

### Unit Overview

#### Introduction to the unit:

Unit 2 is focused on healthy, work-based collaboration. Students will apply their strengths and leadership styles to understand effective team dynamics and peer collaboration. Students will understand the importance of communication, including verbal and nonverbal communication, during group assignments. Students will be given multiple opportunities to develop teaming skills and organize tasks to solve real world problems. The performance task asks students to design a company website that helps to attract potential clients and future employees to the advanced manufacturing sector, an important industry sector in the state.

#### Students Will Know and Be Able To...

- work in teams to manage competing ideas and develop a shared idea of success;
- hold themselves and their peers accountable for contributing to the team's success;
- develop and lead diverse teams to generate creative solutions to complex problems;
- communicate effectively using verbal and nonverbal techniques with members of a team;
- describe the advanced manufacturing sector, including the range of companies and careers and its significance;
- consider the audience and purpose in designing a website and social media campaign.

The following vocabulary words are used throughout the unit. All vocabulary definitions are from *Merriam Webster* unless indicated otherwise.

- **appearance:** the outward aspect or look of something (*Teacher Guide, Unit Plan*)
- **artifact:** a usually simple object (such as a tool or ornament) showing human workmanship or modification as distinguished from a natural object (*Teacher Guide, Unit Plan*)
- **body language:** the gestures, movements, and mannerisms by which a person or animal communicates with others (*Teacher Guide, Unit Plan*)
- **constraints:** a constraining condition, agency, or force; a check (*PT 2.1B, PT 2.1A, Teacher Guide, Unit Plan*)
- **criteria:** a standard on which a judgment or decision may be based (*PT 2.1B, PT 2.1A, Teacher Guide, Unit Plan*)
- **encourager:** a person who inspires others with courage, spirit, or confidence (*Teacher Guide, Unit Plan*)
- **facial expression:** the look on one's face which is responsible for a vast percentage of nonverbal communication (created definition) (*Teacher Guide, Unit Plan*)
- **facilitator:** a person who makes an action or process easier (created definition) (*Teacher Guide, Unit Plan*)
- **gesture:** a movement usually of the body or limbs that expresses or emphasizes an idea, sentiment, or attitude (*Teacher Guide, Unit Plan*)
- **innovator:** a person who introduces something as new or as if new (*Teacher Guide, Unit Plan*)
- **mediator:** a person who attempts to make people involved in a conflict come to an agreement; a go-between (*Oxford Dictionaries' Definition*) (*Teacher Guide, Unit Plan*)
- **manufacture:** to produce something with a machine (*Teacher Guide, Unit Plan*)
- **nonverbal communication:** communication that is not involving or using words (*PT 2.1B, PT 2.1A, Teacher Guide, Unit Plan*)
- **prioritize:** to list or rate (projects, goals, etc.) in order of priority (*Teacher Guide, Unit Plan*)
- **recorder:** a person who keeps records (*Teacher Guide, Unit Plan*)
- **teamwork:** work done by several associates with each doing a part but all subordinating personal prominence to the efficiency of the whole (*Teacher Guide, Unit Plan, PT 2.1 Rubric*)

Introducing, reinforcing, and using academic vocabulary with students is an important part of a student’s comprehension of the subject matter. As explained by Robert Marzano and Debra Pickering in *Building Academic Vocabulary: Teacher Manual*, there is a six-step process for direct instruction in subject-area vocabulary (2005):

1. Teacher provides a description, explanation, or example of the new vocabulary word.
2. Students restate explanation of the new vocabulary word in their own words.
3. Students create a picture or image representing the vocabulary word.
4. Students periodically do activities that help add to the knowledge of vocabulary words.
5. Students are asked to discuss the vocabulary word with another student.
6. Students periodically participate in games that allow them to play with the vocabulary words.

Many teachers incorporate this process into their bell ringers at the beginning of class or have students complete a Frayer model or K-W-L chart to build their knowledge of academic vocabulary. Some teachers also use a [word-wall](#) to provide students with high-frequency words. Most essential to effective vocabulary learning is the opportunity for students to experience new words, multiple times, and in a range of contexts—for them to hear, read, and use new words and concepts authentically. Teachers are therefore encouraged to plan for how they will introduce new words and terms, the examples they will offer and/or solicit from students, and when and how they will frequently model their own use of new words and encourage students to use new vocabulary in their own writing, discussions, and presentations. (Of note, more traditional approaches to word learning, such as having students research and/or copy definitions, complete flash card “drills,” and complete work sheets or quizzes generally “teach” vocabulary in isolation and show little positive, lasting effect on student learning.)

Throughout the unit, different vocabulary words will be introduced in each lesson. Teachers can use the above strategies and process, or leverage the strategies linked below that have other ideas for interactive strategies and activities that can be incorporated into the six-step process to help students build and utilize academic vocabulary:

- [Internalization of Vocabulary Through the Use of a Word Map](#)
- [Grades 3-8 EngageNY ELA Appendix](#)
- [15 Vocabulary Strategies in 15 Minutes](#)
- [12 Vocabulary Activities and Mini-Lessons for High School Students](#)
- [5 Brain-Based Vocabulary Activities for the Secondary Classroom](#)

### Lesson One: Communication Is the Key

The power and necessity of communication and collaboration is hardly lost on people these days. A [survey of midsize and large employers](#) by the Association of American Colleges and Universities found that more than 80 percent of the employers look for collaboration skills in new hires – but fewer than 40 percent of these employers consider new graduates prepared to work in teams. Students can develop collaboration skills that prove beneficial to their academic pursuits. [One recent study](#) found that students who are taught how to be part of a team, disagree with a team, and their responsibility within team are able to create longer chains of reasoning to answer complex questions in group discussions. In addition to the academic performance benefits, students also experience [benefits in confidence building and improved psychological health](#) when they learn how to collaborate. The following lesson (and unit) is designed to help students develop those collaboration and **teamwork** skills.

**Day 1:** Students will discuss the meaning of the idiom “two heads are better than one.” Students will divide into teams of 4-5 and participate in an obstacle course activity. Students will discuss team activity questions provided by the teacher on how **teamwork** is essential to success. Students will share with the class their responses to the activity

questions. Students will watch a video and discuss the research.

**Virtual Learning Option:** The teacher may offer a personal example of where a message got lost when carried across multiple people (such as when s/he asked one child to share a message with another, when s/he missed a meeting and asked different coworkers what happened, or how Covid communications and myths spread and get corrupted and confused). You can either facilitate this discussion in a virtual, whole-class setting, or share the prompt with students and have them respond electronically by adding their thoughts to a shared document or chat.

### Activity: Obstacle Course

**Time Frame:** 25 minutes

**Class Configuration:** groups of two or three

**Materials:** blindfold, classroom objects to form an obstacle course, stopwatch

**Description:**

This is a team-building activity with a classroom obstacle course created with objects like desks.

**Tip:** The teacher may want to set up two similar obstacle courses and assign two students as timekeepers so that more than one group can go at a time. The teacher may want to rearrange the obstacle courses before the next set of groups start the activity to keep the activity fresh. Teachers will also want to consider issues of physical accessibility when completing this activity so that all students can participate.

1. Use the personality traits chart from the previous unit to place students with others of the same domain (e.g., all diplomats in the same group). Each team should choose one person in the team to wear a blindfold. The others will tell the blindfolded student how to navigate the obstacle course.
2. In groups of three, one student will be wearing the blindfold, one student will have the opportunity to speak, and the third student will need to communicate with his/her peers using **nonverbal communication**. Student teams determine the role and responsibility for each member. Teams have two minutes to prepare for how they will navigate the course. The timekeeper uses a stopwatch to record the amount of time it takes the student teams to complete the course.
3. As part of the formative assessment, the teacher will monitor the responses to the following questions:
  - What was most difficult about this task? How might the experience have been different if you had had more time or no time constraints?
  - How did communication vary by different team members?
  - What types of communication worked best? Why did those types of communications work for this activity?
  - What types of communication worked the least? Why did those types of communications not work for this activity?
  - How did the team work together to determine methods of communication?
  - What could the team have done to improve communication? Would better communication between team members have helped students navigate the course? Why?
  - What factors contributed to the success of the group? Do things like personality domains play a role in the success of a group? Why?
  - What two ideas would have helped your team to be more effective?

- What are the ways different teams (e.g., basketball team, McDonald’s drive-thru, drama club) communicate?
4. Show the video, “[How Google Builds the Perfect Team](#)” (2:12 minutes). Ask: Did you find the results of the study surprising?
  5. Discuss with students the importance of effective communication (communicating verbally, listening actively). Teachers are encouraged to draw on some of the verbal and nonverbal communication they observed in the obstacle course exercise and/or in their classrooms and across the school, as well as from their broader personal experience. As you discuss the meaning/interpretation of various non-verbal cues, be sensitive to variations across cultures and prior experiences.

**Virtual Learning Option:** In place of the obstacle course, leverage breakout rooms on Zoom or coordinate another video conference platform for small groups where they can share their screens. Have students obey the same constraints (blindfold, can’t speak, etc.) while they take turns trying to complete [Super Mario Crossover 3](#). (Note: Students will need certain software enabled (Flash) in order for the game to work.) Have small groups reflect on the prompts and share 2-3 responses with the teacher or with the whole class. Students can watch the video individually and then share their responses the question in #4 and complete the exit ticket below with their group or individually in their virtual notebooks.

Alternatively, turn the obstacle course activity into a family task — ask students to go for a walk with a sibling and parent/guardian and have one person close their eyes and be guided by the others, talk a parent/guardian through playing a new video game, or have someone in the house put groceries away or fold the laundry, blindfolded. Encourage students to video, share, and discuss their experiences as much as possible. (Note: This would be a good time to highlight that abilities are not fixed, but can develop and improve over time with feedback and practice, and despite early setbacks — reinforcing a growth mindset.)

**Tip:** *In addition to this lesson on teamwork, the following are other resources, tips, and suggestions that teachers may use to help students develop collaboration and **teamwork** skills. As articulated in “PBL for 21<sup>st</sup> Century Success: Teaching Critical Thinking, Collaboration, Communication, and Creativity,” successful project-based learning includes providing students with the autonomy to lead in their projects and teams while also providing them with supports and structures to make this possible. For some students who are used to working alone on more traditional class assignments, working in a team can sometimes be a difficult transition. Teachers may need to help students learn to work with other students from different backgrounds or perspectives. Techniques such as developing shared leadership, conducting team-building activities, developing norms, encouraging accountability, teaching how to give and receive feedback, and reinforcing conflict resolution strategies are all critical actions that teachers can take to help students develop a collaborative culture. More in-depth information about each of these techniques can be found in “PBL for 21<sup>st</sup> Century Success.” Some of other resources, which also include specific recommendations for increasing collaboration including suggested group size, group norms, protocols, etc. are:*

- [20 Collaborative Learning Tips and Strategies for Teachers](#)
- [5 Strategies for Deepening Student Collaboration](#)
- [The After-Action Review Strategy for Student Collaboration](#)
- [Essential Student Collaboration Strategies for the Diverse Classroom](#)

**Exit Ticket:** Students will work with their team to list three ways they could improve communication during group work. Encourage students to think specifically about ways they can show others they are actively listening to them, open to multiple perspectives, etc.

**Day 2:** Students will practice speaking and listening as a team and understand the importance of recognizing and correctly interpreting nonverbal cues. Students will be introduced to the idea of **nonverbal communication** by watching an animated short film and participate in a pantomime activity to practice **nonverbal communication**. Students will explore the ways this kind of communication can be used to express feelings in an appropriate and inappropriate manner.

### Activity: Circle of Voices

**Time Frame:** 20 minutes

**Class Configuration:** teams of three or four

**Materials:** video

**Description:** This activity provides the opportunity to practice effective communication techniques by encouraging students to work with students from a different personality trait domain.

**Tip:** Use a topic of relevance—a current event or an important issue in the school or community. Allow students to have a few minutes to organize their thoughts about the issue.

1. Form students into circles and provide them with a relevant topic. Students will take turns speaking.
2. Once a topic is established and students have had time to collect thoughts the discussion begins. Each student will have up to three minutes (or less) of uninterrupted time to speak. During this time, no one else is allowed to communicate. Each student will begin by paraphrasing the comments of the previous student or by showing how his or her remarks relate to those of the previous student. After everyone has spoken once, each group will engage in general discussion. Specify that students will only build on what someone else has said, not on their own ideas; also, at this point, they should not introduce new ideas. Students will then work in their teams to answer the questions below.
3. As part of the formative assessment, monitor responses to the following questions which guide the post-activity discussion:
  - Was it easy or difficult to engage in individual discussions building from each other's ideas? Why?
  - Was it easy or difficult to engage in group discussion building from each other's ideas? Why?
  - What factors contributed to the group's ability to dialogue as a team? Did the group configuration aid or detract from the group's ability to dialogue?
  - In what ways did students in the group communicate in other ways besides verbal communication? Explain.
4. Show the video, "[Pixar: For the Birds](#)" (3:25 minutes). Ask: Could you tell the emotions, thoughts, and feelings of the birds? How?
5. Discuss the various types of **nonverbal communication**:
  - **appearance**
  - **artifacts**



- **body language and posture**
- **facial expressions**
- **gestures**

Teachers may consider using one of the previously mentioned games or activities at the beginning of the unit to build this academic vocabulary.

**Virtual Learning Option:** The introduction to this lesson and the Circle of Voices activity is best facilitated in a whole-class setting. Use video to allow students to participate in this activity together in real-time. If the class is large, consider offering two different times for this lesson to allow flexibility for students and keep the activity at an appropriate length.

### Activity: Pantomime

**Time Frame:** 20 minutes

**Class Configuration:** pairs

**Materials:** slips of paper with a different pantomime activity on each one

**Description:** As a way to consider the many ways we use nonverbal communication, students will take turns acting out an activity and guessing what another student is acting out.

1. Give each student the chance to draw a slip of paper that describes an activity to pantomime.
2. Move students into pairs, where they will take turns acting out the activity and guessing their partner's activity. The activities can be repeated. Sample activities include
  - choking in a restaurant, needing help; others' reactions
  - coming home late, parents waiting up angry
  - walking down a scary street late at night
  - finding out a favorite celebrity is coming to town
  - receiving a bad grade on a test unexpectedly
  - arguing about a sporting event
  - opening a gift, surprised at contents; others' reactions
  - begging parents for car, parents resisting
3. Ask: What was easy and what was hard about acting out the activity? What was easy and what was hard about guessing the activity? How did nonverbal cues help?
4. Ask: Do you think nonverbal cues can be misinterpreted? Why or why not?  
Be prepared to share examples of possible miscues, e.g., does a nodding head always mean agreement; when is a waving hand a greeting and when is it the "brush-off"; when is silence respectful, active listening and when is it ignoring/tuning out and how do you know?
5. Observe students doing the pantomime activity as a formative assessment.

**Virtual Learning Option:** The Pantomime activity can be facilitated via video. It's best to do the activity in real-time with students taking turns acting out an activity. The teacher can assign students an activity by sending them a direct/private chat, text message, or email. The teacher can leverage breakout rooms for partner or small group collaboration and then bring the class back together to discuss (#3 and #4 above) and debrief the activity.

**Exit Ticket:** What are some strategies you can use to show you are interested in what a team member has to say?

#### Lesson Two: Using Teamwork to Solve a Problem:

**Day 1:** Students will understand team roles and responsibilities and explore how teams determine functions. Students will discuss the variety of roles within a team: **facilitator, innovator, mediator, encourager, prioritizer** and **recorder**. Students will identify which role they believe matches their strengths and values and work with a group of students who self-identify with their same role and then move into alternative groups in which each student identifies with a different role. Students will discuss the importance of team members fulfilling their roles and responsibilities and the potential impacts to teams if all individuals are not functioning as part of the team. Students will participate in a team-building activity with students who each fulfil a different role of their choosing.

Students will understand there are specific team roles and responsibilities that each team member has and if these are not fulfilled the team will not be successful.

#### Activity: Think-pair-share

**Time Frame:** 25 minutes

**Class Configuration:** pairs

**Materials:** self-stick notes

**Description:**

1. Students will work with a partner to think-pair-share different times that they were part of a team project or on another team such as a sports team, drama performance, choir, or band and the types of roles that they played on the team (10 minutes).
2. If students cannot identify different roles, have the students identify words that sound like the roles listed below. Students should then predict what roles each of the team members might play based on their prior knowledge. The teacher may divide students up in pairs or triads to complete the activity.
  - **Encourager:** a person who inspires courage, spirit, or confidence
  - **Facilitator:** a person that makes an action or process easier
  - **Innovator:** a person who introduces something as new or as if new
  - **Mediator:** a person who attempts to make people involved in a conflict come to an agreement; a go-between
  - **Prioritizer:** a person who lists or rates (projects, goals, etc.) in order of priority
  - **Recorder:** a person who keeps records
3. Ask students to write on a self-stick note which role they believe best suits them and share it with the class.
4. Break students into groups of three or four with students who identified with the same role. Students will discuss and list the characteristics that correspond with to their shared role.
5. Break students into different groups of three or four in which each student has a different role. Students will share and discuss the characteristics that correspond to their role.
6. Ask students to review their note to determine if their stated role is the role that best suits their personality (10 minutes).

**Virtual Learning Option:** Prior to a synchronous class, assign students a partner and ask them to think-pair-share together or consider the prompts individually. Ask students to share the role that best suits them in a shared document or chat. Create virtual groups for students to discuss with their peers and complete #4 and #5 above.

### Activity: Build a Tower

**Time Frame:** 15 minutes

**Class Configuration:** groups of four

**Materials:** 10 balloons or 20 straws for each team of four, masking tape (in 3-foot strips), yard stick (activity can be done with balloons or straws)

**Description:**

1. Divide students into groups of four. Give each team balloons or straws and a strip of masking tape. Explain that the object of this challenge is to build the tallest free-standing tower using just the balloons (or straws) and provided masking tape. The tower must be built on the floor (or table) and may not use any other objects to help support it. Students will have ten minutes to build their tower. Remind students of the ten-minute deadline when there is five, then two, minutes remaining. Give a final reminder at 30 seconds.
2. Give students five minutes to answer the following questions as a team.
  - a. What happened?
    - How tall was your team’s tower?
    - Did your team plan before you started to build?
    - Did your group change the plan after starting to build? How?
    - Did everyone provide input to the plan? Why or why not?
    - As you had less time to work, what happened in your group?
    - Was your end product satisfactory? What would you change next time?
  - b. What does it mean?
    - What can this activity tell us about working in teams?
    - In what ways was communication important among your team members?
    - What problems did your team encounter during this activity? How were you able to overcome them?
    - What types of roles did members of your team assume? Did a **facilitator** emerge? Why or why not?
    - Were some people more involved than others? Why?

**Exit Ticket:** I work best in a group when \_\_\_\_\_. What kind of norms need to be in place to make sure a team functions successfully?

**Virtual Learning Option:** In a completely online environment, the tower building activity will likely have to be skipped, but the teacher can repurpose some of the “what does it mean” reflection questions, the exit ticket, and the connection to growth mindset to have students reflect again on their experience with the Mario game or alternate activity. Alternatively, students could work in teams in virtual video conferences to complete a craft building activity. One student would build the craft/object while others collaborate on the design. Each team would have a certain amount of time to build something from materials available at home. For example, a student may combine an egg beater with a fork to make an ultimate spaghetti twirling machine.



**Day 2:** Students will form groups to discuss project guidelines, **criteria** and **constraints**, and a new performance task rubric. Students will determine roles and responsibilities and develop a list of team rules and norms that they agree to follow and discuss other functions of a team contract.

1. Introduce the first performance task by providing students with an overview of the project, including the final team formation (teams of three or four students each), the PT 2.1A student handout, the PT 2.1B student handout, and the PT 2.1 rubric. Provide time for students to ask questions.
2. Allow students to meet with their teams and determine roles and responsibilities. Students will develop their team member contracts (see PT 2.1A).

**Exit Ticket:** Why do teams need group norms or agreements? What are the risks/potential dangers of not having agreed to norms?

**Virtual Learning Option:** Model a think-aloud and/or share a video introducing the team contract or start with a whole-class virtual session. Either way, brainstorm with students about different kinds of contracts — for example, agreeing to a curfew with their parents. Students can share their thoughts aloud in a whole-class video conference or add ideas to a chat or shared document. Then either create spaces (chats, phone or video conference lines) or leverage breakout rooms in Zoom for small groups to work together to draft their team contract. The teacher can pop in-and-out of the small groups to ask clarifying questions. Refer to the Virtual Learning Guide to review best practices for virtual team work.

**Day 3:** Students will watch a video about advanced manufacturing and individually complete research on the sector with the goal of understanding what it is and what the sector looks like (range of careers, major companies/products, etc.) in their region and across the state and report back to their team. Leveraging the *Advanced Manufacturing Sector Overview* documents, the teacher will select and/or identify resources for students to review. The *Advanced Manufacturing Sector Overview* includes a brief description of the sector; questions for teachers and/or students to consider about the sector; a list of clusters, pathways, and certifications connected to the sector; and a list of resources (texts, videos, etc.) for further teacher and/or student research about the sector

Teachers should select or adapt appropriate resources, or excerpts of them, based on students' abilities and interests and/or identify additional resources to share. Lexile levels are listed for the readings in the resources section.

1. Introduce advanced manufacturing by starting a K-W-L chart as a class and filling out the “K” and the “W”. What do students already know about the manufacturing and advanced manufacturing sectors? What do students know about robots and automation? Do students know of any local manufacturing companies? If so, what do those companies produce? Do students know what types of jobs are available in the advanced manufacturing sector? What do they want to learn? What will they be required to learn during the performance task? (10 minutes).
2. Students will then watch the [Advanced Manufacturing Overview from Lockheed Martin video](#) (2 minutes, 51 seconds) and, time permitting, the [How it's Made: Ice Cream video](#) (4 minutes, 42 seconds). After the video(s), spend a few minutes beginning to complete the “L” section of the chart.
3. Advanced Manufacturing Jigsaw Activity. (20 minutes)

- After the Advanced Manufacturing Jigsaw Activity, one student from each group reports to the whole class about what his/her group learned to complete the “L” section of the chart. The teacher will present any missed information about the sector. (10 minutes)

*Tip: Read about Achieve the Core’s [Text Set Project](#) to learn about how text sets can help build students’ knowledge and vocabulary. Review one of the Achieve the Core text sets ([Bacteria and Viruses](#), for example) to review additional supports for struggling students and a text set protocol for ELL students (pg. 4-6). Teachers can utilize these resources and the presented protocol to potentially supplement their instruction to go deeper into readings on the Advanced Manufacturing sector.*

### Activity: Advanced Manufacturing Jigsaw

**Time Frame:** 20 minutes

**Materials:** printed or electronic readings or excerpts

**Description:**

The teacher will divide students into [jigsaw groups](#) so that reading levels and interests are evenly distributed across groups. If possible, each performance task group (established on Day 2) will have at least one representative for each reading.

The teacher will assign each jigsaw group one reading or excerpt about advanced manufacturing from the *Advanced Manufacturing Sector Overview*. The students will complete the reading for the jigsaw activity, synthesizing the most important information that they will then share with their respective performance task group. Depending on the selected readings, sample questions that students can consider include:

- How have new developments in technology changed the advanced manufacturing sector? What new possibilities exist given these new developments in technology?
- How are the realities of advanced manufacturing potentially different than traditional views held about the manufacturing sector?
- What are the various careers within the advanced manufacturing sector?
- What advanced manufacturing companies are located in your region and your state?
- What skills, competencies and dispositions will be necessary for future jobs in the Advanced Manufacturing sector?
- What post-secondary training and experiences are necessary for jobs in the Advanced Manufacturing sector?

Once all students have synthesized their information on their reading, students will return to their performance task groups and share their findings.

**Exit Ticket:** What skills, competencies and training are necessary for a job in Advanced Manufacturing? (Prompt students to begin to think about specific careers in the sector that they might be interested in and what they think it would require.)

**Virtual Learning Option:** This lesson could be conducted in a whole-class virtual setting by starting with a whole-class discussion and using a virtual whiteboard for the K-W-L and then leveraging two rounds of breakout rooms for the jigsaw activity. Alternatively, it could be conducted asynchronously. The teacher could share a short video introducing the lesson and advanced manufacturing and ask students to share their “K” and “W” in a shared virtual space.

- The teacher would first assign the articles and have students share reflections in a group chat or shared document with the other students who read the same article.

- Then the performance task groups will each have their own separate shared document or chat. In this document, students would share what they learned from their article and article group discussion with their performance task group.

**Day 4:** Students will individually complete research on various occupations within the manufacturing industry and identify current demographics of the workforce including gender, race, and ethnicity of people who hold these positions. Students will document underrepresented populations in the workforce and identify potential audiences for recruitment. Students will individually research various companies within the manufacturing industry and document products and potential clients. The team will develop a decision matrix and apply categories within the matrix to determine one company website that the team will review and redesign.

**Tip:** The teacher may want to provide students with links to manufacturing company sites in their state.

- Allow students time to individually research the manufacturing industry by reviewing various company and organization websites. Students will record types of companies and/or organizations and the products they manufacture (15 minutes).
- Have students individually research employee demographics in the manufacturing industry. Students will record the current demographics of the manufacturing industry including gender, race, ethnicity, etc. and hypothesize why different groups may or may not be well represented. Ask students to discuss why a lack of diversity may or may not be good for an organization. (15 minutes).
- Ask student teams to list the company and/or organization names and the types of products that were manufactured (on paper or white board). Student teams will list facts depicting employees in the manufacturing industry, including workforce demographics like gender, race, ethnicity, etc.
- Allow students to develop a list of **criteria** and **constraints** they can use to evaluate each company to determine which company the team will select. Students will record the top five **criteria** and **constraints** in the decision matrix (see PT 2.1B). The team will use the decision matrix to select their company.

**Tip:** To learn more about Decision Matrices visit [What Is a Decision Matrix? Definition and Examples](#) and/or [What is a Decision or Pugh Matrix?](#) To make the assignment more challenging for students, consider requiring them to assign weights to each criteria and constraint. See Unit 2\_PT1B\_DecisionMatrix\_Example2.

- Monitor the industry research for a formative assessment. Review information gathered by students and ensure that student work reflects the industry.

**Exit Ticket:** Name a time you could have used a decision matrix to help you make a choice and how it might have helped and/or changed your final decision.

**Tip:** Teaching students online research skills can often be a tricky endeavor. Students may need to understand which search engines to use or how to evaluate content or websites. The teacher as a “modeler” of this process can be an effective instructional strategy that may be helpful for students. The following resources also provide other strategies to help students develop online research skills:

- [Teaching Students Better Online Research Skills](#)
- [10 Strategic Steps for Teaching Online Research Skills to Your Learners](#)
- [5 Tips for Teaching Students How to Research and Filter Information](#)
- [11 Ways to Teach Savvy Search Skills](#)

**Virtual Learning Option:** Online research and the decision matrix tool are often challenging for students, so you'll want to make sure you are available to support them during this lesson. Students can conduct the research on their own, asynchronously, though you may want to share a video or a model note catcher highlighting an example. For the decision matrix, you can either have the whole-class online and leverage breakout rooms (that way you can hop in-and-out to support students) or have student teams set up their own time to meet and complete the decision matrix and ensure that you are available to support them (via text, email, phone, etc.) if they have any questions.

**Days 5 and 6:** Students will individually research the selected company's website and document recommendations to attract potential clients and future employees. The team will apply categories within a decision matrix to determine the top five recommendations to incorporate in the redesigned website. Students will develop a mock-up or sketch of the redesigned web page and share it with their team for feedback.

1. Have students reflect on what makes an attractive website. Ask: What websites do you go to often? What features about the websites make that an attractive website? What features lure you back to the website? As a follow-up question, have students think now about a company's website. Ask: What features lure a customer back to the website?
2. Allow students time to individually research the select company or organization's website and develop a list of five potential recommendations that will help to attract potential clients and/or future employees, specifically those from underrepresented employee demographics.
3. Have teams list each team member's recommendations. Teams will group similar recommendations and develop a final list of ideas. Student teams will develop a list of **criteria** and **constraints** to evaluate the final list of ideas.
4. Demonstrate how to develop a decision matrix and apply the **criteria** and **constraints** within the matrix to determine the top five ideas as a group (see PT 2.1B). Student teams will select the top five recommendations. Student teams will determine which three or four web pages need to be redesigned (matching the number of students in the group). Student teams will agree to how the top recommendations can be applied to each page.
5. Allow students to work independently to develop a mock-up of the redesigned company web page and share that with their group for feedback. Students will revise their designs based on group feedback.

**Exit Ticket:** What features of a website make visitors want to return? How did we use these features in our team web page design?

**Virtual Learning Option:** Open this lesson with a short whole-class discussion about websites, then send students off to do some research independently, asynchronously. Alternatively, as a check for understanding, have student teams select

an example of a compelling website to share with the class. Then student teams will meet (via video, chat, etc.) to compare notes and come to a consensus on which pages they will redesign.

**Days 7, 8, and 9:** Students will research the best method to create their website and subsequent web pages. Students will work in teams to select the technology used to redesign the website and provide support to others in their team to design their pages.

**Tip:** *The teacher will want to research the available web design resources ahead of time.*

1. Allow student teams time to research the best method to create their redesigned company website. Encourage student teams to brainstorm the best method to support each other or train each other on developing the website. Student teams may choose to update their team contract.
2. Suggest resources such as wix, hibu, blogger, web.com, or Google Sites to develop the company website. Review potential website products in advance of the lesson to determine limitations to the technology tools that students will use and apply and speak with building technology staff to ensure students have access to various website resources. Students can log onto wix.com and Google sites with student email addresses (if your district is a Google district). The lesson is designed to allow students to research, evaluate, and select free website tools. The teacher can determine what additional limitations are applied to technology tools. Both advanced tools and low-tech tools are provided below.
  - <https://globaldigitalcitizen.org/8-free-website-creator-tools>
  - <https://support.google.com/blogger/answer/1623800?hl=en>
  - <http://www.freotech4teachers.com/2011/02/10-ways-for-teachers-and-students-to.html#.WtH24ljwa70>

If students cannot make a website online, they can always use Microsoft Word to create the website. The following links provide instructions on that process.

- <https://www.wikihow.com/Make-a-Website-With-Word>
  - <https://www.youtube.com/watch?v=oSfNIDR2WSY>
3. Remind students that they will create a webpage incorporating the design ideas necessary to attract potential clients and future employees, specifically under-represented employee demographics.
  4. Support students as they create a series of web pages in an overall effort to redesign a company website. Work with students individually and as teams to check to understanding of the assignment and ensure that each team member is actively engaged in the assignment. Ask questions about how the students made decisions using the decision matrix and observe how students are applying their recommendations as part of the website redesign.

**Virtual Learning Option:** Much of these lessons can be completed by students asynchronously. The teacher should make sure student teams are set up with a website-building platform and that students know when and how to provide feedback to their teammates. (Perhaps use Days 8 and 9 for students to create their mock-ups and Day 10 for students to review each other's' work and provide feedback — via phone, text, chat, email, shared doc, etc.)

**Days 10 and 11:** Students will individually research media campaigns. Students will document the types of advertisements as verbal or nonverbal and discuss their effectiveness as a team. Student teams will brainstorm **criteria** for an effective social media campaign. Student teams will determine which **criteria** can be used to promote their company website to attract potential clients and future workforce. Student teams will complete their social media campaign plan.

1. Teachers should present the different components of a social media campaign. Teachers may present the concept within the context of a presidential campaign. Each presidential candidate utilizes multiple platforms and medias to make sure voters understand his or her message. This may mean that the candidate utilizes different platforms (Facebook, Twitter, Instagram, etc.) and different messages to target different voters. A campaign therefore is different from just a single ad or tweet.
2. Allow students to individually research marketing techniques to build a social media campaign. Students will record the types of techniques they find (10 minutes).
3. Have students research various advertisements and social media activity for the selected company and/or related products. Students will record the types of advertisements, social media formats, and the types of social media activity for the company or for related products (10 minutes).
4. Allow teams time to brainstorm ideas or **criteria** for an effective social media campaign. Student teams may list ideas and develop a decision matrix to **prioritize** the best ideas.
5. Instruct student teams to create a social media campaign plan that would make people aware of the changes to the website, specifically updates to attract potential clients and future employees. The social media plan should include the following:
  - definition of the target audience
  - timeline for the campaign to begin and end
  - which social media platform(s) will be used
  - examples of the social media advertisements that will be developed
  - goal statements for the social media campaign
6. Work with students individually and as teams to check to understanding of the assignment and ensure that each team member is actively engaged in the assignment. Ask questions about how the target audience was determined, the types of social media platforms that the social media campaign will apply, and types of advertisements that will be effective in reaching the target audience.

**Virtual Learning Option:** Introduce this part of the performance task and the concept of a social media campaign in a whole-class video meeting or recorded video to share with students. Students can work individually and then with teams, asynchronously, to develop their social media campaign. Be sure to check in on team progress and be available to students who have questions.



**Days 12 and 13:** Student teams will develop a team presentation to demonstrate the updates to their company website, outline their social media plan, and explain how their team contact supported group work and the overall success of the team. The following are resources to help students develop good presentations:

- [Structuring a presentation](#)
- [How to Give a Good Presentation—Without Anxiety](#)
- [13 Ways Designers Screw Up Client Presentations](#)
- [How to present like a pro: Seven tips for your upcoming projects.](#)
- [Three Tips for Great Presentations](#)
- [How to Give a Good Presentation](#)

1. Provide student teams with enough time to develop their team presentation, which will include updates to their company’s website, a social media plan, and their team contract.
2. Instruct student teams to determine the roles and responsibilities of team members during the presentation and allow time for teams to rehearse their presentation.

**Day 14:** Student teams will present their website, social media campaigns, and team contracts to another class or to members of the manufacturing industry.

To close the unit, the teacher will explain to students that they now have experience working in teams. In the next unit they will use their team skills to initiate, plan, execute, monitor, and close a project.

**Virtual Learning Option:** Student presentations can either take place in real time via video conference or student teams can create short videos of their presentations and a screencast of their website redesign to share with the class. As much as possible, students should present in real-time to the whole class, or at least to another group, so that the pitch/presentation experience is as authentic as possible and so that students get real-time feedback from their peers.

### Website Links Referenced in Unit 2

- <http://www.readwritethink.org/classroom-resources/lesson-plans/internalization-vocabulary-through-word-307.html>
- <https://www.engageny.org/resource/grades-3-8-ela-curriculum-appendix-1-protocols-and-resources>
- <http://learningtasks.weebly.com/vocabulary-strategies.html>
- <https://k12.thoughtfullearning.com/blogpost/12-vocabulary-activities-high-school>
- [http://www.readingrockets.org/content/pdfs/World\\_Walls\\_A\\_Support\\_for\\_Literacy\\_in\\_Secondary\\_School\\_Classrooms.pdf](http://www.readingrockets.org/content/pdfs/World_Walls_A_Support_for_Literacy_in_Secondary_School_Classrooms.pdf)
- <https://www.readingandwritinghaven.com/5-brain-based-vocabulary-activities-for-the-secondary-classroom/>
- <https://www.aacu.org/leap/public-opinion-research/2015-survey-falling-short>
- <https://www.youtube.com/watch?v=v2PaZ8NI2T4>
- <https://www.edweek.org/ew/articles/2017/05/17/children-must-be-taught-to-collaborate-studies.html>
- <https://resourced.prometheanworld.com/collaborative-learning-students/>
- <https://www.edutopia.org/article/5-strategies-deepen-student-collaboration-mary-burns>

- <https://www.teachthought.com/pedagogy/20-collaborative-learning-tips-and-strategies/>
- <https://www.edutopia.org/article/strategy-effective-student-collaboration>
- <https://www.teachingchannel.org/blog/2018/05/16/surviving-group-work>
- <https://www.youtube.com/watch?v=YlnrcXHG4mc>
- <https://achievethecore.org/page/2784/text-set-project-building-knowledge-and-vocabulary>
- <https://achievethecore.org/page/2701/bacteria-and-viruses>
- <https://www.teachhub.com/jigsaw-method-teaching-strategy>
- <https://www.businessnewsdaily.com/6146-decision-matrix.html>
- <https://asq.org/quality-resources/decision-matrix>
- <https://www.edweek.org/ew/articles/2013/05/22/32el-studentresearch.h32.html>
- <https://www.wabisabilearning.com/blog/10-steps-teaching-online-research-skills>
- <http://www.kathleenamorris.com/2018/02/23/research-filter/>
- <https://www.weareteachers.com/11-ways-to-teach-savvy-search-skills/>
- <https://globaldigitalcitizen.org/8-free-website-creator-tools>
- <https://support.google.com/blogger/answer/1623800?hl=en>
- <http://www.freetech4teachers.com/2011/02/10-ways-for-teachers-and-students-to.html#.WtH24Ijwa70>
- <https://www.wikihow.com/Make-a-Website-With-Word>
- <https://www.youtube.com/watch?v=oSfNIDR2WSY>
- <https://www2.le.ac.uk/offices/ld/resources/presentations/structuring-presentation>
- <https://business.tutsplus.com/tutorials/how-to-give-a-good-presentation-without-anxiety--cms-27476>
- <https://muledesign.com/2014/09/13-ways-designers-screw-up-client-presentations>
- <https://www.ue-germany.com/blog/en/how-to-present/>
- <https://www.youtube.com/watch?v=IRqsCVgeiG8>
- <https://magneticspeaking.com/3-tips-on-how-to-give-a-good-presentation/>
- <https://cte.careertech.org/sites/default/files/CCFrame-Manufacturing.pdf>
- <https://www.louisianabelieves.com/docs/default-source/jumpstart/c4m-manufacturing-certification.pdf?sfvrsn=13>
- [https://www.brookings.edu/wp-content/uploads/2015/02/AdvancedIndustry\\_FinalFeb2lores.pdf](https://www.brookings.edu/wp-content/uploads/2015/02/AdvancedIndustry_FinalFeb2lores.pdf)
- <https://www.whitehouse.gov/wp-content/uploads/2018/10/Advanced-Manufacturing-Strategic-Plan-2018.pdf>
- <https://newsela.com/read/lib-convo-globalization-us-china-workers/id/32317/>
- <https://www.thebalance.com/u-s-manufacturing-what-it-is-statistics-and-outlook-3305575>
- <https://newsela.com/read/manufacturing-3d/id/571/>
- <https://newsela.com/read/elem-flippy-hamburger-robot/id/41047/>
- <https://www.rodongroup.com/blog/a-brief-history-of-the-american-manufacturing-industry-infographic>
- <https://newsela.com/read/career-industrial-production-managers/id/32521/>
- <https://jcadusa.com/types-of-manufacturing-industry/>
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- <https://medium.com/mistyrobotics/mech-a-what-mechatronics-the-engineering-field-you-didnt-know-existed-1b6edc7b3fa9>
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- <https://newsela.com/text-sets/207930>
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- <https://www.nam.org/Data-and-Reports/State-Manufacturing-Data/2014-State-Manufacturing-Data/Manufacturing-Facts--Louisiana/>
- <https://www.youtube.com/watch?v=cNAi1JhCf6g>
- <https://www.cmu.edu/advanced-manufacturing/>
- <https://www.youtube.com/watch?v=P5R12zXuSvk&feature=youtu.be>
- <https://www.youtube.com/watch?v=2NzUm7UEEIY>
- <https://www.manufactureyourfuture.com/>
- <http://www.madehow.com>
- <https://www.mfgday.com/>