text.

Reading Strategy #2 - Annotating:

- <u>Annotating</u>: Students use a simple system of five symbols to mark a text as they read to identify important point, surprising information, questions, and thoughts and ideas that they agree or disagree with.
- <u>Talking-to-the-Text</u>: Students learn to write questions and other comments on the text while reading the text.

Reading Strategy #3 - Questioning:

- <u>Request:</u> Students work in pairs to come up with a set of questions about the text that they know the answers to. Pairs then take turns asking one of their questions, calling on other students who think they know the answer, and repeating this process for the pair that answers the question correctly.
- <u>Question Around</u>: Students learn to identify the types of question typically asked on multiple choice tests like the HiSET and college placement exams. The four types of questions are: <u>Right there</u> (in the text); <u>Pulling it together</u> (from the text); <u>Author and me</u>: where students use information in the text and his/her knowledge; and <u>On my own</u>: where the answer is not in the text.

Reading Strategy #4 - Summarizing:

Students use language and writing to summarize what they read in their own words. While summarizing is fully described in the writing section, verbal summaries are also important after reading and before writing. A primary activity that supports verbal summaries includes: pairs working together to talk about the meaning of the text in preparation for delivering their summaries. Delivering the summaries includes discussion about the listeners' ease of understanding and how comprehensive each summary is.

Writing Strategies: Fluency, clarity, and correctness are the three primary writing skills employed in a developmental writing process that emphasizes students' need to learn writing fluency first; to work on clearly communicating their ideas to a reader next; and focuses on correctness last. The relative importance of these skills during different phases of the two-semester program is demonstrated in the chart below:

Semester 1, Weeks 1-8	Semester 1, Weeks 9-16 Semester 2, Weeks 1-8	Semester 2, Weeks 9-16
FLUENCY CLARITY CORRECTNESS	FLUENCY CLARITY CORRECTNESS	FLUENCY CLARITY CORRECTNESS
Focus on getting ideas on the page without worrying about making mistakes.	Focus on making ideas clear to a real reader.	Focus on writing 45-minute essays for the HSE exam.

• **Revision Process:** This curriculum utilizes peer review, editing, and revising processes for each piece of formal writing throughout the two-semester program. <u>Peer review</u> involves students reading other students' work and learning to give feedback on issues of clarity, paragraph development, and

effectiveness. <u>Editing</u> focuses on students learning a succession of sentence structure and punctuation skills and applying them to student drafts. <u>Revising</u> includes creating a revision plan based on peer and teacher feedback and writing a final draft.

- Narrative, Informative, and Persuasive Writing: These are the three types of writing taught in this program. These types of writing are taught in succession so that students learn to understand how to connect classroom topics to their own experience, learn to write about new information they have learned, and then form and present their own opinions in essays on the topics and issues they have studied.
- Adopting College-Level Skills: Students learn the technical writing skills that will prepare them for college level courses. These include: writing summaries and essays with proper citations, taking notes on reading, video, and class discussions, creating outlines to prepare for writing essays, and referencing course readings in essays.

Grammar: City Colleges of Chicago intensive programs at the High Intermediate ABE and ASE levels, including the Bridge and the HSE Intensive programs, utilize a trimmed down approach to grammar that adheres to the following principles:

- Grammar should be taught to support the specific writing goals for students at the different developmental levels. This means that grammar should support the development of:
 - Sentences and paragraphs at the first level. The focus is on fluency and basic writing tools.
 - Sentence-level editing skills at the second level. The focus is on writing clarity.
 - The ability to use a full range of punctuation in the editing process, as correctness is the focus at this level.
- Students and teachers should help each other edit only those grammar issues that are appropriate to each level. Mistakes must be tolerated so that students can be fluent and clear first.
- Grammar rules should exclude the use on any specialized grammatical language, as all basic grammar can be taught using a far simpler conceptual framework that will allow students to more easily understand and apply.

Learn signal words to aid reading comprehension and writing sophistication: This type of language development will help students improve their reading comprehension (as in Predicting) and to give them more sophisticated language tools for their own writing. These increased tools will better help students organize their thoughts for complex essays that refer to multiple readings and lay out their own ideas in response.

Recommendations for Program Delivery

The lesson plan activity instructions contain full and detailed 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 intention 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, 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; 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 there.

- Highlight the specific portions of the activity that will help you remember the full flow of the activity.
- Make adjustments to the size or the emphasis of each activity to best fit the needs and interest of your class.
- Bring a highlighted outline or create a separate outline that can remind you of how to implement the activity and will be simple for you to follow.
- Prepare all handouts and projection materials so presentation of 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 and interests of students in their classrooms.

These guidelines will 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 daily lesson plans that include activities and worksheets as well as list of the standards covered in each lesson.

City Colleges instructors and staff with questions about the design of the bridge program or customization of the lessons should contact Lauren Hooberman, Bridge Director, City Colleges of Chicago, at https://www.hooberman@ccc.edu or Stephanie Sommers, Curriculum Specialist, at ssammers11@gmail.com.

Reading, Writing, and Grammar Strategies Key

Strategy	Symbol
Predicting	Ŵ
Annotate	*
Talk to the Text	
Request	$\sum_{i=1}^{n}$
Question Around	?
Grammar	لعر
Journaling	
Peer Review	

This key is a guide for teachers as they navigate the strategies used in the curriculum. You will find these symbols next to activities used repeatedly throughout the lesson plans to build student skills.

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Week 1, Lesson 1 Manufacturing Bridge Semester 2: Adult Secondary Education (ASE)

THEME: Introducing the Third Industrial Revolution

Students share what they accomplished in Semester 1, state their goals for Semester 2, and compare them to the course goals. Students watch videos on the four Industrial Revolutions and the growth of global communications, which is the basis for the third Industrial Revolution. Students will use information about increased global communications to predict what globalization of manufacturing might look like.

MATERIALS

For Activity #1:

• Handout (attached): Make one copy for each student. Manufacturing Language Arts Bridge Semester 2 Goals

For Activity #2:

- Handout (attached): Make one copy for each student. The Four Industrial Revolutions Treasure Hunt
- Teacher Resource: Make one copy for the teacher. Answer Key: The Four Industrial Revolutions Treasure Hunt
- Video: The Industrial Revolution (First, Second, Third, and Fourth) History White Board Animation (Davos) (running time: 01:13 minutes) https://www.youtube.com/watch?v=7SfLEiHuzbs
- Video: Humanity from Space: The Growth of Communications (11:03 minutes) <u>https://illinois.pbslearningmedia.org/resource/13e4105f-42a9-4a24-af9e-795941d61a32/the-growth-of-global-communication-humanity-from-space/?#.Wuo0lq2ZP-Y</u>

ACTIVITY #1: Introduction to Manufacturing Language Arts Bridge Semester 2 Course - 40 minutes

Articulate Student Goals

- Welcome students to the Manufacturing Language Arts Bridge Semester 2 Course and tell them the course will focus on two broad themes:
 - The first 8-weeks will focus on the field of manufacturing now and feature the third Industrial Revolution as it pertains to global communication. Students will learn about offshoring and reshoring of manufacturing in recent decades and the role that the movement of manufacturing jobs has plays in our current economy.
 - The second 8-weeks will focus on technological changes that will influence manufacturing in the future and how manufacturing might change to meet larger global trends.

The course will require a lot of reading, note taking, and writing of informational and persuasive essays so that students can develop and present their ideas on class topics. These will be 45-minute inclass essays based on class notes and outlines prepared beforehand. This essay writing practice will prepare them for both the HSE exam and college-level writing.

• But first, introductions!

- Introduce yourself and explain how and why you are a strong and supportive teacher.
- Write the following questions on the board:
 - 1. What goals did you achieve in Semester 1 of the Manufacturing Bridge?
 - 2. What did you most enjoy? Least enjoy?
 - 3. What do you want to achieve in Bridge Semester 2?
 - Academic goals including reading, writing, and/or grammar?
 - 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 asking each other the questions on the board as they prepare to introduce each other to the class. Encourage students to:
 - Take notes on what their partner says.
 - Ask their partner additional questions to better understand the details of their answers.
 - Have students introduce their partners by answering the three questions on the board.
 - Write students' goals in the appropriate categories. If a goal is stated more than once, make put a check next to that goal for each student that identifies it.
- After each person has been introduced, ask students if they would like to add to the lists of goals on the board.
- Ask the class if there are any general statements they can make about the goals of the students in this class.
 - Do your classmates have similar or very different kinds of goals?

Compare Student Goals to Formal Course Goals

- Tell students they will compare the goals they have identified on the board with the goals of the course.
- Pass out the Manufacturing Language Arts Bridge Semester 2 Goals attached to this lesson.
- Go round robin having each student read a course goal aloud: loud, clear, and with feeling!
- After each course goal is read, ask:
 - Is this goal already on the list 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 note 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?
 - 0

Break – 10 minutes.

ACTIVITY #2: Watch Two Videos That Helps Define Globalization - 70 minutes



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Prediction Activity on the Four Industrial Revolutions

- Tell students they will watch a short video that outlines the four Industrial Revolutions. But before they do that, we see what they already know and make some predictions about what each of these revolutions are.
- Create four columns on the board, one for each Industrial Revolution. Ask:
 - What do we already know about Industrial Revolutions 1 and 2 from the first semester?

- Take notes on student answers in the appropriate column.
- What can we guess about Industrial Revolutions 3 and 4?
 - Give the hint that the third Industrial Revolution is now and the Fourth is in the future.
 - Take notes on student answers in the appropriate column.

Watch and Discuss a Short Video

- Tell students they will now watch a short video that gives an overview of the four Industrial Revolutions.
- Pass out The 4 Industrial Revolutions Treasure Hunt and have students read the questions for the first video.
- Explain that because the video moves quickly, they only need to take notes on two of the Revolutions.
- Put students into three different groups to take notes Give them the following assignments:
 - Group #1: Take notes on Industrial Revolution #1.
 - Group #2: Take notes on Industrial Revolution #2.
 - Group #3: Take notes on Industrial Revolution #3.
- Have all students take notes on Industrial Revolution #4.
- Watch the video.
- Have groups to get together and:
 - \circ Check their answers for their assigned Revolution and Revolution #4.
 - Complete the second question by discussing it as a group and then writing their answer in the Treasure Hunt sheet.
- Go from group to group to get answers for the first three Industrial Revolutions.
 - What were the major innovations?
 - What impact did that or will that Industrial Revolution have on the people? On society?
 - Take notes on student answers on the board in appropriate columns on the board.
- Lastly, ask:
 - What are the major innovations for the 4th Industrial Revolution?
 - What do you think these innovations might change the world in the future?



Watch and Discuss a Video on Global Communication

- Tell students they will watch a longer video about information technology and global communication, one of the primary components of the Third Industrial Revolution. This video should give a good picture of where we are now regarding global communication and suggests connections between information technology and current major trends in manufacturing.
- Go over the questions for the second video on the Treasure Hunt sheet.
- Watch the video.
- Put students in pairs to review the questions and their answers, making adjustments to their responses, as needed.
- Go over the Treasure Hunt questions and answers as a class.
 - Lastly, have students predict two of the primary questions in this unit:
 - How do you think manufacturing has been impacted by global communications?
 - How do you think the world is being affected by these changes in manufacturing?
 Take notes on student answers.
- Tell students they will reexamine their responses after learning new information and compare what they have predicted and what they have learned.

HOMEWORK

WRITE: Have students write answer the questions discussed in class. Students can choose which two they want to write about:

- How would you define globalization?
- What do you think the possible impacts of globalization are?
- What do you think is the impact of global communication systems on manufacturing?

Manufacturing Language Arts Bridge Semester 2 Goals

Prepare for tests:

- Improve test scores in reading on both the Tests of Adult Basic Education (TABE) and the college placement test.
- Practice skills needed to pass the high school equivalency exam, including selected Science and Social Studies skills as they apply to Manufacturing topics.
- Practice writing the kinds of essays required for the High School Equivalency exams.
- Practice taking the grammar portion of the High School Equivalency exam.

Prepare for a Career:

- Understand what is and will be happening in manufacturing now and in the future.
- Understanding how global changes are impacting the manufacturing field.
- Use new information about the changing manufacturing field to help think through your long-term career planning.

Specific Reading Skills- Learn to:

- With more complex and some longer readings, continue to practice reading skills that improve comprehension:
 - Predict what a reading or part of reading might be about from context clues.
 - Annotate a reading in a way that will increase comprehension skills.
 - Ask different types of questions about a text that that will improve your ability to answer high school equivalency-type questions.

Specific Writing Skills- Learn to:

- Take useful notes for formal summaries and essays.
- Learn to make detailed outlines for writing assignments.
- Understand what plagiarism is and how not to do it.
- Practice using "According to" and quotes in summaries and essays.
- Learn to develop your own thesis on a new topic.
- Learn to provide strong evidence for your thesis.
- Participate in a debate to explore your ideas for your thesis.
- Prepare for and write essays in 45-minutes.

Specific Grammar Skills – Learn to:

- Learn how to use colons and semicolons appropriately.
- Know how to punctuate transition words like: however, therefore, and thus.
- Practice peer editing with a set of grammar rules already covered.
- Practice using transition words to help structure paragraphs and essays.

Other Course Features:

- There will be reading or writing homework after every class.
- All reading and writing class assignments lead to a longer writing assignment.
- There will be several required 45-minutes essays.
- 45-minute essays will be peer-reviewed and revised for a final submission.

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THE FOUR INDUSTRIAL REVOLUTIONS TREASURE HUNT

Video #1: The Industrial Revolution (First, Second, Third, and Fourth) History White Board Animation

1.	1. What are major innovations associated with each of the Industrial Revolutions?			
1	st Industrial Revolution (3 answers)	2 nd Industrial Revolution (2 answers)	3 rd Industrial Revolution (2 answers)	4 th Industrial Revolution (6 answers)
•	Mechanical Equipment Water Steam Engines	• Electricity Mass Production	Information TechnologyRobots and Automation	 Genetics 3d Printing Biotechnology Internet of Things Nanotechnology Quantum Computers
2.	How would you describe the impact that your <u>assigned</u> Industrial Revolution had on the people that experienced the industrial changes? Base your answers on what you know and/ or what you guess might be true.			

1. What was the first communications innovation in this video?	What was the old practice?	What was the communications innovation?	What year did the innovation happen?	What was the primary impact of the innovation?
3. What was the second communications innovation in this video?	What was the old practice?	What was the communications innovation?	What year did the innovation happen?	What was the primary impact of the innovation?
4. How many miles is the 3 Cable that runs from Europe to Japan?				
5. How many words to we send through the cable every second?				

Video #2: Humanity from Space: The Growth of Communications

6. How many miles of cable link America?	
7. What year was the internet invented?	
8. What kind of activities happen on the internet are mentioned on the video?	

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ANSWER KEY: THE FOUR INDUSTRIAL REVOLUTIONS TREASURE HUNT

Video #1: The Industrial Revolution (First, Second, Third, and Fourth) History White Board Animation

1. What are major innovations associated with each of the Industrial Revolutions?				
1 st Industrial Revolution	2 nd Industrial Revolution	3 rd Industrial Revolution	4 th Industrial Revolution	
(3 answers)	(2 answers)	(2 answers)	(6 answers)	
 Mechanical Equipment Water Steam Engines 	ElectricityMass Production	Information TechnologyRobots and Automation	 Genetics 3d Printing Biotechnology Internet of Things Nanotechnology Quantum Computers 	

Video #2: Humanity from Space: The Growth of Communications

1. What was the first communications innovation in this video?	What was the old practice?	What was the communications innovation?	What year did the innovation happen?	What was the primary impact of the innovation?
	Wood letters.	Lead letters.	1450	Mass production of written material. Widespread desire to read and write. Exchange of ideas.
2. What was the second communications innovation in this video?	Delivery of mail by horse or boat.	Electric Telegraph	1858	First inter- continental connection in global communications network.

3.	How many miles is the 3 Cable that runs from Europe to Japan?	24,000
4.	How many words to we send through the cable every second?	200 billion per second
5.	How many miles of cable link America?	35 million miles
6.	What year was the internet invented?	2015
7.	What kind of activities happen on the internet are mentioned on the video?	Socializing, shopping, moving money, business.

THEME: Introducing the Third Industrial Revolution

Students will define plagiarism and learn the rules for citing sources, so they can write summaries and essays that cite text and sources appropriately. Students will also read, annotate, and discuss an article on the first three Industrial Revolutions and then answer and analyze HSE-type Questions about the reading.

MATERIALS

For 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=bT6S4ERI008</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. Citation Template for the Bridge Course

For Activity #2:

- Handout (attached): Make extra copies for students who don't have a copy from the first semester. Annotation Key
- Handout (attached): Make one copy for each student. From Ford to Foxconn: A History of Factories
- Handout (attached): Make one copy for each student. HSE-type Questions for "From Ford to Foxconn: A History of Factories"
- Teacher Resource: Make one copy for the teacher. Answer Key: HSE-type Questions for "From Ford to Foxconn: A History of Factories"

Homework:

• Handout (attached): Make one copy for each student. Summary Practice Sheet

ACTIVITY #1: Learn to Quote and Paraphrase Documents - 50 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.

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

- Tell students they will now 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?
- Conduct a discussion on the answers to these questions while taking notes on the board.
- Watch the video: Melania Trump and Michelle Obama Side-by-Side Comparison.
- Write a third question on the board:
 - Why was the incident in the video such a big deal?
- 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:

- \circ $\;$ Pass out the Simple Citation Template for Bridge Program.
- Tell students to read the two rules and the examples: loud, clear, and with feeling!
- Tell students to take the time to write one new sentence using each of the rules based on their notes.
- \circ $\;$ Tell students to read their sentences out loud, one at a time.
- Tell students they will practice the rules about "According to" language and quotations in summaries they will write and review in the next two classes.

Break - 10 minutes.

ACTIVITY #2: Read an Article on the First 3 Industrial Revolutions - 60 minutes

Read, Annotate, and Discuss the Article

- Tell students they are going to read an interesting article that summarizes the first 2 Industrial Revolutions they have already studies and adds description of aspects of the 3rd. The summary of the 3rd Industrial Revolution will give us a clue about where manufacturing is today.
- Tell students to use their Annotation Key while they read the article.
 - Pass out copies of the Annotation Keys to those who do not have one.
- Pass out From Ford to Foxconn: A History of Factories and ask students to read and do their annotation.
- While students are reading, write the following instructions on the board.
 - \circ What were the most important points brought up in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with?
 - Disagreed with?
- Put students in pairs to talk about their answers to the questions on the board.

- Come together as a class and ask the questions on the board, allowing the pairs to present their different responses to the class.
- Lastly, ask:
 - What do we make of the last paragraph?
 - What jobs have left the US?
 - Where are these huge "mind-boggling" factories?
 - What is this Foxconn referred to in the title?
 - Have you ever heard of this before?
 - Stay tuned!

Answer HSE-type Questions

- Tell students they are now going to answer HSE-type Questions based on this reading.
- Pass out the HSE-type Questions for "From Ford to Foxconn: A History of Factories".
- Ask students to answer the questions.
- Put students in pairs to review their answers and, for those answers that are different, discuss which ones they think are the right answers.
- Assign each student a question to analyze. They should consider:
 - Which answer clearly is not the right answer?
 - Which ones are close?
 - Which one is the right answer? How do you know?
- Project the questions overhead and have pairs present the analysis of their questions.
- After each presentation, ask the class:
 - Do you agree with this analysis?
 - Do have anything you want to add or change?

HOMEWORK

JOURNAL WRITING: Have students journal in response to this prompt: What are some of the negative impacts of factories on American life and what factors made factory life better? Students should write this journal entry in their own words based on what they remember from the reading, taking the HSE test, and class discussions.

TEACHER PREPARATION NOTE: Before the next class, review all of the maps and answers to the Treasure Hunt questions so you can guide students through the process of reading each and getting relevant information and observations from the set.

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CITATION TEMPLATE FOR THE BRIDGE COURSE

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

1. For Quotes:

- Put quotation marks around the group of exact words you are using from someone else's text.
- Include the name of the article or video in parentheses after each quote.
 Capitalize all the words in the title.
- Put the period for the last sentence of the quote after the parenthesis.

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).

2. Using an Introductory Phrase to Cite Facts in Your Own Words:

- Use one of the introductory phrases listed below before referring to an article, video, or website.
- Put a coma after this introductory phrase:
 - According to (title),
 - As indicated by (title),
 - As reported by (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.
- 3. Cite Facts or Ideas in Your Own Words at the End of a Sentence:
- Write the sentence of facts or ideas in your own words.
- Put the name of the source at the end of the sentence in parentheses.
- Put a period after the parentheses.

Examples:

- The most unacceptable kind of plagiarism is when you copy someone else's work and turn it in as an essay you wrote yourself (*Plagiarism:* How To Avoid It).
- You can write whole songs using quotes of many different people's work (Plagiarism Rap).

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ANNOTATION KEY

Underline or highlight what you think is important.

O - Circle words you don't understand.

! - Put an exclamation point next to anything surprising or interesting.

? - Put a question mark next to anything you don't understand or is confusing.

* - Put an asterisk next to anything you agree with.

NO - Write <u>No</u> next to anything you disagree with.

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From Ford to Foxconn: A History of Factories

Adapted and paraphrased from source: <u>https://www.pri.org/stories/2018-03-23/ford-foxconn-history-factories</u>



A scale model of the Boott Cotton Mill Credit: NPS

Look around you: at your computer, your phone, your water bottle, or the books on your desk. Chances are, all of these things came from a factory. Even if you don't think about them too often, factories make our modern world possible. Indeed, you might argue that factories created the modern world, sometimes in ways that are rarely discussed. The factory has been an integral part of America for a long time. Consider the 1876 centennial exhibition in Philadelphia. It was a celebration of the American nation; its legacy, triumphs, and greatness. And what was its centerpiece? "It's not the [founding] documents," Joshua Freeman author of Behemoth: A History of the Factory and the Making of the Modern World, says. "It's not George Washington's wooden teeth. It's a steam engine. And President Grant comes and flips the switch, and the steam engine starts and powers all the factory equipment that's there."

Though the first factory was an English silk mill, built in 1721, the idea of the factory system spread quickly. First throughout England, then Europe, then to America. The reason? "There are just enormous efficiencies associated with the factory, with the coordination of production, the scale of production, and the application of external power to production," Freeman says.

And these enormous efficiencies have sometimes impacted people's lives in horrifying ways. Freeman notes that young children were often put to work in the crowded chaos of early factory floors. Sometimes orphans would be conscripted.

Much like labor conditions, environmental impacts often weren't important to factory owners of the 18th and 19th century. (Freeman points out that smoke was seen as a sign of

prosperity.)

These factories drove foreign policy too. Growing cotton isn't exactly possible in Europe, and England needed that raw material for its textile mills. Freeman believes that Europe's hunger for cotton absolutely shaped the entire world order. "[It] was one of the great reasons for the spread of American slavery. ... Ninety percent of their cotton comes from America by the 1820s, 1830s. So there's a huge amount of global transformation, and frankly, global misery, in the process of supplying factories with raw materials," he says. Beyond the motivations of nations, the factory also changed the daily lives of workers. Henry Ford introduced the assembly line, as children learn in school, but that wasn't the end of it. When he first launched the assembly line, workers absolutely hated it, according to Freeman.

Turnover was so great that Ford had to hire four times the number of laborers the assembly line actually needed. His solution was to increase wages, and make that wage increase contingent on workers adopting "good habits." These included not drinking, not being wasteful, and not "living in sin." And he created a "sociological department" that would go to people's homes and make sure they were practicing those habits. In a sense, Freeman says, Ford didn't just create "a new assembly line, but a new social system to accompany it."

But this social system didn't stay in place. It evolved, and was shaped by workers themselves, especially workers in unions. Freeman points out that consolidation in factories actually gave workers power, since they were able to stop work and go on strike. (Think of Norma Rae as a cinematic example.)

"You could argue [that] this golden age of America that people are often very nostalgic for — from the end of the Second World War up to the late 1970s — in part, rested on the combination of the large factory and unionization," Freeman says.

This golden age may have ended, and many manufacturing jobs may have left the US, but the factory still shapes our world. "The largest factories in human history exist right now," Freeman says. "They're making things like your sneakers and your cell phone. And some of these factories have 200,000 or 300,000 workers in a single factory complex. They're absolutely mind-boggling."

HSE-type Questions for Form Ford to Foxconn: A History of Factories

- 1. What were labor conditions like in factories during the 18th and 19th centuries?
 - a. Long hours, fair pay, severe health risks, and child labor was permitted
 - b. Unfair pay, smoke, dim lighting, child labor was permitted, and short hours
 - c. Long hours, low pay, smoke, unsafe machines, and child labor was permitted
 - d. Unfair pay, strict supervisors, cramped workplaces, unsafe machines, and smoke
- 2. What did the first factory make and where was it located?
 - a. Books, England
 - b. Silk, America
 - c. Books, Great Britain
 - d. Silk, England
- 3. How do factories currently affect the environment?
 - a. Water filtration systems have become less efficient because of factories
 - b. Noise pollution and light pollution have disrupted ecosystems
 - c. Factories increase air pollution, water pollution, soil pollution
 - d. Engineers filter out all harmful chemicals from their factory emissions
- 4. How did factories drive foreign policy?
 - a. The government played a huge role in how factories were run and therefore based their policies off of business demands
 - b. The demand for raw materials increased the demand on foreign exports resulting in more factories and the spread of slavery
 - c. The demand for factories called for more immigrant workers resulting in mass migration and travel laws
 - d. The need for more land to grow more cotton drove England to purchase plantations elsewhere
- 5. What is the "global misery" that the author mentions?
 - a. The global spread of slavery, poor working conditions, and long hours with little or no pay
 - b. The rapid spread of cheap products, cheap labor, poor working conditions, and pollution
 - c. The widespread collapse of small businesses that led to a higher rate of global poverty
 - d. The dwindling raw materials that were a result of the spread of factories leaving countries barren

- 6. How does an assembly line work?
 - a. A group of workers begin and finish the manufacturing of a product to identically match its predecessor
 - b. A series of machines work to create a finished product in a factory
 - c. A series of workers and machines work to create a succession of identical items until a product is assembled
 - d. One group of workers constructs an entire product from start to finish
- 7. Why was turnover so high in the Ford factories?
 - a. The machines were extremely dangerous, and employees kept getting injured
 - b. Workers were not getting paid enough for their work, so they left
 - c. Inability to do the job and keep up with the demand
 - d. Hard labor and strict rules that dictated both work and personal life
- 8. How did Henry Ford's "sociological department" evolve?
 - a. It was shaped by workers, especially those in unions, and gave them power
 - b. Ford had more control over his workers, so they were unable to stop work and strike
 - c. The department was dissolved, and workers voted to kick Ford out of his company
 - d. It allowed workers to compromise their pay for better working conditions
- 9. What was the film "Norma Rae" about?
 - a. Factory owners working their employees to death
 - b. Low pay and poor working conditions that caused workers to form a union
 - c. Factory workers who worked their way up to promotions and benefits
 - d. Illegal gambling on horse races during the 1920s
- 10. How do factories still shape the world we live in today?
 - a. Laws are based off of the demands of factories
 - b. Most of the products we use today pass through a factory at some point
 - c. Factories still illegally rob countries of their natural resources
 - d. Factories are the main cause of wage discrimination in the world today
- 11. Why weren't environmental impacts seen as important to factory owners?
 - a. Technology did not exist to predict how factories might influence the environment
 - b. Because prosperity was more important than sustainability
 - c. Climate change did not exist yet
 - d. Because sustainability was more important than prosperity

Answer Key: HSE-type Questions for Form Ford to Foxconn: A History of Factories

- 1. What were labor conditions like in factories during the 18th and 19th centuries? Author and Me
 - a. Long hours, fair pay, severe health risks, and child labor was permitted
 - b. Unfair pay, smoke, dim lighting, child labor was permitted, and short hours
 - c. Long hours, low pay, smoke, unsafe machines, and child labor was permitted
 - d. Unfair pay, strict supervisors, cramped workplaces, unsafe machines, and smoke
- 2. What did the first factory make and where was it located? Right there
 - a. Books, England
 - b. Silk, America
 - c. Books, Great Britain
 - d. Silk, England
- 3. How do factories currently affect the environment? On my own
 - a. Water filtration systems have become less efficient because of factories
 - b. Noise pollution and light pollution have disrupted ecosystems
 - c. Factories increase air pollution, water pollution, soil pollution
 - d. Engineers filter out all harmful chemicals from their factory emissions
- 4. How did factories drive foreign policy? Author and me
 - a. The government played a huge role in how factories were run and therefore based their policies off of business demands
 - b. The demand for raw materials increased the demand on foreign exports resulting in more factories and the spread of slavery
 - c. The demand for factories called for more immigrant workers resulting in mass migration and travel laws
 - d. The need for more land to grow more cotton drove England to purchase plantations elsewhere
- 5. What is the "global misery" that the author mentions? Pulling it together
 - a. The global spread of slavery, poor working conditions, and long hours with little or no pay
 - b. The rapid spread of cheap products, cheap labor, poor working conditions, and pollution
 - c. The widespread collapse of small businesses that led to a higher rate of global poverty
 - d. The dwindling raw materials that were a result of the spread of factories leaving countries barren

- 6. How does an assembly line work? On my own
 - a. A group of workers begin and finish the manufacturing of a product to identically match its predecessor
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 - c. A series of workers and machines work to create a succession of identical items until a product is assembled
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- 9. What was the film "Norma Rae" about? On my own
 - a. Factory owners working their employees to death
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 - c. Factory workers who worked their way up to promotions and benefits
 - d. Illegal gambling on horse races during the 1920s
- 10. How do factories still shape the world we live in today? Author and me
 - a. Laws are based off of the demands of factories
 - b. Most of the products we use today pass through a factory at some point
 - c. Factories still illegally rob countries of their natural resources
 - d. Factories are the main cause of wage discrimination in the world today
- 11. Why weren't environmental impacts seen as important to factory owners? Right there
 - a. Technology did not exist to predict how factories might influence the environment
 - b. Because prosperity was more important than sustainability
 - c. Climate change did not exist yet
 - d. Because sustainability was more important than prosperity

Week 2, Lesson 1

Manufacturing Bridge Semester 2: Adult Secondary Education (ASE)

THEME: The World in the 1990s

Students peer review the summaries they wrote for homework. Next, they will work in small groups to fill in the names of countries on a world map. Students then examine nine world maps and one world map from the 1990s that provide information on varying measures of countries' wellbeing. They will take notes on information that describes China, India, and the US, as these are the countries of focus for the unit.

MATERIALS

For Activity #1:

- Handout (attached): Make two copies for each student, one for the first activity and one for homework. Summary Practice Sheet
- Handout (attached): Make one copy for each student. Blank World Map
- Teacher Resource: One color copy for projecting overhead. World Map with Country Names

For Activity #2:

- Handout (attached): Make one copy for each student. Treasure Hunt for Information on China, India, and the US
- Teacher Resource (attached): Make one copy for yourself. Answer Key: Treasure Hunt for Information on China, India, and the US
- Video: What is GDP? (running time: 01:46) https://www.youtube.com/watch?v=hBgWRayc1kE
- Teacher Resource: Nine World Maps and one Graph in Color for Projection <u>http://www2.harpercollege.edu/~mhealy/eco212/review/ldctextoutline.htm</u>
 - GDP per capita per year: November 1997
 - % Rate of Population Growth: 1990-95
 - o % of Labor in Agriculture
 - Percent Urban Population
 - Energy Use Per Capita
 - Televisions Per 1,000 People
 - Infant Mortality Rate
 - Life Expectancy 1995
 - Literacy Rate Percent
 - Engineering Graduates
- Teacher Resource: Additional 1997 Graph for Projection World Income Distribution

TEACHER PREPARATION

Prior to class, review all of the maps and answers to the Treasure Hunt questions so you can guide students through the process of reading each and getting relevant information and observations from the set.

ACTIVITY #1: Writing a Summary – 50 minutes

Define the Reader

- Tell students they will write a summary of the important information in the article "From Ford to Foxconn" using some new techniques and begin by defining who their reader is.
- Ask:
 - Who are you writing to when you write a summary? (Answer: Someone who is not in this class and has not read this article.)
 - Why would a reader want to read your summary? (Answer: They are interested in the topic and the important facts about it.)
 - How does your reader want you to write your summary? (Answer: They want it to be easy to read and easy to understand.)

How to Use "According To"

- Tell students that their annotation notes will help them with their summaries. They need to choose the facts they think are most important and give credit to the author/article because they are the author's ideas and not the student's ideas.
- Tell students that this article is a summary of a book.
 - What is that name of that book? (Answer: Behemoth: A History of the Factory and the Making of the Modern World)
 - Who wrote it? (Answer: Joshua Freeman)
 - Why is it important that the book's title and author are put into the article? (Answer: To give credit to the original author and his ideas, in order not to commit plagiarism)
- Ask:
 - What is a fact from the article you think is important and want to include in your summary?
 Write the fact on the board.
- Tell students that because they found this fact in a specific place, they have to make sure they tell the reader where the fact comes from.
- Write the following on the board
 - "According to the article_____
 - What is the name of the article?
 - \circ Ask a student to make a sentence using the "According to" on and the fact on the board.
- Repeat this process for a few more volunteers.

How to Use Quotation Marks

- Ask:
 - What is a quotation?
 - Does this author use any quotations?
 - Have students read the ones they find out loud.
 - Who is the author quoting in each of these quotes?
- Have students find a sentence they think is significant and might want to use in their summary.
- Tell students they can use a whole sentence or a part of sentence or a word from an article but ONLY if they use quotation marks.
- Tell students to read the sentences they may want to include in their summary. They should have used quotations marks with the language from the article.

Prepare for and Write a Summary

- Pass out the Summary Practice Sheet and have students fill it out.
- Put students in pairs to talk through their summaries.
 - Have the listeners ask questions for clarity or more information.
- Collect their summaries to review in the following class.

TEACHER NOTE: Select from student writing a range of summaries to review in the next class. These summaries should range from very good to not so good so you can set a standard and provide useful feedback to students who need to make revisions.

Break – 10 minutes.

ACTIVITY #2: Read a Series of Maps for Information on China, India, and the US – 60 minutes

Predict

- Tell students they will read a series of world maps and collect information about China, India, and the US in 1990-1997, a period just after the 3rd Industrial Revolution began. They will learn about this period so, they can evaluate how these countries have changed.
- First, have students predict what we might find when we look at these maps.
- Write the following questions on the board:
 - Is the country rich or poor?
 - Rural or urban?
 - High levels of population or low?
 - High levels of education or no?
 - Other factors.
- Put students into three groups and assign each group a country: India, China, the US. Have them describe details about that nation that think were true in the 1990s.
- Have each group share their predictions and take notes on the board.
- Lastly, ask:
 - Why do you think China and India are of particular interest in our study of the 3rd Industrial Revolution?
 - List student answers on the board.

Watch a Video to Define GDP

- Tell students that before looking at the world maps and graph, the class needs to define GDP. GDP offers an important measure of how a country is performing economically.
- Pass out the Treasure Hunt for Information on China, India, and the US.
- Have students read the three questions out loud.
- Watch the video What is GDP? and have students complete the Treasure Hunt.
- Go over the answers to the questions.

Read Maps and Gather Information on China, India, and the US

- Tell students that they will look at the World Maps and one graph to get information about China, India and the US in the 1990s.
- Use the following process to help you move through each map quickly:
 - Project the map overhead.
 - Ask:

- What is the title of this map?
- What kind of information is this map going to give us?
- What are the countries or continents that have the most of this measure?
- What are the countries or continents that have the least of this measure?
- Which are in between?
- Next, ask:
 - What is the measure for China? (Have students write it down.)
 - India? (Have students write these measures down.)
 - The US? (Have students write these measures down.)
- Have students write a sentence that summarizes the information and then share their summaries.
- Lastly, for each map ask:
 - Do you notice any patterns among world countries regarding this measure?

For the Engineering Graduates graph at the end:

- Have students predict which of the three countries has the highest number of engineers graduating each year.
 - Ask: What are the reasons for your prediction?
 - Jot down student answers on the board.
- Project the Engineering Graduates graph overhead.
- Ask students to read the title and the numbers associated with each of the countries on the graph. (Be sure that they read the numbers in thousands.)
- Ask:
 - Is there anything surprising about the information in this graph?
 - Why do you think there are differences in education?
 - How do you think the difference in the number of engineers between these countries might make China and India attractive to manufacturers?
- Tell students to remember these facts as we learn more about the 3rd Industrial Revolution. They play a role in the big changes that come after the 1990s.
- For the World Income Distribution Map:
 - Read the information in the right-hand column and ask students to put these facts in their own words.
 - Take notes of these facts on the board.
 - Put students in pairs.
 - \circ Ask them to come up with five facts they can get from reading this graphic.
 - \circ $\;$ Have students share these facts and add them to the list on the board.

HOMEWORK

WRITE: Pass out a Summary Practice Sheet for students to prepare for writing their summaries. They will only need to fill out the first two sections of the Summary Practice Sheet as they have been reviewing maps, not readings.

Have students choose one of the countries studied and write a description of that country referring to the information from the maps using "According to" language. (The name of the source is Economic Growth and Less Developed Countries). Students may also include their own ideas about what they think the country is based on the information they learned from the maps and graph in class.

TEACHER NOTE: Be prepared to project sample summaries for discussion in the next class. Also, tell students they will need their treasure hunts again in Week 3, Lesson 1.

SUMMARY PRACTICE SHEET

Follow the directions on the left to fill in the boxes on the right. These notes will help you write your summary.

Write what the article was about in your own words.	
Write "according to" statements to bring in facts to support your summary.	
Optional: Choose an important sentence from your reading that you want to use in your summary because it makes an important point. If you choose one, write it here using quotation marks.	

Blank World Map



World Map with Country Names



TREASURE HUNT FOR INFORMATION ON CHINA, INDIA, AND THE US

Video: What is GDP?

1. What does GDP stand for?	
2. What does it mean?	
3. What does "per capita"	
moon?	

10 World Maps from 1997

Map # and Measure	CHINA	INDIA	THE US
1. Level of income economies.			
Summarize how these three countries compare.			
2. Rate of population growth.			
Summarize how these three countries compare.			
3. Percent of labor in agriculture.			
Summarize how these three countries compare.			

4.	Percent urban population.		
	Summarize how these three countries compare.		
5.	Energy per capita (Kg of oil).		
	Summarize how these three countries compare.		
6.	Televisions per 1,000 people.		
	Summarize how these three countries compare.		
7.	Infant mortality rate (deaths per 1,000)		
	Summarize how these three countries compare.		
8.	Life expectancy - 1995		
	Summarize how these three countries compare.		
9.	Literacy rate percent		
	Summarize how these three countries compare.		
10	. Engineering graduates		
	What is your explanation for this?	·	·

ANSWER KEY: TREASURE HUNT FOR INFORMATION ON CHINA, INDIA, AND THE US

Video: What is GDP?

1. What does GDP stand for?	Gross Domestic Product
2. What does it mean?	It is the total of all the goods and services a country produces. Or it is the sum total of everyone's income.
3. What does "per capita" mean?	Per Person

10 World Maps from 1997

	Map # and Measure	CHINA	INDIA	THE US
4.	Level of income	Low income	Low income	High Income (\$9, 386 or
	economies.	(\$765 or less)	(\$765 or less)	morej
	Summarize how these	For example: Both China and India are low income countries while the US is a high-income		
	three countries compare.	country.		
5.	Rate of population	.04- 1.6	1.7 - 2.4	.04- 1.6
	growth.			
	Summarize how these	For example: China and the US have the same population growth rate while India's		
	three countries compare.	population growth rate is higher.		
6.	Percent of labor in	31.0	31.0	2.0
	agriculture.			
	Summarize how these	For example: China and India's percent of labor in agriculture is much higher than in the US.		
	three countries compare.			

7. Percent urban population.	27.0-43.0	27.0-43.0	74.0 - 96.0
Summarize how these three countries compare.	For example: The US population is mostly urban where China and India's is less than half.		
8. Energy per capita (Kg of oil).	252.0 – 1.1 k	252.0 – 1.1 k	2.9k - 10.9 k
Summarize how these three countries compare.	For example: The US uses up to 10 times more energy per person than China or India.		
9. Televisions per 1,000 people.	15.0 - 59.0	15.0 - 59.0	323.0 - 942.0
Summarize how these three countries compare.	For example: Almost everyone has a television in the US while very few have them in China and India.		
10. Infant mortality rate (deaths per 1,000)	23.0- 53.0	54.0 - 97.0	1.0 - 9.0
Summarize how these three countries compare.	For example: The US has rare infant mortality deaths, China has many times more than the US, and India has almost twice China's.		
11. Life expectancy - 1995	66.0 - 70.0	52.0- 56.0	75.0 - 79.0
Summarize how these three countries compare.	For example: The US has the highest infant mortality, China's is somewhat lower, and India's is much lower than China's.		
12. Literacy rate percent	64.0 - 84.9	48.0 - 63.9	97.0 - 98.9
Summarize how these three countries compare.	For example: The US has the highest literacy rate, China's is somewhat lower, and India's is much lower than China's.		
13. Engineering graduates	1,200	1,000	100
Summarize how these three countries compare.			



GDP per capita per year: November 1997

% Rate of Population Growth, 1990-95



Source: Newsweek Education Program

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WORLD INCOME DISTRIBUTION



1. U.S. 1999 GDP was more than the total output of the poorest 109 countries combined.

2. The U.S. has 5 percent of the population but produces 27 percent of the world's output.

3. The largest U.S. corporations have sales greater than most poor nations' total output. General Motors had sales greater than the output value of all but 22 lowerincome nations of the world.

4. The assets of the three wealthiest people in the world exceeded the

The poorest fifth receives 1.4% of total world income

Source: UNDP, Human Development Report 1992 (New York: Oxford University Press, 1992).

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THEME: Reasons to Move Manufacturing to China

Students read about why manufacturers have been moving production to China and watch a video that shows how China's urban centers have grown over the past 30 years. Students will then use this information to prepare and deliver a commercial to persuade US manufactures to move their production to China, too.

MATERIALS

For Activity #1:

• Handout (attached): Make enough copies for the whole class. 5 Reasons to Manufacture Overseas

For Activity #2:

- Video: Time-Lapse Video Shows 30 Years of China's Growth in Minutes (running time: 01:20) https://www.youtube.com/watch?v=ndrQSqtrmgo
- Classroom Resource: Flip chart paper and markers.

ACTIVITY #1: Reasons to Move Manufacturing to China - 60 minutes

• Tell students they will peer review their summaries and then examine why many manufacturers have moved their production operations overseas.

Review Homework Summaries

- Tell students they will review summaries from last class to get an idea of which summaries work well and how to improve summaries that may need more work.
- Write the following sentences on the board:
 - The summary was written in the student's own words.
 - The summary uses "According to" language to be clear about where their facts came from.
 - The summary uses a quote to help make an important point.
 - The summary is interesting and easy to follow.
- Project the first summary overhead. This summary should be one that you think meets basic summary criteria.
- Read the summary out loud.
- Ask the class:
 - Does the first statement on the board apply to this summary?
 - Why or why not?
 - Repeat these questions for each of the statements on the board.
 - Project the second summary on the overhead and read it out loud.
- Put students in pairs and have them:
 - Choose the statements on the board that they think apply to this summary.
 - \circ Make recommendations to improve this summary as needed.
- For each statement on the board:
 - Go from pair to pair to ask:
 - Did they think that statement applied to this summary?
 - Why or why not?

- Repeat this process with another summary overhead as time allows.
- Hand back the summaries and provide a due date for revisions.

Read, Annotate, and Discuss the Article on Moving Manufacturing Overseas

- Pass out the article 5 Reasons to Manufacture Overseas.
- Have students read and annotate, using the symbols on the Annotation Key.
- While students are reading, write the following on the board and discuss once they have finished reading:
 - Look at what you underlined. Of those things, what were the most important points brought up in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
- Put students in pairs to talk about their answers to the questions on the board.
- Come together as a class and ask the questions on the board, allowing pairs to present their responses to the class.

Break - 10 minutes.

ACTIVITY #2: Create a Commercial to Attract US Manufacturers to China -- 50 minutes

Predict the Impact of US Manufacturing on China and Watch a Video

- Tell students they will predict the impact on China of US (and European) countries moving their manufacturing to China.
- Ask the following questions, taking notes on the board:
 - What was China like in 1997?
 - What do you imagine that China of 1997 would have to do to accommodate the factories?
 - How do you think China would have to change?
- Watch the video.
- Ask the following questions, taking notes on the board:
 - What is the point of the video?
 - How is this rapid urban development similar to development in England and the US during their 1st and 2nd Industrial Revolutions?
 - What changes do you think have taken place in people's lives during the past 30 years?
- Watch the short video again, having students jot down the beginning dates of the time-lapse photography; students do not have to write the names of the cities
 - List these starting date for Chinese industrialization on the board.
- Lastly, ask:
 - What do these starting and ending dates show you about how fast Chinese society has been changing?
 - What additional questions do you have about how the Chinese people are being affected by these changes?
 - We will investigate more as the unit moves along.

Prepare a Commercial

• Tell students they will imagine that they are a Chinese company whose job it is to attract US manufacturers to China. They are tasked with creating a commercial that will entice US manufacturers to move.

- Put students into pairs (or small groups) to work on their commercials. Have them:
 - Use the information from the maps, graphics and reading, as well as this video, to make a commercial.
 - Write the commercial.
 - \circ Use "According to" and quotes that will make the commercial persuasive.
 - Use flip chart paper and markers as needed.

Present a Commercial

- Have pairs or small groups perform their commercial. Ask commercial viewers to be US manufacturers and take notes on what they find convincing about the commercial. Students will use this information later to write an essay.
- After each commercial, ask:
 - What parts of this commercial convinced you that moving to China to manufacture your product is beneficial?
 - What techniques did the commercial use to get your attention and interest?

HOMEWORK

JOURNAL WRITING: Have students journal in response to the following prompt: How will US manufacturers benefit from doing business in China? What do you imagine the impact of large numbers of manufactures coming to China would be on the Chinese people?

TEACHER PREPARATION NOTE: Before the next class, review all materials and be sure you can fill out the *Treasure Hunt for Outsourcing*. This preparation will help you lead a discussion on the reasons some US companies take their business overseas. Also, let students know that they will need the article, *5 Reasons to Manufacture Overseas*, again in the next class.

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5 Reasons to Manufacture Overseas

Adapted and paraphrased from source: <u>https://www.itimanufacturing.com/news/5-reasons-to-manufacture-overseas/</u>

Original author: Mike Stewart



Large companies and small businesses alike are opting to manufacture their products overseas and for very good reason. There are lots of benefits to be had from manufacturing goods offshore when compared to the alternative of doing it in your own backyard. Below we look at five main reasons overseas manufacturing may be just what you need to take your business and product to the next level.

1. Lower Production Cost

Every sensible business owner will tell you that keeping production costs low without sacrificing quality is the first step toward running a successful business or company. More often than not, raw material costs are the same in China as they are elsewhere in the world. The advantage in China is not just the cost of labor, but the cost of skilled labor. A multitude of China manufacturing options have the skilled labor force and the equipment to take your product from raw material to final output, all at a fraction of the cost.

2. Lower Tooling Cost

Injection molds, die cast molds, production fixtures, and other production tooling are not really seen as profit centers for China manufacturers. China tooling costs are roughly 1/5 of US tooling costs, so there's a significant advantage to start up projects in China. Modifications to tooling are also very inexpensive while most preventative maintenance is free.

3. Mass Production

Overseas manufacturing, because it is less expensive, allows for goods to be produced in very large volumes. Volume ensures that businesses and companies are able to meet their market needs every time. The ability to consistently mass produce and meet demand is crucial to a company's success. Being able to do so at reduced cost is, of course, an added

bonus.

4. Scale and Flexibility

China has a unique ability to scale manufacturing capacity extremely quickly in order to respond to customer demand. Adding workshops and hiring skilled labor can be done almost overnight. The nimble nature of China's factories can allow you to grow your demand without interruption.

5. Out of Sight, Out of Mind

Opting for overseas manufacturing allows business owners to turn over manufacturing responsibilities to the professionals and focus on other areas of building the business. Being able to focus on product development, marketing, promotions, and brokering new deals can help business owners grow their businesses while they have a competent team handling issues of quality control on their behalf. It is a win-win situation for all stakeholders.

THEME: Reasons to Outsource to India and the Philippines

Students complete a Treasure Hunt on outsourcing and record reasons it is beneficial for US companies to move some services to India or the Philippines. Students then imagine that they were a US company and write about the most convincing reasons for them to move some part of their operations overseas.

MATERIALS

For Activity #1:

- Handout (attached): Make one copy for each student. Treasure Hunt for Outsourcing
- Handout (attached): Students should have brought their copies to class. Teachers may wish to have extra copies on hand.

5 Reasons Why Companies Outsource to India

For Activity #2

- Video: Why Outsource? (running time: 03:48) <u>https://www.youtube.com/watch?v=aqhjNJkvC9w</u>
- Handout (attached): Make one copy for each student.
 U.S. Companies Find Cheap Labor -- and Growing Consumer Market -- in Philippines

TEACHER PREPARATION

Prior to class, review all materials and be sure you can fill out the *Treasure Hunt for Outsourcing*. This preparation will help you lead a discussion on the reasons some US companies take their business overseas.

ACTIVITY #1: Read About Reasons US Companies Outsource to India - 50 minutes

Journal Writing Homework Check-In

- Write the following journal writing questions on the board:
 - How will US manufacturers benefit from doing business in China?
 - What do you imagine the impact of large numbers of manufactures coming to China would be on the Chinese people?
- As the class discusses answers to these questions, take notes on the board.
- Tell students to remember their predictions because they will look at this second question again later in the unit.

Read, Annotate, and Discuss the First Reading

- Tell students they are going to read about outsourcing the US does to other overseas countries. Explain that outsourcing and offshoring are very similar and so should be understood as being basically the same. Most often offshoring pertains to manufacturing production going overseas and outsourcing pertains to services going overseas, but not always. What is important to remember is that in both instances, US companies are working with foreign companies to get work done at a cheaper rate than they could get at home.
- Tell students they will learn reasons for US companies to, in this case, outsource overseas. By learning new reasons for this practice, they will get a fuller understanding about why US companies have been doing such extensive business overseas.
- Pass out 5 Reasons Why Companies Outsource to India.
- Pass out the Treasure Hunt for Outsourcing and go over the directions.
- Have students read and annotate, using the symbols on the Annotation Key.
- While students are reading, write the following instructions on the board. Go over the questions with students once they have finished reading:
 - Look at what you underlined. Of those things, what were the most important points brought up in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with? Disagreed with?
- Put students in pairs to talk about their answers.
- Come together as a class and ask the questions on the board, allowing pairs to present their responses to the class.
- Have students complete the questions in their *Treasure Hunt* for this reading.
- Go over the first question in Treasure Hunt by asking:
 - What is one reason that companies should outsource to India?
 - What are the details that help you understand what that means?
- Repeat this questioning process for each of the 5 reasons.

Break – 10 minutes.

ACTIVITY #2: Read About Outsourcing to the Philippines and Write About Why US Companies Take their Business Overseas – 60 minutes

Watch a Commercial Video on Outsourcing

- Tell students they will add additional reasons for US companies to outsource as a general practice and to the Philippines specifically. They will create a commercial for a consulting firm that wants to pair US businesses and overseas countries for outsourcing.
- Tell students to watch the video without taking notes.
- Watch the video.
- Ask:
 - What reasons for outsourcing do you remember?
 - Did anything jump out at you?
 - Watch the video for the second time. This time tell students to:
 - Take notes on the Treasure Hunt while they are watching.

- When they are done, ask:
 - What is one reason that companies should outsource?
 - \circ $\;$ What are the details that help you understand what that means?
- Repeat this procedure until you have collected all their reasons to outsource
 - \circ Take notes on the board so students can fill in their Treasure Hunt further.

Read and Annotate an Article

- Pass out U.S. Companies Find Cheap Labor -- and Growing Consumer Market -- in Philippines.
- Have students read and annotate.
- While students are reading, re-write the following questions on the board if you erased them from earlier. Go over these questions with students once they have finished reading:
 - Look at what you underlined. Of those things, what were the most important points brought up in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with? Disagreed with?
- Come together as a class and ask the questions on the board, allowing pairs to present their responses to the class.
- Have students write down their answers to the Treasure Hunt questions for this reading.

Write About Why US Companies Take their Business Overseas

- Tell students that they will now prepare to write about why US companies take their business overseas.
- Write the following prompts on the board:
 - \circ You are a US company that is considering moving a portion of their operations overseas.
 - What are the three reasons for moving overseas that you find the most convincing?
 - Why are each of these reasons convincing?
- Ask students to take out their reading from last class (5 Reasons to Manufacture Overseas) to review alongside today's Treasure Hunt.
- Tell students that to prepare for their writing, they will need to imagine that they are a US manufacturer that wants to stay competitive with other manufacturers that make the same or similar kind of product.
 - \circ $\;$ To spark students' imaginations, go round robin and ask:
 - What product does your company make?
 - Are you a big or small company?
 - How might moving part of your company's operations overseas help your bottom line?
- Tell students to look over today's Treasure Hunts and the reading from last class and choose their top three reasons for moving a portion of their operations overseas.
 - Ask volunteer students to disclose the reasons they chose and why.
- Give students at least 20 minutes to respond to the prompt on the board.
 - \circ $\;$ Tell them to write their first draft like it was a journal entry.
 - Don't worry about all the details- just write.
- Collect students' drafts at the end of the class and provide feedback that will help students develop their next essay.

TEACHER NOTE: Look over students' writing and give feedback on how the piece of writing could be developed further. Provide students with a due date for revisions.

HOMEWORK

Research: Have students choose which country they are most interested in writing about: China or India. Research on-line articles and/or videos that give them more information about why a US company would want to outsource their manufacturing or service there. Write down the name of the source/website and take notes on important information. This information will help with their upcoming essays.

TEACHER PREPARATION #1: Choose two paragraphs from student writings that demonstrate the kinds of grammar and spelling challenges most students are exhibiting. Type up these paragraphs with the mistakes intact and put them on separate pieces of paper to be printed as two-sided handouts. You will need one copy per student for the Editing Games in the next lesson.

TEACHER PREPARATION NOTE: Before the next class, prepare a demonstration for how to best use the *Essay Planning Assistant* for Activity #2.

TREASURE HUNT

List the 5 reasons in the article, 5 Reasons Why Companies Outsource to India, that explain why companies outsource to India and the details that help you understand each one.

What are the five reasons for outsourcing to India?	Details that help you understand each of the five reasons.
1.	
2.	
3.	
4.	
5.	

Find additional reasons why companies outsource in the video, *Why Outsource*?

What are the additional reasons for outsourcing pointed out in the video?	Details that help you understand each of the reasons
outsourcing pointed out in the video.	
1.	
2.	
3.	
4	
5.	

Find additional reasons why companies outsource in the reading, U.S. Companies Find Cheap Labor – and Growing Consumer Market – in Philippines.

What are the additional reasons for	Details that help you understand
outsourcing?	each of the reasons.
6.	
7.	
8.	

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5 Reasons Why Companies Outsource to India

Adapted and Paraphrased from Source: <u>https://blog.flatworldsolutions.com/5-reasons-why-companies-outsource-to-india/</u>

Why do companies prefer to outsource to India? Is it because of high quality work, a favorable time zone, outsourcing-friendly policies or low labor cost? The answer is all of the above. Over the years, India has evolved into being the world's most preferred outsourcing destination for a host of IT and ITES services across domains. India is one of the few outsourcing locations that offer several advantages that enable organizations to work efficiently, cut down on cost and improve quality all at once.

1. High Quality Services

When it comes to quality, there is no compromise from India. Indian service providers use the very latest in technology, software and infrastructure to provide services that are on par with international quality standards. Research surveys have even proved that Indian professionals are technically superior when compared with IT professionals from other countries. Global businesses love to outsource to India as they can get access to a highly educated workforce that is experienced, skilled, proficient in English, computer-literate and technically talented.

2. Unique time zone advantage

As any business will tell you, time is equal to money. If a company can get access to 24/7 services, it can be sure to complete work much ahead of deadlines and take on more projects. Customers too are happy when they can avail services or get their queries answered on a 24/7 basis. Now this has become a reality with outsourcing. Since the Indian time zone is 5.5 hours ahead of GMT and 10.5 hours ahead of the EST, companies can take on more work and keep their customers happy by outsourcing to India.

3. Stable government

When compared with other outsourcing locations, India has a stable government that has been firmly built over 60 years of democracy. The IT sector has always been a top priority for India's government and India has ensured that the outsourcing process is seamless by setting up a ministry of information technology. This IT ministry streamlines regulatory processes and quickly approves the implementation of IT projects. Over the past 10 years, India has been able to build several hi-tech IT parks with cutting-edge technology and bestof-breed infrastructure. The government in India has even permitted 100% foreign equity.

4. Low cost services

The cost of labor in India is much lower when compared to other outsourcing locations. In fact, low cost services are one of the primary advantages that you can leverage by outsourcing to India. Though the cost of labor is low, there is no compromise on the level of quality. India has the highest number of ISO-9000 software companies and several Indian service providers have even achieved the prestigious SEI-CMM level.

5. Preferred outsourcing location

Research surveys have proved time and again that India is the most preferred outsourcing location among global companies. In the United States alone, more than 90% have ranked India as their first choice for outsourcing IT and software services. Over the years, the United States, Canada, Europe and the United Kingdom have recognized the country of India as an outsourcing superpower.

Has your company thought about outsourcing to India? If no, why not try outsourcing to India today and leverage the benefits that only India offers.

U.S. Companies Find Cheap Labor - and Growing Consumer Market - in Philippines

No longer are store shelves largely comprised of only Philippine brands, as multinationals increasingly capture a slice of the market.

Adapted and paraphrased from source: <u>https://www.thestreet.com/story/13046938/1/us-companies-find-cheap-labor--and-growing-consumer-market--in-philippines.html</u>

Original author: Ralph Jennings



MANILA (TheStreet) - The fast-growing Philippines is becoming a magnet for U.S. companies, both as source of cheap labor and a thriving consumer market.

Economic growth reached 6.2% last year and the Asian Development Bank forecasts 6.4% this year, making it one of the strongest economies in Asia behind China and India. The country's nagging unemployment rate has also fallen below 7%, thanks in part to the expansion of back-office operations by foreign firms that has created about half a million jobs.

The move by multinationals to rely on the Philippines as a source of inexpensive labor is helping to provide that country's residents with greater wealth. And, in turn, fueling the economic growth in the region.

U.S. companies playing a role in helping to drive this growth include technology consulting firm Accenture (ACN), which employs Filipinos as back-office workers and also in call centers. **Intel** (INTC) also relies on residents in the region to staff its 18-year-old Manila sales and marketing office, which the chip giant states on its website is answering a "growing demand for PC technology."

Foreign companies, however, sometimes need more than inexpensive labor to entice them to the Philippines. The country's government is taking other action to make the region more appealing. The government plans to spend \$25.2 million in the coming years to train its residents in such professional occupations as accountants and medical transcribers, in an effort to give multinationals another reason to operate in the country beyond offering inexpensive labor costs and cheap land, says Benedict Uy, a Philippine government trade officer based in Taipei.

Philippine officials are planning to raise the country's infrastructure budget to 5% of GDP next year from 1.8%, in a move to improve its airports, roads, water supply and transportation, according to a report in the *Wall Street Journal*.

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THEME: Present Outsourcing Commercial and Prepare for an Essay

Students play the Editing Game with two teacher-selected paragraphs from student writing. Students are then given time to complete their Essay Planning Assistant in preparation for writing a full 45-minute essay during the next class.

MATERIALS

For Activity #1:

Handout: One copy of each paragraph for each student.
 Two student paragraphs typed up with all the grammatical and spelling mistakes intact.

For Activity #2:

• Handout (attached): Make one copy for each student. Essay Planning Assistant

TEACHER PREPARATION

Prior to class, type up two paragraphs from student writing in the last class that demonstrate the kinds of grammar, spelling, and other issues many students are having in the class. Also, prepare a demonstration for how to best use the *Essay Planning Assistant* for Activity #2.

ACTIVITY #1: Play the Editing Game – 60 minutes

First Typewritten Paragraph

- Pass out typewritten copies of two paragraphs of student writing that you have chosen before the class with all the grammar and spelling mistakes intact.
- Have students read the paragraph and underline the grammar and spelling issues they find. While students are doing that, copy the paragraph on the board with all the mistakes intact.
- Put students into three or four teams and have them compare the issues they have identified and talk about what the problems are for each of the underlined items.
- Choose a member from one team to come up to the board, underline a problem, and correct it.
- Ask the student who made the correction: What is the grammar or spelling rule that you are applying?
- Ask the class: Is the underline in the right place? Is this the right correction? If yes, give one point to the team that made the correction; give the team a second point if they correctly identified the grammar or spelling rule that they applied.
- Go around to all the teams and have a different student come to the board and repeat the process.
- Keep team scores on the board until all the issues in the paragraph have been corrected.

Second Paragraph

• Repeat process above for the second paragraph.

Break - 10 minutes.

ACTIVITY #2: Introduce the Essay Assignment - 50 minutes

- Tell students they will prepare for a 45-minute essay on outsourcing during the next class. This essay will include the information they have gathered so far. Students are to convince US corporate executives to either outsource their manufacturing production to China or outsource some of their services to India.
- Write the following questions on the board.
 - How will you grab the interest of US company executives?
 - What are the reasons you think US companies should do business in China or India?
 - Name your three top reasons and explain and/or give examples; use reason per paragraph.
 - How will US company executives become big winners by following your advice?

Consider the Reader

- Write a column heading: Who are the US corporate executives?
- Tell students to think of a US manufacturer or company executive and take notes on the board:
 - What kind of person do you imagine this executive to be?
 - What do they care about? What do thy not care about?
 - How do they communicate with others?
 - What will they find most persuasive?

Fill out the Essay Planning Assistant

- Distribute the Essay Planning Assistant.
- Have a student read the instructions out loud.
- Demonstrate how you want students to use the Essay Planning Assistant on the overhead.
- Allow students time to fill out their Essay Planning Assistant.

HOMEWORK

COMPLETE: Have students complete the Essay Planning Assistant so they can use it to write their essays in the next class.

ESSAY PLANNING ASSISTANT

Answer the essay questions in a way that you think will give you the best chance of convincing a US company executive to take your advice. Read the essay questions in the left-hand column; write your ideas on the topic; then review your readings and Treasure Hunt notes and select those notes that will help you make your case to the US executive; put these notes in the right-hand column along with the source where you got the information.

Essay Questions	Your Ideas About How to Answer This Question	Useful Notes and Their Sources From Your Readings and Writings
 How will you grab the interest of US company executives? Introduction. 		
 What is the first reason you think US companies should do business in your country (China or India? Body Paragraph. 		

3. What is the second	
reason you think US	
companies should do	
business in your	
country (China or	
India)?	
Body Paragraph.	
Joay Falagraphi	
4. What is the third	
reason you think US	
companies should de	
business in your	
country (China or	
India)?	
Body Paraaraph.	
5. How will US company	
executives become big	
winners by following	
your advice?	
,	
Conclusion	
conclosion.	

THEME: Prepare for and Write a 45-Minute Essay

Students do a talk through of their essay using their outlines and take 45 minutes to write their essay.

MATERIALS

Homework:

- Handout (attached): Make one copy for each student. Practicing with Sentence Structure
- Teacher Resource: Make one copy for yourself. Possible Answers (for the Practicing with Sentence Structure handout)

ACTIVITY #1: Talk Through Your Essay - 60 minutes

- Tell students they will talk through their essays with a partner before they start writing.
- Tell students to get out their Essay Planning Assistant outlines.
- Put students into pairs to listen and respond to each other's plans for the essay. After each section, the partner should ask questions that:
 - Improve clarity
 - Request more information
 - Ensure the author's information is in her/his own words
 - Ensure the author uses "According to" and quotes in a way that supports their facts and opinions.
- Have students switch roles so both students have a chance to talk through their essays.
- Have students make changes to their outline that will improve their essays.
- Tell students to focus on the US corporate executives as their audience and getting their attention. The goal is that they will listen to and act on students' advice.
- After students have talked through their essays, ask:
 - Did you get good ideas from your listeners?
 - How have your plans for your essay improved?

Break – 10 minutes.

ACTIVITY #2: Write Your Essay - 50 minutes

- Give students 45 minutes to write their essays.
- After they have completed their essays, ask:
 - What was your experience writing a timed essay?
 - Did you feel prepared?
 - How do you feel about this first draft?
 - What would you do differently for the next 45-minute essay?

HOMEWORK

COMPLETE: Have students complete the worksheet on transition words from the *Practicing with Sentence Structure* handout.

TEACHER PREPARATION: Before the next class, create five index cards, each one with the following sentences. These will be used in Week 4, Lesson 2, Activity #2 on semicolons.

- My alarm didn't sound this morning. I was late for work.
- Dominique likes to eat broccoli. She likes to eat cauliflower and green beans.
- I usually bring donuts on Monday. It's become a tradition that my coworkers look forward to every week.
- Tuition increases, say officials, are driven by the universities' costs; consequently, tuition income typically covers less than 50% of college budgets.
- Leon's apartment complex does not allow dogs over thirty pounds. He would have bought the gangly Great Dane puppy playing in the pet store window.

Practicing with Sentence Structure

<u>Part 1:</u> Read the sample sentences on the previous page to see how some connecting and transition words are used in context. Then, put the following words into four categories of meaning: a. cause/effect, b. time, c. contradiction, and d. addition.

however,	as soon as	even though	in addition,
therefore,	and	but	although
when	furthermore,	so	until
because	as a result,	moreover,	nevertheless,

since... plus,

Cause/Effect	Time	Contradiction	Addition

<u>Part II:</u> Which of the words above show one part in the sentence and which words show *at least two parts* in the sentence? Write (1) next to the words that show *one part* in the sentence and (2) next to the words that show *at least two parts* in the sentence.

Directions: Fill in the blanks with an appropriate transition/connecting word.

"If I die, you'd have nothing. I have nothing to leave you." Those are harsh words to hear when you're only 11, _____ I knew my mother was only telling me the truth. "Don't make the same mistake I did," she said. "Educate yourself. Don't grow up expecting that a man will always provide for you. Anything can happen."

She knew what she was talking about ______ she had learned that lesson the hard way. ______ she only had an eighth-grade education, she had few job opportunities available to her. She worked as a nanny. ______ my father died suddenly, we were forced to care for ourselves. My mother struggled to make ends meet. We had to give up our car, _____ we nearly lost our house. _____, I learned how vulnerable an uneducated woman is.

I think that was my first lesson in preparing myself for adulthood. _____ I was young, I decided that when I grew up I would be a financial equal in a marriage. I didn't want to be unable to support myself if my man was no longer around, _____ I set about the task of becoming self-sufficient.

______ it was time for college, Franklin & Marshall College offered me a scholarship. F&M is a very good school with a small minority enrollment. When I attended, there were 1,500 students, of whom about 50 were African American. I had gone to a Catholic high school with white students. ______, being with white people was not that big a deal for me. For me, the adjustment was more about class than about race. It wasn't so obvious who had money and who didn't in high school ______ in high school we all wore uniforms. _____, at F&M I really saw the difference.

_____ F&M didn't have a large enrollment of Black students, the Black Student Union made special efforts to help us get to know each other. One student noticed me sitting on the sidelines and asked me to the dance. That student was Rod Sutton, the man I would later marry. As Rod and I exchanged stories, I came to respect him. We began to date, and my good opinion of Rod kept growing. He is hardworking, considerate, respectful, and a good communicator. ______, I see so many of the girls I grew up with settle for less than they deserve. Ladies, love yourself enough to, first, be the best person that you can be. ______ you do, you won't be able to love yourself enough to demand of your partner all that is rightfully yours.

Possible answers.

"If I die, you'd have nothing. I have nothing to leave you." Those are harsh words to hear when you're only 11, **<u>but</u>** I knew my mother was only telling me the truth. "Don't make the same mistake I did," she said. "Educate yourself. Don't grow up expecting that a man will always provide for you. Anything can happen."

She knew what she was talking about <u>because</u> she had learned that lesson the hard way. <u>Since</u> she only had an eighth-grade education, she had few job opportunities available to her. She worked as a nanny. <u>When</u> my father died suddenly, we were forced to care for ourselves. My mother struggled to make ends meet. We had to give up our car,<u>and</u> we nearly lost our house. <u>As</u> <u>a result</u>, I learned how vulnerable an uneducated woman is.

I think that was my first lesson in preparing myself for adulthood. <u>Since</u> I was young, I decided that when I grew up I would be a financial equal in a marriage. I didn't want to be unable to support myself if my man was no longer around, <u>so</u> I set about the task of becoming self-sufficient.

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THEME: Peer Review and Grammar Activities

Students will do a peer review of their 45-minute essays and practice using the two rules of semicolons.

MATERIALS

For Activity #1:

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

For Activity #2:

- Teacher Resource: Five index cards with one of the following sentences written on each:
 - My alarm didn't sound this morning. I was late for work.
 - Dominique likes to eat broccoli. She likes to eat cauliflower and green beans.
 - I usually bring donuts on Monday. It's become a tradition that my coworkers look forward to every week.
 - Tuition increases, say officials, are driven by the universities' costs; consequently, tuition income typically covers less than 50% of college budgets.
 - Leon's apartment complex does not allow dogs over thirty pounds. He would have bought the gangly Great Dane puppy playing in the pet store window.

TEACHER PREPARATION

Before class, write out the index cards for Activity #2 on semicolons.

OACTIVITY #1: Conduct a Peer Review – 60 minutes

- Tell students they will provide constructive feedback on each other's essays. They should pretend they are the US corporate executives who are reading the essay; how convincing is the writer's knowledge and recommendations?
- Put students into groups of three and have students take out their written essays.
 - Pass out two copies of the Reader Comment Page to each student. Explain that they are going to:
 - \circ Read essays written by the other two people in their group.
 - Fill out one Reader Comment Page for each essay 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 encouraging and helpful. Specific comments on their classmates' work will help them when they do a re-write.
- Have students pass their written work to the left.
- After students have evaluated the first student's essay, they should pass it to their left and evaluate a second essay.
- After students have completed two Reader Comment Pages, 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 give your ideas for how to make your paragraphs better?
 What are they?
- Did your evaluators confuse you? If so, ask for clarification when you are back in your group.
- Put students back in their groups to talk through differences and to get clarification.
- Lastly, ask:
 - Are there US corporate executives that will be persuaded to take action?
 - \circ Did you read clear, persuasive reasons for outsourcing overseas?
 - What ideas did your readers give you for improving your own essay?

Break – 10 minutes.

ACTIVITY #2: Grammar: Semicolon Rules - 50 minutes

9 Activity for Semicolon Rule #1: Use it to Join Two Similar Sentences

- Ask students:
 - What is a semicolon?
 - What does it look like?
 - When do you use semicolons?
 - Write students' guesses/predictions on the board.
- Tell students there are two rules for semicolons that they are going to learn in this activity.
- Write the following sentences on the board:
 - LeBron James is a great basketball player. Perhaps he is even greater than Michael Jordon.
- Tell students that when there are two sentences that are closely related, and they want to join them together, they can use a semicolon. Semicolons mean:
 - I know a period goes here (point to the "period" in the semicolon), but these two sentences are so related that I want you to read it as if it were only a comma (point to the "comma" in the semicolon).
 - Put a semicolon between the two sentences on the board:
 - Put a point on the board and say, "I know a period goes here."
 - Then, put the comma below it and say, "but I want you to read it like it's a comma."
- Put students into pairs and distribute the index cards among them. Then, tell the pairs to:
 - Re-write the two closely related sentences using a semicolon.
- Have them pass their index cards to the right so the next pair can correctly punctuate the new sentence and write it in their notebooks.
- Then, have the pairs read their original sentence aloud, shouting out "semicolon" where they put it in.
- Lastly, ask:
 - When do you use a semicolon?
 - (Answer: When you join two closely related sentences.)
 - What is a semicolon telling the reader?
 - (Answer: "I know a period goes here, but these two sentences are so related that I want you to read it as if it were only a comma.")

Review Transition Words Homework

- Tell students this comma rule is for when they want to combine two sentences into one.
- Ask students to get out their Practicing with Sentence Structure homework.
- Put students into pairs to verify or change their answers based on discussion.

• Go over each of the questions, soliciting student answers, and then provide the right answers if students are struggling. You can use the answer sheet to be sure of how the final answer should look.

Activity for Semicolon Rule #2: Use it to Join Two Different Sentences Together with a Transition Word

- Tell students that some words can join two full sentences together, like the words "however", "therefore", and "nevertheless" that we looked at before. This time a semicolon is part of the act!
- Write the following sentence on the board:
 - Stephen Curry is an outstanding shooter and teammate. He is the league's leading three-point shooter.
- Ask:
 - Are both of these statements sentences? (Answer: Yes.)
 - How do you know? (Answer: They both have a subject and a verb.)
 - What is the subject of the first sentence? (Answer: Stephen Curry.)
 - What is the subject of the second sentence? (Answer: He.)
 - What word would you use to connect the two sentences? (Answer: Moreover, furthermore).
- Insert the connecting word between the two sentences, insert a semicolon before it, and insert a comma
 after the word, while saying:
 - For the semicolon: "I know a period goes here, but these two sentences are so related that I want you to read it as if it were only a comma."
 - For the comma: "This comma will tell the reader that this word is a phrase that is not part of the second sentence."
- Put students in pairs and deal out the index cards with the sentences on them. Pairs are to:
 - Discuss the word that will connect the two sentences.
 - Write the new sentence down in their notebooks with the correct punctuation.
- Next, ask the pairs to pass their index card to the right and repeat the pair work above.
- Repeat this process until all the students have written down the five new sentences in their notebooks.
- Go round-robin to have each pair read their original sentence. Ask students to:
 - Say "semicolon" where the semicolon goes.
 - Say the linking word very loudly.
 - \circ Say "comma" very loudly where the comma goes.
- Ask: What is the semicolon rule for joining two sentences together?
 - (Answer: Put a semicolon after the first sentence, insert the joining word, and insert a comma after the joining word.)

HOMEWORK

COMPLETE: Have students revise their essays.

RESEARCH AND DEFINE: Have students look up and write down definitions of the following words before the next class in their own words:

- Megalopolis
- Sweatshop
- Callous
- Manipulative
- Exploitation
- Normalized
- Turnover

TEACHER PREPARATION NOTE: Prior to the next class, choose a date that the revised essays should be due and collect finished essays on that date. When essays are collected, you should evaluate them using a copy of the *Reader Comment Page*. You will need to read the essays and the student comments on those essays, to see how perceptive the evaluators 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. 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.
READER COMMENT PAGE

WRITER_____ READER _____

1. What is clear and interesting to you about this piece of writing? Help the writer by being as specific as you can.

2. As the reader, what parts of the written piece would you like to be clearer or easier to understand? What would you like to hear more about?

3. Do you have any additional, comments, or suggestions to help the writer with revisions?

THEME: The Impact of Offshoring on Overseas Workers: The Story of Foxconn

Students read and analyze an article about Apple's Foxconn factory in China and complete a Treasure Hunt on the subject.

MATERIALS

For Activity #1:

- Handout (attached): Make one copy for each student. Life and Death in Apple's Forbidden City
- Handout (attached): Make one copy for each student. Foxconn Treasure Hunt

Homework:

• Handout (attached to Week 1, Lesson 2): Make one copy for each student. Summary Practice Sheet

ACTIVITY #1: Read and Analyze Article About Foxconn – 60 minutes

- Tell students that now that they have identified important reasons why US manufacturers and companies are attracted to offshoring and outsourcing, they will focus on negative aspects of offshoring manufacturing. This will give them a fuller view of the costs of the practice.
 - To start, students will look at how overseas workers are affected by offshoring; later, they will look at how US workers are affected.

Define Vocabulary Words Homework

- Tell students that before they look at Apple's company, Foxconn in China, they will define words to help with their comprehension.
- Write the following words on the board:
 - Megalopolis
 - Sweatshop
 - \circ Callous
 - Manipulative
 - o Exploitation
 - o Normalized
 - Turnover
- Put students in pairs or small groups and assign different pairs one or more words. Each pair or group is to:
 - \circ Talk through their definitions of these words in their own words.
 - Put each in a sentence that clearly demonstrates the meaning of the word.
- Come together as a class to define these words together. Tell students to take notes on the definitions, then use the following process for each word:
 - Ask a pair for a definition of the first word, in their own words.
 - Take notes on the definition on the board.
 - \circ $\;$ Ask others if they want to add or change the definition in some way.

Manufacturing Bridge Semester 2 Lesson Plans

- Ask each pair for their sentences.
 - Ask the class if this sentence makes the definition of the word clear.
- Repeat this process until all words have clear definitions on the board.

Read, Annotate, and Discuss the Foxconn Article

*

Tell students they will read and annotate the article about Foxconn, Apple's company in China where they make IPhones.

- Pass out Life and Death in Apple's Forbidden City. Have students read and annotate.
- While students are reading, write the following instructions on the board. Go over these questions with students once they have finished reading:
 - Look at what you underlined. Of those things, what were the most important points brought up in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with? Disagreed with?
 - \circ Put students in pairs to talk about their answers to the questions on the board.
- Come together as a class and ask the questions on the board, allowing students to present their different responses to the class.

Request Activity

- Tell students they will now do the Request activity.
 - Ask students to go over their annotations and 3-4 questions they know the answers to. They should:
 - Review their annotations.
 - Craft questions for what they think are important facts needed to understand the situation at Foxconn.
- Come together as a class and ask: Who wants to be the first lead? Then tell students to follow this pattern:
 - \circ The lead asks a question he/she knows the answer to.
 - 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 starts this process over again.
 - If the answer is incorrect, the lead chooses a new student to answer the question until someone gets the answer.

Break – 10 minutes.

•

ACTIVITY #2: Complete Treasure Hunt and Have Class Discussion – 50 minutes

Complete Treasure Hunt Questions and Have Class Discussion

- Pass out the Foxconn Treasure Hunt.
- Have students answer the Treasure Hunt questions.
 - Use some of the following questions to extend students' thinking:
 - Based on this reading, what Industrial Revolution do you think Foxconn was or is experiencing: 1st, 2nd, or 3rd? What is the evidence?
 - What do you think are some of the reasons Apple allows these working conditions in its factories?

- Do you think American workers are treated differently than Chinese workers?
 - In what ways?
 - Why?

HOMEWORK

WRITE: Tell students to summarize the conditions for Foxconn workers using "According to" and quotes as needed. Have them state what they think needs to be done to improve conditions for workers. Students' summaries should be at least two paragraphs long.

Pass out Summary Practice Sheets to help students plan their summaries.

Life and death in Apple's forbidden city

Adapted and paraphrased from source: https://www.theguardian.com/technology/2017/jun/18/foxconn-life-death-forbidden-citylonghua-suicide-apple-iphone-brian-merchant-one-device-extract

Original author: Brian Merchant



An assembly bench in Foxconn's Longhua complex in Shenzhen, China, where iPhones are manufactured. Photograph: Tony Law/Redux/eyevine

The sprawling factory compound, all grey dormitories and weather-beaten warehouses, blends seamlessly into the outskirts of the Shenzhen megalopolis. Foxconn's enormous Longhua plant is a major manufacturer of Apple products. It might be the best-known factory in the world; it might also be among the most secretive and sealed-off. There are security guards at each of the entry points. Employees can't get in without swiping an ID card; drivers entering with delivery trucks are subject to fingerprint scans. A Reuters journalist was once dragged out of a car and beaten for taking photos from outside the factory walls. The warning signs outside – "This factory area is legally established with state approval. Unauthorized trespassing is prohibited. Offenders will be sent to police for prosecution!" – are more aggressive than those outside many Chinese military compounds.

But it turns out that there's a secret way into the heart of the infamous operation: use the bathroom. I couldn't believe it. Thanks to a simple twist of fate and some clever moves by my interpreter, I'd found myself deep inside so-called Foxconn City.

It's printed on the back of every iPhone: "Designed by Apple in California Assembled in China". US law dictates that products manufactured in China must be labeled as such and so

the phrase means that the cutting edge is conceived and designed in Silicon Valley, but it is assembled by hand in China.

The vast majority of plants that produce the iPhone's component parts and carry out the device's final assembly are based here, in the People's Republic, where low labor costs and a massive, highly skilled workforce have made the nation the ideal place to manufacture iPhones (and just about every other gadget). The country's vast, unprecedented production capabilities – the US Bureau of Labor Statistics estimated that as of 2009 there were 99 million factory workers in China – have helped the nation become the world's second largest economy. And since the first iPhone shipped, the company doing the lion's share of the manufacturing is the Taiwanese Hon Hai Precision Industry Co, Ltd, better known by its trade name, Foxconn.

Foxconn is the single largest employer in mainland China; there are 1.3 million people on its payroll. Worldwide, among corporations, only Walmart and McDonald's employ more. As many people work for Foxconn as live in Estonia.



An employee directs jobseekers to queue up at the Foxconn recruitment centre in Shenzhen. Photograph: David Johnson/Reuters

Today, the iPhone is made at a number of different factories around China, but for years, as it became the bestselling product in the world, it was largely assembled at Foxconn's 1.4 square-mile flagship plant, just outside Shenzhen. The sprawling factory was once home to an estimated 450,000 workers. Today, that number is believed to be smaller, but it remains one of the biggest such operations in the world. If you know of Foxconn, there's a good chance it's because you've heard of the suicides. In 2010, Longhua assembly-line workers began killing themselves. Worker after worker threw themselves off the towering dorm buildings, sometimes in broad daylight, in tragic displays of desperation – and in protest at the work conditions inside. There were 18 reported suicide attempts that year alone and 14 confirmed deaths. Twenty more workers were talked down by Foxconn officials.

The epidemic caused a media sensation – suicides and sweatshop conditions in the House of iPhone. Suicide notes and survivors told of immense stress, long workdays and harsh managers who were prone to humiliate workers for mistakes, of unfair fines and unkept promises of benefits.

The corporate response spurred further unease: Foxconn CEO, Terry Gou, had large nets installed outside many of the buildings to catch falling bodies. The company hired counsellors and workers were made to sign pledges stating they would not attempt to kill themselves.

Steve Jobs, for his part, declared: "We're all over that" when asked about the suicide deaths and he pointed out that the rate of suicides at Foxconn was within the national average. Critics pounced on the comment as callous, though he wasn't technically wrong. Foxconn Longhua was so massive that it could be its own nation-state, and the suicide rate was comparable to its host country's. The difference is that Foxconn City is a nation-state governed entirely by a corporation and one that happened to be producing one of the most profitable products on the planet.

If the boss finds any problems, they don't scold you then. They scold you later, in front of everyone, at a meeting

A cab driver lets us out in front of the factory; boxy blue letters spell out Foxconn next to the entrance. The security guards eye us, half bored, half suspicious. My fixer, a journalist from Shanghai whom I'll call Wang Yang, and I decide to walk the premises first and talk to workers, to see if there might be a way to get inside.

The first people we stop turn out to be a pair of former Foxconn workers.

"It's not a good place for human beings," says one of the young men, who goes by the name Xu. He'd worked in Longhua for about a year, until a couple of months ago, and he says the conditions inside are as bad as ever. "There is no improvement since the media coverage," Xu says. The work is very high pressure and he and his colleagues regularly logged 12-hour shifts. Management is both aggressive and manipulative, publicly scolding workers for being too slow and making them promises they don't keep, he says. His friend, who worked at the factory for two years and chooses to stay anonymous, says he was promised double pay for overtime hours but got only regular pay. They paint a bleak picture of a highpressure working environment where exploitation is routine and where depression and suicide have become normalized.

"It wouldn't be Foxconn without people dying," Xu says. "Every year people kill themselves. They take it as a normal thing."



A Foxconn employee in a dormitory at Longhua. The rooms are currently said to sleep eight. Photograph: Wang Yishu / Imaginechina/Camera Press

The vision of life inside an iPhone factory that emerged was varied. Some found the work tolerable; others had strong criticisms; some had experienced the despair Foxconn was known for; still others had taken a job just to try to find a girlfriend. Most knew of the reports of poor conditions before joining, but they either needed the work or it didn't bother them. Almost everywhere, people said the workforce was young and turnover was high. "Most employees last only a year," was a common refrain. Perhaps that's because the pace of work is widely agreed to be relentless, and the management culture is often described as cruel.

Since the iPhone is such a compact, complex machine, putting one together correctly requires sprawling assembly lines of hundreds of people who build, inspect, test and package each device. One worker said 1,700 iPhones passed through her hands every day; she was in charge of wiping a special polish on the display. That works out at about three screens a minute for 12 hours a day.

More complicated work, like fastening chip boards and assembling back covers, was slower; these workers have a minute apiece for each iPhone. That's still 600 to 700 iPhones a day. Failing to meet a quota or making a mistake can draw public condemnation from superiors. Workers are often expected to stay silent and may draw rebukes from their bosses for asking to use the restroom.

Xu and his friend were both walk-on recruits, though not necessarily willing ones. "They call Foxconn a fox trap," he says. "Because it tricks a lot of people." He says Foxconn promised them free housing but then forced them to pay extremely high bills for electricity and water. The current dorms sleep eight to a room and he says they used to be 12 to a room. And Foxconn would social responsibility and be late or fail to pay bonuses. And many workers sign contracts that subtract a hefty penalty from their pay if they quit before a three-month introductory period.

The body-catching nets are still there. They look a bit like tarps that have blown off the things they're meant to cover

This culture of high-stress work, anxiety and humiliation contributes to widespread depression. Xu says there was another suicide a few months ago. He saw it himself. The man was a student who worked on the iPhone assembly line. "Somebody I knew, somebody I saw around the cafeteria," he says. After being publicly scolded by a manager, he got into a quarrel. Company officials called the police, though the worker hadn't been violent, just angry.

"He took it very personally," Xu says, "and he couldn't get through it." Three days later, he jumped out of a ninth-story window.

So why didn't the incident get any media coverage? I ask. Xu and his friend look at each other and shrug. "Here someone dies, one day later the whole thing doesn't exist," his friend says. "You forget about it."



Employees have lunch in a vast refectory at the Foxconn Longhua plant. Photograph: Wang Yishu/Imaginechina/Camera Press

FOXCONN TREASURE HUNT

Vocabulary: Write down the definitions of these words after the class on discussion on them.

1. Megalopolis	
2. Sweatshop	
3. Callous	
4. Manipulative	
5. Exploitation	
6. Normalized	
7. Turnover	

Reading Questions: Life and Death in Apple's Forbidden City

QUESTIONS	ANSWERS
1. What does Foxconn look like?	
2. What are some of Foxconn's security measures?	
3. How many factory workers are there in China?	

4.	How many are on Foxconn's payroll?	
5.	What is the history of suicides at Foxconn?	
6.	Describe the working conditions at Foxconn.	
7.	Describe the living conditions at Foxconn.	
8.	Describe Foxconn's attitude toward their employees.	

Week 5, Lesson 2 Manufacturing Bridge Semester 2: Adult Secondary Education (ASE)

THEME: The Impact of Offshoring on Workers Overseas: The Story of Nike

Class to be held in the Technology Lab



Students peer review their homework and read an article about Nike factories in Indonesia. Students will then identify research questions they are interested in regarding Foxconn, Nike's overseas factories, or international factory workers in general. Students will then conduct this research in class.

MATERIALS

For Activity #1:

- Handout (attached): Make two copies for each student. Reader Comment Page
- Handout (attached): Make one copy for each student. Nike Faces New Worker Abuse Claims in Indonesia
- Handout (attached): Make one copy for each student. Nike Treasure Hunt

For Activity #2:

• Handout (attached): Make one copy for each student. Research on Foxconn or Nike Overseas

Homework:

 Handout (attached to Week 1, Lesson 2): Make one copy for each student. Summary Practice Sheet

ACTIVITY #1: Read, Annotate, and Discuss an Article on Nike Overseas Factories – 50 minutes

• Tell students they will peer review their summary and response homework, read about Nike factories in Indonesia, and conduct online research to learn more about Foxconn or Nike.

O Peer Review Summary and Response Homework Writing

- Tell students they Swill provide constructive feedback on each other's homework.
- Ask students to remember the audience they are writing to. Take notes on student answers on the board and make sure their answers include that the audience:
 - Does not have background information about Foxconn.
 - Needs explanations and examples that are clear and direct.
 - Needs them to be clear when they use information from other sources, i.e. when they use "According to" or quotes to cite their sources.
- Pass out one Reader Comment Page to each student.

- Put students in pairs and have them exchange summaries and fill out a Reader Comment Page about their partner's summary.
 - Students should give back the summary and the Reader Comment Page to the author to read and ask questions about, if needed.
- Next, ask for volunteers to read summaries and responses aloud as examples.
 - After each reading of a summary, ask the class:
 - Is this summary direct and clear?
 - What do you need clarification or more information about?
 - Does this summary use "According to" and quotes effectively?
 - \circ What do you think of the ideas presented in the response?

🔨 Read, Annotate, and Discuss the Nike Article

- Pass out Nike Faces New Worker Abuse Claims in Indonesia.
- Have students read and annotate.
- While students are reading, write the following instructions on the board. Go over these questions with students once they have finished reading:
 - Look at what you underlined. Of those things, what were the most important points brought up in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with? Disagreed with?
 - Put students in pairs to talk about their answers to the questions on the board.
- Come together as a class and ask the questions on the board, allowing pairs to present their different responses to the class.

Complete the Nike Treasure Hunt

- Pass out the Nike Treasure Hunt.
- Put students into pairs and ask them to discuss their answers and, then, write them down.
- Discuss the questions as a class.
 - Take notes on their answers on the board, as needed.
- Lastly, ask:
 - Why do you think workers in other countries have so few rights?
 - Take notes on these student answers as well.

Break – 10 minutes.

ACTIVITY #2: Conduct Research on Foxconn or Nike – 60 minutes

Identify Research Questions

- Tell students they will conduct Internet research Foxconn, Nike or working conditions for overseas factory workers in general.
- Create three columns on the board with the following headings: Foxconn, Nike, Overseas Factory Workers.
- Put students in pairs to come up with a list of questions for any of these categories.
- Come together as a class, ask the following questions, and note student questions on the board in the appropriate column:
 - What are some questions you have about each of these?

- Foxconn?
- Nike overseas?
- Overseas factory workers?
- Ask students to choose two questions they would like to look into further.
- Go round robin to have each student declare their research questions.

Conduct Research

- Pass out the On-line Research Guide.
- Tell students to write their two questions, one on each page in the "Question" sections.
- Explain that students need to find three or more sources to answer each question, write down their source, and take notes in their own words, unless using a quote.
 - They can look for articles and videos.
 - Students should choose resources they want to read or view. Sometimes things have the right titles but may be difficult to understand. Don't choose those as your sources!
- Demonstrate how to use effective search phrases by:
 - Choosing a question on the board.
 - Asking: What words, phrases, or questions would you put into the "Search" line.
 List these on the board as a good example
 - Tell students you will help them with good search language should they get stuck.
- Allow students to conduct research.

Share Findings

- Before the end of class, ask:
 - \circ Who found good resources to help answer their research questions?
 - What new and surprising information did you learn?
- Have students volunteer to share new facts.

HOMEWORK

WRITE: Have students write a summary of their findings for one of their research questions that uses "According to" and quotes as needed.

Pass out Summary Practice Sheets to help students plan their summaries.

READER COMMENT PAGE

WRITER_____ READER _____

1. What is clear and interesting to you about this piece of writing? Help the writer by being as specific as you can.

2. As the reader, what would you like to be clearer or easier to understand? What would you like to hear more about?

3. Do you have any additional, comments, or suggestions?

Nike Faces New Worker Abuse Claims In Indonesia

Adapted and paraphrased from source: <u>https://www.huffingtonpost.com/2011/07/13/nike-faces-new-worker-abuse-indonesia n 896816.html</u>

SUKABUMI, Indonesia (AP) — Workers making Converse sneakers in Indonesia say supervisors throw shoes at them, slap them in the face and call them dogs and pigs. Nike, the brand's owner, admits that such abuse has occurred among the contractors that make its hip high-tops but says there was little it could do to stop it.

Dozens of workers interviewed by The Associated Press and a document released by Nike show that the footwear and athletic apparel giant has far to go to meet the standards it set for itself a decade ago to end its reliance on sweatshop labor.

That does not appear to explain abuses that workers claim to have happened at the Pou Chen Group factory in Sukabumi, some 100 kilometers (60 miles) from Jakarta. The factory didn't start making Converse products until four years after Nike bought Converse. One worker there said she was kicked by a supervisor last year after making a mistake while cutting rubber for soles.

"We're powerless," said the woman, who like several others interviewed spoke on condition of anonymity out of fear of reprisals. "Our only choice is to stay and suffer or speak out and be fired."

The 10,000 mostly female workers at the Taiwanese-operated Pou Chen plant make around 50 cents an hour. That's enough, for food and bunkhouse-type lodging, but little else. Some workers interviewed by the AP in March and April described being hit or scratched in the arm - one man until he bled. Others said they were fired after filing complaints.

"They throw shoes and other things at us" said a 23-year-old woman in the embroidery division. "They growl and slap us when they get angry.

"It's part of our daily bread."

Mira Agustina, 30, said she was fired in 2009 for taking sick leave, even though she produced a doctor's note.

"It was a horrible job," she said. "Our bosses pointed their feet at us, calling us names like dog, pig or monkey." All are major insults to Muslims. Indonesia is the world's most populous Muslim nation.

At the PT Amara Footwear factory located just outside Jakarta, where another Taiwanese contractor makes Converse shoes, a supervisor ordered six female workers to stand in the

blazing sun after they failed to meet their target of completing 60 dozen pairs of shoes on time.

"They were crying and allowed to continue their job only after two hours under the sun," said Ujang Suhendi, 47, a worker at a warehouse in the factory. The women's supervisor received a warning letter for the May incident after complaints from unionized workers.

The company's own inquiries also found workers at the two factories were subjected to serious physical and verbal abuse, including the punishment of forcing workers to stand in the sun, said Hannah Jones, a Nike executive who oversees the company's efforts to improve working conditions.

"We do see other issues of that similar nature coming up across the supply chain but not on a frequent level," she said. "We see issues of working conditions of a less extreme nature across the board."

Nike, which came under heavy criticism a decade ago for its use of foreign sweatshops and child labor, has taken steps since then to improve conditions at its 1,000 overseas factories. But the progress it has made at factories producing gear with its premier "swoosh" logo is not fully reflected in those making Converse products.

An internal report Nike released to the AP after it inquired about the abuse show that nearly two-thirds of 168 factories making Converse products worldwide fail to meet Nike's own standards for contract manufacturers.

Twelve are in the most serious category, indicating problems that could range from illegally long work hours to denying access to Nike inspectors. A Nike spokeswoman said the company was not aware of physical abuse occurring at those factories. Another 97 are in a category defined as making no progress in improving problems ranging from isolated verbal harassment to paying less than minimum wage. A further six factories had not been audited by Nike.

Nike blames problems on pre-existing licenses to produce Converse goods that it says prevent the parent company from inspecting factories or introducing its own code of conduct.

It says the situation is further complicated because the license holders themselves usually farm out the production work to a subcontractor. Most of the agreements have come up for renewal in the past five years. But it is only the past two years that it has made a concerted effort to incorporate Converse factories into the monitoring program that applies to Nike factories.

"We have been working every time we can to renew those agreements or change those agreements or to cease those agreements and to ensure that when we do new agreements we get more ability to influence the licensee and their subcontractors much more directly," Jones said.

Some corporate experts question whether the company is doing all it can.

"I simply find it impossible that a company of the size and market power of Nike is impotent in persuading a local factory in Indonesia or anywhere else in meeting its code of conduct," said Prakash Sethi, a corporate strategy professor at Baruch College at the City University of New York.

Critics of outsourcing manufacturing to the lowest-cost countries say it keeps prices down but allows apparel, electronics and toy companies to reduce their accountability for the conditions in such factories. Even as concern about sweatshop labor has grown, some contractors have simply moved operations to more remote areas, farther from the prying eyes of international and local watchdogs.

Indonesia is Nike's third-largest manufacturing base, after China and Vietnam, with 140,000 workers at 14 contract factories. Of those, 17,000 produce its Converse line at four factories.

Pou Chen, the largest of the four Converse factories, is located in a hilly city where the minimum wage is well below the national average. Sukabumi can only be reached by car - a five-hour journey across bumpy, winding roads. The plant started making Converse products in 2007.

The Taiwanese contractor said it fired one supervisor after being told workers had spoken to The AP earlier this year.

Others involved in mistreatment, however, have been allowed to keep their jobs, according to Pou Chen.

Nike says the factory is developing programs to teach managers cultural sensitivity and leadership skills.

It says it also is closely monitoring the PT Amara factory.

After years of criticism over its labor practices at factories abroad, Nike in 2005 became the first major apparel company to disclose the names and locations of hundreds of plants that produce its sneakers, clothes and other products.

It admitted finding "abusive treatment" - either physical or verbal - in many of the Nike plants. The complaints ranged from workweeks that exceeded 60 hours to being forbidden to go to the bathroom.

The Beaverton, Oregon-based company has since invested heavily in training managers and more closely monitoring their activities.

Nike has not published the locations of all factories making products for affiliate companies, which includes Converse, but plans to by the end of the year

NIKE TREASURE HUNT

Reading: Nike Faces New Worker Abuse Claims In Indonesia

 List the abuses that Nike overseas workers state are happening to them. 		
2. List the problems that Nike has monitoring its overseas production.		
3. What are the similarities between the problems workers have at Nike in Indonesia and Foxconn?		
4. What are the differences?	Nike	Foxconn

RESEARCH ON FOXCONN OR NIKE OVERSEAS

Go online and find sources that can answer the questions:

YOUR 1st QUESTION	SOURCES	NOTES: FACTS AND QUOTES

YOUR 2 nd QUESTION	SOURCES	NOTES: FACTS AND QUOTES

Week 6, Lesson 1 Manufacturing Bridge Semester 2: Adult Secondary Education (ASE)

THEME: The Impact of Offshoring on US Workers

Students present their research findings; they will read and analyze a New York Times article that features an example of the impact of offshoring in the US. Students will also look at a graph that shows the rise in wages and productivity over the past several decades.

MATERIALS

For Activity #1:

- Handout (attached): Make two copies for each student. Becoming a Steelworker Liberated Her. Then Her Job Moved to Mexico
- Handout (attached): Make two copies for each student. Request Question Organizer on Shannon Mulcahy's Story

For Activity #2:

• Handout (attached): Make one copy for each student. Percent Growth in Productivity and Hourly Compensation (graphic)

<u>Homework</u>:

 Podcast: Listen to "The Daily": Disappearing Factory Jobs (running time: 36:51) https://www.nytimes.com/2017/10/18/podcasts/the-daily/factory-jobs.html

ACTIVITY #1: Read an Article About Offshoring and US Workers - 70 minutes

• Tell students they will share their research findings; read a story about a steelworker whose job was offshored to Mexico and the impact it had on her life; and look at a graph about US worker productivity and wages and see if they can understand the realities of the US situation regarding offshoring.

Present Findings on Research Questions

- Put three columns on the board with the following headings: Foxconn, Nike, and Overseas Factory Workers
- Go round robin and have students declare which category their research question addressed.
 - Put students' names in the appropriate category.
 - Put students who worked on the same topic in pairs or small groups.
- Ask the small groups to:
 - \circ Identify their research questions and verbally relate what they found.
 - Read each other's summaries.
 - \circ Decide on the most interesting findings they would like to report to the group.
 - Prepare a brief report to the class on these findings and why they think these findings are important.
- Ask the pairs or small group to report their findings and thoughts about why these findings are important.

- Lastly, ask:
 - Do these findings make you think of other questions you have about these topics?
 - What are additional questions you have about the topics the class has been exploring?

Predict the Impact of Offshoring on US Workers

- Before reading, have students predict:
 - Based on what you already know about offshoring, what do think are the impacts of offshoring manufacturing on US workers?
 - Do you think things have gotten better or worse for workers? Why?
 - How do you think workers' lives have changed?
 - List predictions on the board.

*

Read, Annotate, and Discuss

- Pass out Becoming a Steelworker Liberated Her. Then Her Job Moved to Mexico.
- Tell students that this was a feature story in the New York Times in 2017. The purpose of reading the story is to learn about someone's life in depth to understand how large social changes are impacting people's personal lives. This reading is only a portion of a longer story that was published over many days.
- Have students read and annotate.
- While students are reading, write the following instructions on the board. Go over these questions with students once they have finished reading:
 - Look at what you underlined. Of those things, what were the most important points brought up in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - \circ Were there aspects of this article you agreed with? Disagreed with?
- Put students in pairs to talk about their answers to the questions on the board.
- Come together as a class and ask the questions on the board, allowing pairs to present their different responses to the class.

Break - 10 minutes.

ACTIVITY #2: Play Request and Read a Graphic on Productivity and Wages – 40 minutes

Plan for and Conduct Request Activity

- Tell students they will do the Request activity. The details of this activity will help their understanding of how the US is changing, along with other nations, as a result of offshoring and outsourcing.
- Pass out Request Question Organizer on Shannon Mulcahy's Story.
- Have a student read the instructions. Make sure students understand the process for preparing for Request.
- Put students into pairs and have them write 3 4 questions they know the answers to; they should write these for different topics listed in the Question Organizer.
- Come together as a class and ask: Who wants to be the first lead? Then tell students to follow this pattern:
 - \circ The lead asks a question he/she knows the answer to.
 - Those who know the answer raise their hands.

Manufacturing Bridge Semester 2 Lesson Plans

- The lead chooses someone to answer the question.
 - If the answer is correct, that person becomes the new lead and starts this process over again.
- If the answer is incorrect, the lead chooses a new student to answer the question until someone gets the answer.
- Lastly, ask:
 - What insights were learned about how US workers are being affected by offshoring?
 - Do we want to alter our predictions about this question?
 - Make adjustments to students' predictions, as needed.

Read a Graph

- Tell students they will look at a graph that may be surprising, given the many companies offshoring manufacturing in recent decades.
- Pass out and project Percent Growth in Productivity and Hourly Compensation.
- Ask:
 - What does the line along the bottom measure?
 - What years are represented here?
 - What does the vertical line on the left-hand side measure?
 - What would "percent increase" mean when associated with wages?
 - What are some examples?
 - What would "percent increase" mean when associated with productivity?
- Put students in pairs and assign half the pairs the gold productivity line and half the green wages line. Ask pairs to:
 - Come up with 3-4 facts that they can read from the line.
 - \circ $\;$ Come up with a general statement about what the line means.
 - Come together as a class, and, for each line, ask and list student responses on the board:
 - What are some facts you came up with?
 - What are some general statements you came up with about what the line is telling us?

Try to Explain a Graph

- Lastly, ask:
 - How do you understand the two lines together?
 - What changes in manufacturing and other services do you think are making people more productive? (Answer: Technology, among others.)
 - o In what decade, approximately, does offshoring start? (Answer: 1980s)
 - How do you think offshoring is impacting wages in the US even though workers are so much more productive?

HOMEWORK

LISTEN TO THE PODCAST: Have students listen to "*The Daily*": *Disappearing Factory Jobs* podcast on Shannon Mulcahy for more information about her life and the how she thinks about the changes caused by offshoring. Tell them to take notes on the important new information they learn from listing to the podcast.

DEFINE: Have students look up and define the word "tariff" and the North American Free Trade Agreement. Have them write down their sources and note important facts about NAFTA.

Becoming a Steelworker Liberated Her. Then Her Job Moved to Mexico.

Adapted and paraphrased from source: <u>https://www.nytimes.com/2017/10/14/us/union-jobs-mexico-rexnord.html</u>

Original author: Farah Stockman Photographs by: Alyssa Schukar



Shannon Mulcahy outside her home in Whitestown, Ind. Photographs by Alyssa Schukar for The New York Times

INDIANAPOLIS — The man from Mexico followed a manager through the factory floor, past whirring exhaust fans, beeping forklifts, and drilling machines that whined against steel. Workers in safety glasses looked up and stared. Others looked away. Shannon Mulcahy felt her stomach lurch.

It was December 2016. The Rexnord Corporation's factory still churned out bearings as it always had. Trucks still dropped off steel pipes at the loading dock. Bill Stinnett, a die-hard Indiana Pacers fan, still cut them into pieces. The pieces still went to the "turning" department, where they were honed into rings as small as a bracelet or as big as a basketball. Then to "heat treat," where Shannon — who loves heavy metal music and abandoned dogs — hardened them with fire. Then to "grinding," where Shannon's cousin Lorry Mannix smoothed out any imperfections. And then to "assembly," where Mark Elliott, a former Marine, joined two rings together, one inside the other, with a wheel of spinning rollers in between. The whole contraption was encased in a cast-iron housing machined by John Feltner, a father of three who'd just recovered from bankruptcy.

The bearings they made were packed into crates like enormous Christmas ornaments and shipped around the world. To digging machines that claw the earth. To wheat combines that spin in the fields. To elevators and escalators in the cities.

Sometimes a bearing was rumored to have ended up in something notable — the retracting roof of the Dallas Cowboys football stadium or a nuclear submarine — giving the workers a feeling of greatness. But mostly, the bearings were unglamorous. Anonymous. Hidden from view. Like the workers themselves, they were rarely thought of beyond the factory walls.

That was fine with Shannon Mulcahy.

When she first started working at the plant, at age 25, her only goal was to break free of a boyfriend who beat her. Back then, her frosted blond hair and hourglass figure turned heads on the factory floor. Now, at 43, men more often remarked on her broad shoulders, which can lift a 75-pound tray of steel. Or her hands, stained with oil.

"My moneymakers," Shannon called them.

Being a female steelworker hadn't been easy. But she'd learned to hold her own. If a man spread a false rumor that he'd slept with her, she spread a false rumor right back that he'd been terrible in bed. If a woman wanted to fight, she learned to say "this is a place of business" instead of brawling then and there.

Shannon worked second shift — 2 p.m. to 10 p.m. — which made it difficult for her to get custody of her daughter or keep her son in check during his teenage years.



Shannon with her granddaughter, Carmella.



Shannon with her son, Kent Roberts Jr. — known as Bub — and Carmella. The two live with Shannon.

But the factory anchored her otherwise tumultuous life. Men had come and gone. Houses had been bought and lost. But the job had always been there. For 17 years. Until now. Shannon and her co-workers had gotten the news back in October: The factory was closing. Ball bearings would move to a new plant in Monterrey, Mexico. Roller bearings would go to McAllen, Tex. About 300 workers would lose their jobs.

The bosses called it "a business decision."

To Shannon, it felt like a backhand across the face.

Her boyfriend tried to console her. "We're survivors," he told her. "We'll get by."

Shannon's daughter, Nicole Wynne, was not so sure. A high school senior, she had dreamed of being the first in her family to go to college. Figuring out how to pay for it kept her up at night. This news made her worry even more.

And Shannon's 23-year-old son, Kent Roberts Jr. — known as Bub — depended on Shannon to help support his disabled 4-year-old daughter, who had just barely survived a litany of major surgeries.

"Oh my God, Mom," Nicole said. "What are you going to do?"

Shannon had no idea. She wished the new factory in Mexico would burn to the ground. She cried that night. And the next night. And the next.

Then, that Monday, Shannon did the only thing she knew how. She put on her electric-blue eyeliner and went back to work.

Halcyon Days and Stormy Months

For months, Shannon kept working as the factory shut down around her. She struggled with straightforward questions: Should she train workers from Mexico for extra pay or refuse? Should she go back to school or find a new job, no matter what it paid?

And she was forced to confront a more sweeping question that nags at many of the 67 percent of adults in this country who do not have a four-year college degree: What does my future look like in the new American economy?

The 410,000-square-foot bearings plant, with its blue and gray tinted windows and flagpole out front, had been built by a company called Link-Belt in 1959, halcyon days for American manufacturing.

Link-Belt meant to bearings what Cadillac meant to cars. "Symbol of quality" was its motto. Even after a series of sales and mergers in the 1980s left the factory in the hands of Rexnord, a Milwaukee-based rival, the Link-Belt brand lived on, stamped into the housings of new bearings.

But over the years, cheaper bearings from overseas eroded profits. To stay profitable, the factory replaced some workers with machines and outsourced some components. Then Rexnord's chief executive announced the plan to send jobs to Mexico, which he said would reduce costs by \$30 million and produce higher returns for investors.

Union representatives drew up a list of concessions in a bid to save the plant. But no concession could change the math. In Indiana, workers earned an average of \$25 an hour, plus benefits. In Monterrey, they earned less than \$6 an hour.

Moving the factory made sense to the people with college degrees. They expected that old workers could be swapped out for new ones, like interchangeable parts. That trainees could learn in a few weeks what Indianapolis workers had spent years mastering. That workers who had devoted their entire lives to building bearings they boasted were the best in the world would train their replacements and move on.

But it didn't happen that way.

Rexnord had announced that the factory would close in six months. It took nearly a year. The company, which declined to comment for this article, struggled with setbacks, sabotage and bad publicity that turned the factory into a symbol of national angst at the loss of bluecollar jobs.

The factory's demise, which mirrored that of so many other American factories, had pierced the national consciousness because of a tweet.
"Rexnord of Indianapolis is moving to Mexico and rather viciously firing all of its 300 workers," Donald J. Trump, then the president-elect, wrote in December. "No more!"



The United Steelworkers Local 1999 in Indianapolis.



The bearing factory, which was built in 1959 during a thriving period for American manufacturing.

Two weeks later, a letter from Todd Adams, Rexnord's chief executive, appeared on the factory bulletin board. "Despite the political rhetoric," Mr. Adams wrote, "our US operations are home to approximately 4,000 associates — more than half of our global workforce."

Rexnord's associates, he wrote, "are talented and valued."

Someone drew a hand on the letter, middle finger pointing up.

Like many workers, Shannon held out hope that Mr. Trump would save the factory, especially after he had announced that he saved some jobs at Carrier, a plant a mile away. After Mr. Trump tweeted a threat to tax Rexnord "big" for moving across the border, Shannon tweeted back: "Go PRESIDENT TRUMP!"

Shannon didn't vote in the election. She considered politicians to be liars. But she found herself rooting for Mr. Trump. Democrats talked about social safety nets, but he talked about jobs.

"I don't look down on anybody who uses food stamps," she said. "But I want to work for a living."

She had always been proud of her job. When she ran into friends from high school, she told them she worked at Link-Belt, conscious of the envy it incited. Shannon was a legacy hire. Her uncle had worked at the factory since before she was born. Her sense of self-worth was tied to the brand. The bearings she built were top of the line.

She held onto that. "I still care," she said last March. "I don't know why. It becomes an identity. A part of you."

For workers like Shannon, the factory's final months were a very difficult time. It was a time of praying that Donald Trump would save them and arguing about why he didn't. Of squabbling over whether to train their Mexican replacements or shun them. Of vowing that one day, the corporate bosses would realize that making bearings isn't as easy as they thought.

REQUEST QUESTION ORGANIZER ON SHANNON MULCAHY'S STORY

Instructions: Read the topics below and choose those you know a lot of details about. Work with a partner to come up with a list of questions that you know the answer to and put the questions and answers under the appropriate topic: writing your questions in the left-hand column and the answers to those questions in the right-hand column.

1. The Rexnord plant in Indiana and the products they make.		
Questions:	Answers:	
2. Shannon's family life.		
Questions:	Answers:	
3 Shannon's work life		
Questions:	Answers	
4. Why Rexnord moved the plant to Mexico.		
Questions:	Answers:	
5. The role of the Union in this story.		
Questions:	Answers:	
6 The role of Donald Trump in this story		
	Answers	



Manufacturing Bridge Semester 2: Adult Secondary Education (ASE)

THEME: Impacts of Free Trade on Workers Internationally

Students present their research on NAFTA and read a definition of the Agreement. They will watch a video about the effects of NAFTA on US and Mexican workers. Students then read, analyze, and answer HSE-type questions on an article summarizing the positive and negative impacts of offshoring, indicating reasons for shifts in recent political movements.

MATERIALS

For Activity #1:

- Handout (attached): Make one copy for each student. What Is the North American Free Trade Agreement?
- Handout (attached): Make one copy for each student. Free Trade Treasure Hunt
- Video: Free Trade. Prosperity for All? (running time: 07:54) https://www.youtube.com/watch?v=yC0ON4skcJo

For Activity #2:

- Handout (attached): Make one copy for each student. The story so far: Offshoring has brought huge economic benefits, but at a heavy political price
- Handout (attached): Make one copy for each student. Treasure Hunt: The story so far: Offshoring has brought huge economic benefits, but at a heavy political price
- Handout (attached): Make one copy for each student. HSE-type Questions for The Story So Far
- Teacher Resource (attached): Make one copy for the teacher. Answer Key: HSE-type Questions for The Story So Far

ACTIVITY #1: Read, Annotate, and Complete HSE Questions on an Article about the FDA - 60 minutes

• Tell students they will learn more about the problems with offshoring and outsourcing before they learn about movements that are beginning to improve manufacturing conditions in the US. They will learn about difficult, yet interesting, global changes affecting us right now, that can make us hopeful about the future and the 4th Industrial Revolution.

Define NAFTA Based on Homework Research and a Short Reading

- Tell students they will watch a video about the effects of NAFTA on US and Mexican workers, but they will need a basic understanding of what NAFTA is before they watch it.
- Write NAFTA on the board and go round robin, asking each student for a fact or information that describes NAFTA that they learned doing their homework.
 - \circ List each new fact on the board.

- \circ Ask each student to state their source after they give their fact.
- Have a volunteer(s) write a definition, in their own words, on the board
- Write the word "tariff" on the board and ask students for their definitions.
 - \circ Take notes on student definitions on the board.
- Ask:
 - Do you think NAFTA works to put tariffs in place or to take tariffs away between the countries in the Agreement?
 - What are the reasons for your thinking?
- Pass out What Is the North American Free Trade Agreement?
- Ask students to read it and underline information that will add to their definition of NAFTA.
- Go round robin so that students can add information to the definition on the board.
 - \circ $\;$ Write this information on the board.

Watch and Discuss a Video on Free Trade

- Pass out the Free Trade Treasure Hunt.
- Have students read the questions for the video out loud.
- Tell students that they do not have to take notes while they watch the video the first time.
- Watch the video.
- After the video, ask students to answer the Treasure Hunt questions as best they can.
- Watch the video again, adding more information to their Treasure Hunt sheet.
- Go over each of the questions as a class.
 - \circ Take notes on the student answers.
- Lastly, ask:
 - According to the video:
 - Who does NAFTA help?
 - Who does NAFTA hurt?
 - What needs to be changed in order to make better Free Trade agreements?
 - Take notes on student answers and have them write the notes down to use in their next essay.

Break - 10 minutes.

ACTIVITY #2: Read, Annotate, and Complete HSE Question – 50 minutes

• Tell students they will read an article providing detail on the positive and negative aspects of offshoring and free trade.

C Discuss the Article

- Pass out The story so far: Offshoring has brought huge economic benefits, but at a heavy political price.
- Have students read and annotate.
 - When students are finished, write the following questions on the board:
 - Look at what you underlined. Of those things, what were the most important points brought up in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with? Disagreed with?

- Pass out the *Treasure Hunt* for this article and put students in pairs to talk about their answers to the questions on the board.
- Come together as a class and ask the questions on the board, allowing the pairs to present their responses to the class.
- Ask:
 - What additional questions does this article raise?
 - What questions does this article answer?
- Give students time to answer Treasure Hunt Questions on this reading.

Answer HSE-type Questions

- Tell students they will now answer HSE-type questions for this article.
- Give students time to answer the questions.
- Write the following on the board:
 - Right There: The answer is right there in the text in one place.
 - Pulling-it-together: The answer can be gathered from information in many parts of the text.
 - \circ Author and me: The text has part of the answer, and the reader has the other part.
 - \circ On my own: The text raises these questions but does not answer them.
 - Put students in pairs, assign each pair one of the questions, and tell them to:
 - Talk through answers in general.
 - Focus on their assigned question and:
 - Decide which kind of question is being asked (choose one of the types from on the board).
 - Analyze the answers:
 - Which one is clearly not the right answer?
 - Which one(s) are close?
 - Which one is the right answer? How do you know?
- Project the questions overhead and have pairs provide their analyses.
- After each presentation, ask:
 - Do you agree with this analysis?
 - Do you want to add or change anything?

HOMEWORK

JOURNAL WRITING: Have students journal in response to the following prompt: Based on what you know about global business practices so far, who do you think wins because of offshoring and outsourcing and who do you think loses? Explain your thinking.

VOCABULARY: Assign students to research the following set of vocabulary words, making sure that students are spread relatively evenly across the three sets of words:

Group #1: Globalization, populism

Group #2: Income inequality, migration

Group #3: Plutocrat, stagnant

Tell students to write down their sources, put the definition in their own words, and write a sentence that clearly demonstrates the meaning of each word.

TEACHER PREPARATION NOTE: Before the next class, preview the materials so that you can guide students through a set of graphics and help to adjust their understandings of the Elephant Chart based on new information from the videos. What is important is not that they get the "right" answer, but that they are able to apply what they have learned about offshoring to the Elephant Chart.

What Is the North American Free Trade Agreement?

Adapted and paraphrased from source: <u>https://www.thebalance.com/nafta-definition-north-american-free-trade-agreement-3306147</u>

Original author: Kimberly Amadeo



The North American Free Trade Agreement (NAFTA) is a treaty between Canada, Mexico and the United States. That makes NAFTA the world's largest free trade agreement. The gross domestic product of its three members is more than \$20 trillion. NAFTA is the first time two developed nations signed a trade agreement with an emerging market country.

The three signatories agreed to remove trade barriers between them. By eliminating tariffs, NAFTA increases investment opportunities.

NAFTA's pros and cons are hotly debated. Critics point to three main disadvantages of NAFTA. First, it sent many U.S manufacturing jobs to lower-cost Mexico. Second, workers who kept jobs in those industries had to accept lower wages. Third, Mexico's workers have suffered exploitation.

But NAFTA also has three significant advantages. U.S. grocery prices would be higher without tariff-free imports from Mexico. Imported oil from both Canada and Mexico has prevented higher gas prices. NAFTA has also increased trade and economic growth for all three countries.

FREE TRADE TREASURE HUNT

VIDEO: Free Trade. Prosperity for All?

1. How did NAFTA encourage companies to move from Ypsilanti?	
2. How have US workers been impacted by NAFTA?	
3. According to one of the workers, what important elements are missing from NAFTA?	
4. What is the difference between what Mexican and US workers make?	
5. How have Mexican workers been impacted by NAFTA?	
6. How do Mexican pay rates influence US pay rates?	

The story so far

Offshoring has brought huge economic benefits, but at a heavy political price

Adapted and paraphrased from source: <u>https://www.economist.com/special-report/2013/01/19/the-story-so-far</u>

ONCE UPON A time the rich world's manufacturing firms largely produced in the rich world for the rich world, and most services were produced close to where they were consumed. Then Western firms started sending manufacturing work abroad on a large scale. By the 1980s this was well established. The movement was overwhelmingly in one direction: away from rich countries to places where workers with adequate skills were much cheaper.

Whether openly stated or not, lower labor costs were almost always the chief rationale. For many firms their very survival was at stake, since new competitors were undercutting them on price. This often involved shutting capacity in America and Europe as new factories were opened in China, Mexico, Taiwan, Thailand, eastern Europe or wherever offered the lowest cost.

The footloose, opportunistic philosophy of the time was best expressed by Jack Welch, the then chief executive of General Electric. He said the ideal strategy for a global company would be to put every factory it owned on a barge and float it around the world, taking advantage of short-term changes in different country's economies that could benefit them.

The economic benefits of offshoring have been immense. For workers in low-cost countries, it has meant jobs and rapidly rising standards of living. Rich-world workers have been able to leave the drudge work to someone else. For companies, lower labor costs have brought higher profits. Western consumers have enjoyed access to more goods at far lower prices than if production had stayed at home.

But offshoring from West to East has also contributed to job losses in rich countries, especially for the less skilled, yet increasingly for the middle classes too. It has become the aspect of globalization that workers in the developed world dislike and fear the most. Around a decade ago firms realized they could use the Internet to offshore information technology and back-office work to places such as India and the Philippines. India's outsourcing industry took wing and is still growing.

How many jobs in manufacturing and services have left rich countries is the subject of debate, since definitions are slippery, and companies do not give out numbers. If a factory shuts and another one opens halfway round the world the effect is clear. Estimates of the overall numbers can vary by tens of millions, but Alan Blinder, an economics professor at Princeton University, wrote in 2006 that sending service jobs abroad could cause some 40 million American jobs to disappear to India and other emerging countries.

Such dramatic forecasts caused widespread alarm. In a survey by NBC News and the *Wall Street Journal* in 2010, 86% of Americans polled said that offshoring of jobs by local firms to low-wage locations was a leading cause of their country's economic problems.

High levels of unemployment in Western countries after the <u>2007-08 financial crisis</u> have made the public in many countries so hostile towards offshoring that many companies are now reluctant to engage in it. Public concern over the issue has also encouraged politicians to bash companies that send their work abroad, compounding the effect.

 What did Jack Welch say manufacturers should do to stay competitive? 	
2. What are the benefits of offshoring?	
3. Why have many Western countries turn against offshoring?	
4. How do you relate the experiences of these US and Mexican workers to Shannon Mulcahy's experience?	

Treasure Hunt: The story so far: Offshoring has brought huge economic benefits, but at a heavy political price

The story so far – HSE-type Questions

- 1. What is offshoring?
 - a. The relocation of workers from one country to another
 - b. The process of moving a company from on shore to the next
 - c. Establishing a company in one country and hiring workers from another
 - d. The relocation of a business process from one country to another
- 2. What did competition do to the labor market?
 - a. Competition caused a downturn in the labor market and millions of workers lost their jobs as a result
 - b. There was an increased need for higher wages because competitors were increasing their benefits to decrease turnover
 - c. The labor market boomed as a result of competition and the unemployment rate in the United States almost completely disappeared.
 - d. Competition increased the need for lower labor costs because competitors were undercutting each other on price
- 3. What are some of the benefits of offshoring for workers in low-cost countries?
 - a. Rising standards of living and jobs
 - b. Safe workplace practices and an increase in promotions
 - c. Fair wages and better benefits packages
 - d. More vacation time and rising standards of workplace practices
- 4. How might offshoring hurt workers in low-cost countries?
 - a. Offshoring does not hurt workers in low-cost countries; it provides them with jobs they may never have had access to before
 - b. Employers are more likely to exploit workers because of weak labor laws on the promise of better pay
 - c. Jobs created by offshoring are lower paying than workers in low-cost countries are used to
 - d. There are little to no worker safety laws in low-cost countries which results in a higher number of worker injuries and deaths on the job
- 5. How have low labor costs benefited companies?
 - a. They have allowed companies to pay their employees a fair wage
 - b. Companies have become more efficient with their time and resources
 - c. They have brought high profits to manufacturing companies
 - d. High profits and fair wages are a result of the low labor costs

- 6. What are some arguments for the negative impacts that offshoring might have on countries like the United States?
 - a. Offshoring jobs takes away highly technical jobs from workers resulting in less access to the newest technology in manufacturing
 - b. It takes away jobs, deindustrializes the nation, and threatens standards of living
 - c. Offshoring is just a quick fix to a company's financial troubles and can lead to an unstable marketplace
 - d. Offshoring has caused an increase in lower paying jobs in countries like the U.S.
- 7. How many jobs were predicted to disappear in the United States by sending service jobs abroad according to Alan Blinder?
 - a. 400
 - b. 40
 - c. 40,000,000
 - d. 4,000
- 8. What are three causes of unemployment?
 - a. Advances in technology, relocation, job outsourcing
 - b. Job outsourcing, voluntary, incarceration
 - c. Lack of experience, relocation, advances in technology
 - d. Offshoring, voluntary, strikes

Answer Key: The story so far – HSE-type Questions

- 1. What is offshoring? Author and me
 - a. The relocation of workers from one country to another
 - b. The process of moving a company from on shore to the next
 - c. Establishing a company in one country and hiring workers from another
 - d. The relocation of a business process from one country to another
- 2. What did competition do to the labor market? Right there
 - a. Competition caused a downturn in the labor market and millions of workers lost their jobs as a result
 - b. There was an increased need for higher wages because competitors were increasing their benefits to decrease turnover
 - c. The labor market boomed as a result of competition and the unemployment rate in the United States almost completely disappeared.
 - d. Competition increased the need for lower labor costs because competitors were undercutting each other on price
- 3. What are some of the benefits of offshoring for workers in low-cost countries? Right there
 - a. Rising standards of living and jobs
 - b. Safe workplace practices and an increase in promotions
 - c. Fair wages and better benefits packages
 - d. More vacation time and rising standards of workplace practices
- 4. How might offshoring hurt workers in low-cost countries? On my own
 - a. Offshoring does not hurt workers in low-cost countries; it provides them with jobs they may never have had access to before
 - b. Employers are more likely to exploit workers because of weak labor laws on the promise of better pay
 - c. Jobs created by offshoring are lower paying than workers in low-cost countries are used to
 - d. There are little to no worker safety laws in low-cost countries which results in a higher number of worker injuries and deaths on the job
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 - It takes away jobs, deindustrializes the nation, and threatens standards of living
 - c. Offshoring is just a quick fix to a company's financial troubles and can lead to an unstable marketplace
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 - d. 4,000
- 8. What are three causes of unemployment? Author and me
 - a. Advances in technology, relocation, job outsourcing
 - b. Job outsourcing, voluntary, incarceration
 - c. Lack of experience, relocation, advances in technology
 - d. Offshoring, voluntary, strikes

THEME: The Elephant Chart

Students look at graphics that show the explosive growth in GDP for China and India and the slow growth in Western countries. They apply what they have learned to these graphs and then watch two videos about the meaning and implications of the chart that will help them draw conclusions about the global impact of offshoring.

MATERIALS

For Activity #1:

- Handout (attached): Make one copy for each student. Elephant Chart Treasure Hunt: Part 1
- Handout (attached): Make one copy for each student. Growth of GDP (Graphic #1) <u>https://www.huffingtonpost.com/john_ross-/china-india-growth_b_11655472.html</u>
- Handout (attached): Make one copy for each student. GDP Per Capita (Graphic #2) <u>https://www.huffingtonpost.com/john_ross-/china-india-growth_b_11655472.html</u>
- Handout (attached): Make one copy for each student. Percentile of global income distribution (Elephant Chart, Graphic #3) <u>https://urbanmilwaukee.com/2018/01/17/data-wonk-behold-the-elephant-chart/</u>
- Teacher Resource (attached): Percentile of global income distribution ("Picture" of the Elephant Chart, Graphic #4) <u>https://www.adamtownsend.me/dont-be-scared-by-the-elephant-chart-it-shows-that-most-of-us-are-getting-richer/</u>
- Teacher Resource (attached): Global Income Growth from 1988 to 2008 (Graphic #5) <u>http://www.pewresearch.org/fact-tank/2014/01/24/chart-of-the-week-how-two-decades-of-globalization-have-changed-the-world/</u>

For Activity #2:

- Classroom Resource: Flip chart paper and markers for three groups of students.
- Handout (attached): Make one copy for each student. Elephant Chart Treasure Hunt: Part 2
- Video: How Globalization Effects Inequality and Populism in One Chart (running time: 06:55) https://www.pbs.org/newshour/show/globalization-affects-inequality-populism-one-chart
- <u>https://www.marketplace.org/2017/08/07/world/trade-stories-globalization-and-backlash/what-went-wrong-with-globalization</u>Video: The Winners and Losers in Globalization (running time: 02:36)

TEACHER PREPARATION

Prior to this class, preview the materials so that you can guide students through a set of graphics and help to adjust their understandings of the Elephant Chart based on new information from the videos. What is important is not that they get the "right" answer, but that they are able to apply what they have learned about offshoring to the Elephant Chart.

• ACTIVITY #1: Predict the Meaning of the Elephant Chart – 60 minutes

• Tell students they will read a set of graphics on world economics and watch two videos that will explain the impact world economics has had on current political trends. By the end of the class, they will be able to discuss the impact of the 3rd Industrial Revolution on how we live.

Journal Writing Check-In

- Put following title on the board: Offshoring and Outsourcing.
- Put three columns under the title with the following headings:
 - Winners
 - o Losers
 - Ideas for Solving the Problems
- Ask students to share what they wrote in their journals on this topic. For each student who volunteers, ask:
 - Who did you say were the winners? Why?
 - Who did you say were the losers? Why?
 - What are your ideas for solving the problems?
 - Ask students to use "According to" and quotes as appropriate.
- Tell students to keep thinking about ideas for how to solve the problems they have identified. They will need these for their upcoming essay.

Read and Interpret Graph #1 & #2: Year on Year Growth In Per Capita GDP and GDP Per Capita

Graph #1: Year on Year Growth in Per Capita GDP

- Tell students they will read some graphs with information that may surprise them.
- Ask:
 - How did we define GDP earlier in the class?
 - What do the letters stand for? (Answer: Gross Domestic Product)
 - What is the meaning of GDP? (Answer: The total value of goods and services produced in a country during one year)
 - What does "per capita" mean? (Answer: Per person)
 - What does GDP per capita mean? (Answer: The amount of goods and services per person)
- Pass out Elephant Chart Treasure Hunt: Part 1 and put students in pairs. Tell students they will have an opportunity to talk about each group with their partner before class discussions.
- Project Graphic #1: Year on Year Growth in GDP per Capita
- Ask:
 - What is the title of this graph?
 - What is the year of per capita GDP being measured here? (Answer: 2015-2016)
 - What is the meaning of the title? (Answer: The growth in per capita GDP for the year 2015-2016. It is only a 1-year measure.)
 - What are the countries that have had their per capita GDP measured?
 - What does the vertical line on the left-hand side measure?

- What do the percentages under each country name tell us?
- Put students in pairs to answer Treasure Hunt questions for Graphic #1.
- As a class, ask pairs to provide new facts, one at a time.
- Point to the part of the graph on the overhead where students are getting their facts as they report them and have students share their interpretation of the facts.
- Then, ask the class:
 - Are you surprised by the facts?
 - Why might these facts be true?

Graph #2: GDP Per Capita

- Pass out and project Graph #2: GDP Per Capita.
- Use this same questioning pattern used for Graph #1.
 - Ask:
 - What does the title mean?
 - How is the information on this graph different than the first one?
 - What is being measured on the horizontal line on the bottom?
 - What is being measured on the vertical line on the left-hand side of the graph?
 - \circ Ask pairs to answer the questions on their Treasure Hunt for Graph #2.
- As a class, ask pairs to provide:
 - New facts, one at a time:
 - Point to the part of the graph on the overhead where students are getting their facts.
 - Their interpretation of the facts.
 - Their comments about the facts.
 - Are they surprised?
 - Why might these facts be true?
 - Lastly, ask:
 - What do the two graphs tell you together?
 - What is growth like when just one year is measured?
 - What has growth been like over time?

Read and Interpret Graph #3: The Elephant Chart

- Pass out and project the Elephant Chart overhead.
- Ask:
- What does the title mean?
- What is being measured on the horizontal line on the bottom?
 - Where are the poorest people on the graph? The richest?
- What is being measured on the vertical line on the left-hand side of the graph?
- Put pairs together to see if they can guess what is going on in this graph and answer the Treasure Hunt questions for Graph #3 as best they can.
- Have students share their answers to these questions.
 - \circ $\;$ Take notes on their interpretations of the graph on the board.
- Lastly, ask:
 - Why is this chart called the Elephant Chart?
- Project Graphic #4: the "Picture" of the Elephant Chart to help answer the question, "why is it called the elephant chart?"

Read and Interpret Graph #5: The Elephant Chart w/Some Interpretations

- Tell students they will now hear from an expert on the Elephant Chart.
- Project Graph #5 and ask:
 - What is the income growth rate for the poorest in the world?
 - Who has seen rapid rises in their incomes?

Manufacturing Bridge Semester 2 Lesson Plans

- Who has not seen any growth in their incomes?
- Who has seen the most rapid growth in their incomes?
- Lastly, ask:
 - What is the difference between the predictions made by students and their interpretations of this chart?
 - How do you think changes in growth rates are changing the world?

Break – 10 minutes.

ACTIVITY #2: Watch Two Videos that Read and Interpret the Elephant Chart - 50 minutes

• Tell students they will watch videos that provide more detail about the Elephant Chart and how the changes it shows have already started to affect us.

Vocabulary Review

- Tell students that before they watch the videos, they will make sure they understand some of the key vocabulary used.
- Put students into three groups based on the vocabulary homework:
 - Group #1: Globalization, populism
 - Group #2: Income inequality, migration
 - Group #3: Plutocrat, stagnant
- Give each group a piece of flip chart paper and markers and have them:
 - Share the definitions they found for their two words.
 - \circ Share the sentences they wrote using the words in a way that made their definitions clear.
 - \circ Select the clearest definition from the group and put it on the flip chart paper.
 - Present their selections to the class.
- Have each group present their definitions and sentences and allow the class to ask questions as needed.

Watch and Respond to Video #1: How Globalization Effects Inequality and Populism in One Chart

- Pass out the Elephant Chart Treasure Hunt: Part 2
- Have students write the definitions of word in the Treasure Hunt.
- Ask students to read the questions for the video out loud and have them take notes on the answers as they watch the video.
- Watch the video.
- After the video, put students into pairs to compare and decide on final answers.
- Go over the answers as a class.
- Lastly, ask:
 - What connection do you see between the Elephant Chart and recent political developments?

Watch and Respond to Video #2: The Winners and Losers in Globalization

- To find the second video, click on the link and scroll down on the page until you get to the video.
- Have students read the two questions for this second video.
- Watch the video.
- Put students in pairs to create descriptions of the Globalization 1.0 and 2.0 presented in the video.
- As a class, ask:
 - How would you describe globalization 1.0?
 - Which Industrial Revolutions would you associate with this definition: 1st, 2nd, or 3rd?

- What are the reasons for your answers?
- How would you describe globalization 2.0?
 - Which of the three Industrial Revolutions would you associate with the 2.0 definition? •
 - What are the reasons for your answers?

HOMEWORK

JOURNAL WRITING: Have students journal in response to the following prompt: Based on what you know about global economic changes, what trends do you think will happen next for overseas manufacturers? Will manufacturers continue to move their production overseas or will they come back to the US? What are the reasons for your answer?

ELEPHANT CHART TREASURE HUNT: PART 1

Graphic #1: Year on Year Growth in per Capita GDP

1. List at least 5 facts from this graph.	
2. State your interpretation of the facts in one sentence.	
3. Add your comments.	

Graphic #2: GDP per Capita

1.	List at least 5 facts from this graph.	
2.	State your interpretation of the facts in one sentence.	
3.	Add your comments.	

Graph #3: The Elephant Chart				
1. List at least 5 facts from this graph.				
 State your interpretation of the facts in one sentence. 				
3. Add your comments.				

Growth of GDP (Graphic #1)

Graphics from Source: https://www.huffingtonpost.com/john ross-/china-india-growth b 11655472.html



Slow Growth in Western Economies

Year-to-year growth in per capita GDP 2015-2016 (IMF/OECD)

GDP Per Capita (Graphic #2)





Percentile of global income distribution (Elephant Chart, Graphic #3)
Figure 4. Change in real income between 1988 and 2008 at various percentiles of global income distribution (calculated in 2005 international dollars)



Global Income Growth from 1988 to 2008 (Graphic #5)



Global income growth from 1988 to 2008

Poorest ← Percentile of global income distribution → **Richest**

ELEPHANT CHART TREASURE HUNT: PART 2

Vocabulary: Define the following words based on Group presentations.

Globalization	
Populism	
Income Equality	
Migration	
Plutocrat	
Stagnant	
Video #1: How Globalization Effe	ects Inequality and Populism in One Chart
1. What percent of the world's population have risen out of poverty in the last 20 years?	
2. Which income levels have seen little growth in their incomes?	
3. Where are these people from?	
4. What are some of the results of the lack of income growth for this group?	

Describe Globalization 1.0:		
Who got rich and who didn't?		
Describe Globalization 2.0		
Who got rich and who didn't?		

Video #2: How Globalization Effects Inequality and Populism in One Chart

Week 7, Lesson 2 Manufacturing Bridge Semester 2: Adult Secondary Education (ASE)

THEME: Reshoring

Students learn about reshoring by reading one article and watching 3 short videos. Students should focus on the factors that have brought manufacturers back to the US. Students will also be introduced to their next essay questions and complete their Essay Planning Assistant.

MATERIALS

For Activity #1:

- Handout (attached): Make one copy for each student. Reshoring Treasure Hunt
- Handout (attached): Make one copy for each student. 4 Reasons Companies are Bringing Manufacturing Back to the U.S.
- Video: Reshoring U.S. Manufacturing (running time: 02:13) <u>https://www.youtube.com/watch?v=4xKWnV4HIE0</u>
- Video: Made in America Seating: A Focus on Re-shoring (running time: 02:48) https://www.youtube.com/watch?v=9ScITIUWzu0
- Video: Reshoring: Bringing jobs back to UK from Abroad (running time: 02:33) https://www.youtube.com/watch?v=YZPwLkJUUi0

For Activity #2

• Handout (attached): Make one copy for each student. Essay Planning Assistant

ACTIVITY #1: Reasons for Reshoring - 60 minutes

Journal Writing Check-In

- Tell students they will review their journal writing responses about what they learned and the implications of the Elephant Chart.
- Write the first journal writing question on the board with two columns underneath the question:
 - Based on what you know about global economic changes, what trends do you think will happen next for overseas manufacturers?
 - Column 1: Manufactures continue to move overseas. Your reasons?
 - Column 2: Manufacturers come back to the US. Your reasons?
- Put students into pairs to take turns talking about:
 - Which column their journal response fell into: manufacturers continuing to move overseas or manufacturers coming back to the US.
 - Their reasons for their answer.
- Come back together as a class and have pairs share their thinking.
 - Take notes on students' responses on the board.
- Lastly, ask:
 - Do students in this class have similar or different responses to the question?

- Do you find the reasons for both sides compelling?
 - Why or why not?
- Which reasons are most compelling/convincing? Why?

Introduce the Reshoring Activities

- Tell student they will examine the reshoring movement that has started due to global economic shifts that the Elephant Chart makes clear.
- Ask:

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- What do they think reshoring means?
 - Take notes on student answers, adding to what is already in the second column.
- Tell students they will look for reasons that manufacturers are reshoring in videos and articles and compare them to the reasons listed on the board.
- Pass out the Reshoring Treasure Hunt.

Read an Article on Reasons on Reshoring

- Pass out 4 Reasons Companies are Bringing Manufacturing Back to the U.S.
- Have students read and annotate the article.
- While students are reading, write the following instructions on the board. Go over these questions with students once they have finished reading:
 - Look at what you underlined. What helped you understand the reasons manufacturers are reshoring?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article did you agreed with? Disagreed with?
 - Put students in pairs to discuss these questions.
- Draw three columns on the board without any headings.
- Come together as a class and ask:
 - Why are manufacturers reshoring?
 - Write the three reasons from the article as the headings for the columns.
- For each of the reasons, ask:
 - What are the factors that have made manufacturers come back to the US?
 - Take notes on students' answers in each column.
- Lastly, have students fill in the first section of their Treasure Hunt.

Watch Three Short Videos on Reasons for Reshoring

- Tell students they will watch three videos, listening carefully for new reasons manufacturers are reshoring. For each video, they can opt to watch the video for the second time, if needed.
- Use the following process for each of the three videos:
 - \circ Watch the video and take notes on reasons manufacturers are reshoring.
 - \circ $\;$ Have students talk with a partner to make a list of the reasons they heard.
 - \circ Ask students if they want to watch the video again. Watch it again, as needed.
 - Have pairs discuss again to add any new reasons.
 - \circ $\;$ Ask each pair to add to the list of factors on the board for reshoring.
- Lastly, ask:
 - What are your responses to this movement of manufacturers back to the US?
 - How do you think this reshoring movement will change life for people in the US?

Break -10 minutes.

ACTIVITY #2: Introduce the Essay Assignment- 50 minutes

Introduce the Question Prompts

- Tell students they will prepare for a 45-minute essay that they will write during the next class. This essay will utilize information and notes they have gathered so far.
- Write the essay question prompts on the board:
 - What is offshoring?
 - Why did many American manufacturing firms leave the US to manufacture their products in other countries?
 - What are the significant impacts of offshoring on overseas workers?
 - What are the impacts on US workers?
 - What do you recommend should be done to address some of the negative impacts?
- Tell students to keep in mind that their audience doesn't know about offshoring or its impacts on workers. To make their essays more interesting and convincing, they should:
 - Provide statistics and facts using "According to" language and quotes that help support their points.
 - Provide clear examples to back up their arguments.
 - Provide recommendations to address these issues.
- Tell students to think about their recommendations- what should be done to solve the problems for workers in other countries and the US? All ideas are welcome in the discussion.

Fill out the Essay Planning Assistant

- Distribute the Essay Planning Assistant.
- Have a student read the instructions out loud.
- Provide students time to complete their Essay Planning Assistant.

HOMEWORK

COMPLETE: Have students fill out the Essay Planning Assistant.

RESHORING TREASURE HUNT

Each of the videos and article provide reasons why US manufacturing is reshoring. Take notes on these reasons in the space provided.

SOURCES	REASONS FOR RESHORING MANUFACTURING		
Reading: 4 Reasons Companies are Bringing Manufacturing Back to the U.S.			
Video: Reshoring U.S. Manufacturing			

SOURCES	REASONS FOR RESHORING MANUFACTURING		
Video: Made in America Seating			
Video: Reshoring: Bringing jobs back to UK from Abroad			

4 Reasons Companies are Bringing Manufacturing Back to the U.S.

Adapted and paraphrased from source: <u>http://www.machinedesign.com/blog/4-reasons-companies-are-bringing-manufacturing-back-us</u>

Original author: Stephen Mraz

The trend to offshore or outsource manufacturing began right after China joined the World Trade Organization at the end of 2001, and that is precisely when a large number of U.S. firms took their plants and went overseas, mostly to Asia. They told the press they were having a terrible time competing against China's lower labor costs.

The overseas low-cost, no health-care labor forces lured U.S. manufacturing managers initially, and later other U.S. industries, such as IT and technology services, began outsourcing in a big way as well. These industries went to India and the Philippines based on the large number of English-speaking and relatively highly skilled workers there.

There was always a concern that companies would outsource engineering. And some—mostly software companies—did.

But after a decade of significant offshoring and outsourcing, the cost savings American firms had chased began to decrease rapidly. Labor and transportation costs increased, eating into much of the savings manufacturers had previously enjoyed. And many companies uncovered the hidden costs some consultants warned about. Those costs often outweighed any benefits that came from manufacturing overseas.

Some of these hidden costs that were not always considered included: the increased costs of monitoring and maintaining good quality control, unclear protection of US companies intellectual property, and lengthy global supply chains. As a result of increasing costs and other factors overseas, some manufacturing has already begun returning to the U.S. This act of returning manufacturing, IT, and other service jobs to the US is called "reshoring".

The Boston Consulting Group (BCG) studied 10 years of data (2001 to 2014) from the 25 countries that account for nearly 90% of the world's exports of manufactured goods. As a result of this study, BCG was able to identify three primary factors that influenced manufacturers to offshore their production: manufacturing wages, labor productivity, and energy costs.

Interestingly, the US has become cost competitive over the 10 years of the BCG study. Below are brief descriptions of the four primary factors many manufacturers are deciding to reshore:

"Increased wages" overseas has been the most commonly cited reason for manufactures to reshore. Although the U.S. is the lowest-cost manufacturing location of all the developed nations, manufacturing is still cheaper in China. But the cost difference between the two shrunk from 2004 to 2014, as China began requiring that its companies granted workers 13% minimum wage increases in 2011. These wage increases are high enough that they could eliminate any wage advantage China has by 2020, according the BCG report.

Labor productivity, which is measured as the gains in output per manufacturing worker, is also commonly cited as a significant factor in total manufacturing costs. Although Chinese labor productivity is increasing, BCG expects it to lag behind wage increases by approximately 40% of current U.S. productivity levels.

The lower energy costs during that decade, especially in energy-dependent industries such as iron and steel and chemicals, made reshoring a money-saving option for

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some manufacturers. Large-scale production of shale gas in North America helped cut natural gas prices by 25% to 35% over those 10 years. But overall energy costs in many countries outside of North America are anywhere from 50% to 200% higher than they were in 2004.

For the U.S., less expensive natural gas translates into more affordable electricity and lower prices on the raw materials used to make ammonia, hydrogen, methanol, and other materials. This is a significant cost factor because these chemicals serve as the base for thousands of industrial and consumer products.

ESSAY PLANNING ASSISTANT

Read the questions in the left-hand column. Write your ideas on the topic. Then, review your readings and Treasure Hunt notes and select those notes that will help you write good clear paragraphs. Put these in the right-hand column along with the source where you got the information. This organization can help you use "According to" language and quotes effectively.

Essay Questions	Your Ideas About How to Answer This Question	Useful Notes and Their Sources From Your Readings and Writings
1. What is offshoring?		
Part of the introduction.		
2. Why did many American manufacturing firms leave the US to		
manufacture their products in other countries?		
Part of the introduction.		

Essay Questions	Your Ideas About How to Answer This Question	Useful Notes and Their Sources From Your Readings and Writings
 What are the significant impacts of offshoring on overseas workers? Body paragraph. 		
 What are the significant impacts of offshoring on US workers? 		
Body paragraph		
5. What do you recommend should be done to solve some of these negative impacts?		
Multi-paragraph conclusion.		

THEME: Prepare for and Write a 45-Minute Essay

Students talk through their essay using their Essay Planning Assistant; they have 45 minutes to write the essay.

MATERIALS

<u>Homework:</u>

• Handout (attached): Make one copy for each student. Practicing with Sentence Structure

ACTIVITY #1 Talk Through Your Essay - 60 minutes

- Have students take out their Essay Planning Assistant.
- Put students into pairs to discuss each other's outline:
 - After each paragraph, the listener should ask questions to improve clarity or request more information.
 - \circ They should then exchange roles.
- Have students make any changes to their outline that will improve their essays.
- Tell students to should focus on talking to their partner in a way that will encourage him or her to be open to the student's recommendations.
- After students have talked through their essays, ask:
 - Did you get useful ideas from your listeners?
 - How have your plans for your essay improved?

Break – 10 minutes.

Activity #2: Write Your Essay – 50 minutes

- Give students 45 minutes to complete their essays.
- Collect the essays and bring them back to the next class for Peer Review.

HOMEWORK

COMPLETE: Instruct students to complete the transition words from the *Practicing with Sentence Structure* handout.

Practicing with Sentence Structure

<u>Part 1:</u> Read the sample sentences on the previous page to see how some connecting and transition words are used in context. Then, put the following words into four categories of meaning: a. cause/effect, b. time, c. contradiction, and d. addition.

however,	as soon as	even though	in addition,
therefore,	and	but	although
when	furthermore,	so	until
because	as a result,	moreover,	nevertheless,

since... plus,

Cause/Effect	Time	Contradiction	Addition

<u>Part II:</u> Which of the words above show one part in the sentence and which words show at least two parts in the sentence? Write (1) next to the words that show one part in the sentence and (2) next to the words that show at least two parts in the sentence.

Combine the following sentences, using any transition phrase/connecting word that works. Make one sentence from each pair (or trio).

- The author is a professor at MIT.
- She teaches linguistics
- She recently conducted a survey.
- Drivers prefer to hear a woman's voice on their satellite navigation systems.
- Women don't have good reputations as drivers.
- Men as less likely than women to ask for directions.
- Many studies show this.
- Her blood pressure was high.
- Her cholesterol was high, too.
- Many service industry workers don't make adequate salaries.
- They rely on tips.
- The article discusses the positive impact of friendship.
- Our friends can also influence us negatively.

Combine the following sentences. Make one sentence from each pair.

- The author is a financial consultant.
- She counsels married couples.
- Most couples talk about their finances frequently.
- They don't talk very effectively.
- Many couple divorce because of finance issues.
- Numerous studies have shown this.
- He was a spendthrift.
- She was a miser.
- They divorced.
- The couple had a Spartan lifestyle.
- It was all work and no play.
- Her spending style is laissez-faire.
- She buys whatever she likes.
- A study looked at 600 American couples.
- The couples came from various ethnic, religious and economic backgrounds.

THEME: Peer Review and Grammar Activities

Students will do a peer review of their 45-minute essays and practice the two colon rules.

MATERIALS

For Activity #1:

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

For Activity #2:

• Handout (attached): Make one copy for each student. Grammar Rules

ACTIVITY #1: Conduct a Peer Review -- 60 minutes

- Tell students they will provide constructive feedback on each other's written work. Reviewers should pretend they don't know about the topic and be able to evaluate how convincing the writer's knowledge and recommendations are.
- Put students into groups of three.
- Give back the essays students wrote during the last class.
- Pass out two copies of the Reader Comment Page to each student. Explain that they are going to:
 - Read the paragraphs written by the other two people in their group.
 - Fill out one Reader Comment Page for each essay 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 provide helpful feedback. Specific comments on their classmate's work will help them during the rewrite.
- Have students pass their written work to the left.
- After students have evaluated one essay, they should pass it to their left and evaluate a second essay.
- After students have completed two Reader Comment Pages, they should give their evaluations to the writers, and the writers should read the comments.
- Ask the class as a whole:
 - \circ $\;$ Did your evaluators say the same or different things?
 - Did your evaluators say things that gave you ideas for how to make your letter better?
 What are they?
 - Did your evaluators confuse you? Ask for clarification when they are back in their group.
- Put students back in their groups to talk through differences and to get clarification.
- Lastly, ask:
 - Were you as a reader persuaded to take action?
 - What recommendations were compelling or convincing?
 - What ideas did your peers give you for improving your rough draft?

Breaks – 10 minutes.

Activity #2: Grammar: Colon Rules and Peer Editing - 50 minutes

• Briefly go over the Transition Word homework, reading the sentences, and getting students' word choices for each blank. Have the class approve the different words that could work in most instances.

Use colons after a complete sentence that presents a list.

- Tell students that colons mean:
 - "I know a period goes here, but here comes a list."
 - Or: "Here is what I really mean."
 - Emphasize that colons can only be used after a full sentence.
- Put the following on the board:
 - These are the rules for the pool
 - I have a list of things I want from Santa
 - This is what I have to do when I get up in the morning
 - There are many things I have to do to make more money
- Demonstrate by using the first sentence, "These are the rules for the pool"
 - Ask students for a list of pool rules.
 - Write their ideas on the board in a line.
 - Put in a colon saying, "I know a period goes here, but here comes a list"
 - Put commas between the items in the list.
 - Use "and" before the last item.
- Put students into three groups and assign each group one of the remaining three sentences. Tell the groups to:
 - Write an expanded sentence using a colon, creating a list, and inserting commas between items in the list.
 - Have students come to the board and write their expanded sentences.
 - Go over each sentence and ask:
 - Is the first part a sentence?
 - Is the colon in the right place?
 - Are the commas in the right places? Are any commas missing?
- Ask: What's the rule? (Answer: If there is a sentence that introduces a list, put a colon at the end of the sentence and commas between each item in the list.)

"Here is what I really mean" colon rule:

- Give quick examples of "Here is what I really mean" colons. Write these on the board:
 - He got what he asked for: a promotion.
 - You know what to do: practice.
 - The title of the book is Playing the Race Card: Melodramas of Black and White from Uncle Tom to OJ Simpson.
- For each, ask:
 - Is the first part a sentence?
 - What does the colon mean? (Answer: "Here is what I really mean")
 - Does the second part answer, "Here is what I really mean"?

Peer Editing

- Pass out Grammar Rules.
- Go round robin to have student read the rules out loud: loud, clear, and with feeling!
- Assign students a different grammar rule and have them come to the board to:

- \circ Write the number of the grammar rule they were assigned.
- Write a sentence that demonstrates that rule.
- Read each sentence aloud and ask:
 - Is this a good demonstration of the grammar rule?
 - Make adjustments as needed.
- Put students and pairs and tell them to:
 - Read their partner's essay.
 - Underline the words, phrases, or sentences where they see a problem.
 - \circ Put the number of the rule they believe was broken next to each underline.
 - If something they underlined is not described on the Grammar Rules sheet, like spelling or contractions for example, just leave the underline without a number next to it.
- Next, tell pairs to give the essays back to the writers to make corrections. Pairs may:
 - Go over the underlines together and make changes together.
 - \circ Work independently and ask questions of each other on specific underlines.
 - If neither partner knows how to fix an underline, they should just leave it.
- As a class, tell students to:
 - Come to the board to write sentences with the underlines that the pair couldn't fix.
 - \circ Go from sentence to sentence and have students come to the board and fix the sentences.

HOMEWORK

COMPLETE: Instruct students to complete a final draft of their essay.

TEACHER PREPARATION

Before the next class, review the Treasure Hunt questions that accompany the video in Activity #2 and have answers prepared.

READER COMMENT PAGE

WRITER_____ READER _____

1. What is clear and interesting to you about this piece of writing? Help the writer by being as specific as you can.

2. As the reader, what parts of the written piece would you like to be clearer or easier to understand? What would you like to hear more about?

3. Do you have any additional, comments, or suggestions to help the writer with revisions?

GRAMMAR RULES

- 1. A sentence must have at least a noun and a verb to be a sentence.
- 2. All proper nouns must be capitalized.
- 3. Sentence fragments can be fixed by adding the noun or verb that is missing to make the fragment a sentence.
- 4. Sentence run-ons can be fixed by: identifying the different actions in the run on and making a new sentence for each action.
- 5. Two sentences can be put together using words like: but, and, yet, or, nor, for, so. A comma is required after the first sentence.
- 6. Information can be added to the beginning, middle, or end of a sentence. All new information needs to be separated from the main sentence by a comma or commas:
 - In the beginning,_____.
 - She grew up in Chicago, a wild city that helped mold her personality.
 - He, the man in the black hat, fell in love as soon as he saw her.
- 7. You can join two related sentences together with a semi-colon between them.
- 8. You can join two sentences together using transition words like: however, therefore, thus, and nevertheless. When using these words, put a semi- colon after the first sentence and a comma after the transition word.
- 9. Use a colon after a sentence and before a list.
- 10. Use a colon after a sentence or title and then say what the sentence or title really means.

THEME: Introduction to the Fourth Industrial Revolution

Students recall their knowledge about the first three Industrial Revolutions and predict what the fourth Industrial Revolution might be like. Students then learn about three major developments that are impacting manufacturing and watch a video on the first of them: Artificial Intelligence (AI). Then, they write an opinion on whether or not they think AI will be good or harmful for society in the long run.

MATERIAL

For Activity #1:

 Video: The Fourth Industrial Revolution (running time 1:42) <u>https://www.youtube.com/watch?v=SCGV1tNBoeU&frags=pl%2Cwn</u>

For Activity #2:

- Handout (attached): Make one copy for each student. Note-Taking Activity for Artificial Intelligence (AI)
- Video: The Rise of Artificial Intelligence (running time: 08:40) <u>http://www.pbslearningmedia.org/resource/1ecc10f5-239e-4d18-acb2-5422f00a6565/the-rise-of-artificial-intelligence-off-book/</u>

TEACHER PREPARATION

Before class, review the questions in the Note -Taking Activity for Artificial Intelligence that accompany the video in Activity #2 and have answers prepared.

ACTIVITY #1: Identify What We Already Know About the Four Industrial Revolutions - 70 minutes

Opening

- Tell students this next eight weeks of the semester will be focused on the Fourth Industrial Revolution. This Industrial Revolution has not happened yet, but is what people predict will happen in manufacturing in the future. Students will make predictions about manufacturing's future once they are up-to-date on the latest developments impacting manufacturing now.
- Tell students it will be important for them to develop their own opinions on these new developments and how they think these developments will impact our future.
- Also, tell students that this process of developing opinions is crucial to learning how to write persuasive pieces in the HSE exam and in college.



What do We Already Know about the First Three Industrial Revolutions?

- Tell students they will briefly review the first three Industrial Revolutions, which may inform their predictions about the fourth.
- Draw three columns on the board with the headings: First Industrial Revolution (IR), Second IR, Third IR.

- Put students in three groups, assign each group a different IR and have them describe the one they were assigned.
 - \circ Have students refer to their notes to get as many details as possible.
- When students are prepared, have each group:
 - Describe their IR.
 - Take notes on their descriptions in the appropriate category.
 - \circ $\;$ Ask the class for additions to the description on the board.
 - Record these changes and additions on the board as well.
- Put a fourth column on the board with the heading: Fourth IR.
- Ask:
 - Based on what we know about the history of manufacturing, what are your predictions about the Fourth IR?
 - Take notes on student responses.

Re-Watch The Fourth Industrial Revolution Video

- Tell students they will re-watch a video that introduces the four IRs.
- Watch the video and encourage students to take notes on new items they would like to add to each category.
- Ask:
 - What additional information do you want to add to each category?
 - Take notes on student answers.
- Ask:
 - What about the closing statements in the video?
 - \circ $\;$ Read each of the following statements one at a time:
 - "The business models of each and every industry will be transformed."
 - "How do we avoid a world of joblessness, low productivity, and inequality?"
 - "Answer: By ensuring the Fourth Industrial Revolution really does improve the state of the world."
- After each statement, ask:
 - What does this statement mean?
 - What could it be referring to?
 - What questions do you need answered to better understand this statement?

Introduce the Ideas of Thesis and Evidence

- Write the following question on the board:
 - Based on what you know about the four IRs so far, do you predict the future of manufacturing will "improve the world" or not?
- Also, write the following statements with room to take notes on students answers under each:
 - I predict the future of manufacturing will be bright because it will _
 - I predict the future of manufacturing will NOT be bright because it will _____.
 - \circ I predict the future of manufacturing will not change much because _
- Tell students to choose one of these and complete the statement in writing as it relates to their prediction.
- Give students time to jot down their statement.
- Go round robin to have students read their statements aloud.
 - Take notes on students' answers of the board.
- Tell students that all the statements they read aloud to the class are their thesis statements. Explain that thesis statements:
 - Express the opinion of the author and states the basic reason the author thinks/feels that way.
 - Is most often found in the introduction of an essay because it tells the reader what the essay is going to be about.

- \circ $\;$ Is supported by body paragraphs that present reasons for the author's opinion.
- Ask a student to volunteer to re-read their thesis statement and identify evidence that they would use to explain to a reader why their opinion makes sense.
- Tell students that what they have just done is create a quick sketch for a persuasive essay and that they will get more practice writing them during in this unit. Soon, they will be writing persuasive outlines that require:
 - A clear statement of their opinion.
 - \circ The reasons they have that opinion.
 - \circ Evidence that backs up each of their reasons, so the reader is persuaded by their argument.

Break - 10 minutes.

ACTIVITY #2: Watch a Video On Artificial Intelligence – 40 minutes

Introduce the First 3 Major Developments in Manufacturing - Then Focus on Artificial Intelligence

- Tell students they are going to examine the first of three major developments that are impacting manufacturing. The three developments are:
 - Artificial Intelligence
 - The Internet of Things
 - o Big Data
- Ask students:
- What do you already know or want to guess about:
 - Artificial Intelligence?
 - The Internet of Things?
 - Big Data?
 - Take notes on students answers on the board.
- Ask students:
 - How might each of these influence manufacturing?
- Tell students they will be looking at both how each new development is impacting society in general and then in manufacturing specifically.

Watch the Video on Artificial Intelligence.

- Tell students they are going to watch a video that will give them a definition, background, and ideas about the future of Artificial Intelligence.
- Pass out the Note-Taking Activity for Artificial Intelligence
- Have students volunteer to read the instructions and questions out loud.
- Watch the video.
- Put student in pairs to discuss their answers to the questions in the Note-Taking Activity, adding new information as needed.
- Review the questions and answers as a class.

Journal About Your Response to AI in the Future

- Write the following statements on the board:
 - I think Artificial Intelligence will be a good thing for society because it will
 - o I think Artificial Intelligence will NOT be a good thing for society because it will

- o I think Artificial Intelligence will have good and bad influences on society because it will
- Have students choose one of the statements and complete it.
- Go round robin to have students read their statement and explain why they made that statement. • Ask each student: What from the video convinced you that your statement is true?
- Tell students to get out their journals and write by:
 - Starting with their statement.
 - Explaining why they think their statement is true using their own knowledge and information they learned from the video.
 - Using appropriate "According to" language with the name of the video when they use information from the video.
- Lastly, ask:
 - What was your thesis statement?
 - What were some reasons you gave for your opinion you thought were especially strong?
 - Why do you think this reason is strong?

HOMEWORK

RESEARCH: Have students find an article in a newspaper, magazine, or on-line that provides more facts on Al in advanced manufacturing. Choose a reading that you are interested in. Write down the name of the article, read and annotate the article, and then make a list of facts.

Students should be prepared to hand-in your annotated article and the list of facts in the next lesson.

TEACHER PREPARATION NOTE

Prior to the next lesson, complete the questions in the Note-Taking Activity for AI In Manufacturing that accompany the video in Activity #2. This preparation includes planning to stop the video at specific times to review five graphs that will help students answer the questions in the Note-Taking Activity. The times for stopping the video and taking time to read the graphs are at: 01:03, 03:44, 05:14, 05:59, 07:22.
NOTE-TAKING ACTIVITY: ARTIFICIAL INTELLIGENCE (AI)

Take notes on the video: *The Rise of Artificial Intelligence* to answer the questions below.

QUESTIONS	NOTES
1. What is Artificial Intelligence?	
2. What is the "end goal" of AI?	
3. What is hard to get a machine to do?	
4. What are some examples of AI today?	
5. What was the approach to building AI in the past that didn't work well?	
6. What is brain emulation?	

Week 9, Lesson 2

Manufacturing Bridge Semester 2: Adult Secondary Education (ASE)

THEME: Artificial Intelligence in Manufacturing

Students read a graphic and an article on the increasing use of robots in manufacturing, use the Question Around exercise, and answer questions in the Note-Taking Activity. Next, students watch a video and answer questions in a Note-Taking Activity about it and the five graphs embedded in it.

MATERIALS

For Activity #1:

- Handout (attached): One copy for each student. Graphic: Robot prices have fallen in comparison with labor costs <u>https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/Operations/Our%20Insights/A</u> <u>utomation%20robotics%20and%20the%20factory%20of%20the%20future/SVGZ-Automation-</u> <u>robotics-and-the-factory-of-the-future-Ex1.ashx</u>
- Handout (attached): One copy for each student. Effects of Automation on Manufacturing
- Handout (attached): Make one copy for each student. Prepare for Question Around

For Activity #2:

- Handout (attached): One copy for each student. Note-Taking Activity for AI in Manufacturing
- Video: The Robot Revolution: The New Age of Manufacturing (running time 9:11) <u>https://www.youtube.com/watch?v=HX6M4QunVmA&frags=pl%2Cwn</u>
- Teacher Resource (attached): Five Graphics from the video The Robot Revolution: The New Age of Manufacturing to project in class if needed
 - Industrial Robot Shipments (at 1:03)
 - Human and Machine Collaboration (at 03:44)
 - Median Age of the Population in China (at 05:14)
 - Annual Salary of Urban Employee in China (at 05:59)
 - China Workforce Percent by Sector 2006-2016 (at 07:22)

TEACHER PREPARATION

Prior to class, complete the questions in the Note-Taking Activity for AI In Manufacturing that accompany the video in Activity #2. This preparation includes planning to stop the video at specific times to review five graphs that will help students answer questions in the Note-Taking Activity. The times for stopping the video and taking time to read the graphs are at: 01:03, 03:44, 05:14, 05:59, 07:22.

ACTIVITY #1: Read About AI in Manufacturing - 60 minutes

AI in Manufacturing from Homework Research

- Tell students they are going to look at the way Al is moving into manufacturing and could impact its future.
- Ask students:
 - What facts did you find about Al in manufacturing from your homework research?
 List these on the board.
 - What is the name of the resource you used to get your facts?
- When homework facts have been shared, ask students:
 - How would you summarize AI in manufacturing based on the facts on the board?
 - What would be your general statement about AI in manufacturing?
 - What would be the facts on the board that support that statement?
- Collect these annotated articles and lists of facts after students have shared the information with the class. Please also note down that they completed this homework before hand them back as convenient.

Read the Graph

- Tell students they will look at a graph that talks about labor and robot prices.
- Project the graph: Robot Prices Have Fallen.
- Ask students:
 - What has happened to labor costs?
 - Over what period of time?
 - By how much?
 - What has happened to robot prices?
 - Over what period of time?
 - By how much?
- Lastly, ask:

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- What do you think these numbers mean for manufacturers?
 - What impacts do you think this will this have on manufacturing in the future?
 - Note these on the board.

Read, Annotate, and Discuss the Article

- Pass out the article: The Effects of Automation on Manufacturing.
- Have students get out their Annotation Key and use it while they read the article.
- When students are finished, write the following instructions on the board.
 - Of those things that you underlined, what are the most important points in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with? Disagreed with?
- Put students in pairs to talk about their answers to the questions on the board.
- Come together as a class and ask the questions on the board, allowing pairs to present their different responses to the class.
- Ask:
- Who is the audience for this article?
 - How do you know?
- \circ $\;$ What is the thesis of the article?
- What is the strongest evidence?
 - Instruct students to use "According to" language and quotes as needed.

Prepare for Question Around

- Write the following question types on the board and go over each one:
 - \circ Right There: The answer is right there in the text in one place.
 - Pulling-it-together: The answer can be gathered from information in many parts of the text.
 - Author and me: The text has part of the answer, and the reader has the other part.
 - On my own: The text raises these questions but does not answer them.
- Have students come up with examples of questions for each one of these categories: right there; pulling it together; author and me; and on my own.
 - Write those that are good models on the board.
- Pass out Prepare for Question Around.
- Have a student read the instructions out loud.
- Put students in pairs to write their questions. They should not use the examples on the board.
- Explain that when students ask each other their questions, the student responding must answer the question and identify what kind of question it is.

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Conduct the Question Around Activity

- Ask: Who wants to be the first lead? Then tell students to follow this pattern:
 - \circ $\;$ The lead asks a question he/she knows the answer to.
 - Those who know the answer raise their hands.
 - \circ The lead chooses someone to answer the question and identify what kind of question it is.
 - If the answer is correct and they can identify the kind of question of it is, that person becomes the new lead and starts this process over again.
 - If the answer is incorrect, the lead chooses a new student to answer the question until someone gets the right answer.
- Repeat this pattern until students are out of questions.

Break – 10 minutes.

ACTIVITY #2: Watch a Video about AI in Manufacturing - 50 minutes

Answer Questions in the Note-Taking Activity for the Article

- Pass out the Note-Taking Activity for AI in Manufacturing.
- Have students answer the three questions for the article.
- Briefly review their answers.

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Watch the Video and Read the Graphs in the Video

- Tell students they are now going to watch a video that has five graphs embedded in it. It will be about the rise of robots in manufacturing in China.
- Let's review what we know about China and manufacturing from our last unit:
 - What do we already know about manufacturing in China?
 - Hint: How has offshoring impacted manufacturing in China?
 - \circ $\;$ How have labor costs changed in China over the past 15 years?
 - Hint: Remember the Elephant Chart.
 - Why might China be interested in robotics in their manufacturing system?
 - Hint: It has to do with rising labor costs.
- Have students volunteer to read the questions in the Note-Taking Activity for the video.
 - $\circ~$ Explain that they are to take notes on the questions in the Note-Taking Activity as they go along.

- Watch the video and stop at the appointed times to discuss the graphs.
- If needed, project each graph overhead at the appointed time.
- For each graph, ask:
 - What is being measured in this graph? (Look at the key.)
 - If it is a line graph, what do the two axes measure?
 - What are some of the measurements?
 - What can you conclude from the measurements in this graph?
 - Give students time to write down three important facts on the graph in their Note-Taking Activity sheet.
- When the video is over, put students in pairs to review and fill in more information for their answers.
- Review the answers to the Note-Taking Activity, asking different pairs:
 - How did you answer this question?
 - Asking other pairs:
 - Is this the right answer?
 - Is there anything you would like to change or add?
- Lastly, ask:
 - What is your response to the question posed at the end of the video?
 - "What do you think are the pros of robots taking on more work?
 - What are the cons of robots taking on more work?"

HOMEWORK

JOURNAL WRITING: Have students write two pages in response to the following prompts:

- What do you think about robots taking on more work?
- What could be the pros of this happening?
- What could be the cons?

RESEARCH: Assign students to find an article in a newspaper, magazine, or on-line that provides facts or examples about the Internet of Things. Choose a reading that you find interesting and comfortable reading. Write down the name of the article; read and annotate the article; and then, jot down a list of your facts or examples.

Students should be prepared to hand-in their annotated article and the list of their facts or examples in the next class.

Robot prices have fallen in comparison with labor costs.

Cost of automation

Index of average robot prices and labor compensation in manufacturing in United States, 1990=100%



Source: Economist Intelligence Unit; IMB; Institut für Arbeitsmarkt- und Berufsforschung; International Robot Federation; US Social Security data; McKinsey analysis

McKinsey&Company

Effects of Automation on Manufacturing

Adapted and paraphrased from original source: <u>https://www.productionmachining.com/columns/the-effects-of-automation-on-manufacturing</u>

Original Author: Jonathan Grigg

American manufacturing has weathered some dark times over the last few decades, but recently it has been making a comeback. Part of its success can be attributed to the rise we are seeing in automation, robotics and advanced manufacturing. Today, manufacturing, machine tools and automation go hand in hand.

With the labor force in manufacturing declining and with rising wages in the U.S., many manufacturing companies turn to other countries for their production needs. But automation is slowly changing that mindset and the ability for U.S.-owned companies to be competitive. Automation in manufacturing is no magic wand, but it can certainly level the playing field. Companies that are not currently using automation in their manufacturing processes should definitely be considering it.

What exactly is automation? How is it helping our industry? How can it help you? Automation is defined as the use of largely automatic equipment in a system of manufacturing processes.

Many people think of automation on a large scale; historically, that would be in environments such as the big three (Ford, Chrysler and GM). But automation can be added to machine tools in many other, more affordable ways as well.

- A shop can start with basic automation such as adding a bar feeder to a lathe and build from there, or perhaps all the way to a complete, automated cell that handles the part from start to finish.
- Automation can include robots that load and unload machines that are mounted to the machine tool. Conveyors can move material from one place to the next with flip or turn stations that rotate a part for the next operation.

The bottom line is that by automating a production facility, a shop can increase production, reduce cycle times, improve quality, reduce manufacturing lead times, create a safer workplace and become more competitive.

But certain challenges should be considered when automating a shop. Some of these concerns include floor space, cost, deciding what to automate, finding skilled employees and employee resistance to change.

Generally, the benefits of using automation outweigh the challenges, especially when it can increase efficiency and production. It's realistic to see up to a 30-percent increase in

production by using automation in the manufacturing process. A more efficient production process gives way to increased output making manufacturers in the U.S. more competitive. The Association for Advancing Automation stated in a "60 Minutes" segment entitled "March of the Machines" that American manufacturing's embrace of robotics will ensure a new manufacturing golden age in this country. I happen to believe this to be true, and I think manufacturers are embracing robots and other automated technology.

On the other hand, some employees may feel like they will lose their job because of automation. This fear is far from being true, as automation opens the door to employee advancement to new positions. For example, because manufacturers are relying on more and more automation in the production process, there is a new demand for skilled maintenance and service technicians. When equipment fails, it needs to be back up and running as quickly as possible.

Matt Highfield, a director at Deloitte Consulting LLP who specializes in global location strategy, makes a valid point when he says factories of the future are going to be "lower touch" and more automated. They will have higher costs on equipment with lower labor costs, which will also translate to higher skills and higher paying jobs. In theory, those factories will be more efficient and will be able to produce more, as more automation is introduced.

Today, almost 56 percent of global companies do some type of automation. Automation has made us stronger, faster and more competitive and future possibilities are limitless. Now is the time to decide—is automation right for you? I say yes.

PREPARE FOR QUESTION AROUND

Talk to your partner and come up with questions. Make sure you and your partner have at least one question in each category.

THE 4 QUESTION TYPES	YOUR QUESTIONS
Right there is a question whose answer is right there in the text; all the reader has to do is copy it down or repeat it.	
Pulling-it-together is a question whose answer is in the text, but the reader has to pull it together from different parts of the text- he or she cannot simply copy it from one place.	
Author and me is a question whose answer is not in the text. The reader has to use the information in the text and his or her own knowledge to figure out the answer. In other words, the author provides some of the information, but does not provide the answer itself; the reader has to infer meaning from the text.	
On my own is a question whose answer is not in the text. The reader has to read the text, however, to make an informed answer on his or her own.	

NOTE-TAKING ACTIVITY FOR AI IN MANUFACTURING

Take notes on *The Effects of Automation on Manufacturing* article and on the video: *The Robot Revolution: The New Age of Manufacturing* to answer the questions below.

QUESTIONS	NOTES	
Article: The Effects of Automation on Manufacturing		
1. What are the benefits of automation?		
2. What are some concerns about automation the author brings up?		
3. What new employment opportunities have come about because of automation?		

Video: The Robot Revolution: The New Age of Manufacturing		
4.	Graph #1: Industrial Robot Shipments (01:03)	Facts from the Graph:
5.	Why are robots becoming so much more valuable to manufacturers?	
6.	How are co-bots different from other industrial robots?	
7.	Graph #2: Human and Machine Collaboration (03:44)	Facts from the Graph:
8.	Which is more efficient: humans only, robots only, or humans and robots working together? Why?	
9.	How much has the Chinese market in robots grown? Why?	
10	. Graph #3: Median Age in China (05:14)	Facts from the Graph:

11. Graph #4: Increase in Salary in China (05:59)	Facts from the Graph:
12. How many jobs were lost when Rapoo brought in robots?	
13. Does the CEO think this is a problem? Why or why not?	
14. Graph #5: China Workforce	Facts from the Graph:
15. What is the fastest growing sector in China?	
16. What choices do we have to make about robotics in the coming years? Why?	

Industrial Robot Shipments



Human and Machine Collaboration



Median Age of the Population in China



Annual Salary of Urban Employee in China



NATIONAL BUREAU OF STATISTICS OF CHINA

China Workforce Percent by sector 2006-2016



THEME: Introduction to the Internet of Things

Students will define the Internet of Things using their homework research; read, annotate, and discuss an article on the Internet of Things for home and office; and do the Request exercise. Students then watch a video that shows all the features of an IoT system of the future for home and office. Lastly, students discuss and write about the pros and cons of such new systems.

MATERIALS

For Activity #1:

• Handout (attached): Make one copy for each student. You Can't Avoid the Internet of Thinks Hype, So You Might As Well Understand It

For Activity #2:

 Video: Life Simplified with Connected Devices (running time: 05:37) <u>https://www.youtube.com/watch?v=NjYTzvAVozo</u>

<u>Homework:</u>

- Handout (attached): The class will need to be divided into five groups and each group will get a different one of the "5 Ways". The number of each section will depend on the size of the class.
 5 Ways the Internet of Things Will Change the Ways We Live and Work the sub-articles:
 - 1. Cities: Goodbye Gridlock
 - 2. Transportation: Planes, trains, shipping lanes
 - 3. Healthcare: Fit (and you know it)
 - 4. Energy: Power to the People
 - 5. Agriculture: Grain Expectations
- Video: The Future of the Internet (running time: 06:36) https://www.youtube.com/watch?v=E1CHWJ6ZY4c
- Handout (attached): Make one copy for each student. Note-Taking Activity for The Future of the Internet

ACTIVITY #1: Read an Article on the Internet of Things - 60 minutes

Journal Writing Check-In

- Write the following homework writing prompts on the board:
 - What do you think about robots taking on more work?
 - What could be the pros of this happening?
 - What could be the cons?
- Draw two columns on the board with the headings: pro and con.
- Ask students:
 - Do you think that inclusion of robots in the workplace is a positive or negative development?
- Group students by pro or con.

- Put students in like-minded pairs to list out the reasons for their opinions.
- Let the "pro" pairs go first, each stating one reason at a time.
 - Record these pros in the pro column.
- Repeat this process with the "con" pairs.
- Lastly, ask:
 - Which of the arguments on the pro side do you think are strongest? Why?
 - Which arguments on the con side are strongest? Why?

Internet of Things (IoT) Homework Research

- Have students get out their research on the IoT.
- Put two columns on the board with the headings: Facts about IoT and Examples of IoT.
- Go round robin for each student to add one new fact or example to the lists accumulating on the board. Ask each student:
 - Do you have a fact or example to add?
 - Continue going from student to student until you have collected what they have to offer.
- Lastly, ask:
 - What new questions do have about IoT?
 - How do you think IoT might change our everyday lives?
- Collect these annotated articles and lists of facts after students have shared the information with the class. Please also note down that they completed this homework before hand them back as convenient.

Read, Annotate, and Discuss

- Tell students they are now going to read an article that talks about what IoT is and what needs to happen to make IoT a reality.
- Pass out the article You Can't Avoid the Internet of Thinks Hype, So You Might As Well Understand It.
 - Have students annotate the article using the following guide:
 - Underline facts about IoT.
 - Double underline examples of IoT.
 - Put a ? next to things you don't understand.
- Give students time to annotate their drafts.

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Do the Request Exercise

- Put students in pairs to:
 - Make a list of IoT facts and IoT examples.
 - Create a list of five questions they know that answers to quiz their classmates with.
- Ask: Who wants to be the first lead? Then tell students to follow this pattern:
 - \circ The lead asks a question he/she knows the answer to.
 - \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 starts this process over again.
 - If the answer is incorrect, the lead chooses a new student to answer the question until someone gets the right answer.
 - After each question is answered:
 - Ask if there is a fact or example that can be added to the list on the board.
 - Add these to the two columns as appropriate.
- Repeat this pattern until students are out of questions.
- Lastly, ask:
 - What are the four reasons the IoT has not been fully implemented yet?

Break – 10 minutes.

ACTIVITY #2: Watch a Video on IoT and Write About the Pros and Cons of IoT in Our Future - 50 minutes



- Tell students they are going to watch a video about IoT in the home; they should consider whether IoT is positive or negative.
- Draw two columns on the board with the headings: IoT Pros and IoT Cons.
- Ask students what they think the pros might be and fill in their ideas in the "loT Pro" column.
- Repeat for the "IoT Cons" column.

Watch the Video

- Tell students that this video demonstrates IoT features in the process of being developed for the home and office.
- While they watch the video, they should write down five (or more) aspects of the IoT home that surprised them.
- Watch the video.
- Have students talk to two other students to find out what aspects of the home and office IoT systems were surprising. Encourage students to add to their lists.
- Have students share their surprises with the class.

Add to the List of Pros and Cons

- Ask students these discussion questions to help them develop new pros and cons for their lists on the board:
 - What kinds of IoT features do you think would be great in your life?
 - What kinds of IoT features do you think would not be useful?
 - Who do you think will have access to IoT and who do you think will not?
 - What might be the effects of some having IoT systems and some not?
- Lastly, ask:
 - What pros would you like to add to the list on the board?
 - What cons?
 - Which of the arguments on each side do you think are strongest? Why?

Journal on You Opinion on the Impact of IoT

- Write the following writing prompt on the board:
 - What is your opinion:
 - IoT will be beneficial for society because _____?
 - IoT will not be beneficial for society because _____?
- Give students 15 minutes to respond to this prompt.

Assign Homework Readings

- Tell students they are going to each read a short piece that describes how IoT is being implemented in a number of industries. This will give information about how big the industry is and get them thinking about how IoT might be impacting manufacturing.
- Put students into five groups.
- Give each of those groups one of these sections of the article:

- 1. Cities: Goodbye Gridlock
- 2. Transportation: Planes, trains, shipping lanes
- 3. Healthcare: Fit (and you know it)
- 4. Energy: Power to the People
- 5. Agriculture: Grain Expectations
- Explain that they must use the following annotation strategies while reading:
 - Underline the facts about IoT.
 - Double underline the examples of IoT the article provides.

HOMEWORK

READ: Have students read 5 Ways the Internet of Things Will Change the Ways We Live and Work as described above.

WATCH: Watch the video *The Future of the Internet* (running time: 06:36) and answer the questions in the related Note-Taking Activity to bring in for next class.

TEACHER PREPARATION NOTE

Prior to the next lessons, review the video, *How it Works: The Internet of Things*, and be prepared to answer the questions in the Note-Taking Activity and lead a discussion on the video in the next class.

You Can't Avoid the Internet of Things Hype, So You Might As Well Understand It

Adapted and paraphrased from original source: <u>http://www.digitaltrends.com/home/heck-internet-things-dont-yet/</u>

Original author: Geoff Duncan

For pretty much anyone in the Western world, the Internet is everywhere; it's practically *inescapable*. Between phones, tablets, PCs, game consoles, televisions and settop boxes, the Internet exists in every corner of our lives. Almost.

After the 2014 Consumer Electronics Show (CES), we're hearing louder and clearer than ever that the future is "The Internet of Things," everyday devices equipped with sensors and connectivity to work together, understand what we're doing, and operate automatically to make our lives easier. And, of course, we'll be able to control it all, likely with our tablets and smartphones, or by speaking. After all, Siri and Google Now have taken voice recognition mainstream.

But beyond a well-meaning concept that promises to deliver us all to an even higher state of connectivity, what does the Internet of Things mean? When will it finally arrive? How will it change our daily lives? What happens when it goes wrong?

The big idea

At a very basic level, "Internet of Things" means devices that can sense aspects of the real world—like temperature, lighting, the presence or absence of people or objects, etc. — and report that real-world data, or act on it. Instead of most data on the Internet being produced and used by people (text, audio, video), more and more information would be produced and used by *machines*, communicating between themselves to (hopefully) improve the quality of our lives.

Smart devices use Internet technologies like Wi-Fi to communicate with each other, your laptop, and sometimes directly with the cloud. Some also talk to a central hub that serves as an information station for many different devices.

That's all pretty abstract, so let's bring it down to Earth. The classic example is a smart refrigerator that can read RFID tags on grocery items as they're put inside, then look up those tags via the Internet to identify milk, eggs, butter, and those four frozen pizzas you just bought. The fridge tracks usage, then—cue trumpets!—alerts owners when they're running out of groceries or need more food since people are coming over to watch the game this weekend. (The fridge can tap into your calendar, of course.) The refrigerator could even place a grocery order automatically to a grocery delivery outlet. Similarly, that smart fridge could warn about products nearing (or past) their expiration dates.

In theory, extending these ideas to things like pantries, closets, and medicine cabinets is simple. Seniors and others could benefit from smart medicine cabinets that track meds, order refills, and even alert physicians if something's amiss. And just think: A bathroom cabinet that lets you know when it's running low on toilet paper could be worth its weight in gold. Smart closets could help you manage your clothes with reminders when you *really* ought to do laundry (you've got two pairs of clean socks left!), or take things to the dry cleaners, or even say goodbye to some items you never wear.

Can't remember whether you need to buy toothpaste? Ask your house.

The Internet of Things concept lends itself to fantastic ideas. What if your house could save you effort by recognizing that you're at a drugstore and automatically sending a list of things you need? Stuck out of town on a business trip? Tell your house to stay in vacation mode, turning lights on and off to make the place look lived-in, but not running up heating and cooling bills.

Device-to-device communication creates other possibilities. Simple motion sensors can detect people moving around the house, turning lights on and off, opening or closing blinds or drapes, or even adjusting temperature. This functionality is already so refined that many sensors are reasonably "pet immune," so dogs and cats don't trigger automated functions. Got an important phone call and left the TV on? The house could turn the TV off (to save power) but leave the DVR running. Sensors in a bed (or an alarm clock) could notify other devices when you wake; in turn, they could open drapes, start the coffeemaker, and discretely turn on the TV in the breakfast nook for news, weather, and traffic. When the clothes dryer finishes, maybe an alert appears on your TV so you can grab items before they wrinkle. If it's dark outside, a sensor in your front door lock could turn on the inside lights *before* you step inside—after all, cars have been doing things like that for decades.

Why aren't we there yet?

If there are so many smart devices, why aren't we all living in the home of the future? Lots of reasons.

First, RFID tagging of items like groceries, clothes, and medicines hasn't trickled down to consumers—and probably won't anytime soon. Even if items are tagged, there's no simple way to look them up. Without the ability to easily and accurately identify items, many smart appliances (like refrigerators) are pretty dumb. For instance, even the latest smart fridges demonstrated this year at CES make users track food items by scanning receipts or barcodes with their phones. That makes keeping track of household items for smart devices a fiddly chore—the kind of annoyance the Internet of Things is supposed to *eliminate*, not create.

Second, most "connected home" products have to be all from the same company to work right. Good luck getting your Samsung refrigerator, Whirlpool washer, Nest thermostat, Sears dishwasher, and ADT home security system to talk to each other. Noted technologist Jean-Louis Gassee calls this the "basket of remotes" problem—sure, there are ways to get (some) devices (kind of) working together, but it's too much hassle for most people — like programming a universal remote. Until connected home technology works simply and stays out of our way, having a workable connected home system means tying ourselves to just one system or brand.

However, there is some room for having different brands talk to each. The AllSeen Alliance is creating a universal, open-source framework to enable the "Internet of Everything." If this standard gains traction, the open-source framework might solve the "basket of remotes" problem.

Third, home appliances don't turn over at the same rate as smartphones, tablets, or even PCs. People don't replace refrigerators and other home appliances very quickly. Tablets may have killed off netbooks in just a few years, but it will take far longer for smart appliances to migrate into many people's lives.

Fourth, the "Internet of Things" brings a multitude of privacy and security issues. Although recent reports of smart refrigerators sending spam are likely exaggerated, an "Internet of Things" is also an "Internet of Things That Can Be Hacked." Smart-home devices will know a great deal about our personal lives, from our schedules to shopping habits, appointments, what medicines we take, and even what room we're in. That makes the privacy issues enormous. We might think twice about what our homes know about us, not just what we post to social networks.

Wait and see

There's little question the "Internet of Things" will eventually be enormous: IDC anticipates 200 billion connected devices by 2021, with more than 30 billion being autonomous devices. Using Internet technology to make our homes and devices smarter is easy to understand but is also a very *large* endeavor that will take a lot more time—after all, we've already been at it over a decade.

5 ways the Internet of Things will change the way we live and workthe sub-articles

Adapted and paraphrased from original source: <u>https://www.theglobeandmail.com/report-on-business/rob-magazine/the-future-is-smart/article24586994/</u>

Original Author: Alec Scott



Cities: Goodbye gridlock

More than half of the world's people now live in urban centers, and almost two-thirds of us will do so by 2050—which means 2.5 billion more city-dwellers to house, employ and transport. That's a nightmare for today's cities, overwhelmed by traffic, smog, crime, overflowing trash bins and inefficient lighting that uses between one-quarter and half of city's electricity budgets. But technologies being tested right now will help the cities of the future better cope with the increasing number of people moving to looming cities.

Stoplights with embedded video sensors can adjust their green and red lights according to where the cars are and the time of day. They're a double-win, reducing both congestion and smog, since vehicles idling at red lights burn up to 17% of the fuel consumed in urban areas.

In Barcelona's Born Market, sensors embedded into parking spaces send real-time information on empty spots to an app for would-be parkers. Siemens recently gave a grant to a start-up company devoted to building parking drones that could guide cars to available spots. These drones will help to decrease congestion that is caused by drivers cruising the streets in search of a place to park by up to 30%.

Tel Aviv, a large city in Israel, is tackling traffic on busier roadways by reserving one lane for buses, shuttles, taxis and car poolers—and allowing impatient and wealthier commuters to use the designated lane, as well. Sensors in the asphalt pick up the car's license plate number and automatically charge the owner's credit card at a rate that varies depending on how busy the road is.

Smart LED streetlights in San Diego turn on only when a pedestrian or vehicle approaches—the city recently replaced 3,000 old streetlamps with sensor-equipped ones to save an estimated \$250,000 a year. San Diego has replaced 3,000 old streetlamps with smarter LED ones. Savings: about \$250,000 per year. The British, in an effort to deter stop

vandalism, are testing a lamp that comes on extra-bright when it detects all kinds of mischief and is armed with cameras that transmit have a live video feed to the cloud.

Philadelphia and Chicago have invested in \$4,000-apiece solar-powered garbage cans (called Big Bellies) that crush waste and send a message to a dispatcher requesting pickup when they're full. Philadelphia has been able to reduce the number of weekly garbage-collecting shifts from 17 to just three, and have saved \$1 million a year on fuel, maintenance and labor costs.


Transportation: Planes, trains, shipping lanes

The airline industry has always been slow to adopt new technologies—America's air traffic control system, for instance, still runs on older computer systems built in the 1970s. And it's understandable, to some degree: the consequences of a technological glitch can be particularly dangerous when we're talking about airline traffic 30,000 feet up in the air. But the fact that the technology to prevent tragedies like the Germanwings crash (Germanwings is the name of a low-cost German airline)—in which a mentally disturbed co-pilot locked out the captain and deliberately flew the plane into the side of a mountain the French Alps—already exists makes it all the more senseless. Airplanes have long been equipped with sensors that collect data on fuel efficiency, altitude, location and maintenance issues. But that data has typically only been analyzed after the aircraft lands. With advances in connectivity and data processing software, there's no reason it can't be sent off to sophisticated computers and analyzed mid-flight, helping air traffic controllers to correct all kinds of flight problems while the plane is still in the air.

But change is coming, slowly. Sensors in an aircraft's engines can now detect and isolate developing problems—in part by measuring the temperature of a jet engine's exhaust—and communicate those to both pilots and ground crews while the plane is still in the air. On the efficiency side, GE has developed a tool that measures fuel use inflight and subtly moves the wing flaps (among other things) to reduce unnecessary drag. The technology helped Alitalia Airlines reduce fuel consumption by 1% in a year. With industry-wide spending on fuel at around \$30 billion annually, even such small savings can add up.

The rail business, too, is slowly chugging toward modernity. Britain's Network Rail Telecom and Cisco are in the process of installing sensors in and beside railroad tracks to send information to a centralized command center about whether they need maintenance or are threatened by weather conditions like landslides or flooding. This will reduce the estimated 1.3 million hours currently spent on rail inspections.

New York commuters have the Internet of Things to thank for shorter commutes. The city's subway line recently installed tracks and trains that can pinpoint location with far more precision than before. Because smart tracks know exactly where the trains are, gaps between trains don't need to be as large, allowing more trains to run on a busy route—up to 26 trains per hour, instead of only 15.

The shipping industry is modernizing, too. Germany's main port has faced difficult

problems in recent years. Many of the 550 trucks that arrived at the port each day were sitting in long lines for hours or parking in residential neighborhoods near the port, since port-side spots were scarce. With 10,000 ships unloading there each year, too many arriving at once jams the small harbor. Now, thanks to a project with Cisco and SAP, the ships and many of the nine million containers moving through the port transmit (and constantly update) their precise arrival times, so trucks can arrange pick-up and drop-off of freight without waiting. Truckers can even book parking spaces remotely, so they don't have to drive around looking for spots.



Health care: Fit (and you know it)

Technology designed to help older people live at home longer is becoming a larger industry. Sensors can tell if the physical condition of elderly people living at home has worsened and then communicate that at once to their health care teams. Philips—best known for light bulbs and electric toothbrushes—has created a pillbox that pops open when it's time to take medications and sends a message to a family member or nurse confirming that the individual has taken them.

Their sensors can be specially refined, like ones used to monitor premature babies. Since sensors can't be placed directly on delicate skin, they instead use high-definition cameras to monitor skin color, breathing and temperature and alert nurses of any changes. These devices will eventually help doctors and nurses care for and monitor more patients both at home and in hospitals. Smart beds now being used at New York-Presbyterian Hospital can tell immediately if a patient has gotten up and let the nursing station know.

The average cost of a sensor will fall from about 50¢ now to 38¢ by 2020. There's also the booming market for fitness trackers like Fitbit, Apple Watch, Suunto and others, with over 84 million sold so far. These trackers measure heart rate, sleep patterns, diet, exercise and more, and send data to mobile apps. Soon, that information could be sent directly to a health care provider, which will show them that you exercised four times a week and always take the stairs. A U.S. insurance company, John Hancock, is offering clients a discount if they share data that proves they lead a healthy lifestyle.

Energy: Power to the People

The power grid was designed to deliver power on an as-needed basis—a challenge, given that demand varies by time of day, by weather and by season. A heat wave, a blizzard—heck, even an Academy Awards broadcast—can all put stress on this old system. To meet sudden spikes in demand, backup power stations and generators must be ready to provide more power, using up even more resources. It is far from efficient.

The basic theory behind the so-called *Smart Grid* is simple: Power is priced on the basis of demand, and this information is transmitted immediately to smart meters, thermostats and appliances so that they can draw the power they need at off-peak times, when it's cheapest.

Pilot or experimental programs in Italy and Texas have demonstrated that the *Smart Grid* can work across large countries or areas. The U.S. has set 2030 as target to implement the *Smart Grid*.

For now, energy meters are simply transmitting time-of-day usage directly to the utility company. But the meters could, in the future, receive information on pricing and the demands placed on the system, and operate accordingly.

Power lines and pipelines are getting high-tech upgrades, too. Data collected by sensors in the power lines can be analyzed to detect maintenance problems. And predictive software can anticipate which trees are most likely to fall and take down power lines. Cisco builds pipelines lined with sensitive fibers that can sense leaks and radio for help right away.

The growth of renewable energy sources, like wind and solar power, also depend on a *Smart Grid*. By next year, according to the International Energy Association, renewable energy will replace natural gas as the world's second-largest source of power (coal is the top). In Canada, wind and solar energy are the fastest-growing sectors. While they are better for the environment, they put pressure on the grid, since the energy generated by solar and wind farms varies by time of year and day.

Solar panels and wind turbines on wind farms can now communicate the amount of power they're generating. However, work still needs to be done to integrate the energy they generate into the power grid and to find a way to store extra energy when the grid does not need it.



Wind turbines on a wind farm.



Agriculture: Grain expectations

Despite the beautiful image we might have of a family farm, farmers have always been quick to adopt technology—after all, anything that can increase their production is a good thing.

These days, many farmers walk their fields with GPS-enabled smartphones in their hands, loaded with agriculture-related apps. And with farms getting larger—the average farm in the United States has doubled in the 25 years—farmers (or the huge corporations that own these operations) have been quick to use data-gathering, Internet-linked devices.

New machines from John Deere can plow, sow and reap as well as collect valuable data, including air and soil temperatures, moisture, wind speed, humidity, solar radiation and rainfall. Watering systems with smart data sprinkle just the right amount of water on the fields and can detect leaks in water pipes, which is essential in dry and drought-affected regions like California. One company has developed a sensor that can detect high counts of a particular pest and then release the chemicals that disrupt their mating rituals, which can reduce the need for pesticides. Even cows are now transmitting bits of data: A European company has created sensors that can tell farmers which animals are in heat, pregnant or ill.

NOTE-TAKING ACTIVITY FOR THE FUTURE OF THE INTERNET

Take notes on the video: *The Future of the Internet* to answer the questions below. The link is: <u>https://www.youtube.com/watch?v=E1CHWJ6ZY4c</u>

QUESTIONS	NOTES
1. How many people are not on-line now?	
2. How recently were Facebook, Google, YouTube, Wikipedia, and Twitter created?	
3. What is the Google Loon project and what will it change?	
4. How many objects could be on-line in the near future?	
5. What is an interplanetary Internet?	

THEME: The Internet of Things in Manufacturing

Students who read the same article for homework will work with each other to present key information to the class, so everyone gets information about the way IoT is impacting many areas of our lives. Students will then watch a video and read on article on the ways IoT is impacting manufacturing specifically.

TEACHER PREPARATION

Prior to class, review the video, *How it Works: The Internet of Things*, that was given for homework and be prepared to answer the questions in the Note-Taking Activity and lead a discussion on the video in class.

MATERIALS

For Activity #1:

• Classroom Resource: Flip chart paper and markers.

For Activity #2:

- Video: How to Benefit from Predictive Maintenance (running time 2:53) <u>https://www.youtube.com/watch?v=BzHg11QmEwl&frags=pl%2Cwn</u>
- Handout (attached): Make one copy for each student. How the Industrial Internet of Things Is Changing the Face of Manufacturing
- Handout (attached): Make one copy for each student. HSE-Type Questions: How the Industrial Internet of Things Is Changing the Face of Manufacturing
- Teacher Resource: HSE Answers: How the Industrial Internet of Things Is Changing the Face of Manufacturing

Homework:

- Handout (attached): Make one copy for each student. HSE Question Analysis Assistant
- Handout (attached): Make one copy for each student. HSE-Type Answers for: How the Industrial Internet of Things Is Changing the Face of Manufacturing
- Handout (attached): Make one copy for each student. Note-Taking Activity for How It Works: The Internet of Things
- Video: How It Works: The Internet of Things (running time: 03:38) https://www.youtube.com/watch?v=QSIPNhOiMoE

ACTIVITY #1: Report on Homework Articles - 60 minutes

Work In Groups to Prepare a Presentation

- Tell students they are going to share out on their homework readings, so the whole class can understand many of the ways the IoT is impacting our lives.
- Put students into groups based on who read the same article.
- Draw two columns on the board with the following headings: Important Facts and Examples.
- Tell students that they are to come up with a presentation that has these two columns on a piece of flip chart paper that will clearly communicate the most important elements of what they read for homework.
- Have each group:
 - Make a list of important facts from the reading.
 - Make a list of important examples from the reading.
 - Choose the most significant facts and examples that will help the rest of the class understand how IoT affects the area you read about.
 - \circ $\;$ Put together a flip chart paper using the columns on the board.
 - Ensure each student in the group has a role in the presentation.
- Give students time to prepare their presentations.

Give the Presentations

- Allow each group to give their presentations.
- After each presentation, ask:
 - Do you have any questions for the presenters?
 - How would you summarize the impact of IoT in the area on our lives?

Review Questions for Note-Taking Activity for The Future of the Internet Video

- Tell students they will now review the Note-Taking Activity.
- Have the class answer each question on the Note-Taking Activity sheet. After each answer, ask:
 - Does anyone have something to add to this answer?
- Lastly, ask:
 - What do you think of a world that has all people and all objects on-line?
 - How do you think this will make the world better?
 - What are your concerns?

Break – 10 minutes.

ACTIVITY #2: Read an Article on IoT in Manufacturing - 50 minutes



Predict How IoT is Impacting Manufacturing

- Tell students, now that you have a sense of just how many objects will be connected through the Internet of Things, let's turn our focus to impact IoT might have on manufacturing.
- Ask:
 - Based on what you know about IoT in other sectors, what kinds of changes do you expect to see in manufacturing?
 - How might the IoT impact people's jobs?
 - Record students' predictions on the board.

Watch a Short Film as an Example of IoT in Manufacturing

- Tell students they are now going to watch a short video that shows clearly how the IoT will impact one kind of job.
- Draw two columns on the board with the headings: Tom's work before IoT and Tom's work after IoT
- Have students watch the film and take notes on each of these topics.
- Ask students:

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- What was Tom's work like before IoT?
 - Take notes on student answers in the appropriate column on the board.
 - What was Tom's work like after IoT?
 - Again, take notes in the appropriate column on the board.
- How has loT improved Tom's work?
- Lastly, ask:
 - Does this video give you ideas for other predictions you want to make about IoT in manufacturing?
 - What are they?

Read, Discuss, and Annotate an Article

- Tell students they are going to read an article about IoT in manufacturing. After students annotate and discuss the article, they will complete HSE-type questions in preparation for the test.
- Pass out the article How the Industrial Internet of Things Is Changing the Face of Manufacturing.
- Instruct students to use their Annotation Key as their guide while annotating the article.
- While students are reading, write the following instructions on the board.
 - Of those things that you underlined, what are the most important points in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with? Disagreed with?
- Come together as a class and ask the questions on the board, allowing students to present their different responses to the class.
- Ask:
- Who is the audience for this article?
 - How do you know?
- What is the thesis of the article?
 - What is the strongest evidence?
 - Ask students to use "According to" language and quotes as needed.

Complete HSE-Type Questions

- Pass out the HSE-Type Questions and have students answer them.
- Assign different students the questions on the test to report on for next class. Aim for one or two
 questions per student. If you have a large class, you can assign a single question to several students.
- Pass out the HSE Question Analysis Assistant.
- Have students read it out loud.
- Pass out the HSE-Type Answers for: How the Industrial Internet of Things Is Changing the Face of Manufacturing.
 - \circ Tell students they can use this to check their work.
- Tell students they will be presenting their analysis of their assigned question during the next class using this "Assistant" as their guide.
- Also, pass out the Note-Taking Activity and review the instructions for the video homework.

HOMEWORK

PREPARE: Have student prepare an analysis of assigned HSE-type questions. They should be prepared to tell the class: What do you think is the right answer to your assigned question and what was the process you used to get to the answer?

WATCH AND WRITE: Have students watch the homework video and take notes to answer the questions in the Note-Taking Activity.

How the Industrial Internet of Things Is Changing the Face of Manufacturing New networks could reduce maintenance costs and make workplaces safer

Adapted and paraphrased from original source: <u>http://theinstitute.ieee.org/technology-topics/smart-technology/how-the-industrial-internet-of-things-is-changing-the-face-of-manufacturing</u>

Original author: Kathy Pretz



Photo-illustration: iStockphoto

Manufacturing is undergoing a digital revolution. All types of machinery—old and new are being embedded with sensors, switches, and controls to generate data and send it over the Internet, all to make factories operate smarter. It's the industrial Internet of Things (IIoT).

A huge amount of useful data is trapped in factory-floor machines. Instead, the data could be used to improve operations, reduce costs, and make for a safer workplace. The ability to predict when a machine needs servicing instead of waiting until it breaks could reduce maintenance costs by about 30 percent and could lead to nearly 70 percent fewer breakdowns, according to an IIoT report from Accenture, an international consulting company.

"The idea behind IIoT is to connect machines, robots, and humans, for example, and use that data to get more value from them together than you can individually," says Anurag Garg, founder of Dattus, a company that helps manufacturing facilities collect, manage, and analyze data from a variety of sources.

"Data from the machines is there because new technologies are able to capture it," says David Durocher, Global Industry Manager for Mining, Metals, and Minerals at Eaton, in Cleveland. "The data around the electronics in the equipment is helping to solve problems in the electrical industry, as well as entire systems."

TRADITIONAL SYSTEMS

Attempts to make factories more intelligent are nothing new. Supervisory Control and Data (SCADA) systems have been on factory floors for years. Through a network, these systems gather data and send it to computers. But these systems don't communicate or "talk" to machines or computers in other departments, like logistics or production, nor is the data that used in any meaningful way.

"Most people think the IIoT is the sensors and data on the SCADA dashboard, but that's just scratching the surface," Garg says. "The value of IIoT comes from what you do with that data."

Imagine an assembly line that can automatically reset itself to produce products in small batches because it can be connected to other systems that include sales, inventory, and delivery.

"Companies have always had access to the data, but they had to develop software to give the data meaning. That took a lot of time and testing," says Robert Fenton, a Product Line Manager at Eaton. Fenton also helps set up IIoT systems for the company's customers. "In the long term the programs were a good idea," he says, "but in the short term, factory owners just wanted to get their processes up and running."

WORTH THE PRICE?

The cost to have a large service provider such as General Electric or Siemens install an IIoT system can be hundreds of thousands or even millions of dollars. But a startup company like Dattus handles smaller installations and charges much less. Manufacturers can also upgrade their equipment themselves with smart sensors and components, or they can buy machines with these features built in.

Eaton, for example, offers on-line sensors that continuously monitor equipment to predict machine failure. Similarly, new sensors on large machines use computer algorithms to detect cracked or broken parts, alerting staff before there's a mechanical failure. Industrial motor control centers also now send technical information and summaries of significant data, which humans can monitor. The idea is to increase productivity by communicating data about how systems are operating; this allows for better company-wide processes and maintenance.

The saving because of the smart devices comes from making operations more efficient and improving workplace safety. A smart device in pumping stations can alert the maintenance staff when there's a problem. That eliminates the need for a worker to routinely drive to each location to check on the machines, he says.

Workplace safety is also enhanced. For example, sophisticated motor protection and management relays can reduce the risk of an electrician being exposed to an electrical explosion. That's because the worker no longer must manually connect instruments to measure power.

HSE-Type Questions: How the Industrial Internet of Things is changing the Face of Manufacturing

- 1. What are the benefits of taking data from machines?
 - a. Reducing costs, improving operations, and no hands-on work
 - b. Safer workplace, fewer employees, and increased productivity
 - c. Newer technology, more predictability, and reduced profit
 - d. Increased worker safety, improved operations, and reduced costs
- 2. What is a digital revolution?
 - a. A revolution that involves the increase in creation of new and different technologies
 - b. A switch from using manual labor to robots and technology in manufacturing
 - c. A change in the way products are manufactured and delivered
 - d. A shift from mechanical and analogue electronic technology to digital electronics
- 3. What is the Industrial Internet of Things?
 - a. The use of internet of things technologies to enhance manufacturing and industrial processes
 - b. The Industrial Internet of Things is just another term for the World Wide Web
 - c. A digital revolution where factories provide energy-efficient solutions that help customers effectively manage electrical, hydraulic, and mechanical power more efficiently
 - d. The Industrial Internet of Things encompasses all social media outlets and active user platforms
- 4. What is the main idea behind IIoT?
 - a. To collect data on such a large scale so that products and marketing can be better utilized by businesses to grow and maintain the consumer base
 - b. To connect independent things such as machines, robots, and humans, and use that intelligence to get much more value from them together than you can individually
 - c. To make human participation in manufacturing obsolete and replace any manual labor with robots and computers in order to increase profits and productivity
 - d. To make factories more intelligent by creating an assembly line of robots that can detect and correct any manufacturing defects

- 5. What do SCADA systems do?
 - a. Monitor workplace productivity in order to create systems that make production as efficient as possible
 - b. Debug and update failing manufacturing computer systems in order to keep up with the latest technology
 - c. Collect user data to better analyze cultural shifts and consumer trends so it becomes easier to manufacture useful goods
 - d. Gather data on the processes, send it on to computers, and issue commands to connected devices
- 6. What is the difference between SCADA systems and IIoT?
 - a. The data that IIoT systems generate is not analyzed in any meaningful way and the system itself does not talk to others
 - b. Companies that use SCADA systems do not have access to data and are not able to develop the software to give data value
 - c. SCADA systems do not talk to other systems and the data that they generate is not analyzed in any meaningful way
 - d. SCADA and IIoT systems are extremely similar with the only difference being the manufacturers who use them
- 7. How expensive are IIoT systems?
 - a. Tens of hundreds of dollars, if not hundreds
 - b. Hundreds of thousands of dollars, if not millions
 - c. Millions of dollars, if not billions of dollars
 - d. Hundreds of thousands of dollars, if not hundreds of millions
- 8. What is an example of increased worker safety as a result of IIOT?
 - a. Assembly line workers no longer risk any injury due to an unsafe environment because robots have replaced them
 - b. Electricians no longer manually connect instruments to measure power, reducing the risk of being exposed to arc flash
 - c. Builders no longer risk equipment malfunctioning because of self-repair systems that have been installed in all tools
 - d. Computer safety has been increased therefore employee information is safer than ever

- 9. How has automation effected the workforce?
 - a. Automation has replaced a large percentage of tech industry jobs
 - b. Automation has made blue collar jobs in a number of industries obsolete
 - c. Automation has caused an upswing in the number of tech related jobs in manufacturing
 - d. Automation has replaced a percentage of blue-collar jobs

HSE Answers: How the Industrial Internet of Things is changing the Face of Manufacturing

- 1. What are the benefits of taking data from machines? Right there
 - a. Reducing costs, improving operations, and no hands-on work
 - b. Safer workplace, fewer employees, and increased productivity
 - c. Newer technology, more predictability, and reduced profit
 - d. Increased worker safety, improved operations, and reduced costs
- 2. What is a digital revolution? On your own
 - a. A revolution that involves the increase in creation of new and different technologies
 - b. A switch from using manual labor to robots and technology in manufacturing
 - c. A change in the way products are manufactured and delivered
 - d. A shift from mechanical and analogue electronic technology to digital electronics
- 3. What is the Industrial Internet of Things? Author and me
 - a. The use of internet of things technologies to enhance manufacturing and industrial processes
 - b. The Industrial Internet of Things is just another term for the World Wide Web
 - c. A digital revolution where factories provide energy-efficient solutions that help customers effectively manage electrical, hydraulic, and mechanical power more efficiently
 - d. The Industrial Internet of Things encompasses all social media outlets and active user platforms
- 4. What is the main idea behind IIoT? Right there
 - a. To collect data on such a large scale so that products and marketing can be better utilized by businesses to grow and maintain the consumer base
 - b. To connect independent things such as machines, robots, and humans, and use that intelligence to get much more value from them together than you can individually
 - c. To make human participation in manufacturing obsolete and replace any manual labor with robots and computers in order to increase profits and productivity
 - d. To make factories more intelligent by creating an assembly line of robots that can detect and correct any manufacturing defects

- 5. What do SCADA systems do? Right there
 - a. Monitor workplace productivity in order to create systems that make production as efficient as possible
 - b. Debug and update failing manufacturing computer systems in order to keep up with the latest technology
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 - SCADA systems do not talk to other systems and the data that they generate is not analyzed in any meaningful way
 - d. SCADA and IIoT systems are extremely similar with the only difference being the manufacturers who use them
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 - c. Builders no longer risk equipment malfunctioning because of self-repair systems that have been installed in all tools
 - d. Computer safety has been increased therefore employee information is safer than ever

- 9. How has automation effected the workforce? On my own
 - a. Automation has replaced a large percentage of tech industry jobs
 - b. Automation has made blue collar jobs in a number of industries obsolete
 - c. Automation has caused an upswing in the number of tech related jobs in manufacturing
 - d. Automation has replaced a percentage of blue-collar jobs

HSE QUESTION ANALYSIS ASSISTANT

1. Look at the question and decide which type it is:

- **Right there** is a question whose answer is right there in the text, all you have to do is copy it down or repeat it.
- **Pulling-it-together** is a question whose answer is in the text, but you have to pull it together from different parts of the text. You cannot simply copy it from one place.
- **Author and me** is a question whose answer is not in the text. You have to use the information in the text and your own knowledge to figure out the answer. In other words, the author provides some of the information, but does not provide the answer itself; you have to infer meaning from the text.
- **On my own** is a question whose answer is not in the text. You have to read the text, however, to form your own answer.

2. Look at the answers and decide:

- Is there one that is clearly not the right answer?
- Is there one that that is a trick answer? Why is it a trick?
- Which answers are close?
- Which one is the right answer? How do you know?

3. Prepare a short presentation that answers the following questions:

- What type of question are you presenting?
- How did you decide it was that type of question?
- What was the process you used to choose the right answer?

NOTE-TAKING ACTIVITY FOR How It Works: The Internet of Things

Take notes on the video: *How It Works: The Internet of Things* to answer the questions below. The link is: <u>https://www.youtube.com/watch?v=QSIPNhOiMoE</u>

QUESTIONS	NOTES
 1. How does the IoT operate to fix a problem in a car? What are all the Internet connections that are made? 	
2. How does this IoT system make things easier for the customer?	
3. How does the information make things easier for the dealer and the manufacturer?	

THEME: Introduction to Big Data

Students will analyze HSE questions from last class, discuss study questions from a homework video, and predict the definition of Big Data. Students will then watch a few short videos to help them add to their definition before they read and analyze a full definition of Big Data.

MATERIALS

For Activity #1:

- 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 (running time: 03:29)</u>

For Activity #2:

- Handout (attached): Make one copy for each student. What is Big Data? A super simple explanation for everyone
- Handout (attached): Make one copy for each student. *Prepare for Question Around*

ACTIVITY #1: Introduce Big Data - 60 minutes

• Tell students they are going to analyze their HSE questions, talk about their homework video, and then introduce the topic of big data. As you will see, big data keeps getting bigger because of developments in social media, the Internet of Things, and Artificial Intelligence.

Present HSE Question Analysis Homework

- Write the three HSE analysis questions on the board:
 - What type of question are you presenting?
 - How did you decide it was that type of question?
 - What was the process you used to choose the right answer?
- If you assigned groups to analyze the same questions, put students in their groups to talk through the analysis they want to present for their HSE question.
- Project the HSE questions and have small groups or individuals come up to present their analysis.
- After each presentation, ask:
 - Do you agree with this analysis?
 - Do have anything you want to add or change?

Discuss Video Homework

- Instruct students to get out their Note-Taking Activity for the video: How It Works: The Internet of Things.
- Put students into pairs to talk through their answers to each question.
- Ask each of the three Note-Taking Activity questions and have different pairs present their answers.

- After a pair has presented their answer, ask:
 - Is there something you want to add or change?

Introduce Big Data

- Tell students they are now going to learn about Big Data.
- Draw two new columns on the board with the following headings: Facts and Examples.
- Ask:
 - What do we already know about Big Data?
 - Take notes on student answers on the board in the appropriate columns.
- Tell students they are going to watch two short videos that might help them expand their definitions. • Explain that they are to take notes on new information that is not listed on the board.
- Watch the first video.
- Ask students:
 - Did you find new information that could help with the definition?
 - Were there any good examples provided in the video?
 - Take additional notes in the appropriate columns.
- Repeat this process for the second video.

Break - 10 minutes.

ACTIVITY #2: Read an Article on Big Data - 50 minutes

Read an Article on Big Data

- Pass out the article What is Big Data? A super simple explanation for everyone.
- Have students get out their Annotation Key and use it while they read the article.
- While students are reading, write the following instructions on the board.
 - Of those things that you underlined, what are the most important points in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with? Disagreed with?
- Put students in pairs to talk about their answers to the questions on the board.
- Come together as a class and ask the questions on the board, allowing pairs to present their different responses to the class.

Prepare for Question Around

- Write the following question types on the board and go over each one:
 - \circ Right There: The answer is right there in the text in one place.
 - Pulling-it-together: The answer can be gathered from information in many parts of the text.
 - Author and me: The text has part of the answer, and the reader has the other part.
 - \circ $\,$ On my own: The text raises these questions but does not answer them.
- Have students come up with examples of questions for each one of these categories: right there; pulling it together; author and me; and on my own.
- Pass out Prepare for Question Around.
- Have a student read the instructions out loud.
- Put students in pairs to write their questions. They should not use the examples on the board.

• Explain that when students ask each other their questions, the student responding must answer the question and identify what kind of question it is.

Conduct the Question Around Activity

- Ask: Who wants to be the first lead? Then tell students to follow this pattern:
 - The lead asks a question he/she knows the answer to.
 - Those who know the answer raise their hands.
 - The lead chooses someone to answer the question and identify what kind of question it is.
 - If the answer is correct and they can identify the kind of question of it is, that person becomes the new lead and starts this process over again.
 - If the answer is incorrect, the lead chooses a new student to answer the question until someone gets the right answer.
- Repeat this pattern until students are out of questions.
- Lastly, ask:
 - Do you think Big Data will improve our lives? How?
 - What about Big Data concerns you most?
 - What are the reasons for your concerns?

HOMEWORK

RESEARCH: Have students find an article in a newspaper, magazine, or on-line that provides facts or examples of concerns about big data. Choose an article that you are interested in and comfortable reading. Write down the name of the article; read and annotate it; and then jot down a list of facts or examples.

Students should be prepared to hand-in their annotated article and the list of facts or examples.



JOURNAL WRITING: Have students complete a journal entry based on the following prompts:

- What about Big Data concerns you most?
- What are the reasons for your concerns?

What is Big Data? A super simple explanation for everyone

Adapted and paraphrased from original source: https://www.bernardmarr.com/default.asp?contentID=766

Original author: Bernard Marr

The term "Big Data" may have been around for some time now, but there is still confusion about what it actually means. In truth, the concept is continually evolving, as it remains the driving force behind many ongoing waves of digital transformation, including artificial intelligence, data science and the Internet of Things. But what exactly is Big Data and how is it changing our world?



The astonishing growth of Big Data

It all starts with the explosion in the amount of data we have generated since the dawn of the digital age. This is largely due to the rise of computers, the Internet and technology capable of capturing data from the world we live in. Data in itself isn't a new invention. Going back even before computers and databases, we had paper transaction records, customer records and archive files – all of which are data. Computers, and particularly spreadsheets and databases, gave us a way to store and organize data on a large scale, in an easily accessible way. Suddenly, information was available at the click of a mouse. We've come a long way since early spreadsheets and databases, though. Today, every two days we create as much data as we did from the beginning of time until 2000. That's right, every two days. And the amount of data we're creating continues to increase rapidly; by 2020, the amount of digital information available will have grown from around 5 zettabytes today to 50 zettabytes.

Nowadays, almost every action we take leaves a digital trail. We generate data whenever we go online, when we carry our GPS-equipped smartphones, when we communicate with our friends through social media or chat applications, and when we shop. You could say we leave digital footprints with everything we do that involves a digital action, which is almost everything. On top of this, the amount of machine-generated data is rapidly growing too. Data is generated and shared when our "smart" home devices communicate with each other or with their home servers. Industrial machinery in plants and factories around the world are increasingly equipped with sensors that gather and transmit data. The term "Big Data" refers to the collection of all this data and our ability to use it to our advantage across a wide range of areas, including business.

How does Big Data work?

Big Data works on the principle that the more you know about anything or any situation, the more reliably you can gain new insights and make predictions about what will happen in the future. By comparing more data points, relationships begin to emerge that were previously hidden, and these relationships enable us to learn and make smarter decisions. Most commonly, this is done through a process that involves building models, based on the data we can collect, and then running simulations, tweaking the value of data points each time and monitoring how it impacts our results. This process is automated – today's advanced analytics technology will run millions of these simulations, tweaking all the possible variables until it finds a pattern – or an insight – that helps solve the problem it is working on.

Until relatively recently, data was limited to spreadsheets or databases – and it was all very ordered and neat. Anything that wasn't easily organized into rows and columns was simply too difficult to work with and was ignored. Now though, advances in storage and analytics mean that we can capture, store and work with many, many different types of data. As a result, "data" can now mean anything from databases to photos, videos, sound recordings, written text and sensor data.

To make sense of all of this messy data, Big Data projects often use cutting-edge analytics involving artificial intelligence and machine learning. By teaching computers to identify what this data represents– through image recognition or natural language processing, for example - they can learn to spot patterns much more quickly and reliably than humans.

How is Big Data being used?

This ever-growing stream of sensor information, photographs, text, voice and video data means we can now use data in ways that were not possible even a few years ago. This is revolutionizing the world of business across almost every industry. Companies can now accurately predict what specific segments of customers will want to buy, and when, to an incredibly accurate degree. And Big Data is also helping companies run their operations in a much more efficient way.

Even outside of business, Big Data projects are already helping to change our world in a number of ways, such as:

• <u>Improving healthcare</u> – Data-driven medicine involves analyzing vast numbers of medical records and images for patterns that can help spot disease early and develop new medicines.

- <u>Predicting and responding to natural and man-made disasters</u> Sensor data can be analyzed to predict where earthquakes are likely to strike next, and patterns of human behavior give clues that help organizations give relief to survivors. Big Data technology is also used to monitor and safeguard the flow of refugees away from war zones around the world.
- <u>Preventing crime</u> Police forces are increasingly adopting data-driven strategies based on their own intelligence and public data sets in order to deploy resources more efficiently and act as a deterrent where one is needed.

Big Data concerns

Big Data gives us unprecedented insights and opportunities, but it also raises concerns and questions that must be addressed:

- <u>Data privacy</u> The Big Data we now generate contains a lot of information about our personal lives, much of which we have a right to keep private. Increasingly, we are asked to strike a balance between the amount of personal data we give out, and the convenience that Big Data-powered apps and services offer.
- <u>Data security</u> Even if we decide we are happy for someone to have our data for a particular purpose, can we trust them to keep it safe?
- <u>Data discrimination</u> When everything is known, will it become acceptable to discriminate against people based on data we have on their lives? We already use credit scoring to decide who can borrow money, and insurance is heavily datadriven. We can expect to be analyzed and assessed in greater detail, and care must be taken that this isn't done in a way that contributes to making life more difficult for those who already have fewer resources and access to information.

Facing up to these challenges is an important part of Big Data, and they must be addressed by organizations who want to take advantage of data. Failure to do so can leave businesses vulnerable, not just in terms of their reputation, but also legally and financially.

Looking to the future

Data is changing our world and the way we live at an unprecedented rate. If Big Data is capable of all this today – just imagine what it will be capable of tomorrow. The amount of data available to us is only going to increase, and analytics technology will become more advanced.

For businesses, the ability to leverage Big Data is going to become increasingly critical in the coming years. Those companies that view data as a strategic asset are the ones that will survive and thrive. Those that ignore this revolution risk being left behind.

PREPARE FOR QUESTION AROUND

Talk to your partner and come up with questions. Make sure you and your partner have at least one question in each category.

THE 4 QUESTION TYPES	YOUR QUESTIONS
Right there is a question whose answer is right there in the text; all the reader has to do is copy it down or repeat it.	
Pulling-it-together is a question whose answer is in the text, but the reader has to pull it together from different parts of the text- he or she cannot simply copy it from one place.	
Author and me is a question whose answer is not in the text. The reader has to use the information in the text and his or her own knowledge to figure out the answer. In other words, the author provides some of the information, but does not provide the answer itself; the reader has to infer meaning from the text.	
On my own is a question whose answer is not in the text. The reader has to read the text, however, to make an informed answer on his or her own.	
THEME: Some Negative Impacts of Big Data

Students will discuss the pros and cons of Big Data and read an article on the intersection of Big Data and American politics. Students will then develop a thesis about the influence of Big Data and work with classmates with similar opinions to present their thesis and the reasons for their thesis.

MATERIALS

For Activity #1:

• Handout (attached): Make one copy for each student. Politicians Are Addicted to Big Data Like It's Campaign Cash

For Activity #2:

- Handout (attached): Make one copy for each student.
 HSE-Type Questions: Politicians Are Addicted to Big Data Like It's Campaign Cash
- Teacher Resource: Make one copy for projection overhead. HSE Answers: Politicians Are Addicted to Big Data Like It's Campaign Cash

Homework:

• Handout (attached): Make one copy for each student, as needed. HSE Question Analysis Assistant

ACTIVITY #1: Big Data and American Politics - 60 minutes

Establish a Definition and the Pros and Cons of Big Data We Already Know About

- Tell students they are going to look at negative aspects of Big Data and then develop a thesis and an argument about why Big Data is beneficial or harmful for our society. But first, they need to list the pros and cons they have learned about big data.
- Draw three columns on the board with the following headings: What is Big Data? Pros, and Cons.
- Ask students while taking notes on student answers in the first column on the board:
 - What is Big Data?
 - Where does it come from?
 - What are some ways it is used?
 - How are AI and the Internet of Things part of Big Data?
 - Hint: Automation powered by AI and IoT work together to create Big Data that then can be analyzed by computers using powerful algorithms.
 - \circ Why should we be aware of how Big Data is being used?
 - Hint: Sensors are being put on everything and invading our privacy.
- Put students in pairs to make a list of the pros and cons.
 - o Instruct students to include the cons they researched as homework in their lists.
- Start with the pro column and go round robin from pair to pair to have each give you one pro.
 - \circ $\;$ Take notes on student answers in the appropriate column.

Review Homework Journal Writing Concerning Cons of Big Data

- Write the following questions on the board:
 - What about Big Data concerns you most?
 - What are the reasons for your concerns?
- Have a number of students volunteer to share the con they wrote about and give reasons for their opinion.
 - \circ Tell students to listen for those reasons they think are particularly convincing.
- Lastly, ask:
 - Which reasons did you find particularly convincing?
 - Why do you think these reasons are convincing?
- Collect these annotated articles and lists of facts after students have shared the information with the class. Please also note down that they completed this homework before hand them back as convenient.

Do a Vocabulary Prep for the Article

- Write the following words on the board:
 - Tactic
 - Digital ads
 - Government regulation
 - RNC/DNC
 - Lobbying
 - Substantive
- Put students in pairs and distribute the words among the pairs.
- Instruct each pair to:
 - Define their word.
 - \circ Put the word in a sentence that clearly demonstrates its meaning.
- Go from word to word on the board and ask:
 - What is the definition?
 - Take notes next to the word.
 - What is your sentence for the word?

K Read, Annotate, and Discuss the Article

- Pass out the article Politicians Are Addicted to Big Data Like It's Campaign Cash.
- Have students get out their Annotation Key and use it while they read the article.
- While students are reading, write the following instructions on the board.
 - \circ Of those things that you underlined, what are the most important points in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with? Disagreed with?
- When students are finished reading, ask the questions on the board and take notes on answers to the first question.
- Lastly, ask:
 - What is the author's thesis?
 - Can you find it stated somewhere?
 - What are the reasons the author gives for her thesis?
 - Do you find these reasons convincing?
 - Why or why not?

Break - 10 minutes.

ACTIVITY #2: Develop a Thesis about Big Data - 50 minutes Develop a Thesis About Big Data

• Draw the following continuum on the board:



Big Data is an amazing development and could really improve society. Big Data has positive and negative qualities; we need to make sure it is used to improve society.

- Big Data is a dangerous development that could have a negative impact on society.
- Ask where the author of the article's thesis fits on this continuum.
 What is their evidence from the article?
- Ask, when they consider what they know about Big Data, where is their own thesis on the continuum?
- Put the students' name along the continuum on the board according to each student's instructions.
- For each student, ask:
 - What are some of your reasons for your thesis?

Groups Discuss and Present Reasons for Their Opinions

- Put students into like-minded groups based on where they fall on the continuum on the board.
- Instruct each group to:
 - State a clear thesis that incorporates the word "because" in it.
 - \circ Discuss and choose some strong reasons for their thesis.
 - Assign each person in the group to either:
 - Present their thesis.
 - Present a reason for their thesis and explain it to the audience.
- Have each group present their thesis and reasons.
- After each presentation, ask:
 - Which reasons in this presentation were especially strong?
 - Why?

Answer HSE-Type Questions and Give Homework

- Pass out the HSE-Type Questions for Politicians Are Addicted to Big Data Like It's Campaign Cash and tell students to answer them.
- Give students their homework:
 - Pass out the HSE Answers and have students check their answers.
 - Tell students they are to pick a question they got right and a question they got wrong to analyze in writing.
 - They are to use the HSE Question Analysis Assistant they used for the last question analysis they did.
 - Pass out an HSE Question Analysis Assistant to students who need another sheet.
 - Tell students to answer the three questions under "Prepare a short Presentation" as the prompts for the written versions of their analysis.

HOMEWORK

WRITE: Have students write one analysis for a question they got right and one analysis for a question they got wrong using the question prompts at the end of the *HSE Question Analysis Assistant*, as explained above.

TEACHER PREPARATION NOTE

Prior to the next lesson, review the video in Activity #1 in order to be able to answer the Note-Taking Activity questions and define the words that are in bold in the Note-Taking Activity, so you can lead an informed discussion.

Politicians Are Addicted to Big Data Like It's Campaign Cash

It's one reason they'll never crack down on Facebook and Google's data collection.

Adapted and paraphrased from original source: <u>http://www.slate.com/articles/technology/technology/2017/10/politicians are addicted to big data l</u> <u>ike it s campaign cash.html</u>

Original author: April Glazer



Photo illustration by Lisa Larson-Walker. Photo by Getty Images.

"Without Facebook, Trump wouldn't have won," said Theresa Hong, one of the main brains behind the Trump campaign's digital efforts. She's right.

Today, data-driven advertising on the Internet is essential to any political campaign. That's especially true for the presidential election, when candidates must reach millions of voters. People use social media all the time; it's one of the main ways Americans get their political information. And when one candidate uses a voter-targeting tactic—buying voter lists, booking local TV spots, buying huge numbers of Facebook ads—other candidates have to do it, too. Without these tools, they risk losing votes.

In the 2016 election, candidates spent more than \$1.4 billion on online advertising. Campaigns and super PACs--money from groups of contributors-- poured money into digital ads that targeted specific groups of people.

For example, women in their 40s with kids who are Christian in the Midwest could receive different ads than a young male teen gamer in New York City—and they did, every time they logged onto Twitter, Facebook, or any website that runs Google ads.

Online ads hit such specific groups and subgroups of people because they rely on data collected from your Internet browsing activity or things you like on Facebook. They also can collect your location, credit card data, personal connections with friends, and other bits of information.

This data collection could be subject to tighter regulations—for example, putting time

limits on how long an individual's information can be held. But, politicians increasingly rely on data-driven advertising and targeting of their voters to win elections. Therefore, it's unlikely that the U.S. will ever adopt privacy legislation or regulation of big Internet platforms (like Google or Facebook).

Meaningful privacy legislation is unlikely to occur even with all the evidence that Facebook, Google, and others' data-targeting tools were used by Russian government–backed forces in their effort to create extreme divisions between Democrats and Republicans, resulting in helping Trump to win the election.

"The Republican National Committee (RNC) and the Democratic National Committee (DNC) have databases that have over 900 points of data on every member of the electorate [or voter]," says Daniel Kreiss, a journalism professor at the University of North Carolina. Much of this data is about things like credit card purchases and grocery card purchases and magazine subscription lists. Information that is bundled with data about political party affiliation and voter turnout to target people on websites like Facebook, Kreiss explained.

To make regulation even less likely, Google is on track to be the largest corporate spender on lobbying in the U.S. this year, and executives from major tech companies are often massive donors to electoral campaigns.

In our most recent election, Trump's campaign spent \$85 million on Facebook alone, according to Hong, who also wrote Trump's Facebook posts. Republicans and Democrats alike are only likely to increase spending on online voter targeting in future elections. That means that no matter how damaging the effects of targeting ads can be, the chances of Congress taking action to regulate them and minimize the harms to our democracy are slim.

HSE-Type Questions: Politicians Are Addicted to Big Data Like It's Campaign Cash

- 1. How powerful is social media in effecting political campaigns?
 - a. Social media does not play an active part in effecting political campaigns
 - b. Social media has turned into the deciding factor when it comes to who wins an election
 - c. Social media is extremely powerful in when it comes to reaching voters
 - d. Social media had very little effect on elections
- 2. What are some different voter targeting tactics?
 - a. Booking local TV spots and buying voter lists
 - b. Sending campaign mail
 - c. Door to door canvasing
 - d. All of the above
- 3. What are the downfalls of getting political information from social media?
 - a. There is too much information and sometimes campaign messages get lost
 - b. The political information might not include important details
 - c. There are only a few candidates using social media as a voter targeting tactic
 - d. Some of the political information on social media may not be true
- 4. How much money did candidates spend on online advertising in the 2016 election?
 - a. More than \$1.4 billion
 - b. More than \$1.4 million
 - c. Less than \$1.4 billion
 - d. Less than 1.4 million
- 5. What kind of data is collected to make sure online ads can hit such subsets of people?
 - a. Credit card data, social security number, birth certificate, travel history
 - b. Browsing activity, your location, credit card data, personal connections
 - c. Things you like on Facebook, Retweets, and email information
 - d. Job history, relationship status, current location, browsing activity, income

- 6. What is an example of tighter regulation of corporate data collection?
 - a. Putting limits on the amount of data that can be collecting by any one corporation
 - b. Limits on how long a user's information can be held by a corporation
 - c. Strict limits on how much data a user can create and distribute to corporations
 - d. Regulation of when data can be collected by a corporation
- 7. What is the likelihood that corporate data collection regulations will be enforced?
 - a. Extremely likely
 - b. Somewhat likely
 - c. Somewhat unlikely
 - d. Very unlikely
- 8. What is lobbying?
 - a. Standing and waiting in the lobby of a government building to talk to an official
 - b. Convincing voters to switch political parties
 - c. Seeking to influence either a politician or public official on an issue
 - d. Calling government officials to tell you think they are doing a good job
- 9. Why is it unlikely that privacy legislation or regulation will occur?
 - a. Because politicians increasingly rely on data-driven advertising and microtargeting to win elections
 - b. Because people do not want their data regulated by the government
 - c. Because privacy legislation has already been put in place and it failed
 - d. Because privacy legislation and regulation are illegal in the United States and bill would never get passed
- 10. What is micro-targeting?
 - a. Targeting different politicians to identify their strengths and weaknesses
 - b. A marketing strategy that uses consumer data to identify the type of products companies manufacture
 - c. Targeting one type of consumer to create a specific product
 - d. The use of consumer data in marketing to identify the interests of groups or individuals

HSE Answers: Politicians Are Addicted to Big Data Like It's Campaign Cash

- 1. How powerful is social media in effecting political campaigns? Pulling it together
 - a. Social media does not play an active part in effecting political campaigns
 - b. Social media has turned into the deciding factor when it comes to who wins an election
 - c. Social media is extremely powerful in when it comes to reaching voters
 - d. Social media had very little effect on elections
- 2. What are some different voter targeting tactics? Author and me
 - a. Booking local TV spots and buying voter lists
 - b. Sending campaign mail
 - c. Relying on door to door canvasing.
 - d. All of the above
- 3. What are the downfalls of getting political information from social media? Author and me
 - a. There is too much information and sometimes campaign messages get lost
 - b. The political information might not include important details
 - c. There are only a few candidates using social media as a voter targeting tactic
 - d. Some of the political information on social media may not be true
- 4. How much money did candidates spend on online advertising in the 2016 election? Right there
 - a. More than \$1.4 billion
 - b. More than \$1.4 million
 - c. Less than \$1.4 billion
 - d. Less than 1.4 million
- 5. What kind of data is collected to make sure online ads can hit such subsets of people? Right there
 - a. Credit card data, social security number, birth certificate, travel history
 - b. Browsing activity, your location, credit card data, personal connections
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- 6. What is an example of tighter regulation of corporate data collection? Right there
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- 8. What is lobbying? On my own
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 - c. Targeting one type of consumer to create a specific product
 - d. The use of consumer data in marketing to identify the interests of groups or individuals

HSE QUESTION ANALYSIS ASSISTANT

1. Look at the question and decide which type it is:

- **Right there** is a question whose answer is right there in the text, all you have to do is copy it down or repeat it.
- **Pulling-it-together** is a question whose answer is in the text, but you have to pull it together from different parts of the text. You cannot simply copy it from one place.
- **Author and me** is a question whose answer is not in the text. You have to use the information in the text and your own knowledge to figure out the answer. In other words, the author provides some of the information, but does not provide the answer itself; you have to infer meaning from the text.
- **On my own** is a question whose answer is not in the text. You have to read the text, however, to form your own answer.

2. Look at the answers and decide:

- Is there one that is clearly is not the right answer?
- Is there one that that is a trick answer? Why is it a trick?
- Which answers are close?
- Which one is the right answer? How do you know?

3. Prepare a short presentation that answers the following questions:

- What type of question are you presenting?
- How did you decide it was that type of question?
- What was the process you used to choose the right answer?

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THEME: Big Data and Manufacturing

Students will watch a video and analyze a reading on Big Data in manufacturing. Students will also be introduced to their first essay assignment and they will use class time to complete their Essay Planning Assistants.

TEACHER PREPARATION

Prior to class, review the video in Activity #1 in order to be able to answer the Note-Taking Activity questions and define the words that are in bold in the Note-Taking Activity, so you can lead an informed discussion.

MATERIALS

For Activity #1:

- Handout (attached): Make one copy for each student. Note-Taking Activity Questions for "Sight Machine - Manufacturing Analytics Overview"
- Video: Sight Machine- Manufacturing Analytics Overview (running time 2:35) <u>https://www.youtube.com/watch?v=x8hOqzBFkRk&frags=p1%2Cwn</u>
- Handout (attached): Make one copy for each student.
 5 Ways Manufacturing Analytics Will Change Your Business

For Activity #2:

- Handout (attached): Make one copy for each student plus one to project overhead. Essay Planning Assistant: General
- Handout (attached): Make one copy for each student plus one to project overhead. Essay Planning Assistant: Manufacturing Specifically

ACTIVITY #1: Read an Article and Analyze an Opinion - 60 minutes



Prediction Exercise

- Tell students they are now going to look at how Big Data is being incorporated into manufacturing
 processes and how these processes are helping manufacturers improve their efficiency to become more
 competitive.
- But before they look at a video and read an article on the topic, ask:
 - What has been the impact of AI on manufacturing?
 - What has been the impact of IoT on manufacturing?
 - Write the following questions and take notes on student answers for each:
 - How do you think Big Data has impacted manufacturing?

- How might manufacturers be collecting Big Data?
- What do you think Big Data is helping them to do?

Vocabulary Review and Video

- Tell students they are going to watch a video that aims to sell manufacturers a Big Data platform to track data that can help them describe and understand what is going on in all its processes.
- Pass out the Note-Taking Activity for, Sight Machine Manufacturing Analytics Overview.
- Tell students that before they watch the video, they are going to define the bolded words and concepts in the Note-Taking Activity.
- Put students into pairs and distribute the bolded words and/or concepts between the different groups.
- Instruct each group to:
 - Define their words or concepts, in their own words.
 - \circ Put the words in a sentence that clearly demonstrates what the word or concept means.
- Go over each of the bolded words in order:
 - \circ $\;$ Have each student present their definition and read their sentence.
 - \circ Take notes on the definitions of the word or concept on the board.
 - Have students write the definitions in their Note-Taking Activity as well.
- Have students volunteer to read the questions in the out loud.
- Watch the video once or twice, should students want to watch the video a second time.
- Review the questions and answers as a class. When students give their answers, ask the class:
 - Is that the right answer?
 - o Is there something you want to add or change?

Kead, Annotate, and Discuss the Article

- Pass out the article No, The Government Should Not Provide Health Insurance For All Americans.
- Tell students to get out their Annotation Key and read and annotate the article.
- Write the following questions on the board.
 - Of those things that you underlined, what are the most important points in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with? Disagreed with?
- Put students in pairs to talk about their answers to the questions on the board.
- Come together as a class to answer the questions on the board, allowing the pairs to present their responses to the class.

Review Students' Predictions

- Go back to the three prediction questions on the board and ask students:
 - \circ $\;$ Based on what we have learned from the video and the reading:
 - Which predictions were correct?
 - Which predictions were incorrect?
 - What would you add to these predictions to make the answers to these questions complete?

Break – 10 minutes.

ACTIVITY #2: Introduce and Work on the Essay Planning Assistant - 50 minutes

Introduce the Essay Planning Assistant

- Tell students they are going to choose one of the two available *Essay Planning Assistants* to help them structure the essay they will write during the next class.
- Project the General Essay Planning Assistant overhead.
- Review the instructions and provide guidance on how students can use the planning sheet to prepare for their 45-minute essay during the next class.
- Read the essay prompts aloud and make sure students understand that this is a persuasive essay, so these are their opinions on AI, IoT, and/ or Big Data. Do they think these developments will have a positive or negative impact or a bit of both for society and why?
- Next, project the "Manufacturing" Essay Planning Assistant overhead. Tell students:
 - This Planning Assistant is only about how the new technology developments have impacted manufacturing; specifically, if they think these developments are positive or negative or a bit of both.
 - Go over the questions and emphasize how this essay will focus on manufacturing.
 - Go from student to student and ask:
 - Which Essay Planning Assistant do you wish to work on?
 - What are your reasons for your choice?
 - Pass out the appropriate Essay Planning Assistant to each student.
- Give students time to work on their Planning Assistant.

HOMEWORK

COMPLETE: Have students complete the *Essay Planning Assistant*. Tell them that they will be able to use it while they write their 45-minute essay during the next class. They should be prepared to:

- Use appropriate "According to" language, as needed.
- Use a quote that can help make their essay stronger, as needed.

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NOTE-TAKING ACTIVITY FOR Sight Machine: Manufacturing Analytics Overview

Take notes on the video: *Sight Machine: Manufacturing Analytics Overview* to answer the questions below.

QUESTIONS	NOTES
1. What do manufacturers need to monitor?	
2. What kinds of devices can help manufacturing processes?	 Machines (with sensors embedded) Sensors Camera images PLC Digital gage Bar Code scans
3. What are some specific problems big data analytics can solve?	
4. What does Big Data Analytics mean?	
5. What are the three types of Big Data Analytics?	 Real-time monitoring Retrospective analysis Predictive analytics

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5 Ways Manufacturing Analytics Will Change Your Business

Adapted and paraphrased from original source: <u>https://dzone.com/articles/5-ways-manufacturing-analytics-will-change-your-bu</u>

Original author: Shelby Blitz

Successful manufacturing depends on businesses constantly finding new ways to improve their operations. In the past, this meant spending months examining every single process, testing and re-testing ideas, and finally implementing changes. However, this old-fashioned approach can sink manufacturers before they even gain the opportunity to make improvements.

So, how can you improve manufacturing operations faster and more efficiently? Big Data platforms can improve your operations by giving you better insights that help you continuously fine-tune your production line. Here are five ways using big data analytics in manufacturing can lead to noticeable improvements across your operations!

1. Understand the Supply Side of Your Manufacturing Chain

Purchasing is a standard part of most companies' supply chains, but one that can easily be ignored when you're too busy trying to improve upon other aspects of your production processes. Starting off from a not-so-good supplier, or one that is a few cents too expensive per component may not seem like the end of the world, but if you produce thousands of products a day, a cent here or there turns into thousands of dollars easily.

Manufacturing big data analytics can help you understand the cost and efficiency of every part of your production process, all the way from your suppliers' trucks to delivery of the product to your customer. Advanced analytics can help you reach better decisions by understanding how each aspect of a process impacts the final result. If certain parts of the process are constantly failing or are not doing exactly what they need to be doing, analytics will help you spot them before they become an issue.

2. Create Systems That Can Fix Themselves

Manufacturing systems are constantly operating under big time pressures and any stoppage in work can translate to big losses. Even so, the best solution many companies have available for fixing issues is waiting until they happen. This reactive system has worked until now, but only because manufacturers lacked better alternatives.

By incorporating big data analytics, companies can develop manufacturing systems that can consistently gauge their own need for repairs. This helps systems fix themselves in many cases and provide early alerts for situations that are not easily resolved. More importantly, data analytics can deliver insights into which components fail most frequently, letting you turn your reactive solutions into proactive ones.

3. Better Understand Your Machine Utilization and Effectiveness

One of the biggest problems manufacturers run into is wasted time. While manufacturing lines can be built with efficiency in mind, different factors may play a role in reducing the overall efficiency of the line because of poor installation, misuse, or simply a lack of downtime coordination.



By combining existing IoT systems with a powerful predictive analytics manufacturing system, companies can gain real-time insight into how well their manufacturing lines are operating. Big data will help manufacturers understand how to solve downtime issues when single machines fail as well as how best to set up the shop floor to improve efficiency. By generating useful data and sophisticated analytics, manufacturers can diagnose and implement real improvements on an ongoing basis.

4. Create Better Demand Forecasts for Products

Every manufacturer knows that they are not just making their products for someone today, but also for the perceived demand that will emerge in the near future. Demand forecasts matter because they guide a production chain and can be the difference between strong sales or a warehouse full of un-purchased products. Instead, manufacturers can combine existing data with predictive analytics to build a more precise projection of what purchasing trends will be.

5. Manage Your Warehouse Better

Another sometimes-overlooked aspect of the manufacturing process is storage. Once products are ready to be shipped, they must be placed in warehouses before leaving for their destination. At this point, seconds and minutes become important, especially in a world that is increasingly embracing 'just-enough' and zero-inventory models. Managing warehouses is more than simply finding space for products to wait. Manufacturers need to arrange product, so it can easily be moved in and out and replace product in the simplest way possible. Advanced analytics make it easier to understand how to improve your inventory and manage your warehouses better.

Bringing your manufacturing processes into the 21st century can be a straightforward process. By using advanced analytics and other big data tools, you can build a more detailed understanding of how your production line operates, and how you can improve it further.

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GENERAL ESSAY PLANNING ASSISTANT

To prepare for this essay, write your ideas on the topic. Then, review your Note-Taking Activity notes, readings, and writings; select those notes that will help you make your case; and put them in the right-hand column alongside the source where you got the information.

Your Essay Prompt Questions	Your Ideas About How to Answer This Question	Useful Notes and Their Sources From Your Readings and Writings
 Explain one of the technological changes we have studied that is changing society now and in the future. (Choose from Al, IoT, or Big Data.) Explain that technological change and some of its impacts. (This will be your Introduction.) 		
 Do you think the impacts from this technological change you have described will be mostly positive, negative or somewhere in between? What are your reasons? 	Write your thesis statement here. Paragraph #1: Paragraph #2:	
 Put one reason for your opinion in each paragraph. 	Paragraph #3:	

Your Essay Prompt Questions	Your Ideas About How to Answer This Question	Useful Notes and Their Sources From Your Readings and Writings
 What do you think people should do to prepare for the future you see coming? 		
(This is your conclusion.)		

MANUFACTURING SPECIFIC ESSAY PLANNING ASSISTANT

To prepare for this essay, write your ideas on the topic. Then, review your Note-Taking Activity notes, readings, and writings; select those notes that will help you make your case; and put them in the right-hand column alongside the source where you got the information.

	Your Essay Prompt Questions	Your Ideas About How to Answer This Question	Useful Notes and Their Sources From Your Readings and Writings
•	Describe one of the three technological changes that is changing manufacturing now and in the future. (Choose from Al, IoT, or Big Data.) (This will be your Introduction.)		
•	Do you think the changes this technological change will be mostly positive, negative, or somewhere in between? What are your reasons?	Write your thesis statement here. Paragraph #1: Paragraph #2:	
	 Put one reason for your opinion in each paragraph. 	Paragraph #3:	

Your Essay Prompt Questions	Your Ideas About How to Answer This Question	Useful Notes and Their Sources From Your Readings and Writings
 What do you think manufacturers or others should do to prepare for the future you see coming? 		
(This is your conclusion.)		

THEME: 45-Minute Essay on Technology and Manufacturing

Students do a talk through of their essay using their outlines, take 45 minutes to write their essay, and get one peer review.

MATERIALS

For Activity #2:

• Handout (attached): Make one copy for each student. Reader Comment Page

<u>Homework:</u>

- Handout (attached): Make one copy for each student. Sentence Structure Packet Selection: According To... <u>https://www.dropbox.com/s/6cotwi2lislst1y/Sentence%20Structure%20Packet%20-%20pg%209%20and%2011.docx?dl=0</u>
- Handout (attached): Make one copy for each student. Sentence Structure Packet Selection: Although and Even Though <u>https://www.dropbox.com/s/6cotwi2lislst1y/Sentence%20Structure%20Packet%20-%20pg%209%20and%2011.docx?dl=0</u>

ACTIVITY #1: Talk Through Your Essay - 60 minutes

- Tell students they are going to talk through of their essays with a partner before they take 45 minutes to write their essays.
- Tell students to get out their Essay Planning Assistant homework.
- Put students into pairs to hear and respond to each other's plans for the in-class essay:
 - The listener should listen to the speaker, section by section.
 - After each section, the listener should ask questions that could improve clarity or request more information.
 - \circ The listener should then become the speaker, and visa-versa.
- Tell students to make any changes to their outline that will improve their essays as they go along.
- Tell students to focus on talking to an audience who is interested in what they have to say, but wants things clearly explained.
- After students have talked through their essays, ask:
 - Did you get good ideas from your listeners?
 - How have your plans for your essay improved?

Break – 10 minutes.

ACTIVITY #2: Write Your Essay and Get a Peer Review - 50 minutes

- Give students 45 minutes to complete their essays using their Essay Planning Assistant.
- After they have completed their essays, ask:
 - What was your experience writing this essay?
 - Did you feel prepared?
 - How do you feel about this first draft? Why?

Peer Review

- Pass out one Reader Comment Page per person.
- Put students into pairs to read each other's essays and provide written feedback.
- Collect the essays and the student feedback.

HOMEWORK

COMPLETE: Have students complete the worksheet on transition words from *Practicing with Sentence Structure Packet*.

TEACHER PREPARTION NOTE

Prior to the next class, choose a date that the revised essays should be due and collect finished essays on that date. You should evaluate the student essays using a copy of the *Reader Comment Page*. You will need to read the essays and the student comments on those essays, in order to see if the reviewers' comments will help the student improve their written work. Your comments should include suggestions on how better to develop the piece of writing. You can reinforce feedback from other reviewers and/or steer the writer to consider other important issues. Additionally, DO NOT correct ALL grammar issues in students' drafts. Only mark those errors in their writing related to grammar rules and editing that have been taught in class. In your comments, you should also indicate a due date for rewrites of these drafts.

Also, review the questions on the *HiSET* 2016 *Writing Test-Part* 1. Be prepared to explain how the test is laid out and how students should answer the questions. Also, select test questions and match them to one of the rules on the Grammar Rule Sheet. Mark your copy of the Practice Test with the grammar rule being used from the Grammar Rule Sheet as needed.

READER COMMENT PAGE

WRITER_____ READER _____

1. What is clear and interesting to you about this piece of writing? Help the writer by being as specific as you can.

2. As the reader, what parts of the written piece would you like to be clearer or easier to understand? What would you like to hear more about?

3. Do you have any additional comments or suggestions to help the writer with revisions?

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Sentence Structure Packet Selection: According to ...

Re-write each sentence below so that it begins with "According to...." The first one has been done for you.

- 1. My mother says that I was an athletic child. *According to my mother, I was an athletic child.*
- 2. My sister says that I was a bully.
- 3. My teacher says that his son is a genius.
- 4. My uncle explained that you can catch a cold from walking in the rain without an umbrella.
- 5. My doctor tells people it's fine to have one glass of wine.
- 6. My doctors says not to worry.
- 7. The AAP says that children need more opportunities to play.
- 8. The mayor claims that the population is rising.
- 9. The New York Times reports that marijuana use is on the rise.
- 10. The borough president claims that Brooklyn's parks are safe.
- 11. The mayor has stated that the city's air is cleaner than it was five years ago.
- 12. The statistics show that violent crime is down.

13. Numerous surveys show that Coca Cola is more popular than Pepsi.

14. The numbers suggest that students are graduating from CUNY at higher rates.

15. The article points out that homicide is on the wane.

16. The MTA's position is that budget cuts are unavoidable.

Sentence Structure Packet Selection: Although and Even Though

Re-write each sentence beginning with although or even though. Be sure to keep the comma, but remove the *but*.

- 1. It was cold and snowy, but John went out without a coat.
- 2. They ate an ample dinner, but the boys were still famished.
- 3. She is an excellent employee, but she hasn't received a raise.
- 4. I've encountered her several times, but I can't remember.
- 5. He turned on the light, but he couldn't see anything.
- 6. She enjoyed the movie while watching it, but later thought it was fatuous.
- 7. I set my alarm for seven, but I didn't arrive on time.
- 8. She dreamed of becoming a nurse, but she fainted at the sight of blood.
- 9. He was diligent as a child, but he lost interest in school as a teen.
- 10. Her bank account was nearly empty, but she magnanimously picked up the tab.

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THEME: Grammar Rules and the HiSET Practice Test for Grammar

Students learn and apply the two rules for using colons and take a HiSET Writing Practice Test.

TEACHER PREPARATION

Before class, review the questions on the *HiSET Language Arts Writing Practice Test, Part 1* and be able to explain how the test is laid out and how students should answer the questions. Also, go over the test questions and figure out which questions demonstrate one of the rules on the Grammar Rule Sheet and which ones don't. Mark your copy of the Practice Test with the grammar rule being used from the Grammar Rule Sheet as needed.

MATERIALS

For Activity #2:

- Handout (attached): Make one copy for each student. Grammar Rules
- Handout (attached): Make one copy for each student. HiSET Language Arts Writing Practice Test, Part 1 (2016) https://hiset.ets.org/s/pdf/practice/writing_fpt6a.pdf
- Teacher Resource (attached): Answer Key: HiSET Language Arts Writing Practice Test, Part 1 (2016) <u>https://www.dropbox.com/s/7xit5vfmgmamqlg/HiSET%202016%20Free%20Practice%20Test%20</u> <u>Writing%20FPT%20-%20Part%201%20-%20Answer%20Key.docx?dl=0</u>

9 ACTIVITY #1: Grammar: Colon Rules - 60 minutes

Transition Words Homework

- Briefly go over the Transition Word homework, reading the sentences, and getting students to volunteer their answers. After each student gives an answer, ask the class:
 - Is that the right answer? Why or why not?

Use colons after a complete sentence that presents a list

- Tell students that this is the last lesson on basic sentence and punctuation rules. This lesson will help them prepare to take the HiSET Writing Practice Test, Part 1 to practice their skills. They will take the first practice test in the next hour!
- Tell students that colons mean:
 - "I know a period goes here, but here comes a list."
 - Or: "Here is what I really mean."
- Emphasize that colons can only be used after a full sentence.
- Put the following on the board:

- These are the rules for the pool
- I have a list of things I want from Santa
- This is what I have to do when I get up in the morning
- \circ $\;$ There are many things I have to do to make more money
- Demonstrate using the first sentence, "These are the rules for the pool":
 - \circ $\;$ Ask students for a list of pool rules and write their ideas on the board in a line.
 - Put in a colon saying, "I know a period goes here, but here comes a list."
 - Put commas between the items.
 - \circ $\:$ Use "and" before the last item.
- Put students into three groups and assign each group one of the remaining three sentences. Tell the groups to:
 - \circ $\;$ Write an expanded sentence using a colon and commas.
 - \circ $\;$ Come to the board and write their sentence.
- Go over each sentence and ask:
 - Is the first part a complete sentence?
 - Is the colon in the right place?
 - Are the commas in the right places? Are any commas missing?
- Ask: What's the rule? (Answer: If there is a sentence that introduces a list, put a colon at the end of the sentence and commas between each item in the list.)

"Here is what I really mean" colon rule

- Give quick examples of "Here is what I really mean" colons. Write these on the board:
 - He got what he asked for: a promotion.
 - You know what to do: practice.
 - The title of the book is Playing the Race Card: Melodramas of Black and White from Uncle Tom to OJ Simpson.
- For each, ask:
 - Is the first part a sentence?
 - What does the colon mean? (Answer: "Here is what I really mean")
 - Does the second part tell them, "Here is what I really mean"?

Break - 10 minutes.

ACTIVITY #2: Take and Analyze a HiSET Language Arts Writing Practice Test - Part 1 - 50 minutes

Take the Practice Test

- Pass out the Grammar Rule Sheet.
- Go round robin and have students read the rules one at a time: loud, clear, and with feeling!
- Tell students they will be using these rules to help them answer HiSET questions.
- Pass out the HiSET Writing Practice Test, Part 1.
- Project the first page and explain to students how the test is laid out.
- Do the first question together. Coach students to:
 - Eliminate the answers that "sound" wrong.
 - Check with the Grammar Rules to see if there is one that helps them choose the right answer.
 - **Note:** Not every question will be demonstrating a Grammar Rule from the sheet. Students will have to use the Grammar Rule sheet to recognize when one of their rules is being tested.
- Have students complete the test.
Analyze the Practice Test

- Put students in pairs and assign each pair a different question or set of question, making sure all the questions have been distributed. Tell the pairs to meet to:
 - Compare answers.
 - Decide on the right answer.
 - \circ $\;$ Decide why that answer is right.
 - Identify which rule explains why the answer is right, if one applies.
 - Project each question overhead and read the underlined portions and answers out loud.
- Have the pair assigned to that question:
 - Give their answer
 - State why their answer is right.
 - o Identify which Grammar Rule is being demonstrated, if one applies.
 - After each pair presents their answer and explanations, ask the class:
 - Is this the right answer? How do you know?
 - If students say no, ask:
 - What is the right answer?
 - Why is this the right answer?
 - What Grammar Rule is being demonstrated, if any?

HOMEWORK

RESEARCH: Instruct students to find an article in a newspaper, magazine, or on-line that provides facts on 3D Printing and 3D printing in manufacturing. Choose a reading that they are interested in and feel comfortable reading. Write down the name of the article, read and annotate the article, and then jot down a list of important facts about 3D printing and examples of 3D printing in manufacturing.

• Students should be prepared to hand in their annotated articles and lists of facts or examples in the next class.

DEFINE: Have students define the following list of vocabulary words in their own words and write a sentence for each word that clearly demonstrates the meaning of the word. The words are:

- Economies of scale
- Prototypes
- Brick and mortar retail
- Royalties
- Consumers
- Revenues
- Accelerate

TEACHER PREPARATION

Before the next lesson, preview the videos in Activity #1 and be able to answer the related questions so that you can lead a discussion on the different ways 3D printing is impacting manufacturing now.

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GRAMMAR RULES

- 1. A sentence must have at least a noun and a verb to be a sentence.
- 2. All proper nouns must be capitalized.
- 3. Sentence fragments can be fixed by adding the noun or verb that is missing to make the fragment a sentence.
- 4. Sentence run-ons can be fixed by: identifying the different actions in the run on and making a new sentence for each action.
- 5. Two sentences can be put together using words like: but, and, yet, or, nor, for, so. A comma is required after the first sentence.
- 6. Information can be added to the beginning, middle, or end of a sentence. All new information needs to be separated from the main sentence by a comma or commas:
 - In the beginning, _____.
 - She grew up in Chicago, a wild city that helped mold her personality.
 - He, the man in the black hat, fell in love as soon as he saw her.
- 7. You can join two related sentences together with a semi-colon between them.
- 8. You can join two sentences together using transition words like: however, therefore, thus, and nevertheless. When using these words, put a semi-colon after the first sentence and a comma after the transition word.
- 9. Use a colon after a sentence and before a list.
- 10. Use a colon after a sentence or title and then say what the sentence or title really means.

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Language Arts – Writing

Directions

Part 1 Time – 85 Minutes (Part 1 and Part 2) 25 Questions – Part 1 1 Essay Question – Part 2

This is a test of some of the skills involved in revising written materials. There are three selections that present draft reports, letters, or articles. Each selection is presented twice, first in a box in a conventional format and then in a spread-out format with certain parts underlined and numbered. You will be asked to correct or improve the underlined and numbered parts. There may be some errors in the drafts that you are not asked to correct or improve. Read quickly through the boxed text to get an idea of its purpose and style. Then go on to the spread-out format.

For some of the underlined parts, there is no corresponding question in the right-hand column; instead just four alternatives are listed. Choose the alternative that

- makes the statement grammatically correct
- expresses the idea in the clearest or most appropriate way
- is worded most consistently with the style and purpose of the writing
- organizes the ideas in the most effective way

In some cases, there may be more than one problem to correct or improve. If you think the original underlined version is best, choose "No change."

Other underlined parts have questions about organization or spelling in the right-hand column. In questions about organization, you will probably find it helpful to look at the boxed text. In the questions about spelling, you are to indicate which of three underlined words is misspelled, if any. If there are no errors in any of the words, choose "None."

Work as quickly as you can without becoming careless. Remember, not all errors in the selection will be tested. Do not spend too much time on any question that is difficult for you to answer. Instead, skip it and return to it later if you have time. Try to answer every question even if you have to guess.

Mark all your answers on the answer sheet. Give only one answer to each question.

If you decide to change one of your answers, be sure to erase the first mark completely.

Be sure that the number of the question you are answering matches the number of the row of answer choices you are marking on your answer sheet. The answer sheet may contain more rows than you need.

You will have 85 minutes to complete Part 1 and Part 2 of the Writing test.

Questions 1 - 9 refer to the following selection.

A student is writing a letter to a school in Mexico to propose a cultural exchange program. Read through the draft. Then go on to the suggestions for revision that follow. There may be some errors in the draft you are not asked to revise.

Ridge View High School 1700 Ridge View Avenue Tacoma, Washington 98409

Mr. Luis García, Principal Preparatoria Morelos Ignacio Mariscal 747 58001 MORELIA, MICH MEXICO

Dear Mr. García —

¶1 Jeremy Hunt, who graduated from our high school last year, recently returned from Morelia, where he visited your school, as I guess you should already know. Last week he spoke to our school's International Club about his experiences. He described your school as being about the same sized as ours but having different courses and also he thought it would be a great idea for our schools to initiate an exchange program.

¶2 Since Jeremy's visit, we club members have been discussing different kinds of exchanges: a letter or newspaper exchange, a video exchange, or perhaps even a club trip. The trip idea was naturally very appealing, but we decided that it was impractical because of the expenses that would necessairly be involved. We have concluded that a video exchange would be the funnest. Students at each school could prepare a fifteen- or twenty-minute video about various aspects of their school. Some of our club members are quite proficient at making videos, and the project would be benificial in helping us learn about our two schools' similarities and differences. Ms. Truong, our club advisor, is real excited over this idea. She is encouraging us writing you.

//3 Should you have any questions, please direct them to Ms. Truong at the address given above. We look forward to hearing from you.

¶4 We hope your students will be as eager as we are to have a video exchange. Personally, I'm hoping to be a film major in college. Of course, we would welcome any other ideas for the getting of an exchange program going. We have enclosed a copy of our school newspaper to help you become acquainted with us.

Yours Truly,

Marcella Ramírez

Ridge View High School 1700 Ridge View Avenue Tacoma, Washington 98409 Mr. Luis García, Principal

Preparatoria Morelos

Ignacio Mariscal 747

58001 MORELIA, MICH

MEXICO

1 Dear Mr. García —

¶1 Jeremy Hunt, who graduated from our high school last year, recently returned from Morelia,

2

where he visited your school,

as I guess you

<u>should already know.</u> Last week he spoke to our
<u>school's International Club</u> about his
experiences. He described your school as being about the same sized as ours but having different
<u>courses and also he</u> thought it would be a great idea for our schools to initiate an exchange program.

¶2 Since Jeremy's visit, **5** we club members

have been discussing different kinds of exchanges: a letter or newspaper exchange, a video exchange, or perhaps even a club trip. The trip idea was naturally very appealing, but we decided that it was impractical because of the expenses that would necessairly be involved. We have concluded that a video exchange would be the funnest. Students at each school could prepare a fifteen- or twenty-minute video about various aspects of their school. Some of our club members are quite proficient at making videos,

1

- A. (No change)
- B. Dear Mr. García:
- C. Dear Sir —
- D. Dear Sir,

2

- A. (No change)
- B. a fact you know.
- C. as I probably don't need to tell you.
- D. as you probably know.

3

- A. (No change)
- B. schools International club
- C. schools International Club
- D. school's International club
- 4
 - A. (No change)
 - B. courses. He
 - C. courses, besides which he
 - D. courses mentioning he
- 5
 - A. (No change)
 - B. us club members have been discussing
 - C. we all are as a club discussing
 - D. our club have been discussing

and the project would be benificial in helping us learn about our two schools' similarities and differences. Ms. Truong, our club advisor, is

6 real excited over this 7 idea. She is encouraging us writing you.

¶3 Should you have any questions, please direct them to Ms. Truong at the address given above. We look forward to hearing from you.

¶4 We hope your students will be as eager as we are to have a video exchange. Personally, I'm hoping to be a film major in college. Of course,

we would welcome any other ideas for the

getting of an exchange program going. We have enclosed a copy of our school newspaper to help you become acquainted with us.

Yours Truly,

Marcella Ramírez

6

- A. (No change)
- B. really excited concerning
- C. enthusiastic about
- D. so enthusiastic over

7

- A. (No change)
- B. idea, encouraging us writing you.
- C. idea and has encouraged us to write you.
- D. idea. It was her that encouraged us to write.

8

- A. (No change)
- B. starting an exchange program.
- C. the starting up of an exchange program.
- D. how to get an exchange program going.

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This question refers to the letter as a whole.

Which of the following changes, if any, would improve the organization of ideas in this letter?

- A. (No change; the organization of ideas in the letter is best as written.)
- B. (Make paragraph 3 the second paragraph of the letter.)
- C. (Make paragraph 3 the last paragraph of the letter.)
- D. (Omit paragraph 3 from the letter.)

NO TEST MATERIAL ON THIS PAGE Questions 10 – 16 refer to the following selection.

Read through the following draft report. Then go on to the suggestions for revision that follow. There may be some errors in the draft you are not asked to revise.

The Calculus Wars

¶1 Mathematics may sometimes seem like an impersonal subject. Particularly with the most interesting mathematics, remembering that there were actual people behind it can be hard. In some sense, then, it had to be so, and there is often more to their stories than just numbers and equations. Sometimes stuff like this can be really hard to believe.

 $\[mathcal{I}2\]$ Sir Isaac Newton (1643 – 1727) is often considered the greatest scientist of all time. Defining laws of motion and universal gravitation up until the 20th century, he provided the framework for physics. He also made enormous contributions to optics (the science of light) and to mathematics. In mathematics, Newton invented calculus.

 $\sqrt[n]{3}$ Gottfried Wilhelm Leibniz (1646 – 1716) was a German philosopher, who was a scientist, made inventions, a lawyer, and a mathematician. He has been called "the last man who knew everything." His ideas have been said to anticipate some in contemporary geology, psychology, computer science, and information theory. He has been claimed as an originator of library science. In mathematics, Leibniz also invented calculus.

¶4 In this case, Newton and Leibniz, men who knew one another and were among the greatest geniuses in history, waged "the calculus wars." Their tactics included name calling, publishing attacks on each other's honesty, and allowing their allies to do more of the same. For example, Leibniz wrote an unsigned review of works by Newton and in the unsigned review which he wrote, Leibniz compared Newton to a known mathematical plagiarist. A few years later, the British Royal Society issued a report asserting that Leibniz had been dishonest in describing his work. Newton, the Society's president, had secretly written the entire report. Mathematics is often said to be "timeless," "eternal," and "beautiful." But mathematicians, even great ones, can never be timeless or eternal, and they may be far from beautiful as well.

The Calculus Wars

¶1 Mathematics may sometimes seem like an impersonal subject. Particularly with the most interesting mathematics, remembering that there

were actual people behind it can be hard. **(D)** <u>In</u> <u>some sense, then, it had to be so, and there is often more to their stories than just numbers and</u>

equations. <u>Sometimes stuff like this can be</u>

really hard to believe.

Defining laws of motion and universal gravitation up until the 20th century, he provided the framework for physics. He also made enormous contributions to optics (the science of light) and to mathematics. In mathematics, Newton invented calculus.

1

- A. (No change)
- B. Yet they certainly did exist,
- C. As a result, this has to be true,
- D. Specifically, there always have been,

- A. (No change)
- B. I'm pretty sure that this is one of the truly best

of them.

- C. Here's one that you shouldn't be surprised if you haven't heard of.
- D. (Delete this sentence; the essay is best without it.)

 \mathbf{D}

- A. (No change)
- B. Up until the 20th century, defining laws of motion and universal gravitation, he provided the framework for physics.
- C. By defining laws of motion and universal gravitation, he provided the framework for physics up until the 20th century.
- D. He provided the framework for physics, by defining laws of motion and universal gravitation up until the 20th century.

¶3 Gottfried Wilhelm Leibniz (1646 – 1716) wasa German philosopher, ⁽¹³⁾ who was a scientist,

made inventions, a lawyer, and a mathematician. He has been called "the last man who knew everything." His ideas have been said to

- (1) <u>anticipate</u> some in
- <u>contemporary</u>

geology, psychology, computer science, and
information theory. He has been claimed as an
<u>originator</u> of library science. In mathematics,
Leibniz also invented calculus.

14 **15** In this case, Newton and Leibniz, men who knew one another and were among the greatest geniuses in history, waged "the calculus wars." Their tactics included name calling, publishing attacks on each other's honesty, and allowing their allies to do more of the same. For example, Leibniz wrote an unsigned review of works by Newton **16** and in the unsigned review which he wrote, Leibniz compared Newton to a known mathematical plagiarist. A few years later, the British Royal Society issued a report asserting that Leibniz had been dishonest in describing his work. Newton, the Society's president, had secretly written the entire report. Mathematics is often said to be "timeless," "eternal," and "beautiful." But mathematicians, even great ones, can never be timeless or eternal, and they may be far from beautiful as well.

B

- A. (No change)
- B. did science, inventing, law, and mathematics.
- C. scientist, inventor, lawyer, and mathematician.
- D. scientist, inventor, practiced law, and mathematics.

14

Which word is misspelled, if any?

- A. (None)
- B. anticipate
- C. contemporary
- D. originator

15

The writer wants to add an introductory sentence to paragraph 4. Which of the following would be the best choice?

- A. Their approaches to calculus were somewhat different, and Leibniz developed notation that is still used today.
- B. At around this time in Japan, Seki Takakazu (or Seki Kowa) was independently doing related work.
- C. How common is it for contemporaries to separately make the same discovery or invention?
- D. Are there any effects when two people invent the same thing at about the same time?

16

- A. (No change)
- B. in which there is a comparison by Leibniz of Newton
- C. in which he is compared by him
- D. in which he compared Newton

NO TEST MATERIAL ON THIS PAGE

Questions 17 – 25 refer to the following selection.

Read through the draft report. Then go on to the suggestions for revision that follow. There may be some errors in the draft you are not asked to revise.

Ray Harryhausen

¶1 Special effects in today's movies rely on computer-generated imagery, but this is a relatively recent thing. For most of movie history, what appeared on screen had to exist in real life. One simple but painstaking technique used in older movies was "stop-motion animation," in which a single photograph became one frame in a movie. To produce the illusion of movement, animators would take a series of photographs of three-dimensional miniature models, with tiny, progressive adjustments made to them by hand between the photos. It could take several individual frames to create just one second of film time, but when the frames ran at film speed, giant apes or dinosaurs came to life.

¶2 Ray Harryhausen was to become an industry leader in this technique.

¶3 Born in 1920, Harryhausen grew up in Los Angeles. At thirteen, he saw *King Kong*, one of the first two stop-motion movies and found his life's work. "I haven't been the same since," he was quoted as saying on numerous occasions. Harryhausen decided to try stop-motion himself. With the help of his father, he built tiny movie sets in the family garage. He then congregated within them small, clay models of apes and dinosaurs and photographed them using a borrowed camera.

¶4 Living in Los Angeles, Harryhausen was able to meet Willis O'Brien, he had created the special effects on *King Kong*. After seeing the teenager's models and pictures, O'Brien encouraged him and recommended classes in art, photography, and to learn anatomy. By the early 1940s, Harryhausen will do animation first at the Paramount film studio and then for the Army.

¶5 After the war, O'Brien hired Harryhausen to work on *Mighty Joe Young* another stop-motion movie about a giant ape. The film won an Oscar for best special effects, a success that allowed Harryhausen to make his own feature, *The Beast from 20,000 Fathoms*. It was a preposterous, low-budget film that exuberently detailed a dinosaur's annihilation of New York City, but it looked gorgeous, and audiences loved it.

¶6 Harryhausen made more monster movies, including *It Came From Beneath the Sea*. There were also fantasy, science-fiction, and mythology films such as *The 7th Voyage of Sinbad*, *The First Men in the Moon*, and *Clash of the Titans*. If a genre called for special effects, Harryhausen answered.

¶7 Harryhausen always strove to improve his special effects. Otherwise, he insisted that his miniature monsters share the screen with live actors. In *Jason and the Argonauts*, Harryhausen engineered a complex sword fight between groups of actors and stop-motion skeletons. Realistically combining the two was often a challenge; indeed, a single scene in one movie took him five months to film.

¶8 Harryhausen died in 2013, but his work is still worth checking out. It continues to inspire directors such as James Cameron, George Lucas, and Peter Jackson; Steven Spielberg even credits it for making both *Star Wars* and *Jurassic Park* possible. Harryhausen's career was itself an incredible sight to behold. In one frame, he was a teenager experimenting in his garage; in the next, he was the biggest special-effects legend in movie history.

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(B) <u>congregated within them small</u>, clay models of apes and dinosaurs and photographed them using a borrowed camera.

1	
4	

The writer wants to use a more precise word here. Which choice would best accomplish her goal?

A. style

- B. capability
- C. innovation
- D. occurrence

18

- A. (No change)
- B. located into the sets
- C. thronged them full of
- D. populated the sets with

¶4 Living in Los Angeles, Harryhausen was able to meet Willis O'Brien, (19) <u>he had created the</u>

special effects on *King Kong*. After seeing the teenager's models and pictures, O'Brien encouraged him and recommended classes in art,

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early 1940s, Harryhausen 2 <u>will do</u> animation first at the Paramount film studio and then for the Army. 2

19

- A. (No change)
- B. having created
- C. being creator of
- D. who had created

20

- A. (No change)
- B. anatomy.
- C. taking anatomy.
- D. studying anatomy.

21

- A. (No change)
- B. was doing
- C. having done
- D. would have done

22

Choose the sentence to add at the end of paragraph 4 that would best fit with the ideas in that paragraph.

- A. During World War II he made humorous animated training films and worked alongside Theodor "Dr. Seuss" Geisel.
- B. Harryhausen benefited greatly from the support of his parents, especially his father Frederick, a machinist and inventor.
- C. Harryhausen's groundbreaking movie work was honored in 1992 with a career Academy Award for technical achievement.
- D. In 2004, he published his autobiography, and in 2012 the documentary film *Ray Harryhausen: Special Effects Titan* was released.

¶5 After the war, O'Brien hired Harryhausen to work on 23 <u>Mighty Joe Young another</u>

stop-motion movie about a giant ape. The film won an Oscar for best special effects, a success that allowed Harryhausen to make his own feature, *The Beast from 20,000 Fathoms*. It was a preposterous, low-budget film that exuberently detailed a dinosaur's annihilation of New York City, but it looked gorgeous, and audiences loved it.

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his miniature monsters share the screen with live actors. In *Jason and the Argonauts*, Harryhausen engineered a complex sword fight between groups of actors and stop-motion skeletons. Realistically combining the two was often a challenge; indeed, a single scene in one movie took him five months to film.

- 23
 - A. (No change)
 - B. Mighty Joe Young: another
 - C. Mighty Joe Young; another
 - D. Mighty Joe Young, another

24

- A. (No change)
- B. After all,
- C. In particular,
- D. On the one hand,

#8 Harryhausen died in 2013, but his work is still worth checking out. It continues to inspire directors such as James Cameron, George Lucas, and Peter Jackson; Steven Spielberg even credits it for making both Star Wars and Jurassic Park possible. Harryhausen's career was itself an incredible sight to behold. In one frame, he was a teenager experimenting in his garage; in the next, he was the biggest special-effects legend in movie history. Page Intentionally Blank

Answer Key

Sequence Number	Correct Response	Content Category	Question Difficulty
1	В	III. Writing Conventions	Medium
2	D	II. Language Facility	Medium
3	А	III. Writing Conventions	Medium
4	В	II. Language Facility	Easy
5	Α	III. Writing Conventions	Easy
6	С	III. Writing Conventions	Medium
7	С	III. Writing Conventions	Easy
8	В	II. Language Facility	Easy
9	С	I. Organization of Ideas	Medium
10	В	I. Organization of Ideas	Medium
11	D	I. Organization of Ideas	Easy
12	С	II. Language Facility	Medium
13	С	II. Language Facility	Easy
14	Α	III. Writing Conventions	Easy
15	D	I. Organization of Ideas	Medium
16	D	II. Language Facility	Medium
17	С	II. Language Facility	Medium
18	D	II. Language Facility	Medium
19	D	III. Writing Conventions	Easy
20	В	II. Language Facility	Medium
21	В	III. Writing Conventions	Medium
22	Α	I. Organization of Ideas	Medium
23	D	II. Language Facility	Medium
24	С	I. Organization of Ideas	Hard
25	С	III. Writing Conventions	Medium

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THEME: Introduce 3D Printing

Students will report their homework findings on 3D printing, watch three short videos on the topic, and complete a note-taking activity. Finally, students will read, annotate, and discuss an article on the future of 3D printing that they will then summarize in writing.

TEACHER PREPARATION

Prior to class, preview the videos in Activity #1 and be able to answer the related questions so that you can lead a discussion on the different ways 3D printing is impacting manufacturing now.

MATERIALS

For Activity #1:

- Handout (attached): Make one copy for each student. Treasure Hunt For Videos On 3D Printing
- Video: What is 3D Printing and How Does it Work? | Mashable Explains (running time: 02:21) https://www.youtube.com/watch?v=Vx0Z6LpIaMU
- Video: 3D printing revolution has begun | The Economist (running time: 06:04) https://www.youtube.com/watch?v=-vSOroLQUx0
- Video: Meet the 3D Printing Factory Changing the Manufacturing Game (running time: 02:09) https://www.youtube.com/watch?v=YOpko6P-QT0&frags=pl%2Cwn

For Activity #2:

- Handout (attached): Make one copy for each student.
 3D Printing in Manufacturing: Visualizing a New Mode of Production
- Handout (attached): Make one copy for each student. Summary Practice Sheet

ACTIVITY #1: Watch Videos on 3D Printing in the Manufacturing Process - 70 minutes

Homework Findings

- Tell students they will share what they found out about 3D printing before they dive into the topic during the class.
- Have students get out their research on 3D printing.
- Put two columns on the board with the heading: Facts about 3D Printing/ Examples of 3D Printing in Manufacturing.
- Go round robin and have each student state the reference they read and annotated.

- Go round robin for each student to add one new fact or example to the lists accumulating on the board. Ask each student:
 - Do you have a fact or example to add?
- Continue going from student to student until you have collected what they have to offer.
- Lastly, ask:
 - What are your predictions about how 3D Printing is changing manufacturing?
 - Take notes on student answers on the board.

Vocabulary Words

- Tell student they watch three videos and read an article to see if their predictions are correct. But first students will have to be comfortable with the vocabulary in the videos, so they can get more out of them.
- Write the following vocabulary words on the board:
 - Economies of scale
 - Prototypes
 - Brick and mortar retail
 - Royalties
 - Consumers
 - Revenues
 - Accelerate
- Put students in pairs and assign words to the different pairs.
- Have each pair:
 - \circ Share their homework definitions and decide on a definition that is clearest.
 - \circ $\;$ Select a homework sentence that clearly demonstrates the meaning of the word.
- Go from word to word on the board and ask the appropriate pair:
 - What is the definition?
 - Take notes on the definition next to the word.
 - What is your sentence for the word?
- After each word is presented, ask:
 - Does anyone have something they want to add or change to the definition?

Watch Three Videos and Take Notes

- Tell students they are now going to watch the three videos on 3D Printing.
- Pass out Treasure Hunt for Videos on 3D Printing.
- For the first two videos, use the following process:
 - Have students read each question out loud, then ask:
 - Do we already know some answers to this question from our research?
 - What can we add into the Treasure Hunt before we watch the video?
 - Watch the video.
 - Have students complete the Treasure Hunt questions.
 - \circ Go over the questions as a class.
- For the third video, write the following questions on the board:
 - What makes a 3D printing manufacturer in the US competitive with Chinese manufacturing?
 - How might 3D printing manufacturers impact the industry?
 - \circ Tell students to have these questions in mind while they watch the video.
- Watch the third video.
- Put students in pairs to discuss these questions.
- Have a class discussion on the questions on the board.
- Lastly, ask:
 - Did our predictions capture all that is going on with 3D printing?
 - What do we know now about 3D printing that we didn't know at the beginning of the class?

Take notes on student answers on the board.

Break – 10 minutes.

ACTIVITY #2: Read an Article on the Impact of 3D Printing on Manufacturing - 40 minutes

🗙 Read, Annotate, Discuss

- Tell students they are going to read an article that will update them on how 3D printing is being used today and how it is likely to be used in the future.
- Pass out the article: 3D Printing in Manufacturing: Visualizing a New Mode of Production.
- Ask:
 - Based on what you already know about 3D printing, what do you predict the vision of a new mode of production will be?
- Have students get out their Annotation Key and use it while they read the article.
- While students are working, write the following instructions on the board:
 - Of those things that you underlined, what are the most important points in the article?
 - What was surprising or interesting?
 - What was hard to understand or confusing?
 - Were there aspects of this article you agreed with? Disagreed with?
- Put students in pairs to talk about their answers to these questions.
- Come together as a class and ask the questions on the board, allowing pairs to present their responses to the class.
- Ask:
 - Who is the audience for this article?
 - How do you know?
 - What is the thesis of the article?
 - What is the strongest evidence?
 - Ask students to use "According to" language and quotes as needed.

Prepare a Summary

- Pass out the Summary Practice Sheet.
- Have students fill out the sheet so they can summarize the article.
 - Put students in pairs to talk through their summaries using their notes.
 - Have students ask their partners questions for clarity or more information.
 - Have students help their partners make sure the summary:
 - Is in the writer's own words.
 - Uses "According to" language is appropriate.
 - Uses quotes appropriately.

HOMEWORK

WRITE: Have students complete their summaries to turn in for next class.

DEFINE: Have students define the following vocabulary in their own words and put each word in a sentence that clearly demonstrates the meaning of the word or concept:

- The Great Recession
- Economic Growth
- Productivity
- Micro-Economics
- Macro-Economics
- Sustainability
- Made-to-Order

TEACHER PREPARATION

Before the next lesson, preview the graphs in Activity #1 and make sure you can answer the Treasure Hunt questions in order to lead a class discussion on growth and productivity.

TREASURE HUNT QUESTIONS FOR VIDEOS ON 3D PRINTING

Take notes on the videos to answer the questions below.

QUESTIONS	NOTES
For the Video: What is 3D Printing and How	v Does it Work?
6. What kinds of things do 3D printers make?	
7. What is additive manufacturing?	
8. Where can you go to create a blueprint for your product?	
9. What are some materials used in 3D printers?	
10. What are some unusual things that have been made by 3D printers?	

	For the Video: The 3D Printing Revolution	on Has Begun
1.	What does this video call the 3 rd Industrial Revolution?	
2.	What does the company Shapeways make?	
3.	What materials does Shapeways use to make items?	
4.	What does the company Quirky do?	
5.	Who creates Quirky's products?	
6.	Who mass-produces Quirky's products?	
7.	What are the two things you need to make a new product?	

3D Printing in Manufacturing: Visualizing A New Mode of Production

Adapted and paraphrased from original source: <u>https://www.businessnewsdaily.com/10380-3d-printing-in-manufacturing.html</u>

Original author: Adam C. Uzialko



Credit: Kyrylo Glivin/Shutterstock

Now that 3D printers can make products cheaper than ever before, this technology – which has been around since the 1980s – has recently begun to show up in the home office.

But 3D printers aren't just making an impact on consumers, they're slowly changing the way manufacturers think about design, prototyping and producing products.

As the technology continues to improve, 3D printers can produce more and more parts more cheaply than conventional manufacturing techniques. Could we be looking at a whole new mode of production just over the horizon?

The 3D printing industry today

3D printing has grown into a \$6.063 billion industry and has impacted a large number of industries. In 2016, the "additive manufacturing" industry, as it is known, grew 17.4 percent in worldwide revenues. Last year, nearly 500,000 printers shipped, but that's nothing compared to the estimated 6.7 million that will ship in 2020.

Companies like Formlabs and Stratasys are experimenting with ways to scale up 3D printing production to make it more competitive with conventional manufacturing methods. As 3D printers become capable of making larger and larger runs of products the total cost of production is going to be cut dramatically. The result is a more cost-effective product that is created more quickly and with less human involvement.

"[The] 3D printing industry has proven to have significant implications for such industries as automotive, machinery, aviation and more, and the applications will continue to grow as these industries show the technology's efficiency and effectiveness in production," John Kawola, president of Ultimaker North America, told Business News Daily. "But 3D printing is part of something bigger: the realization of the next manufacturing revolution – Industry 4.0."

Industry 4.0, also called Manufacturing 4.0, refers to the integration of technology in the modern manufacturing space. The vision often includes the internet of things (IoT), machine learning, mixed reality and robotics, and 3D printing is an integral part of that vision.

The role of 3D printing in the manufacturing process

3D printing already plays several roles in the manufacturing process, and it is ready to make further gains as it is refined and perfected. Currently, design and rapid prototyping are two of the main processes that benefit from 3D prints. 3D printers are also useful in low-volume production, such as when small amounts of product are needed to test the market or advertise at trade shows. And as time goes on, 3D printers' production capabilities continue to increase.

In every part of manufacturing, 3D printers can reduce the time and cost required to achieve a marketable product. That is why Jack Beuth, a professor in the Department of Mechanical Engineering at Carnegie Mellon University's College of Engineering and codirector of the NextManufacturing Center, believes 3D printing should be considered a brand-new technology on the level of personal computing or smartphones.

"Companies are now trying to use the technology to become more profitable, and how they do it will involve innovations that are much more than just replacements for traditional manufacturing," Beuth said. "With additive manufacturing, we are about where personal computing was in 1983."

Prototyping

3D printers have also greatly reduced the time it takes to create a working prototype of a product. Cheaper, quicker prototype creation speeds up product development, reducing costs across the board and decreasing the total time to market.

"3D printing is used extensively for prototyping in product development today to accelerate design time and enable designers to efficiently explore multiple options," said Dr. Paul Benning, HP fellow and 3D print chief technologist at HP Inc. "Typically, these designs were manufactured in analog processes like injection molding, but in the future, parts will be manufactured using 3D print."

Using 3D printing, several versions of various designs can easily be created to test and

gather feedback on, allowing companies to determine early on which is the best model. In the past, this sort of practice would be costly for even the most profitable companies. Today, it is within arm's length for nearly everyone.

Low-volume production

While 3D printers currently beat conventional methods for the first several thousand parts produced, that number is steadily rising giving 3D printing in manufacturing a bright future.

Dagoma 3D is a company that is scaling up production of 3D printed 3D printers to produce 50 to 70 printers per day. The company now boasts three facilities – two in France and one in the U.S. – with a fleet of about 850 3D printers in total. This year, the company expects to ship 15,000 printers.

"3D printing is faster and cheaper for the customer," said Matt Regnier, CEO of Dagoma 3D. "3D printing helps us to grow faster, and it helps us to reduce the cost and reduce the price."

A mass-production future?

As time goes on, the number of parts 3D printers all made more cheaply than conventional methods like injection molding continues to grow. Moreover, a production line based on 3D printing technology is easier to tweak.

"I think one of the main advantages ... is to be able to adjust and adapt the whole production line with the speed of the 3D printing production lines," Regnier said. "For example, if we want to improve something on our machine, it's easy - it's just one click away. For another technology like injection, it's not one click away; it's two to three months away. You'd have to change molds, ship it, make sure it's ready and working, and then start producing."

According to Thompson, it's unlikely that 3D printing will completely take the place of traditional manufacturing, but for projects that make sense, it seems inevitable that 3D printing's capabilities will continue to grow.

"The 3D printing industry is making machine efficiency higher and keeping the cost of materials down," Thompson said. "As the industry continues to tackle those challenges, we'll see more projects that make sense for 3D printing at higher quantities, but I think it will be an evolution towards that."

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SUMMARY PRACTICE SHEET

Follow the directions on the left to fill in the boxes on the right. These notes will help you write your summary.

Summarize the article by writing about it in your own words.	
Write "according to" statements to bring in facts to support your summary.	
Include a quote which is a sentence from your reading that makes an important point. Put quotation marks around this sentence.	

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Week 14, Lesson 1 Manufacturing Bridge Semester 2: Adult Secondary Education (ASE)

THEME: A Vision for the Future of Manufacturing

Students will define key vocabulary words and read graphs on growth and productivity. Students will then read an article about the future of manufacturing, do a Question Around activity, and answer HSE-type questions on the reading.

TEACHER PREPARATION

Prior to class, preview the graphs in Activity #1 and make sure you can answer the Treasure Hunt questions in order to lead a class discussion on growth and productivity.

MATERIALS

For Activity #1:

- Handout (attached): Make one copy for each student. Treasure Hunt Questions for 2 Graphs
- Handout (attached): 2 Graphics. Make one copy for each student.
 - Graphic: US Economic Growth
 - o Graphic: United States: Total Factor Productivity Growth

For Activity #2:

- Handout (attached): Make one copy for each student. Fourth manufacturing revolution will spark efficiency and productivity
- Handout (attached): Make one copy for each student. HSE-Type Questions: Fourth manufacturing revolution will spark efficiency and productivity
- Handout (attached): Make one copy for each student. HSE Answers
- Handout (attached): Make one copy for each student. Prepare for Question Around

Homework:

 Handout (attached): Make one copy for each student. Summary Practice Sheet

ACTIVITY #1: Read Graphs on Growth and Productivity in Manufacturing - 40 minutes

• Collect student summaries and let them know they will get feedback on them during the next class.

Vocabulary

- Tell students they look at two graphs on growth and productivity in the US. Next, they will complete a reading on an idea that could increase both growth and productivity through manufacturing in the future (i.e., the fourth Industrial Revolution).
- But first, they need to make sure they understand the words that are critical to understanding the graphs and the reading.
- Write the following vocabulary words on the board:
 - Economic Growth
 - Productivity
 - The Great Recession
 - Micro-Economics
 - Macro-Economics
 - Sustainability
 - Made-to-Order
- Put students in pairs and assign words to the different pairs.
- Have each pair:
 - \circ Share their homework definitions and decide on a definition that is clear.
 - \circ Select a homework sentence that clearly demonstrates the meaning of the word.
- Go from word to word on the board and ask the appropriate pair:
 - What is the definition?
 - Take notes on the definition the board next to the word.
 - What is your sentence for the word?
- After each word is presented, ask:
 - Does anyone have something they want to add or change to the definition?

Read the Graphics

- Pass out the Treasure Hunt for the 4th Industrial Revolution.
- Have students read the questions out loud for the first graph.
- Pass out and project the first graph: US Economic Growth.
- Put students in pairs to look at the graph and answer the questions together.
- As a class, go over the questions making sure that for each answer a student gives, you ask:
 - Is this the right answer?
 - What is the evidence?
- Repeat this process for the second graph: United States: Total Factor Productivity Growth.
- Lastly, ask:
 - How do you think growth rates and productivity rates are related?
 - Why? What is the evidence for your answer?
 - \circ $\,$ Do you think new technological advances have improved growth and productivity rates?
 - Why or why not? What is the evidence?

Break – 10 minutes.

ACTIVITY #2: Read a Summary of a TED Talk on the Fourth Industrial Revolution - 70 minutes

• Tell students they will read an article and work with a partner to come up with questions they can use to quiz each other. They will then take a set of HSE-type questions that demonstrate how the Question Around activity gets them ready for HSE tests.
Prepare for Question Around

- Pass out the article, Fourth manufacturing revolution will spark efficiency and productivity.
- Have students read and annotate the article using their Annotation Key.
- Write the following question types on the board and go over one:
 - Right There: The answer is right there in the text in one place.
 - Pulling-it-together: The answer can be gathered from information in many parts of the text.
 - Author and me: The text has part of the answer, and the reader has the other part.
 - On my own: The text raises these questions but does not answer them.
- Pass out Prepare for Question Around.
- Have a student read the instructions out loud.
- Put students in pairs to write three to five questions.
- Explain that when students ask each other their questions, the chosen student must state:
 - \circ The answer to the question.
 - \circ $\;$ The type of question it is.
 - They will need to choose one of the answers on the board.

Conduct the Question Around Activity

- Ask: Who wants to be the first lead? Then, tell students to follow this pattern:
 - \circ The lead asks a question he/she knows the answer to.
 - \circ $\;$ Those who know the answer raise their hands.
 - The lead chooses someone to answer two questions:
 - What is the answer to the question the student asked?
 - What kind of question is it?
 - If the answer is correct and they can state the kind of question of it is, that person becomes the new lead and starts this process over again.
 - If the answer is incorrect, the lead chooses a new student to answer the question until someone gets the answer.
- Repeat this pattern until students are out of questions.

Take and Analyze HSE-type Questions

- Tell students they are now going to answer HSE-type questions based on this reading.
- Pass out the HSE-type Questions: Fourth manufacturing revolution will spark efficiency and productivity.
- Have students answer the questions.
- Ask students, which questions do you think you got right? For each volunteer follow-up by asking:
 - What kind of question is it?
 - Which answer clearly is not the right answer?
 - Which ones are close?
 - Which one is the right answer? How do you know?

HOMEWORK

WRITE: Have students write a summary of the fourth Industrial Revolution according to Olivier Scalabre using the Summary Practice Sheet. Describe the problems of current manufacturing and how the fourth Industrial Revolution will solve them. Also, give students the following criteria for a good summary:

- The summary is written in the student's own words.
- The summary uses "According to" language to be clear about where their facts came from.
- The summary uses a quote to help make an important point.
- The summary is interesting and easy to follow.

DEFINE: Divide students into three groups and give each group two vocabulary words to define and put in a sentence that clearly demonstrates the meaning of the word or concept:

- Globalization
- Emerging economy
- Regional
- Customization
- Home market
- Domestic market

TEACHER PREPARATION

Before the next lesson, review the summaries students handed in and provide feedback to be handed back to them during the next class.

Also, preview Olivier Scalabre's TED talk and prepare to lead a detailed discussion on his ideas.

TREASURE HUNT QUESTIONS FOR 2 GRAPHS

Work with a partner to come up with answers to the questions below.

QUESTIONS	NOTES	
For the Graphic: US Economic Growth		
 In what year was growth the highest? What do you think explains this growth? 		
2. In what year was growth the lowest?O What do you think explains this lack of growth?		
 3. Since 2001, has growth gone up, down, or stayed the same? o How do you know? Use evidence to support your answer. 		
For the Graphic: Total Factor Productivity		
 How is this graph different than the last one? Review the title. Review the graph itself. 		

2.	What do those 3 horizontal blue lines within the graph tell you?	
3.	In what period was average productivity higher than the period before or after it?	
4.	What do you think happened in 2001 to make the productivity rate go down?	
5.	The productivity rate in 2013 is the same as the productivity rate as in which other years?	
6.	What is a general statement you would say about the productivity rate in the US between 1987 and 2013?	





Fourth manufacturing revolution will spark efficiency and productivity

Adapted and paraphrased from original source: <u>https://www.2wglobal.com/news-and-</u> <u>insights/articles/features/fourth-manufacturing-revolution-will-spark-efficiency-and-productivity/</u>

Original author: Isabelle Kliger



Economic growth may have slowed over the past 50 years, but Olivier Scalabre, Senior Consultant and Managing Director at the Boston Consulting Group in Paris, predicts that relief will come in an unexpected form and from an unforeseen place.

"We are on the verge of a huge change, and this change, surprisingly enough, is going to come from manufacturing – again," he said.

Scalabre explained that the first and second industrial revolutions, defined by the rise of the steam engine and assembly-line production, both brought huge improvements in productivity, but that the third industrial revolution, fueled by large technological advances, has not. Instead, the Internet, which many hoped would produce growth, has made us less productive. Meanwhile, efforts to off-shore production to countries with low-cost labor and create larger more specialized factories have not had the desired impact on efficiency.

"We hoped it [the Internet] would produce growth, and indeed it changed our lives," Scalabre said. "It made big waves in the media, the service, the entertainment spaces, but it hasn't done much for productivity. Actually, what's surprising is that productivity is on the decline despite all of these technological innovations."

Robots and 3D printing

Scalabre predicts that the fourth manufacturing revolution will result from traditional manufacturing and new technologies that are combined to create a new era defined by

improvements in efficiency, productivity and customization. This transition will focus on two principal technologies: advanced robotics and 3D printing.

Whereas only 8 percent of tasks in factories around the world are currently automated, this number is expected to rise to 25 percent by 2025, resulting in a 20 percent increase in productivity. Meanwhile, 3D printing, which has already revolutionized the production of plastic, is making inroads into metal manufacturing. Together, these two materials account for 25 percent of global manufacturing.

These technologies will not only increase productivity and output but, more importantly, will create better, smarter products and an unprecedented level of customization. While advanced manufacturing robots can be programmed to produce any type of product without any set-up time, 3D printing can instantaneously produce any customized design.

"We are now able to produce a batch of one product – your product – at the same cost and lead-time as a batch of many," Scalabre said, adding that manufacturing is set to become not only more productive but also more flexible.

A return to the home market

The transition to customization will cause a huge macroeconomic shift, in which factories will be relocated back to home markets where their customers are. As part of this shift, factories will become smaller and more agile, operating on a multi-product, made-to-order basis.

In the future, China and other emerging economies will no longer be the factories of the world. At present, the cost of producing goods in Brazil is already the same as manufacturing them in France (where Scalabre lives), and by 2018 manufacturing costs in China are expected to be equal to those in the United States. Instead, Scalabre argues that global growth is going to come from the emerging economies like China or India, driven by the needs of their own markets.

"In the next five years, the next billion consumers in China will inject more growth into our economies than the top five European markets together," he said.

"The fourth manufacturing revolution is a chance for all of us," Scalabre says. "If we play it right, we'll see sustainable growth in all of our economies. That means more wealth distributed to all of us and a better future for our children."

HSE-type Questions: Fourth manufacturing revolution will spark efficiency and productivity

- 1. What is the definition of economics?
 - a. Branch of knowledge concerned with the production, consumption, and transfer of wealth
 - b. Branch of knowledge concerned with manufacturing and developing new technologies
 - c. Branch of knowledge concerned with the production and depletion of wealth in low-income areas
 - d. Branch of knowledge concerned with the transfer of wealth between lowincome and wealthy sectors
- 2. What were the first and second industrial revolutions defined by?
 - a. The decline of the steam engine and the rise of assembly-line production
 - b. The rise of the steam engine and assembly-line production
 - c. The rise and fall of the steam engine and assembly-line production
 - d. The rise of the steam engine and the fall of the assembly-line
- 3. What is the difference between microeconomics and macroeconomics?
 - a. Microeconomics is the study of economics at an individual, group or company level. Macroeconomics is the study of a national economy as a whole.
 - b. Macroeconomics is the study of economics at an individual, group, or company level. Microeconomics is the study of economics as related to technology.
 - c. Macroeconomics is the study of economics as related to large businesses. Microeconomics studies small businesses.
 - d. Microeconomics studies economics at a national level and macroeconomics studies economics on a global scale.
- 4. How many industrial revolutions have there been?
 - a. Two
 - b. Four
 - c. Five
 - d. Three

- 5. What fueled the third industrial revolution?
 - a. Assembly-line production
 - b. The steam engine
 - c. Large technological advances
 - d. The internet
- 6. How has the internet changed our lives?
 - a. It has made big waves in media, service, and entertainment spaces
 - b. The first social media revolution happened as a result of the internet
 - c. The internet has made it easier to access anyone's financial records
 - d. It has allowed us to make unnecessary and even dangerous technological advances
- 7. What will the fourth manufacturing revolution focus on?
 - a. The two different ways to efficiently manufacture products
 - b. Advanced robotics and 3D printing
 - c. The transition to custom products
 - d. The cost and lead-time needed to produce a batch of one product
- 8. What sector is least susceptible to automation?
 - a. Healthcare
 - b. Manufacturing
 - c. Information Technology
 - d. Education
- 9. What are some new technologies that have contributed to improvements in efficiency, productivity, and customization?
 - a. Advanced robotics and assembly lines
 - b. The internet and 3D printers
 - c. 3D printers and advanced robotics
 - d. Steam engine and advanced robotics

- 10. What is the purpose of a 3D printer?
 - a. To perform any type of product without setup time
 - b. To instantly produce any customized design
 - c. To produce a batch of one product at same to cost and lead-time as a batch of many
 - d. To revolutionize the production of plastic and aluminum
- 11. What will happen to factories once they are relocated back to home markets?
 - a. They will become smaller and less efficient, operating on a multi-product, made-to-order basis
 - b. They will become smaller and more agile, operating on a single product, made-to-order basis
 - c. The will become smaller and more efficient, operating on a multi-product, ready-made basis
 - d. The will become smaller and more agile, operating on a multi-product, madeto-order basis
- 12. Who is the original author of this article?
 - a. The Boston Consulting Group
 - b. Olivier Scalabre
 - c. Isabelle Kliger
 - d. A group of American manufacturers

HSE Answers: Fourth manufacturing revolution will spark efficiency and productivity

- 1. What is the definition of economics? On my own
 - a. Branch of knowledge concerned with the production, consumption, and transfer of wealth
 - b. Branch of knowledge concerned with manufacturing and developing new technologies
 - c. Branch of knowledge concerned with the production and depletion of wealth in low-income areas
 - d. Branch of knowledge concerned with the transfer of wealth between lowincome and wealthy sectors
- 2. What were the first and second industrial revolutions defined by? Right there
 - a. The decline of the steam engine and the rise of assembly-line production
 - b. The rise of the steam engine and assembly-line production
 - c. The rise and fall of the steam engine and assembly-line production
 - d. The rise of the steam engine and the fall of the assembly-line
- 3. What is the difference between microeconomics and macroeconomics? On my own
 - Microeconomics is the study of economics at an individual, group or company level. Macroeconomics is the study of a national economy as a whole.
 - b. Macroeconomics is the study of economics at an individual, group, or company level. Microeconomics is the study of economics as related to technology.
 - c. Macroeconomics is the study of economics as related to large businesses. Microeconomics studies small businesses.
 - d. Microeconomics studies economics at a national level and macroeconomics studies economics on a global scale.
- 4. How many industrial revolutions have there been? Pulling it together/Right there
 - a. Two
 - b. Four
 - c. Five
 - d. Three

- 5. What fueled the third industrial revolution? Right there
 - a. Assembly-line production
 - b. The steam engine
 - c. Large technological advances
 - d. The Internet
- 6. How has the Internet changed our lives? Right there
 - a. It has made big waves in media, service, and entertainment spaces
 - b. The first social media revolution happened as a result of the Internet
 - c. The Internet has made it easier to access anyone's financial records
 - d. It has allowed us to make unnecessary and even dangerous technological advances
- 7. What will the fourth manufacturing revolution focus on? Right there
 - a. The two different ways to efficiently manufacture products
 - b. Advanced robotics and 3D printing
 - c. The transition to custom products
 - d. The cost and lead-time needed to produce a batch of one product
- 8. What sector is least susceptible to automation? On my own
 - a. Healthcare
 - b. Manufacturing
 - c. Information Technology
 - d. Education
- 9. What are some new technologies that have contributed to improvements in efficiency, productivity, and customization? Pulling it together
 - a. Advanced robotics and assembly lines
 - b. The Internet and 3D printers
 - c. 3D printers and advanced robotics
 - d. Steam engine and advanced robotics

- 10. What is the purpose of a 3D printer? Right there
 - a. To perform any type of product without setup time
 - b. To instantly produce any customized design
 - c. To produce a batch of one product at same to cost and lead-time as a batch of many
 - d. To revolutionize the production of plastic and aluminum
- 11. What will happen to factories once they are relocated back to home markets? Right there
 - a. They will become smaller and less efficient, operating on a multi-product, made-to-order basis
 - b. They will become smaller and more agile, operating on a single product, made-to-order basis
 - c. The will become smaller and more efficient, operating on a multi-product, ready-made basis
 - d. The will become smaller and more agile, operating on a multi-product, madeto-order basis
- 12. Who is the original author of this article? Right there
 - a. The Boston Consulting Group
 - b. Olivier Scalabre
 - <mark>c. Isabelle Kliger</mark>
 - d. A group of American manufacturers

PREPARE FOR QUESTION AROUND

Talk to your partner and come up with questions. Make sure you and your partner have at least one question in each category.

THE 4 QUESTION TYPES	YOUR QUESTIONS
Right there is a question whose answer is right there in the text; all you have to do is copy it down or repeat it.	
Pulling-it-together is a question whose answer is in the text, but you have to pull it together from different parts of the text. You cannot simply copy it from one place.	
Author and me is a question whose answer is not in the text. You have to use the information in the text and your own knowledge to figure out the answer. In other words, the author provides some of the information, but does not provide the answer itself. You have to infer meaning from the text.	
On my own is a question whose answer is not in the text. You have to read the text, however, to make an informed answer on your own.	

SUMMARY PRACTICE SHEET

Follow the directions on the left to fill in the boxes on the right. These notes will help you write your summary.

Summarize the article by writing about it in your own words.	
Write "according to"	
statements to bring in facts to	
support your summary.	
Include a quote which is a	
sentence from your reading	
noint Put quotation marks	
around this sentence.	

THEME: A Vision for the Fourth Industrial Revolution

Students will conduct peer review on two summaries and define key vocabulary words before they watch a famous TED talk on the fourth Industrial Revolution. Students will then discuss their responses to the TED talk and identify reasons for their thinking.

TEACHER PREPARATION

Before class, preview Olivier Scalabre's TED talk and prepare to lead a detailed discussion on his ideas. Also, review the summaries students handed in during the last lesson and provide feedback to be handed back to them.

MATERIALS

For Activity #1:

• Handout (attached): Make one copy for each student. Reader Comment Page on Two Summaries

For Activity #2:

• Video: The next manufacturing revolution is here (running time: 12:27) https://www.ted.com/talks/olivier scalabre the next manufacturing revolution is here#t-35822

J ACTIVITY #1: Peer Review Written Summaries - 40 minutes

Peer Review Summaries

- Write the following sentences on the board:
 - \circ $\;$ The summary was written in the student's own words.
 - The summary uses "According to" language to be clear about where their facts came from.
 - The summary uses a quote to help make an important point.
 - The summary is interesting and easy to follow.
- Have students get out their homework summary on the 4th Industrial Revolution according to Olivier Scalabre.
- Hand back the summaries you collected from the last class on the impact of 3D printing on manufacturing.
- Pass out one Reader Comment Page for Two Summaries to each student.
- Read the questions on the Reader Comment Page for Two Summaries out loud.
- Put students in pairs and have them exchange their summaries on the 4th Industrial Revolution and the impact of 3D printing on manufacturing. Have them:
 - Read both summaries that their partner wrote.
 - Complete the Reader Comment Page for their partner's summaries.
 - When they are finished with their *Reader* Comment Page, they should give the summaries back to the writer, so they can review the reader responses.
- Ask students:
 - Do you have any questions for your readers?

- Give pairs time to talk through the reader responses together.
- Next, ask for volunteers to read their strongest summaries out loud as examples.
- After each summary is read, ask the class:
 - o Is this summary direct and clear?
 - Do you need clarification or more information about anything?
 - Does this summary use "According to" and quotes effectively?

Break - 10 minutes.

ACTIVITY #2: Watch Olivier Scalabre in a Famous TED Talk - 70 minutes

• Tell students they are going to study the vocabulary for and then watch a TED talk by Olivier Scalabre on manufacturing, similar to the article they read during the last class. While this TED talk requires a lot of understanding of technology and its impact on manufacturing, they are likely to be surprised about how much they already know. Olivier Scalabre's talk includes topics such as: the first three industrial revolutions, off-shoring, on-shoring, the rise of Al, and automation, which we know increasingly involves the Internet of Things, Big Data, and 3D printing.

Vocabulary

- Tell students they need to define a set of words to make sure they understand all the concepts in the Olivier Scalabre's TED talk.
- Write the following vocabulary words on the board:
 - Globalization
 - Emerging economy
 - o **Regional**
 - Customization
 - Home market
 - Domestic market
 - Put students in the groups that were assigned the different words.
- Tell each group:
 - \circ Share their homework definitions and decide on a definition that is clear.
 - Select a homework sentence that clearly demonstrates the meaning of the word.
- Go from word to word on the board and ask the appropriate group:
 - \circ What is the definition?
 - Take notes on the definition on the board next to the word.
 - What is your sentence for the word?
- After each word is presented, ask:
 - Does anyone have something they want to add to or change in the definition?

Watch the TED Talk

- Write the following questions on the board:
 - Why is growth and productivity so important?
 - Why has manufacturing been so important to growth in the past?
 - Why has technological innovations such as the internet not added to growth or productivity?
 - What is Olivier Scabre's vision of a fourth Industrial Revolution?
- Tell students there is no Treasure Hunt for this TED talk. They can take notes, but they primarily are trying to listen for the answers to the questions on the board.
- Have students volunteer TO read the questions on the board out loud.

• Watch the video.

Discuss Your Responses to the TED Talk

- Put students in pairs to talk through the questions on the board.
- Have pairs present their answers to the class. Be sure to ask students:
 - How would you answer the question?
 - Would anyone else like to add or make changes to this answer?
- Next, ask:
 - Do you agree with Olivier Scalabre? Can manufacturing merged with technology provide growth for the whole world?
 - Why or why not?
 - Do you think manufacturing will come back to regional markets in the US?
 - Why or why not?

•

- Some of you may have concerns about the future of Al, automation, the Internet of Things, or Big Data.
 - Do you think those issues are still of concern?
 - What are your concerns?
 - List these on the board.
- Do you think the growth created by the fourth Industrial Revolution he describes could really improve everyone's life?
 - Why or why not?
- Draw the following continuum on the board:



- Ask each student to think about these three thesis statements and decide which one they agree with most.
- Go round robin and have them each student state which thesis statement is closest to their own opinion.
 - \circ Put an X on the chart where the students tell you to and write their name next to the X.
 - Ask them the reasons for their answers.
- Give students the journal writing assignment for homework. Tell students that their journal writing on this topic will give them a head start on the essay they will write in the class after next.

HOMEWORK

WRITE: Have students journal in response to the following prompts: What do you think about the future of manufacturing that Olivier Scalabre talks about? Do you think he is right? Or, based on your knowledge of other technological advances in manufacturing, are you skeptical? What are your reasons for your thinking? Ask students to write at least two pages to answer these questions.

TEACHER PREPARATION: Arrange for the next class to take place in a technology lab.

READER COMMENT PAGE ON TWO SUMMARIES

WRITER_____ READER _____

1. Which of the two summaries did you think was clearer and more interesting to read? (circle one)

4th Industrial Revolution by Olivier Scalabre

Impact of 3D Printing on Manufacturing

2. What are the strengths of the summary you chose as clearer and more interesting?

3. Do you have additional comments or suggestions for improving this summary?

THEME: Research Your Fourth Industrial Revolution Question

Class to be held in the Technology Lab



Students talk about their journal writing assignment by declaring their opinion on Olivier Scalabre's vision for the fourth Industrial Revolution. Students then come up with research questions, search for evidence that supports their opinions, and share their findings.

TEACHER PREPARATION

Arrange for this class to take place in a technology lab.

MATERIALS

For Activity #2:

Handout (attached): Make one copy for each student.
 Research Assistant on Your Key 4th Industrial Revolution Question

ACTIVITY #1: - 40 minutes

Journal Share and Demonstrate Choosing a Research Question

- Tell students they are going to state their thesis regarding Olivier Scalabre's vision of the fourth Industrial Revolution and tell the class the kinds of reasons they came up while writing their journal response.
- Draw the following continuum on the board and then read out the different thesis statements at the bottom:



- Have students report on their journal writing:
 - Go round robin and ask each student:
 - Where should I place an X for you on this continuum?
 - Put the student's name next to the X.

- What were the reasons you wrote about to support your opinion?
- Write the following questions on the board:
 - What is your opinion?
 - What are your reasons for your opinion?
 - What kinds of information do you think would help you make your argument stronger?
 - What is your research question?
- Tell students they are going to do some group work to come up with research questions that will help them make their opinions more persuasive to a reader. They are doing this in preparation for their final essay. But before we do this, we need to work through some examples:
 - Choose a student who strongly agrees that Olivier Scalabre's vision is possible.
 - \circ Ask the student the questions on the board. When you are finished asking the four questions,
 - Ask other students for their ideas about good research questions to strengthen this student's argument.
- Repeat this process with someone who strongly disagrees with Olivier Scalabre's vision.

Group Work to Choose Research Questions

- Put students with similar opinions in pairs or small groups. They are to:
 - \circ Ask each student the questions on the board.
 - Make sure each comes up with a research question that will be useful in making their arguments more persuasive.
 - Tell students you expect that students in the same groups will have different research questions.
- Go round robin and have each student state his/ her research question.

Prepare a Research Assistant

- Distribute the Research Assistant.
- Have a student read the instructions out loud.
- Tell students to write down their research questions.
- Ask a student to volunteer to respond to this question:
- What kinds of words or phrases would you use to answer your research question?
- Ask students to come up with three search terms they will use to make their searches.

Break – 10 minutes.

ACTIVITY #2: Conduct Research - 70 minutes

Conduct Your Research and Share Findings

- Allow students to work independently on their research questions.
- Circulate around the room to help students troubleshoot their research process.
- Lastly, ask:
 - What useful information did you find?
 - What were your sources?
 - How will this information help you make your opinion clearer and more persuasive?
- Tell students to save this information as they will need to use their findings in their final essay.
 - Explain that they should bring in all their readings, Treasure Hunts, summaries, and their journal for the next class, as they will be putting together an *Essay Planning Assistant* for this final essay.

HOMEWORK: Have students complete additional research and the Research Assistant as needed.

TEACHER PREPARATION

Before the next class, familiarize yourself with the Essay Planning Assistant so that you can help students understand how to prepare their notes for the essay they will have to write the following week.

RESEARCH ASSISTANT ON YOUR KEY 4TH INDUSTRIAL REVOLUTION QUESTION

Go online and find sources that can answer your research question. Decide on the search terms you want to use and sources you want to read. Write them down in the "Sources" column, and then, take notes on facts and quotes that you could use in a summary.

Research question:

Search terms you will use: _____

YOUR QUESTION	SOURCES	NOTES: FACTS AND QUOTES

Theme: Essay Planning

Students will prepare and present criteria for the three parts the essay – introduction, body, and conclusion – before they fill out their *Essay Planning Assistant*. Next, they will work with a partner to talk through their essay using their *Essay Planning Assistant* as their guide.

TEACHER PREPARATION

Before class, familiarize yourself with the Essay Planning Assistant so that you can help students understand how to prepare their notes for the essay they will have to write during the next class.

MATERIALS:

For Activity #1:

- Classroom Resource: Flip chart paper and markers.
- Handout (attached): Make <u>two</u> copies for each student. Essay Planning Assistant

ACTIVITY #1: Introduce and Fill Out the Essay Planning Assistant - 70 minutes

• Tell students they are going to put together their *Essay Planning Assistant* that will require them to summarize Olivier Scalabre's ideas, present their opinion about his ideas, and what they predict could happen in the fourth Industrial Revolution.

Prepare Criteria for the Three Essay Parts

- Tell students that before they work on their Essay Planning Assistants, they are to review the criteria for good introductions, body paragraphs, and conclusions.
- To get started, ask students, based on how we have talked about our readers before:
 - Who is your reader and what does your reader want?
 - Take notes on student answers on the board.
 - Make sure the following is also listed on the board. The reader:
 - Doesn't know anything about the Industrial Revolutions but is interested.
 - Needs to have everything explained in order to understand what the author is writing about.
 - Will not want to read an essay if he/she gets bored or confused.
- Tell students they will now put together the criteria for the three parts of an essay it can be fresh in their memory while they plan their essays.
- Put students in three groups and make the following assignments:
 - Group 1: The introduction.
 - Group 2: Body paragraphs.
 - Group 3: The conclusion.
- Give each group a piece of flip chart paper and markers and tell them to:

- Make a list of criteria for their assigned essay part.
- Select the most important criteria from that list to put on the flip chart paper.
- Choose someone to present the criteria to the class.
- Have each group present their criteria in order. After each presentation, ask:
 - Does anyone have something they want to add to this list?
 - Are there any changes you would recommend?
 - Make these changes on the flip chart paper as needed.

Prepare the Essay Planning Assistant for a Talk Through

- Pass out the Essay Planning Assistant and go over the instructions.
- Tell students to refer to the criteria on the flip chart paper while they organize their thoughts about what they want to write in each paragraph.
- Give students time to draft their answers and look through their notes, readings, summaries, and journals so they are prepared to give detailed answers to each question in the prompt. Students only need to create a draft of their *Essay Planning Assistant*, as they can do their final set of notes as homework.

Break – 10 minutes.

ACTIVITY #2: Do a Talk Through of Student Essays – 40 minutes

- Tell students they are going to talk through their essays with a partner.
- Put students into pairs to hear and respond to each other's plans for the in-class essay:
 - \circ The listener should listen to the speaker, section by section.
 - After each section, the listener should ask questions that could improve clarity or to request more information.
 - The listener should then become the speaker, and visa-versa.
- Tell students to make any changes to their outline that will improve their essays as they go along.
- Tell students to focus on talking to the readers, educating them, and keeping their interest.
- After students have talked through their essays, ask:
 - Did you get good ideas from your listeners? What are they?
 - How have your plans for your essay improved?
- Pass out an additional *Essay Planning Assistant* to each student so they can put together a full set of notes for the essay they can use to guide their writing during the next class.

HOMEWORK

COMPLETE: Have students complete a final Essay Planning Assistant.

TEACHER PREPARATION

Before the next class, review the questions on the *HiSET Writing Practice Test, Part 1* (2017) and figure out which questions demonstrate one of the rules on the Grammar Rule Sheet and which ones don't. Mark your copy of the Practice Test with the grammar rule being used from the Grammar Rule Sheet as needed.
ESSAY PLANNING ASSISTANT

Plan to inform your reader about Olivier Scalabre's ideas about the 4th Industrial Revolution and your opinion about his ideas. To prepare for the essay, write your ideas on the topic in the middle column, then review your notes, summaries, journal entries, and readings to select those notes that will help you make your case. Put these notes in the right-hand column alongside the source where you got the information.

Your Essay Prompt Questions	Your Ideas About How to Answer This Question	Useful Notes and Their Sources from Your Readings and Writings
 What is the 4th Industrial Revolution and what does Olivier Scalabre predict could happen that would improve growth and productivity? 		
 What is your opinion about Olivier Scalabre's prediction about the future? 		

•	What are your 3 reasons for your opinion?	Paragraph #1:	
	Put each of your 3 reasons in a paragraph and provide explanations and/or examples.		
		Paragraph #2:	
		Paragraph #3:	
•	Describe what you predict the future of manufacturing could look like and what should be done to positively impact society		
	society		

Theme: Essay on Manufacturing Reform & HSE Grammar Practice

Students write their final essay and take another HiSET Writing Practice Test, Part 1.

TEACHER PREPARATION

Before class, review the questions on the *HiSET Writing Practice Test, Part 1* (2017) and figure out which questions demonstrate one of the rules on the Grammar Rule Sheet and which ones don't. Mark your copy of the Practice Test with the grammar rule being used from the Grammar Rule Sheet as needed.

MATERIALS:

For Activity #2:

- Handout (attached): Make one copy for each student. Grammar Rules
- Handout (attached): Make one copy for each student. HiSET Language Arts Writing Practice Test, Part 1 (2017) https://hiset.ets.org/s/pdf/practice/writing fpt7.pdf
- Teacher Resource (attached): Make one copy for the teacher. HiSET Answer Key and Rationales <u>https://www.dropbox.com/s/a27w7bobuvz2tre/HiSET%C2%AE%20Exam%20Free%20Practice%20Test%20F</u> <u>PT%20%E2%80%93%207%20Language%20Arts%E2%80%93Writing%20-%20Answer%20Key.pdf?dl=0</u>

ACTIVITY #1: Write a 45-Minute Essay - 60 minutes

- Tell students to get out the materials they will need to help them write a clear and interesting essay.
- Give students 45 minutes to complete their essays using their Essay Planning Assistant.
 - Remind them to use "According to" language and quotes as needed, and the essay must be in their own words!
- After they have completed their essays, ask:
 - What was your experience writing this essay?
 - Did you feel prepared?
 - How do you feel about this draft? Why?

TEACHER NOTE: Collect the essays and complete a *Reader Comment Page* for each. The essays will be distributed for peer review in the next class and then you can pass out your *Reader Comment Page* after the peer reviews are complete.

Break – 10 minutes.

ACTIVITY #2: Take a HiSET Writing Practice Test, Part 1 – 50 minutes

Take the Practice Test

- Pass out the Grammar Rule sheet:
 - Go round robin and have students read the rules one at a time: loud, clear, and with feeling!
 - \circ Tell students they will be using these rules to help them answer HiSET questions.
- Pass out the HiSET Writing Practice Test, Part 1.
- Project the first page and remind students how the test is laid out.
- Do the first question together. Coach students to:
 - Eliminate the answers that "sound" wrong.
 - Check the Grammar Rules to see if there is one that helps them choose the right answer.

Note: Not every question will be demonstrating a Grammar Rule from the sheet. Students will have to use the Grammar Rule sheet to recognize when one of their rules is being tested.

• Have students complete the test.

Analyze the Practice Test

- Put students in pairs and assign each different questions, making sure all the questions have been evenly distributed among the pairs. Tell the pairs to:
 - Compare answers.
 - Decide on the right answer.
 - Decide why that answer is right.
 - Identify the rule that explains why the answer is right if one applies.
- Project each question overhead and read the underlined portions and answers out loud.
- Have the pair that answered the question:
 - Give their answer
 - State why their answer is right.
 - o Identify which Grammar Rule is being demonstrated, if one applies.
- After each pair presents their answer and explanations, ask:
 - Is this the right answer? How do you know?
 - If students say no, ask:
 - What is the right answer?
 - Why is this the right answer?
 - What Grammar Rule is being demonstrated, if any?

GRAMMAR RULES

- 1. A sentence must have at least a noun and a verb to be a sentence.
- 2. All proper nouns must be capitalized.
- 3. Sentence fragments can be fixed by adding the noun or verb that is missing to make the fragment a sentence.
- 4. Sentence run-ons can be fixed by: identifying the different actions in the run on and making a new sentence for each action.
- 5. Two sentences can be put together using words like: but, and, yet, or, nor, for, so. A comma is required after the first sentence.
- 6. Information can be added to the beginning, middle, or end of a sentence. All new information needs to be separated from the main sentence by a comma or commas:
 - In the beginning, _____.
 - She grew up in Chicago, a wild city that helped mold her personality.
 - He, the man in the black hat, fell in love as soon as he saw her.
- 7. You can join two related sentences together with a semi-colon between them.
- 8. You can join two sentences together using transition words like: however, therefore, thus, and nevertheless. When using these words, put a semi-colon after the first sentence and a comma after the transition word.
- 9. Use a colon after a sentence and before a list.
- 10. Use a colon after a sentence or title and then say what the sentence or title really means.

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Language Arts – Writing

Directions

Multiple-Choice Questions (MC) Time – 85 Minutes (MC and Essay Question) 25 MC Questions 1 Essay Question

This is a test of some of the skills involved in revising written materials. There are three selections that present draft reports, letters, or articles. Each selection is presented twice, first in a box in a conventional format and then in a spread-out format with certain parts underlined and numbered. You will be asked to correct or improve the underlined and numbered parts. Read quickly through the boxed text to get an idea of its purpose and style. Then go on to the spread-out format.

For some of the underlined parts, there is no corresponding question in the right-hand column; instead just four alternatives are listed. Choose the alternative that

- makes the statement grammatically correct;
- expresses the idea in the clearest or most appropriate way;
- is worded most consistently with the style and purpose of the writing;
- organizes the ideas in the most effective way.

In some cases, there may be more than one problem to correct or improve. When you have decided which alternative is best, mark your choice on the answer sheet. If you think the original underlined version is best, choose "No change."

Other underlined parts have questions about organization or spelling in the right-hand column. In questions about organization, you will probably find it helpful to look at the boxed text. In the questions about spelling, you are to indicate which of three underlined words is misspelled, if any. If there are no errors in any of the words, choose "None."

Work as quickly as you can without becoming careless. Do not spend too much time on any question that is difficult for you to answer. Instead, skip it and return to it later if you have time. Try to answer every question even if you have to guess.

Mark all your answers on the answer sheet. Give only one answer to each question.

If you decide to change one of your answers, be sure to erase the first mark completely.

Be sure that the number of the question you are answering matches the number of the row of answer choices you are marking on your answer sheet. The answer sheet may contain more rows than you need. You will have 85 minutes to complete the multiple-choice questions and essay question of the Writing test.

Questions 1 through 10 refer to the following selection.

After a class trip, students each chose a personal highlight from their visit to write about for a newspaper feature. Read through the draft of one student's account. Then go on to the suggestions for revision that follow.

The National Archives

 $\P I$ On our class trip to the U.S. Capital, Washington, D.C., the teachers insisted on taking us to the National Archives, where the government's most important records are kept. Now admitting at first that I did not want to go because a building full of papers and records sounded like a pretty dull thing to see.

¶2 The National Archives is located near what is known as the National Mall, a long parkway stretching westward from the Capitol building. On either side are various Smithsonian museums.

 \P 3 When my turn finally came to view these historic documents, I lingered a long time too. I was unexpectedly moved. Before me were the handwritten principles that have allowed our country to operate according to law and undergoing change peacefully for 200 years. At the bottom of the documents were extravagantly embellished <u>signitures</u> — those of Ben Franklin, George Washington, and Thomas Jefferson, among many others.

¶4 On the day we visited the Archives, a long line of people waited in the huge, marble Exhibition Hall. The cases containing the Declaration of Independence, the Constitution, and the Bill of Rights were on a pedestal at the front of the room. One by one, people passed in front of them and paused looking. No one just hurried by.

¶5 To ensure that the documents continue to be well preserved, they are sealed in helium-filled glass cases. To protect the documents further, the lights in the Exhibition Hall are kept low, and the temperature and humidity are carefully controlled. Each night the cases are lowered into a fireproof and shockproof vault beneath the building, in case of an emergency, they can be lowered instantly.

 $\P \delta$ During our trip, we saw the nation's history reflected in many impressive museums and monuments. Much to my surprise, of all the places we visited, the Archives turned out to be my most favorite.

Interview The National Archives

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¶3 When my turn finally came to view these historic documents, I lingered a long time too. I was unexpectedly moved. Before me were the handwritten principles that have allowed <u>our</u> country to operate according to law **4** <u>and</u> <u>undergoing</u> change peacefully for 200 years. At the bottom of the documents were

<u>extravagantly</u> <u>sembellished</u>
 <u>signitures</u> — those of Ben Franklin,
 George Washington, and Thomas Jefferson,
 among many others.

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- A. No change
- B. capital Washington, D.C. the
- C. capital, Washington, D.C., the
- D. Capital, Washington, D.C. the

A. No change

- B. Now I have to admit that at first
- C. At first admitting that
- D. First I admitted that

A. No change

- B. stretched
- C. it stretches
- D. which is stretched
- Ð

6) -

A. No change

- B. and to undergo
- C. and it can undergo
- D. and the undergoing of

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Which of these words, if any, is misspelled?

- A. None
- B. extravagantly
- C. embellished
- D. signitures

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¶6 During our trip, we saw the nation's history reflected in many impressive museums and monuments. Much to my surprise, of all the places we visited, the Archives turned out to be my
 <u>most favorite.</u>

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- A. No change
- B. pausing looked.
- C. paused to look.
- D. looked pausing.

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- A. No change
- B. To also protect the documents,
- C. To protect the documents besides,
- D. To increasingly protect the documents,

8

- A. No change
- B. the building. In case
- C. the building in case
- D. the building; and so in case

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- A. No change
- B. very favorite of them all.
- C. favorite above all others.
- D. favorite.

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This question concerns the draft as a whole.

For the best organization of ideas, where should paragraph 3 be placed?

- A. No change
- B. After paragraph 1
- C. After paragraph 4
- D. After paragraph 5

NO TEST MATERIAL ON THIS PAGE

Questions 11 through 18 refer to the following selection.

A career counselor was preparing an information sheet about job interviews. Read through the draft. Then go on to the suggestions for revision that follow.

Tips for a Successful Job Interview

 $\P I$ In the days preceding an interview, there are a number of steps applicants can take in order to make a great impression.

Step One: Research the Employer

¶2 First, applicants should try to learn about the business or organization. Use the company's website as well as other resources to gather information about its products, services, who the staff is, and accomplishments.

Step Two: Know What to Say

 \P 3 During interviews applicants should describe themselves in ways that best show how well they fit the position. Nonetheless, be ready to provide information in the following areas. Education and training; any former jobs, especially ones related to the new position; strengths and weaknesses; past challenges; and goals for the future. Become familiar with the following frequently asked interview questions and plan a two-to-three-sentence response for each.

- What would you like to tell me about yourself? Applicants can talk about qualities especially talents and prior experiences, that make them a particularly good fit for the job.
- Why do you want to work here? This is where prior research about the employer can pay
 off, enabling applicants to explain why they respect the employer and restate why they are a
 good fit for the position.
- Tell me about a time you made a mistake. How did you resolve it? Choose a mistake that taught a lesson. Emphasize the lesson. Talk about how, in later situations, to act differently.
- Why should we hire you? If given this opportunity to distinguish oneself from others, tell the interviewer about any unique qualities, skills, and career goals.
- Do you have any questions for me? Ask for more information about the job. For example, this can be a time to ask about hours or pay. It is also the time to ask for clarification of anything discussed during the interview.

Step Three: Practice Being Interviewed

 \P 4 First practice alone and then <u>ask</u> a friend or a mentor to play the role of the interviewer. During the practice interview, make sure to:

- · Give the interviewer a firm handshake.
- · Maintain eye contact.
- · Give thorough answers.
- · Speak clearly and concisely.
- · Thank the interviewer at the end of the interview.

At the conclusion of the role-playing, ask that friend of yours to tell you what he or she really, really thought.

Step Four: Look Sharp, Plan Ahead, Be Confident, and Expect Surprises

¶5 For the interview itself, wear clean, appropriate attire and bring along relevant documents and supplies. Before the interview, get plenty of rest, make sure to eat a nutritious meal, and allowing extra time to get to the destination. Most importantly, remember that it is impossible to prepare for every topic that will come up at an interview. If there is a surprise, take a deep breath, relax, and be natural.

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Step Two: Know What to Say

¶3 During interviews applicants should describe themselves in ways that best show how well they fit the position. n Nonetheless, be ready to provide information in the following (B) areas. Education and training; any former jobs, especially ones related to the new position; strengths and weaknesses; past challenges; and goals for the future. Become familiar with the following frequently asked interview questions and plan a two-to-three-sentence response for each.

 What would you like to tell me about yourself? Applicants can talk about <u>qualities especially talents and prior</u> experiences, that make them a particularly

good fit for the job.

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A. No change

- B. qualities, especially talents and prior experiences, that
- C. qualities, especially talents and prior experiences that
- D. qualities especially talents and prior experiences that

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(P)

- A. No change
- B. what services it provides, staff,
- C. services, staff employed,
- D. services, staff,

- A. No change
- B. For that reason,
- C. So why not
- D. Instead

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- A. No change
- B. areas; education
- C. areas: education
- D. areas, education

- Why do you want to work here? This is where prior research about the employer can pay off, enabling applicants to explain why they respect the employer and restate why they are a good fit for the position.
- Tell me about a time you made a mistake. How did you resolve it? Choose a mistake that taught a lesson.

Emphasize the lesson. Talk about how, in later situations, to act differently.

- Why should we hire you? If given this opportunity to distinguish oneself from others, tell the interviewer about any unique qualities, skills, and career goals.
- Do you have any questions for me?
 Ask for more information about the job. For example, this can be a time to ask about hours or pay. It is also the time to ask for clarification of anything discussed during the interview.

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Choose the best way to combine the indicated sentences.

- A. Emphasizing the lesson, talk about acting differently in later situations.
- B. Talk about how to act differently in later situations that emphasize the lesson.
- C. With the lesson being emphasized, talk in later situations about acting differently.
- D. Talk about how to act differently in later situations with the emphasized lesson.

16

Choose the best way to express the information in the indicated sentences.

- A. Ask for more information about the job, such as the hours or pay, and for clarification of anything discussed during the interview.
- B. Ask for more information about the job hours or job pay and that clarifies anything discussed during the interview.
- C. Ask for more information about the job's hours or pay and its clarifying anything discussed during the interview.
- D. Ask for more information about the job, such as the hours, pay, and to clarify anything discussed during the interview.

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- · Give thorough answers.
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At the conclusion of the role-playing, ask

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- A. No change
- B. to hear something that could help.
- C. for constructive feedback.
- D. if it went ok.

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- A. No change
- B. to allow
- C. allows
- D. allow

NO TEST MATERIAL ON THIS PAGE

Questions 19 through 25 refer to the following selection.

Read through the draft of a report about an influential sports figure. Then go on to the suggestions for revision that follow.

Holcombe Rucker

 $\P I$ When Holcombe Rucker (1926 – 1965) blew the first whistle to start his experiment in summer youth basketball on a Harlem playground in 1947, there were four teams, and he was the only official. By 1965 "The Rucker," as the program had come to be called, has expanded to include youth, college, and professional divisions that played on several playgrounds in Harlem. As The Rucker continued to thrive, its reputation grew, and, in 1974 New York City renamed its home. The city park at 155th Street and 8th Avenue is now called Holcombe Rucker Park. Many players and commentators believe that after 1965 The Rucker became the major force in reshaping how organized basketball is played.

¶2 Successful basketball can go in either direction, emphasizing interdependent team play or individual brilliance, depending on how "successful" is understood. Before The Rucker, success in organized basketball meant developing a team-oriented, often systematized approach to the game. It was players in The Rucker who brought a new definition of success to basketball, one based on the brilliance and creativity of individuals. Crucial to this innovation was the fact that The Rucker, though it administered leagues with coaches, referees, and champions, did not have teams that provided the players or coaches with a livelyhood or that represented institutions such as schools. Thus, although players and coaches certainly wanted to win Rucker games and championships, there were no significant pressures or incentives to do so, other than their own competitive desires. This environment allowed the players more freedom to reinvent how the game was played, opening it up particularly to displays of individual creativity and skill. The Rucker games, played outdoors before large and appreciative crowds, created reputations for players who displayed this individual virtuosity. Beginning in the 1960s, such moments of individual brilliance grew enormously in frequency and at the highest levels of play as well-known professional stars played in The Rucker, often being challenged by legendary playground players.

 \P 3 Helping players to leave the playgrounds and continue their educations, not changing basketball, was what had motivated Holcombe Rucker. He started his program to give young people something to do outside of school, he monitored how players did in school, and he sent hundreds on to prep schools and to college. He himself provided a model, obtaining a high school equivalency diploma, an undergraduate degree, and a position as a junior high school English teacher while running his program. For Rucker, running his program, including enlarging its size and scope, was always a means to achieve his educational goals for the players.

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D

- A. No change
- B. will have expanded
- C. had expanded
- D. expanded

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- A. No change
- B. grew and in 1974,
- C. grew and, in 1974
- D. grew, and in 1974

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The writer is considering whether or not to add the following sentence at the start of paragraph 2:

Athletic contests have two basic forms: matches between highly coordinated teams (e.g., football) or lone individuals competing against each other (e.g., boxing).

Would this be an appropriate sentence to add at this point?

- Yes; it summarizes previously discussed information.
- B. Yes; it introduces subjects developed in paragraph 2.
- C. No; it contradicts assertions made in paragraph 1.
- D. No; it presents opinions as documented facts.

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One of the four indicated words is misspelled. Which change in spelling corrects the error?

- A. inovation
- B. adminestered.
- C. livelihood
- D. instituitions

wanted to win Rucker games and championships, there were no significant pressures or incentives to do so, other than their own competitive desires. 🚯 This environment allowed the players more freedom to reinvent how the game was played, opening it up particularly to displays of individual creativity and skill. The Rucker games, played outdoors before large and appreciative crowds, created reputations for players who displayed this individual virtuosity. Beginning in the 1960s, such moments of individual brilliance 🕗 grew enormously in frequency and at the highest levels of play as well-known professional stars played in The Rucker, often being challenged by legendary playground players.

¶3 Helping players to leave the playgrounds and continue their educations, not changing basketball, was what had motivated Holcombe Rucker. He started his program to give young people something to do outside of school, he monitored how players did in school, and he sent hundreds on to prep schools and to college. He himself provided a model, obtaining a high school equivalency diploma, an undergraduate degree, and a position as a junior high school English teacher while running his program. For Rucker, running his program, including enlarging its size and scope, was always a means to achieve his educational goals for the players.

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- A. No change
- B. On the other hand, this environment
- C. Nevertheless, this environment
- D. Similarly, this environment

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- A. No change
- B. became increasingly common and exemplified
- C. happened repeatedly and the demonstration of
- D. were occurring very much more often and

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Choose the best sentence to add at the end of paragraph 3.

- A. Yet it has been the unintended changes in basketball itself that have done the most to expand educational opportunities for the players, as schools have embraced the individual virtuosity first brought to organized basketball by The Rucker.
- B. Perhaps year-round organized basketball did not begin entirely with Holcombe Rucker in the summers of the late 1940s and early 1950s in New York City, but no other person or place has been put forward as an alternative origin.
- C. The Rucker still continues today, with its outdoor displays of individual virtuosity presented on a removable wooden court at Holcombe Rucker Park in upper Manhattan.
- D. In addition to the city park, there is also a New York public school, the Holcombe Rucker School of Community Research, named for him.

HiSET Answer Key and Rationales

Sequence Number	Correct Response	Content Category	Question Difficulty	
1	С	III. Writing Conventions	Medium	
Rationale				
Option C is correct because "capital" is a common noun and should be lowercase, and commas are correctly used to set off "D.C." from the sentence the same way they would be used with the name of a state.				

Sequence Number	Correct Response	Content Category	Question Difficulty	
2	В	II. Language Facility	Medium	
Rationale				
Option B is correct because the revision of "Now admitting at first that" to "Now I have to admit that at first" corrects the sentence fragment.				

Sequence Number	Correct Response	Content Category	Question Difficulty		
3	Α	III. Writing Conventions	Medium		
Rationale	Rationale				
Option A is correct because no revision is needed; the present participle "stretching" is used to most precisely describe the "long parkway" while maintaining the present verb tense of the sentence.					

pressuy describe the tong parkway while maintaining the present ferb tense of the sentence.				
Sequence Number	Correct Response	Content Category	Question Difficulty	
4	В	II. Language Facility	Medium	

Rationale

Option B is correct because the infinitive "and to undergo" is parallel in form to the infinitive "to operate" that precedes it in the sentence.

Sequence Number	Correct Response	Content Category	Question Difficulty	
5	D	III. Writing Conventions	Medium	
Rationale				
Option D is correct because "signatures" is the correct spelling of "signitures."				

Sequence Number	Correct Response	Content Category	Question Difficulty	
6	С	II. Language Facility	Easy	
Rationale				
Option C is correct because "paused to look" maintains the past verb tense used in the sentence and expresses the idea most precisely.				

Sequence Number	Correct Response	Content Category	Question Difficulty	
7	Α	I. Organization of Ideas	Medium	
Rationale				
Option A is correct because no revision is needed; "To protect the documents further" expresses how the				

documents are protected to a greater extent.

Sequence Number	Correct Response	Content Category	Question Difficulty
8	В	II. Language Facility	Medium
Rationale			

Option B is correct because replacing the comma after "building" with a period and capitalizing "In" revises the run-on sentence.

Sequence Number	Correct Response	Content Category	Question Difficulty	
9	D	II. Language Facility	Medium	
Rationale				
Option D is correct because it eliminates the redundancy in the phrase "most favorite." The adjective "favorite" implies something is the best without the addition of the superlative "most."				

Sequence Number	Correct Response	Content Category	Question Difficulty	
10	С	I. Organization of Ideas	Medium	
Rationale				
Option C is correct because in paragraph 3 the writer describes his/her turn viewing the historic documents,				

Option C is correct because in paragraph 3 the writer describes his/her turn viewing the historic documents, which logically comes after paragraph 4, in which the writer described the initial arrival at the Archives and standing in line to see the documents.

Sequence Number	Correct Response	Content Category	Question Difficulty		
11	D	II. Language Facility	Medium		
Rationale					
Option D is correct because "staff" maintains parallel form with the other nouns in the series, "products" and "services."					

Sequence Number	Correct Response	Content Category	Question Difficulty		
12	В	I. Organization of Ideas	Medium		
Rationale					
Option B is correct because "For that reason" logically transitions from the need for applicants to describe themselves to examples of how they can accomplish this objective.					

Sequence Number	Correct Response	Content Category	Question Difficulty		
13	С	III. Writing Conventions	Medium		
Rationale					
Option C is correct because a colon is used to introduce a series of items.					

Sequence Number	Correct Response	Content Category	Question Difficulty		
14	В	III. Writing Conventions	Medium		
Rationale					
Option B is correct because the parenthetical element "especially talents and prior experiences" is correctly set off from the sentence with commas.					

Sequence Number	Correct Response	Content Category	Question Difficulty		
15	А	II. Language Facility	Medium		
Rationale					
Option A is correct because it most precisely and logically combines the ideas in the two sentences without changing the sentences' intended meanings.					

Sequence Number	Correct Response	Content Category	Question Difficulty		
16	А	II. Language Facility	Medium		
Rationale					
Option A is correct because it greatly reduces the wordiness of the sentence while preserving the original intended meaning.					

Sequence Number	Correct Response	Content Category	Question Difficulty		
17	С	II. Language Facility	Easy		
Rationale					
Option C is correct because it maintains the formal tone of the passage.					

Sequence Number	Correct Response	Content Category	Question Difficulty		
18	D	III. Writing Conventions	Easy		
Rationale					
Option D is correct because it maintains the parallel structure of the imperative verb forms that appear in the paragraph: "wear," "bring," "get," and "make sure."					

Sequence Number	Correct Response	Content Category	Question Difficulty		
19	С	III. Writing Conventions	Medium		
Rationale					
Option C is correct because "had expanded" maintains the verb tense of the sentence established with the verb "had come."					

Sequence Number	Correct Response	Content Category	Question Difficulty		
20	D	III. Writing Conventions	Medium		
Rationale					
Option D is correct because a comma is only needed before the coordinating conjunction "and," not after it.					

Sequence Number	Correct Response	Content Category	Question Difficulty		
21	В	I. Organization of Ideas	Medium		
Rationale					
Option B is correct because the sentence would provide an effective introduction for paragraph 2, which explains the interaction between team sports and individual athletic skills.					

Sequence Number	Correct Response	Content Category	Question Difficulty		
22	С	III. Writing Conventions	Medium		
Rationale					
Option C is correct because "livelihood" is the correct spelling of "livelyhood."					

Sequence Number	Correct Response	Content Category	Question Difficulty				
23	А	I. Organization of Ideas	Medium				
Rationale							
Option A is correct because "This environment" effectively connects the ideas in the previous sentence without the use of an additional transitional phrase.							

Sequence Number	Correct Response	Content Category	Question Difficulty				
24	В	II. Language Facility	Medium				
Rationale							
Option B is correct because it most precisely expresses the ideas in the sentence while maintaining the tone.							

Sequence Number	Correct Response	Content Category	Question Difficulty				
25	Α	I. Organization of Ideas	Medium				
Rationale							
Option A is correct because it presents an effective conclusion of the passage's main ideas.							

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Theme: Peer Review and Course Evaluation

Students participate in a peer review of their final essays and evaluate the course as a class.

MATERIALS:

For Activity #1:

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

ACTIVITY #1: Peer Review - 60 minutes

- Tell students they are to provide constructive feedback on each other's essays.
- Put students into groups of three.
- Pass out the essays collected during the last class.
- Pass out two copies of the Reader Comment Page to each student. Explain that they are going to:
 - Read the essays written by the other two people in their group.
 - Fill out one Reader Comment Page for each piece they read.
 - They are NOT to comment on grammar or spelling. However, if they are not sure what something says, they can ask the writer for clarification.
 - They are to be friendly, encouraging, and helpful.
- Have students pass their essays to the left.
- After students have evaluated one essay, they should pass it to their left and evaluate a second essay.
- After students have completed two Reader Comment Pages, they should give their evaluations to the writers, and the writers should read the comments.
- When students have read each other's comments, hand out your Reader Comment Pages for students to also review.
- Lastly, ask:
 - How were these essays?
 - Has your classmates' writing improved during the Bridge? How?
 - How has your writing improved?

Break – 10 minutes.

ACTIVITY #2: Course Evaluation and Celebration - 50 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?
 - How have your skills improved?

- Do you think your reading has improved? How?
- Do you think your writing has improved? How?
- Do you think your grammar has improved? How?
- What have you learned that makes you feel more ready for college? More ready for the High School Equivalency exam?
- What about the course did you not like?
- 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?
 - \circ $\;$ What were the parts of the class that didn't work so well?
 - \circ What could be done differently next time to make the course more effective?

READER COMMENT PAGE

WRITER_____ READER _____

1. What is clear and interesting to you about this piece of writing? Help the writer by being as specific as you can.

2. As the reader, what parts of the written piece would you like to be clearer or easier to understand? What would you like to hear more about?

3. Do you have any additional comments or suggestions to help the writer with revisions?