

Contextualized Curriculum

for Adult Learners in Math and Literacy

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Putting Safety First

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Quality Control Technician, ELA - Putting Safety First

Industry Sector: [Advanced Manufacturing](#)

Content Area: [Literacy](#)

Core Topic: [Oral and Written Communication](#)

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Common Core State Standards

CCSS.ELA-Literacy.CCRA.W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

CCSS.ELA-Literacy.WHST.6-8.2/9-10.2/11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

CCSS.ELA-Literacy.CCRA.L.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

CCSS.ELA-Literacy.CCRA.L.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

CCSS.ELA-Literacy.CCRA.L.3 Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

CCSS.ELA-Literacy.CCRA.L.6 Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

CCSS.ELA-Literacy.CCRA.SL.6 Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

Adult Basic Education Standards

Writing/Writing for History/Social Studies, Scientific and Technical Subjects

CCR Anchor 2: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content

Speaking and Listening

CCR Anchor 6 Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

Language

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

CCR Anchor 2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

CCR Anchor 3: Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

CCR Anchor 6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering a word or phrase important to comprehension or expression.

Industry Overview

Today's Manufacturing Workplace

A manufacturing renaissance is occurring in the United States. The United States is the largest manufacturing economy in the world, producing 21 percent of the goods manufactured across the globe. In addition to the 12 million Americans working directly in the manufacturing industry, manufacturing supports more than 6.5 million other jobs, thus accounting for nearly 17 percent of all private sector jobs in the United States. In 2010, the average U.S. manufacturing worker earned \$77,186, including pay and [benefits](#) (the average in all industries was \$56,436).¹

While manufacturing jobs in Massachusetts have declined, as they have nationally, manufacturing is still a critical industry in this state and provides opportunities for good, high-paying jobs. In the Greater Boston area, most of the manufacturing jobs are in computer and electronics companies, and much of the state relies on manufacturing positions in these and other very high-tech areas, such as aerospace and biotechnology.²

Advanced manufacturing involves the use of computers and technology in the [manufacture](#) of products. While not all manufacturing companies use technological innovations in developing their products or processes, the competitive advantage of the United States in the [manufacture](#) of goods relies on technological innovations. This means that today's manufacturing workplace is usually highly technical, which accounts for the high-paying positions many workers in this field receive in compensation for their work. It also means that today's advanced manufacturing workplace is very different from many people's conceptions of factories and mills as dark, dirty, and unsafe. Today's advanced manufacturing facilities are usually bright, clean, and very safe, and the emphasis is on working efficiently—with as little waste as possible.

In the advanced manufacturing industry, there has been a marked [shift](#) from the traditional role of [line workers](#) to workers who demonstrate creativity and innovation. Innovation is a hallmark of the U.S. manufacturing industry, and key to maintaining its position in the global market since products can often be produced at a lower cost in developing countries. Critical-thinking, problem solving and reasoning are important components of the innovation process. Today's manufacturing workers are expected to formulate solutions to problems using critical thinking and reasoning skills while working independently and/or in teams.

1. <http://www.nam.org/~media/AF4039988F9241C09218152A709CD06D.ashx>

2. <http://www.bostonglobe.com/business/2012/05/08/high-end-factory-jobs-boston-paying-high-wages/3gZuNc6GywDGKoYNP2hnaO/story.html?camp=pm>

Careers in Advanced Manufacturing

The manufacturing sector includes jobs related to planning, managing, and performing the processing of materials into intermediate or final products and related activities such as production planning and

control, maintenance, and engineering. Thus, this industry includes not only those people who actually produce the manufactured goods, but also managers, maintenance staff, scientists and researchers, analysts, administrative personnel, and IT personnel.

Career Pathways

The manufacturing industry includes six career pathways:

- Production is the construction and assembly of parts and final products. People in these positions work in factories and mills, with machines, to make or assemble parts, construct components of parts (such as plastics), and print materials. Occupations in this pathway range from production helpers who move parts and materials around the factory, to numerical control machine operators who run the computer-controlled machines that modify metal and plastic to create products, to manufacturing production technicians who oversee production.
- Manufacturing production process development occupations are involved in designing products and manufacturing processes. People in these occupations work with production workers to set up the machines and processes to develop new products. These occupations include engineers and production managers.
- Maintenance, installation and repair workers take care of products after they've been sold and delivered to customers—they install the products, perform maintenance on machines, tools, and equipment so that they work properly, and repair systems that are not performing adequately. Workers in this pathway include automotive technicians, automotive electronics installers, building maintenance workers, industrial electronics repairers, industrial machinery mechanics, millwrights, and small engine mechanics.
- Quality assurance is provided by quality control inspectors and technicians, who ensure that products both meet design standards and are of high quality.
- Logistics and [inventory](#) control workers ensure that those working in Production have the materials they need to complete their work. Workers in these occupations [inventory](#) materials and products, move materials to the line, and pack and ship finished products. Thus, they include production and planning clerks, and operators of moving machinery such as cranes and forklifts, and packers.
- Health, safety and environmental assurance occupations are focused on keeping the workplace safe by ensuring that workers are using equipment safely and that manufacturing processes are as safe as they can be. They also conduct investigations and conduct inspections.

Mathematics and Communication Skills Needed in Advanced Manufacturing

Mathematics and communication are key skills needed for success in today's high-performance advanced manufacturing workplaces. Mathematics is used in the advanced manufacturing industry to measure the amounts and sizes of materials and parts, create "recipes" used to [manufacture](#) man-made materials, and analyze data. Data analysis is critical at many levels of a manufacturing organization in order to ensure quality and to continuously improve both quality and processes. Today's manufacturing industry must operate extremely efficiently and produce very high-quality products in order to maintain competitiveness. Many front-[line workers](#) are involved in collecting data and working to improve quality and efficiency. Thus, in addition to basic mathematical calculations (which rarely involve simple whole numbers), workers are engaged in mathematical reasoning and solving problems using a variety of mathematical tools.

To succeed and move up the ladder in today's advanced manufacturing workplace, workers need reading skills to understand technical concepts, vocabulary, and to bring together information needed for a particular situation; to locate, organize, and document written information from various sources needed by co-workers and customers; and to locate written information needed by co-workers and customers. They need to use correct grammar, punctuation and terminology to write and edit documents and to develop and deliver formal and informal presentations using appropriate media to engage and inform audiences. In addition, they need to interpret verbal and nonverbal behaviors to enhance communication with co-workers and clients/participants; apply active listening skills to obtain and clarify information; and interpret and use information in tables, charts, and figures to support

written and oral communications. They also must communicate with co-workers and customers using technology tools. As they move up the corporate ladder they will need to explain written organizational policies, rules and procedures to help employees perform their jobs.

Career Opportunities in Advanced Manufacturing with Education from Community Colleges

Massachusetts Community Colleges play an important role in preparing the state's citizens to take advantage of the career opportunities available in advanced manufacturing. Degree and certificate programs prepare students to enter advanced manufacturing occupations, including:

- production occupations, including people who work as assemblers (such as airplane assemblers), machine operators, machinists, systems operators, [CNC](#) machine tool operators, machine setters, laminators/fabricators, metal and plastic workers, packers, molders, semiconductor processing operators, welders and solderers, tool and die makers, and other production workers;
- manufacturing production process development occupations, including numerical control tool programmers who write the programs that control machine tools and industrial production managers who plan and oversee production;
- maintenance, installation and repair occupations include automotive, electronics, and biotechnology technicians, industrial machinery mechanics, and millwrights (who install and maintain heavy equipment);
- quality assurance occupations including quality control technicians and inspectors.

Recent Career Opportunities in Massachusetts

The following is a sample of advanced manufacturing job listings in Massachusetts that require associate's degree or certificate:

- Manufacturing Engineering Technician, Randstad Corporation, Framingham, MA, [[show](#)]
- Quality Control Technician, QD Vision, Lexington, MA [[show](#)]
- Manufacturing Technican, Hologic, Marlborough, MA [[show](#)]

Employment Outlook for Advanced Manufacturing

Advanced manufacturing continues to be a high-growth industry, given the knowledge capital in the United States. However, the work in this industry is increasingly technical and requires far fewer workers as more tasks are automated. Entry-level positions in this industry require the same skills that only a select group of highly-experienced and well-paid workers once had. Unfortunately manufacturers find it difficult to fill these high-skill positions. A 2011 survey found that there is a persistent skills gap between the skills that are needed in the today's manufacturing workplace and the skills that candidates bring to the workforce.

Most of the advanced manufacturing companies in Massachusetts are small to mid-sized operations that employ smaller numbers of workers and rely on computer-operated machinery for production. While the numbers of workers are smaller than in the past, the more highly-skilled nature of the work means that these are high-paying jobs and provide workers with opportunities to grow through training and education and to be part of the effort to innovate.

Resources:

Advanced Manufacturing Industry

- [National Council for Advanced Manufacturing](#)
- [Advanced Manufacturing](#)
- Brookings: "[Why Does Manufacturing Matter? Which Manufacturing Matters?](#)" (2012)
- National Association of Manufacturers: "[A Manufacturing Renaissance: Four Goals for Economic Growth](#)" (2012)

Advanced Manufacturing Industry Outlook Information

- [Bureau of Labor Statistics: Manufacturing Industry at a Glance](#)
- [Massachusetts Labor Market Data](#)
- [Massachusetts Career Information System](#)

Careers in Advanced Manufacturing

- [Massachusetts Career Information System](#)
- [Manufacturing Career Opportunities](#)
- [Manufacturing Career Pathways](#)
- [Industry Competency Model for Advanced Manufacturing](#) shows the skills and knowledge needed to work in this industry
- [National Association of State Directors of Career Technical Education Consortium's Common Career Technical Core](#)
- [National Association of State Directors of Career Technical Education Consortium's Knowledge and Skills: Manufacturing](#)
- [O*NET](#)
- [WorkKeys Occupational Profiles](#)
- [Manufacturing's Missing Generation](#)
- [A Career in Toolmaking or Machining Technologies: The Right Choice for Students, Community, & Country](#)

Workplace Scenario (8th Grade Level)

You are a quality control technician. You work in a small manufacturing company. Your company produces plastic parts. It specializes in metals to plastic conversion. This means that it makes parts from plastic that used to be made from metal. Converting from metal to plastic has many [benefits](#). For example, plastic parts are lighter and stronger than metal. They also are cheaper and more efficient to make.

Quality control technician is an important job. It ensures that all products that reach the public are safe. In this job, you interact with managers and other staff. You are often called on to talk with your [supervisor](#). You coordinate work plans and exchange information. You frequently talk with production supervisors. Sometimes products do not meet quality standards. You explain errors that need to be corrected. Supervisors and operators may not always understand the issues. You must explain clearly and calmly what the problem is. Also, you provide progress reports to the quality manager.

In your job, writing skills are important. You observe production operators on the job. It is up to you to make sure they are doing things correctly. As you observe the work, you take careful notes. The notes must be clear and easily readable. Later these notes will help you prepare your reports. You must also inspect the final product. You make sure that it meets quality standards. You write short quality-control reports. These may be used to make production changes. It is critical that these reports are clear and accurate.

Often you must complete research. You review customer history. You also read reports of problems with products. You then consult with supervisors about what you have found. You determine what changes need to be made in the production process. You then write a report. You recommend corrections. This helps improve processes and products that do not meet quality standards.

Workplace Scenario (High School Level)

You are a quality control technician in a small manufacturing company. Your company produces plastic parts for a variety of machines, and specializes in metals to plastic conversion. This means that it makes parts from plastic that previously were manufactured from metal. Converting from metal to plastic has many [benefits](#), including lighter-[weight](#) components, cost savings, improved efficiency and structural strength improvement.

Quality control technician is an important job because it ensures that all products that reach the public are safe. In this job, you interact with other people such as project managers and other employees.

You are often called on to talk with your [supervisor](#) to coordinate work plans and to exchange information with supervisors during quality control meetings. You frequently need to talk with production supervisors to discuss product quality. Additionally, you need to explain errors that need to be corrected for work that does not meet quality standards. Sometimes, production supervisors and operators may not understand the information you are providing. You need to be able to explain clearly and calmly what the problem is. Also, you need to provide oral and written progress reports to the quality manager.

In your job, writing skills are important. Quality control technicians are expected to observe production operators as they perform their jobs to make sure they are doing things correctly. As you observe the work, you have to take careful notes. The notes must be clear and easily readable at a later time to help you prepare your reports. After manufacturing has been completed, the quality control technician inspects the final product to make sure that it meets quality standards. The short quality-control reports you write may be used to make production changes. It is critical that these reports are clear and accurate.

Often you must complete research on accepted standards and regulations. You research customer history and reports of problems with products. You also consult with supervisors about what you have discovered. You must analyze these reports and determine what adjustments need to be made in the production process. You then need to write a report recommending corrections for processes and products that do not meet quality standards.

Core instructional context

Written Communication

Lack of writing skills presents significant challenges to students' career and college readiness. In response to a 2006 survey, 72% of employers stated that they considered high school graduates to be deficient in writing and 80.9% deemed high school graduates deficient in written communication skills (Conference Board, 2006). As a result of these and other factors, writing is a critical skill for career readiness.

Writing is typically considered to be a **five-step process**: pre-writing, drafting, revising, editing and publishing. It's important to keep in mind that writing is a recursive process in which good writers move back and forth between pre-writing, drafting, and revising many times during the course of creating a single document.

For many adult writers, **pre-writing** may actually be a pre-thinking stage before any writing is started. In this pre-thinking stage various ideas are considered about the topic. If the topic has not been assigned by the instructor, this is the time the writer chooses and narrows the topic. According to [Purdue Online Writing Lab](#), the writer then needs to ask questions about the writing project such as:

- Who is the audience?
- Are they interested in the topic? Why or why not?
- What does your audience need to know about this topic?
- What experiences has your audience had that would influence them on this topic?
- What do you hope the audience will gain from your text?

To kick off the pre-writing process, lead students in [brainstorming, clustering or questioning](#) to generate ideas about the topic. This is also the time to gather any additional information required to write about the topic. Mind mapping is a brainstorming technique that helps build connections between ideas. [The Brain](#) is a website that provides free tools including for one for mind mapping. Another useful and free site is [Spiderscribe](#).

One way for students to identify the additional information they need is to use a [KWL chart](#) to identify what they need to know. Groups of students can work on KWL charts together to guide their research.

In the **drafting stage**, the writer's goal is to use the pre-writing outcomes to help build the content. In this stage, the writer can use various strategies to get started, including free writing, listing and outlining both to develop the topic and get started. During the drafting stage, students should concentrate on organizing information logically and developing the topic with enough detail for the

audience and purpose. At this stage, it is a good idea for students to work with a partner to discuss the early draft versions and to get another point of view about the organization and sequencing of the content.

Revision is the process of refining the draft by evaluating it and making changes in order to improve the draft. Revising is a critical stage of the writing process and for most writers it is the most difficult. This stage is a good time for students to work in peer review groups. Peer reviewers need preparation for this role. The [Conducting Peer Reviews](#) section of the Writer's Handbook website from University of Wisconsin-Madison provides guidance for peer reviewers. For more information on guiding peer reviewers, visit the resource [Using Peer Review to Help Students Improve Their Writing](#) from Washington University at St. Louis.

Editing is a stage distinct from revision and it should be done after the revision process is completed. This stage is sometimes referred to as proofreading. During this stage, the writer takes a close look at the piece of writing with an eye to correcting errors in grammar and punctuation, checking spelling and word choice, and checking each sentence for readability. During this stage, the focus is on correctness and clarity. Common errors to look for while editing are listed in the [Twelve Common Errors](#) section of the Writer's Handbook website from University of Wisconsin-Madison.

Publishing takes place when a piece of writing is shared with its intended audience. Ideally students will write for an authentic audience (beyond the instructor) such as for the whole class or others outside class through a class website or other means. A [student wiki](#) or [blog](#) or other free online platform is another excellent way for students to share their writing beyond the classroom.

The worker mentioned in the scenario must make observations and take good notes to help them prepare reports about events or situations. The quality control technician will go through the writing process by considering what to say, drafting the report, revising the wording until it clearly or describes a situation or event, editing to polish the piece, and then publishing it by delivering the report.

Assessment

To assess writing, use a classroom or college informal writing rubric. Other sample rubrics or checklists to review are:

- [Email Writing Rubric](#), Fermilab
- [iRubric: Business Email Assignment Rubric](#), RCampus
- [10 Rules of Email Netiquette](#), Zimbio

Other useful rubrics for writing projects are:

- [College Writing Rubric](#), Rio Salado College
- [Grade 11 Writing Rubric](#), West Virginia Department of Education Teach 21
- [Writing Rubric](#), Winona State University
- [Rubric Examples](#), California State University, Bakersfield

Communication Skills

[Brainstorm](#) with students why they think communication skills are important in the workplace. Capture these ideas by creating a graphic organizer such as a [semantic map](#). Show the video "Oral Communication" by Jeff Kavanaugh, Consulting Managing Partner for Manufacturing and High-Tech at Infosys. Ask students to take notes during the video and to compare and contrast the ideas mentioned in the video with those listed on the semantic map.

Point out that speaking and listening are at the heart of much human interaction and good communication skills are an important aspect of employability in most professions. A person working with clients must listen carefully to identify the clients' wishes and needs, and they must also be able to translate that information to their colleagues and staff. Poor listening skills may lead to missing key pieces of information, and poor speaking skills will lead to others not fully understanding their tasks. Good listening and speaking skills are particularly important in a kaizen team as described in the scenario if the person is to fulfill his or her role as a contributing member of the team.

Since 80% of our communication is non-verbal, it is also important to pay attention to body language and tone of voice, both the patient's and that of the nursing assistant. Body language can provide important clues to meaning or state of mind. If a patient appears with arms crossed across the chest and is not verbally forthcoming, the patient may not want to be in there and is expressing anger or unhappiness. If the nursing assistant delivers messages in a gruff voice with arms crossed, this posture and tone also indicate anger, frustration or unhappiness. If the patient is slurring words or seems disoriented, there may be a medical problem preventing good communication.

Adults typically view speaking and listening as areas of strength because of the level of experience they bring to these activities. They may be used to speaking with ease and confidence and reporting information in a logical sequence. The more challenging aspects of speaking and listening are related to their previous experiences since many adults must unlearn poor habits in both areas. Speaking and listening are skills we learn in the first year of life, which means that each individual may have spent a lifetime learning poor habits that must be unlearned. For example, few adults listen attentively enough to be able to fully comprehend, analyze and synthesize what they have heard and to recall and apply it later in critical situations. In addition, most adults have learned poor speaking habits that need to be replaced with good ones, including the use of filler words or phrases or using nonstandard language in formal situations such as working with clients, colleagues or staff. Since speaking and listening skills are so important in nursing, nursing assistants must develop these skills to do their jobs effectively. Fortunately, these are skills that can be improved with practice.

Poor listening skills contribute to poor comprehension and the ability to apply knowledge. In order to comprehend, analyze, and synthesize information, students must listen effectively.

A good listener uses the following techniques:

- maintains eye contact with the speaker;
- avoids distractions in the surroundings;
- avoids interrupting;
- sits or stands still;
- nods his or her head or uses other nonverbal cues to show understanding;
- maintains focus by avoiding internal distractions or thoughts;
- takes brief notes;
- listens for subtext but tests assumptions;
- tests his or her understanding by repeating instructions or key details; and
- asks clarifying or other appropriate questions when the speaker has finished.

Good speaking skills are critical to good communication and require the speaker to organize his or her thoughts before speaking. Good speakers ask themselves: Who is the audience? What vocabulary is appropriate for the audience? What is my goal? What are the important details that I need to share? What is the most logical sequence?

A good speaker

- organizes his or her thoughts before speaking;
- is clear and concise without including extraneous information;
- delivers main ideas and supporting details in a logical sequence;
- speaks clearly and practices good enunciation;
- uses correct pronunciation;
- uses correct standard English;
- uses appropriate [volume](#) – speaks neither too loudly nor too softly for the environment;
- speaks confidently and avoids filler sounds, words or phrases; and
- maintains appropriate level of eye contact with the listener.

Contextualized learning activities

1. Activating prior knowledge/finding an entry point into the field

Some students may be unfamiliar with advanced manufacturing as a field, or may not have a clear understanding of what is involved in the process of manufacturing everyday objects. To help activate students' prior knowledge and/or spark an interest in the scenario and role of QC technician, consider trying one of these introductory activities.

- a. Ask students what objects in their lives they “can’t live” without (perhaps a cell phone, glasses, toothbrush, etc). What do they know about how these things are made? What/who makes the parts that make up those objects, and how are they assembled? What happens if a part is defective or badly made?
- b. If possible, bring in someone from a local advanced manufacturing company to speak and answer questions about a typical work day as well as how things are made at their company. As an alternative, have students watch short videos about jobs in advanced manufacturing, such as this one: <http://www.today.com/video/today/51674446#51674446> (focuses on workers under 25 but gives a good overview of the entry level opportunities in the industry in MA).

2. Developing interpersonal communication skills

As described in the scenario, it is very important for a quality control technician to be able to communicate in a calm, professional manner with production workers, supervisors and sometimes clients. The following activities may foster your students’ growth in their interpersonal communication skills.

- a. To begin practicing basic speaking and listening skills, have students work in pairs in which one partner gives oral directions on how to complete a particular task, such as parallel parking or making a recipe. The other partner practices listening with attention and then reflects back what she heard and how well she feels she could accomplish the task based on the oral communication given. Have students comment on both the content of what was shared and the delivery (tone, body language, how formal the speech was, etc), ideally using a rubric provided beforehand (this could also be created as a group). Give all students the opportunity to be both the speaker and the listener.
- b. Discuss with students that there are certain norms (as well as “soft skills”) related to interpersonal communication in the American workplace that they may be expected to understand and/or adopt. Some examples in an advanced manufacturing setting might include knowing how to appropriately address someone with a higher level of authority as well as less authority; when and how to ask for guidance or help and when to solve a problem independently; how to accept constructive feedback and respond calmly; and even knowing when not to speak or interrupt.

Using a framework such as [this one](#), have students first read about different workplace values and then reflect on their own experiences working in the US or elsewhere. Then, in small groups, have students share personal anecdotes illustrating where they might naturally fall on the spectrum of the values outlined, and what a typical American advanced manufacturing employer might expect. What adjustments might they need to make to fit into the workplace norms of their employer?

Then segue into the role play activity listed below.

- c. Create student groups of 3 or 4. Have each group role play different workplace-based interactions that might arise in the scenario described in this module. Examples could include: giving constructive feedback to a production worker that a product does not meet the client’s specifications and needs to be rerun; reporting a problem or concern to a [supervisor](#); sharing report data in a quality control team meeting; asking a [client](#) for more concise product specifications; or responding to constructive feedback from a [supervisor](#). Before each role play, prepare students by having them [brainstorm](#) what effective communication would look or sound like in each of those situations, as well as how workplace values might come into play. After each role play, have the group share feedback on how the oral communication was professional/effective and how it could be improved.

3. Written communication and documentation

Accurate and clear written communication and documentation is another key skill set a quality control technician needs to develop. In many advanced manufacturing companies, detailed databases are kept which outline the history of quality control decisions and how issues were resolved in the past. Quality control technicians need to be able to keep accurate ongoing records, using both numerical and written documentation.

To practice written documentation, have students work in pairs and provide one student with instructions for building something (perhaps a simple structure with basic materials or even Legos) while a classmate observes and inspects the work. The “inspector” practices taking notes and

documenting how well the “builder” is following the instructions and whether any corrections need to be made. Students should have the opportunity to be both the builder and the inspector.

As a variation on this activity, you might provide instructions that are seemingly clear but ultimately ambiguous. As students follow the steps they will come up with an imperfect product. They can then discuss how the process could be improved, how to give feedback and how to focus on the product/process rather than the people involved being “bad” at their task. How does clear and comprehensive documentation influence the outcome of the product?

Contextualized test items

- Discussion question: Have students write a paragraph about why quality control is important.
- Discussion question: Describe when quality control is implemented in a production process.
- Be able to define or use technical terms related to quality control technician’s work.
- Read a report with grammatical and punctuation errors and make corrections.
- Audio: Listen to instructions and identify the key steps in a task

Contextualized project

1. Making connections with everyday life

- a. Have students choose an everyday object that is created through a manufacturing process and research how it is made.

Resources that could support this project include:

- “Who Made That?” column in the New York Times Magazine (for example, “[Who Made That Sippy Cup?](#)” or “[Who Made That Super Soaker?](#)”)
- [PBS Connections video series](#) (scroll down on the site for more recent episodes)

- b. Have students research products that have recently been recalled. What is wrong with the product, when was it detected and how is the company holding itself accountable? How is the company disseminating information about the recall? How might things have been different if quality control technicians had caught the problem before the product was released? What might the consequences be if the product were not recalled?

2. Effective oral communication/presentation skills

- a. Have students pick something they are good at and then teach the rest of the class. Make sure they demonstrate how they are meeting specific standards for effective oral communication and/or presentation skills.
- b. Have students research an emerging manufacturing process/technology or product and create a presentation to share with the class. For ideas, see, for example, the recent [Scientific American](#) issue devoted to the future of manufacturing.

Additional or extension activities, multimedia, readings and/or resources

- Government agencies such as [OSHA](#).
- Field trip to a local production plant, if possible.



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