

Unit 3 Remote Learning Modifications

Introduction to the Unit:

Unit 3 encourages **innovation** and helps students to lead **entrepreneurial** projects. Students will develop **innovative** solutions to real-world problems and market products for a specific field. The performance task asks students to investigate **innovation** in a specific career field, conduct research on innovation currently occurring in the market, and develop ideas and plans based on a defined audience and target market.

Modifications:

The following lesson(s) have been modified to make learning opportunities more accessible to students in a remote setting. The use of an LMS with the capability of posting discussions, assignments, and video/content links for students is recommended.

- In a modification to Lesson One: Innovation and Entrepreneurship (Paper Tower Challenge Activity), students are asked to brainstorm tower building methods using an online virtual tower builder simulator and will record their journey through the engineering design process using a digital journal. Students will use up to 20 sheets of paper to build the tallest, most creative, or most interestingly engineered paper tower. All parts of the engineering design process will be recorded in the student's digital engineering design journal.
- In a modification to Lesson Three: Solving Problems through Creativity (Design a Catapult Activity), students are asked to brainstorm a conceptual catapult to solve an everyday problem using an online virtual catapult simulator. Students will test changing launch angle and mass virtually to make a design plan for their catapult design. Students will test the launch angle and mass of their design and record their design process in their digital engineering journal. Note: Students will research the best catapult type for their conceptual design but will not physically construct a catapult.
- In a modification to Lesson Four: Innovation and Entrepreneurship at Work (Unit 3 Performance Task), students are asked to develop a business plan for a food truck company. Students will work individually to develop the food truck menu, floor plan, 3-D model, business plan, and final presentation. All parts of the engineering design process will be recorded in the student's digital engineering design journal. Students will submit digital exit tickets/reflections and will receive virtual feedback from peers at various stages throughout the project development. Note: Since students will complete this project independently, students will not use the team contract, project roles and responsibilities and will not be assessed on team work. Students will complete a decision matrix independently and will receive peer evaluation using the matrix.

Lesson One: Innovation and Entrepreneurship (Modified)

Refer to the original [Unit 3: Solving Problems Creatively Teacher Resource Guide](#) for guidance on Day 1 of this activity.

Day 2: Students will complete a modified, hands-on activity to practice the engineering design process by building a paper tower remotely. Students will record each step of the process in their digital engineering journal.

1. Briefly review the five stages of the engineering design process. Explain that today, students will practice using these steps in a Paper Tower Challenge activity. Teachers may want to use the engineering design process graphic organizer provided with PT 3.1 Student Resource to guide students' thinking and perform a formative check of student

understanding.

Engineering Design Process: <https://www.eie.org/overview/engineering-design-process>

2. Provide students the link for the virtual Tower Builder game, a digital copy of the engineering design process graphic organizer, and a copy of the digital engineering design journal.

Virtual Tower Builder: <https://www.scienceathome.org/games/tower-builder/play-tower-builder-v2/>

3. Discuss the project goals and constraints and expectations for digital journal recordings for each phase of the design process.

Example of Paper Tower Challenge: <https://edu.workbencheducation.com/cwists/preview/4957-paper-tower-challengex>

4. As students work through the activity, the teacher will need to monitor student activity if conducting the lesson synchronously. Remind students to record each part of a phase before moving on to the next phase.

Tips for Digital Design Journal: https://deseng.ryerson.ca/dokuwiki/design:online_design_journals

Teacher Tip: Alternately, digital student learning portfolios such as SeeSaw or ClassDojo can be used to capture students' engineering design process thinking. Links provided within the lesson can be linked directly for students or embedded into a teacher-generated learning agenda or checklist document. Tools such as these make navigating objectives easier for students, helping ensure that learners of various modalities are successful in meeting the desired learning outcomes.

Activity: Paper Tower Challenge

Time Frame: 55 minutes

Class Configuration: Synchronous option: Individual with assigned partner feedback; Asynchronous option: Individual with teacher feedback

Materials:

- Virtual Tower Builder: <https://www.scienceathome.org/games/tower-builder/play-tower-builder-v2/>
- Digital copy of engineering design process graphic organizer (provided with PT 3.1 Student Resources)
- Copy of the digital engineering design journal (provided in Modified Student Resources)
- Remote students will provide the paper for the Tower Build. (Notify synchronous students in advance that 20 sheets of paper and scissors are needed for this activity.)

Description: Students individually with an assigned feedback partner (Synchronously) or individually with teacher feedback (Asynchronously) will see who can build the tallest paper tower using the engineering design process.

Remote Learning Tip: To make the "Paper Tower Challenge" activity as accessible to remote learning students as possible, links to external content, graphic organizers, and formative assessment checkpoints have been designed to easily integrate into a school or district's Learning Management System (LMS). It is suggested that links found within the lesson be shared with students directly through the LMS and tested prior to releasing them to students to ensure that links are still active and mapped correctly.

- **Synchronous instruction:** For live synchronous instruction such as web conferencing, teachers can facilitate this activity by allowing students time to brainstorm solutions to the paper tower challenge using the virtual tower

builder (5 minutes) and creating the paper tower (20 minutes). If assigning to students individually, teachers might consider modeling the virtual tower builder and digital engineering design journal before assigning to the students.

- **Asynchronous instruction:** The “Paper Tower Challenge” activity can be posted for students to complete independently or at their own pace (self-paced) as long as additional structures are in place. Providing a learning agenda or checklist for students detailing the various steps of the activity would give students more agency and provide support for students in need of accommodations such as this. Teachers may also consider providing an example of a digital engineering design journal to ensure that students have enough direction to meet the desired learning outcomes.

Teacher Tip: Teacher may wish to provide a digital copy of the graphic organizer to help students apply the engineering design process. Extensions such as Kami or Lumin can be used to make PDFs interactive.

1. Group students in partner groups of two (Synchronously) or individually (Asynchronously) and inform them that they will record the process for building the paper tower in their digital engineering journal.
2. Demonstrate to the class how to use the virtual tower builder game. Announce that students will be using the engineering design process to create the tallest paper tower. Provide constraints for the project (e.g.; students may only use paper to build the tower; student are limited to 20 sheets of paper; students may not use tape to hold the tower together or to secure to the floor; paper may be folded, cut, or rolled; 5 minutes will be provided to brainstorm using the virtual tower builder; only 20 minutes will be provided to develop the paper tower, all activities should be recorded in each student’s digital engineering design journal). Once the activity has ended, the class or teacher will determine which student created the tallest paper tower, most creative, or most interestingly engineered.
3. During the “Ask” phase (of the engineering design process), ensure that students are able to define the problem as well as any constraints. The problem definition and constraints should be recorded in their digital engineering design journals.

Ask: What is the problem? What do I need to know to solve the problem? What are the project constraints? What materials can I use? How much time do I have?

4. During the “Imagine” phase, ensure that students are able to brainstorm solutions using the virtual tower builder. All ideas should be recorded in their digital engineering journals with both text and visual depictions.

Imagine: Brainstorm possible solutions.

Teacher Tip: Students can take a screenshot of their virtual tower build and add to their digital engineering journal.

5. During the “Plan” phase, ensure that students are able to determine how they will create the paper tower. Allow students 5 minutes to plan their tower. The project plan should be recorded by students in their digital engineering design journal. Students should not move to the next phase until this part of the process is complete.

Plan: Draw a diagram. Make a list of the materials you will need.

Teacher Tip: Students can use extensions such as Kami or Lumin to sketch their design into their digital journal. Alternately, students can upload pictures of their design sketches to their digital journals.

(Synchronous) Allow students 5 minutes to provide written or verbal feedback to their assigned partner.

6. During the “Create” phase, ensure that students are working to create the paper tower. Feedback and iteration should be recorded in their digital journals including whether their design changed during construction, whether they applied ideas from their partner, and ongoing discussion about how their proposed solution is functioning.

Create: Follow your plan. Test it out!

(Synchronous) Allow students 5 minutes to provide written or verbal feedback to their assigned partner.

7. After the “Create” phase is complete, determine with the class which student had the tallest tower, most creative, or most interestingly engineered. Students should ensure that all notes during the prior phases are recorded in their journals.

8. During the “Improve” phase, ensure that students are reflecting on their design. Reflection should be recorded in journals. The following questions may be used to prompt reflection:

- Was the design functional? Why or why not?
- What would you change about the design?
- How closely did you follow the planning process?
- How did you use ongoing feedback during the “create” phase of the project? (Synchronous)

Improve: Modify your design so that it better meets the goal. Test it out!

Formative assessment will be captured through completion of the tower activity. All written research and information should be captured in the students’ digital engineering design journals.

Accessibility Tip: For students that need more scaffolding, the teacher can provide a more complete copy of the engineering design process. Teachers may also allow some students to use illustrations, videos, photos, or voice recordings.

Lesson Three: Solving Problems Through Creativity (Modified)

Refer to the original [Unit 3: Solving Problems Creatively Teacher Resource Guide](#) for guidance on Day 1 of this activity.

Day 2: Students will apply the engineering design process to develop an invention or innovation that solves a problem and will work individually to apply creativity and peer iteration to the solution. Students will document the engineering design process in their digital engineering design journal and develop reflection statements on the experience.

(Synchronous) Take 5 minutes to introduce the lesson and tell students that they will practice their creativity skills while using the engineering design process to develop a solution to an everyday problem using projectile motion. Briefly have students name the steps in the engineering design process. Remind them that the best solutions come from using their creativity.

Tip: Teachers may wish to establish one or more ways that catapults (projectile motion) can be successful (e.g., distance, accuracy, innovation). This may be discussed prior to the start of the project so that students may help define the

problem.

Activity: Design a Catapult

Time Frame: 55 minutes

Class Size: Synchronous option: Individual with assigned partner feedback; Asynchronous option: Individual with teacher feedback

Materials:

- Virtual Catapult: <https://phet.colorado.edu/en/simulation/projectile-motion>
- Digital copy of engineering design process graphic organizer (provided with PT 3.1 Student Resources)
- Copy of the digital engineering design journal (provided in Modified Student Resources)
- Remote students will use household items to design a solution to an everyday problem using projectile motion.

Description: Students will work independently to design a conceptual catapult to solve an everyday problem using the steps of the engineering design process.

Remote Learning Tip: To make the “Design a Catapult” activity as accessible to remote learning students as possible, links to external content, graphic organizers, and formative assessment checkpoints have been designed to easily integrate into a school or district’s Learning Management System (LMS). It is suggested that links found within the lesson be shared with students directly through the LMS and tested prior to releasing them to students to ensure that links are still active and mapped correctly.

- **Synchronous instruction:** For live synchronous instruction such as web conferencing, teachers can facilitate this activity by allowing students time to brainstorm solutions to the catapult challenge using the virtual catapult (10 minutes) and creating the catapult (20 minutes). If assigning to students individually, teachers might consider modeling the virtual catapult and digital engineering design journal before assigning to the students.
- **Asynchronous instruction:** The “Design a Catapult” activity can be posted for students to complete independently or at their own pace (self-paced) as long as additional structures are in place. Providing a learning agenda or checklist for students detailing the various steps of the activity would give students more agency and provide support for students in need of accommodations such as this. Teachers may also consider providing an example of a digital engineering design journal to ensure that students have enough direction to meet the desired learning outcomes.

1. Group students in partner groups of two (Synchronously) or individually (Asynchronously) and inform them that they will record the process for designing the catapult in their digital engineering journal.
2. Demonstrate how to use the virtual catapult. Announce that students will be using the engineering design process to design a catapult to solve an everyday problem. Explain constraints to the project (students may only use household materials for their catapult prototype, only 20 minutes will be provided to design the initial catapult, all activities should be recorded in each student’s digital engineering design journal). Let them know that the class will determine which student created the most innovative catapult design at the end of the activity. Provide a graphic organizer to help students apply the engineering design process.

Note: Students will create a conceptual design of a catapult to solve an everyday problem through innovation. Students will test mass and launch angle of their design but will not physically construct a catapult.

3. During the “Ask” phase, ensure that students are able to define the problem as well as any constraints. Students should record the problem definition and constraints in their digital journals.

Teacher Tip: Remind students that they are designing a conceptual catapult to solve an everyday problem. Examples

could be a dirty clothes sorter that launches laundry into the hamper, a water bottle/soda launcher that encourages recycling, or a t-shirt launcher for school pep rallies.

4. During the “Imagine” phase, ensure that students are able to brainstorm solutions using the virtual catapult. Both text and visuals should be recorded in journals.

Virtual Catapult: <https://phet.colorado.edu/en/simulation/projectile-motion>

5. During the “Plan” phase, ensure that students are able to determine how they will design the conceptual catapult and record the project plans in their digital journals. Students should research types of catapults to determine which type of catapult would be best for their idea? This phase of the process must be completed before students begin work on the next phase.

Types of Catapults Resource:

[Storm the castle! Learn about catapults and make your own](#)

(Synchronous) Allow students 5 minutes to provide written or verbal feedback to their assigned partner.

6. During the “Create” phase, ensure that students are working to design the catapult and recording feedback and iterations in their digital journals. (Did their design change during testing? Any ongoing discussion about how their proposed solution is functioning?)

7. After the “Create” phase is complete, students will determine how they will test the prototype catapult. Each student should develop criteria for the evaluation and how information will be captured to improve their catapult design. This phase of the process must be complete before students begin to test their catapults.

Note: Students will be testing the projectile motion of their design (How mass and launch angle affects their design). Example: Students can test either if a loose sock or balled up sock works best for the laundry launcher. Students can test the best position of the hamper and determine which type of catapult will work best to achieve the launch.

(Synchronous) Allow students 5 minutes to provide written or verbal feedback to their assigned partner.

8. During the “Improve” phase, ensure that students are testing their design and reflecting on it. The catapult design should be improved during this phase. Students should record reflections in their digital journals and whether the student improved their design or generated new ideas.

9. After the “Improve” phase is complete, students should reflect on the following questions:

- Was the design functional? Why or why not?
- What would you change about the design?
- How closely did you follow the planning process?
- How did you use ongoing feedback during the “create” phase of the project?

Formative assessment will be captured through the completion of the catapult activity. All written research and information should be captured in the students’ digital engineering design journals.

Lesson Four: Innovation and Entrepreneurship at Work (Modified)

Remote Learning Tip: To make the “Food Truck” performance task as accessible to remote learning students as possible, links to external content, graphic organizers, and formative assessment checkpoints have been designed to easily integrate into a school or district’s Learning Management System (LMS). It is suggested that links found within the lesson be shared with students directly through the LMS and tested prior to releasing them to students to ensure that links are still active and mapped correctly.

- **Synchronous instruction:** For live synchronous instruction such as web conferencing, teachers can facilitate this lesson by allowing time for students to ask clarifying questions and get feedback from peers although they will be completing the task independently. Remote learning tips on the use of digital tools for student feedback, virtual gallery walks, and virtual exit tickets are embedded in the modified lesson.
- **Asynchronous instruction:** The “Food Truck” performance task can be posted for students to complete independently at their own pace (self-paced) as long as additional structures are in place. Providing a learning agenda or checklist for students detailing the various steps of the activity would give students more agency and provide support for students in need of accommodations such as this. Teachers may also consider providing an example of a digital engineering design journal and a model Food Truck presentation to ensure that students have enough direction to meet the desired learning outcomes.

Day 1: Students will be introduced to the performance task and provided time to ask clarifying questions. The teacher will discuss the project guidelines and the performance task rubric.

Remote Learning Tip: If conducting the lesson synchronously, students may ask questions during the live session. If conducting the lesson asynchronously, students may message their teacher or classmates through the school approved messaging system.

Students will determine their individual responsibilities to complete the performance task according to the project guidelines and rubric.

Students will then conduct research on careers in culinary and hospitality management and learn about **entrepreneurs** in this occupational sector. Students will be able to identify three or more possible careers in the culinary and hospitality industry and discuss the skills necessary for these careers.

Begin the class session by telling students that for the next few weeks they will be using the tools they have learned to design a food truck. To begin to build background knowledge, show the video [“History of Food Trucks”](#) by the History Channel and or review the [History of Food Trucks](#) PowerPoint.

Activity: History of Food Trucks

Time Frame: 55 minutes

Class Size: Individual

Materials: History of Food Trucks Venn diagram activity sheet

Description: Students will use the information they gained from the video and PowerPoint to compare Food Trucks then and now.

1. Have students complete the Venn diagram activity on the History of Food Trucks and post their response to the Learning Management System (LMS). If conducting the lesson synchronously, allow time for students to share their responses with the class and discuss what motivated changes (technology, etc.) and why some things remained the

same. (10 min) If conducting the lesson asynchronously, encourage students to comment and ask questions about their peers' responses through the schools Learning Management System (LMS).

Remote Learning Tip: Teacher may wish to provide a digital copy of the graphic organizer. Extensions such as Kami or Lumin can be used to make PDFs interactive.

2. Provide a digital copy of the task overview (Modified PT 3.1 Student Resource task overview) and performance task rubric. Review the task and rubric. If conducting the lesson synchronously, provide time for students to ask questions. If conducting the lesson asynchronously, encourage students to ask questions using the school approved messaging system.

3. Have students **research** the culinary and hospitality industry independently by reviewing various company and organization websites. Students will identify three or more occupations in the culinary and hospitality industry and provide the skills necessary to be successful in that occupation. Students should record their occupational research in their digital engineering design journal. In the journal entry, students should include potential career pathways that are available for students who are interested in pursuing a career in the culinary or hospitality field.

Students should find two websites and record the following information in their digital engineering design journal (**ASK**).

- Company profiles: including the name of the company, specific products, and target audience.
- Occupations and details: including training required, job outlook, potential entry salary, and growth options for the profession.

4. From the two websites, students should **brainstorm** a list of jobs that might be available at those companies and the skills they require. Students should record this information in their digital engineering design journal (**IMAGINE**).

To formatively assess whether students are aware of career in the culinary and hospitality industry, have each student complete a virtual exit ticket with the following statements:

Three occupations in the culinary and hospitality industry are 1 _____, 2 _____, and 3 _____.
Provide one/two sentences about each career and the occupation skills of its employees.

Teacher Tip: Virtual Exit Ticket <https://ditchthattextbook.com/10-ideas-for-digital-exit-tickets-and-some-analog-ones-too/>

Day 2: Students will review the business plan template in Modified PT 3.1. Students will apply the **engineering design process** to identify the stated problem and constraints. Students will **imagine** and **brainstorm** solutions to a problem and conduct research on restaurants and hospitality groups in their local or regional communities and use a decision matrix to evaluate ideas.

1. Provide a digital copy of the decision matrix. Review the decision matrix and remind students how they used it in Unit 2 of Quest for Success to select a company website to review and redesign.

Remote Learning Modification: Students will complete the decision matrix independently and will have a peer evaluate their ideas using the matrix.

2. Provide a digital copy of the **business plan** template. Review the Modified PT 3.1 and discuss the **business plan** template. Review the **engineering design process** to help frame the Modified PT 3.1 and students' responsibilities. Explain that students will apply the **engineering design process** to complete the Modified PT 3.1.
3. Have students review the Modified PT 3.1 to **identify the stated problem** and **constraints**. Students will record information in their digital engineering design journal.
4. Have students **imagine** and **brainstorm** solutions to the problem.
5. Students will **research** restaurants in their local or regional communities. Students will review menus and promotion concepts from local businesses on sites such as Yelp. Students will record promotion concepts and menu ideas they might want to use for their food truck.
6. Students may use a decision matrix (used in Quest for Success Unit 2) to evaluate their food truck ideas. Students will record information in their digital engineering design journal.

Note: The decision matrix has been modified to be completed independently and have a peer evaluate student ideas using the matrix.

7. Remind students to record their ideas and reflections in their digital journal.

As a formative assessment measure, students will document the **engineering design process** in their digital engineering journal and develop reflection statements for the **act** and **imagine** phases.

Day 3: Students will reflect on a video and discuss progress made on Modified PT 3.1. Students will begin to develop their food truck project and **business plan**. Students will update the project schedule template for the food truck **project schedule** to ensure that all deliverables and timelines to execute the project will be met.

1. Show "[The Great Food Truck Race](#)" and have students reflect on the video and review their work on the **act** and **imagine** phases of the **engineering design process**.

The following questions may be used for student reflection:

- What made the food trucks successful or not successful?
- What factors influenced the success of the food truck team?
- What factors influenced the customer's satisfaction with the food truck?
- How was success determined for each food truck?

2. Have students review the list of expectations for the Modified PT 3.1 and the business plan template. Students will begin to develop their food truck project and **business plan**.

3. Ask students to update project schedules for the food truck project to ensure that all deliverables and timelines to execute the project will be met.

Remind students of available tools to help with developing a **project schedule**.

Remind students to record their ideas and reflections in their digital journal.

As a formative assessment measure, students will document the **engineering design process** in their digital engineering journal. Students will reflect and answer how they can use the **plan** phase of the **engineering design process** to ensure successful project completion.

Day 4: Students will review their **project schedule** for the food truck project. Students should state how they know that they are on-track for project completion by the deadline.

Students will finalize their plan for the food truck project and begin to develop the food truck concept and menu. The teacher should provide support to students as needed. Students will document the **engineering design process** in their digital engineering journal and develop reflection statements for the **create** phase.

1. Teachers should tell students to review their project schedule template for the food truck project. Direct students to review how they are ensuring that they are on-track for project completion by the deadline.
2. The teacher should remind students to review how they will use planning tools to make sure they are on-track to complete the project.

Ask students to reflect: ***How might my experience be different if I were working with a team?***

3. Students will finalize their plan for the food truck project and begin to develop the food truck concept and menu (i.e. **create** phase).

The teacher will assist students as needed. Remind students to record their ideas and reflections in their digital journal.

As a formative assessment measure, students will document the **engineering design process** in their digital engineering journal and develop reflection statements for the **create** phase.

Days 5: The teacher should review project schedules and remind students that they may choose to continue to refine their project tools. Students should use a **project schedule** to manage their time and execute tasks associated with the project.

Students will complete their food truck concept, menu, and **prototype**. Students will design their food truck menu on a computer.

Activity: Menu

Time Frame: 55 minutes

Class Size: Individual

Materials: Computers

Description: Students will develop a menu for their food truck. Students will give and receive feedback on menu designs.

1. To encourage students to think creatively, share the [Unique Food Truck Menu](#) PowerPoint showing pictures of food truck menus (15 minutes). As you review the PowerPoint, point out what is unique about each menu if conducting the lesson asynchronously. Students will develop a list similar to the list below.

Food Truck Menu Tricks & Tips:

- The menu is the main way you have to market your Food Truck/ The menu tells your customers who you are and is one of the major ways you show your personality.

- Your menu should highlight your best-selling or most unique items. Make sure your eyes are drawn to these items on your menu.
 - To draw in customers, make sure to add color, images, labels, and logos to your menu.
 - Use attractive, creative descriptions of the ingredients to the dishes. This will make customers want to try your items.
 - Make sure your food is affordable. What kind of food truck are you going to have? What is the name? What details make sense for food items? Does the menu do more than just name your food items? What kinds of names are used?
 - What colors belong on the menu? How do the colors relate to the other parts of the menu?
2. Give students the following guidelines for their menu:
- 4-8 menu items (does not include drinks etc.)
 - Include prices
 - Create appealing, short descriptions of each dish
 - Does your menu have a name?
 - Provide pictures
3. Encourage students to be creative. Use the Tricks and Tips to ask students questions about their menu if conducting the lesson synchronously.
4. Ask students to post their menus to the school Learning Management System (LMS) for inspiration and motivation for other students.
5. Organize a virtual gallery walk of student menus for other students to provide feedback.

Remote Learning Tip: Virtual Gallery Walk

[Virtual Learning How-To: Gallery Walk — TARA](#)

6. Students will record digital feedback for other students.

Remote Learning Tip: Digital Peer Feedback - <https://ditchthattextbook.com/10-tools-for-effective-peer-feedback-in-the-classroom/>

If students complete their menu, they may begin work to design their food truck and its interior design.

As a formative assessment measure, the teacher should review student menus and digital feedback.

Day 6: Students will complete their food truck concept and prototype. The teacher should provide support to students as needed. Students will document the engineering design process in their digital engineering journal and develop reflection statements for the **create** phase.

Activity: Food Truck Concept

Time Frame: 50 minutes

Class Size: Individual

Materials: [“Inside a Food Truck”](#) video, [Inside a Food Truck](#) PPT, graph paper, computer

Description: Students will create a list of appliances they will need in their food truck. Students will then design the inside of a 16x30 foot food truck.

1. The teacher will begin the class session by showing the 2-minute video from History Channel “[Inside a Food Truck](#)”
2. If conducting the lesson synchronously, go through the Inside a Food Truck PowerPoint slides, showing pictures of the inside of a food truck and floor plans.
 - With each slide, point out what types of appliances are inside the food truck.
 - If conducting the lesson asynchronously, make the [Inside a Food Truck](#) PowerPoint slides available to students.

Remote Learning Tip: Create a voice-over of the Inside a Food Truck PowerPoint. With each slide, point out what types of appliances are inside the food truck.

- PowerPoint Voice Over How To - <https://www.lifewire.com/how-to-record-voiceover-powerpoint-4173784>

3. Have students do their best to think of everything they would need inside their food truck. Examples of things to consider:

- Placement of the foodservice window?
- What type of food will be served?
- What appliances are needed? An oven? Freezer? Refrigerator?
- How much area is needed for food preparation?

4. Students will record their thinking in their digital engineering design journal. Students will begin to understand the design of the interior is directly linked to the food they are serving.

5. Students will use the menu they designed, along with the equipment list needed to serve the food. Students will write down each piece of equipment they need to include in their future truck. This could include a refrigerator, deep fryer, freezer, heat lamp, and storage space to list a few of the basics.

6. After the list of equipment is created, the next part will be to determine how much space is needed. Students will need to **research** the specifics of each piece of equipment they want to put into the truck and design a layout of where each piece of equipment is to be placed. (Like the floor plans from the PowerPoint.) An average food truck is around 16 feet long but could be up to 30 feet long. It all depends on what size truck. Interior Design Tricks and Tips Ergonomics (people’s efficiency in the working space) is the number one consideration in the design of kitchen space.

- The kitchen should be designed for maximum labor efficiency, safety, and functionality.
- Ensure that there is enough room to move around when carrying supplies and dishes.
- When the set up helps your employees to decrease extra movement and not waste time, efficiency is increased, and fatigue and workplace injuries are reduced.

7. The student will sketch their initial Food Truck floor plan either on paper and upload the image to their digital journal or create an initial computer-generated floor plan. **(PLAN)**

Remote Learning Tip: Students can create their initial Food Truck floor plan digitally by using the drawing tools in Microsoft Word or Google Docs. Students who choose to sketch their initial floor plan on paper may need additional support in uploading the image to their digital journal.

As a formative assessment, teachers will review lists of equipment from their digital engineering design journal.

Teachers should also review the initial floor plan.

Day 7: Students will understand the use of a **Request for Proposal (RFP)** when operating a food truck and will design a **prototype** of their food truck using common household materials.

The teacher will explain that there is a legal document that is used to purchase or procure goods or services from potential vendors called a **Request for Proposal (RFP)**. An entrepreneur would potentially respond to an RFP to operate the food truck in a certain location or for a certain festival or event.

Sample food truck RFPs can be found here:

- [Scenic Hudson Food Truck RFP](#)
- [City of Langley Food Truck RFP](#)
- [Greenway Conservancy Food Truck RFP](#)

As the samples demonstrate, the RFP usually contains an overview of the project, timeline for completion, deadline for submission, available funding, and budget period. The teacher will review one of the sample RFPs. Have the students identify the overview, deadline for submission, costs, and evaluation process in the RFP. Have students think about what aspects (costs, variety, etc.) of their food truck would they include or highlight in their proposal if they were to apply for the RFP.

Activity: Food Truck Prototype

Time Frame: 45 minutes

Class Size: Independent

Materials: [Creative and Unique Food Trucks](#) PPT, [The Great Food Truck Race](#), Household Items for 3-D models, Digital tools for 3-D model

Description: Students will view and discuss Creative and Unique Food Trucks. Students will then use technology tools or ordinary household items to build a 3-D prototype of their food truck.

1. Share with students the [Creative and Unique Food Trucks](#) PPT. If conducting the lessons synchronously, ask students to vote for their favorite food truck, and explain why their selection is their favorite.
2. Students will begin to think about the design of their own food truck. Students may choose to re-watch "[The Great Food Truck Race](#)" video clip or research food truck concepts and models to think about the design of their prototype.
3. Have students **brainstorm** on how they would design their own food truck. Students will design a 3-D model of their food truck. Remind students to be creative!
4. Assist students as needed. Check to ensure student ideas and reflections are captured in the digital engineering design journal.
7. Students will create a 3-D model (either physical or computer-aided) of the inside of their food truck using available materials or digital tools.

Remote Learning Tip: Students can use tools such as SketchUp for Schools to digitally design their food truck. If students choose to build a physical model of their food truck, household materials can be used. The model can be photographed and uploaded into the digital journal and final presentation.

SketchUp for Schools Tutorial: <https://www.youtube.com/watch?v=NRdd7VT-Qi8>

As a formative assessment measure, students will document the **engineering design process** in their digital engineering journal and develop reflection statements for the **create** phase. (**CREATE**)

Days 8 and 9: Students will read the LinkedIn article [How Entrepreneurs are Making Big Bucks with Food Trucks](#). The teacher should review their **project schedules**. Students may choose to review and revise their **project schedule**. Students will complete their food truck concept, menu, and **prototype** as well as the **business plan** template. As the **business plan** template is complete, students should be vetting the food truck concept and menu with their potential clients (their classmates), conducting market research, and iterating on the idea and concept (i.e. **improve** phase of the **engineering design process**). The teacher should provide support to students. Students will document the **engineering design process** in their digital engineering journal and develop reflection statements for the **create** and **improve** phases.

Activity: Say Something

Time Frame: 55 minutes

Class Size: Individual

Materials: [How Entrepreneurs are Making Big Bucks with Food Trucks](#)

Description: If conducting the lesson synchronously, students will use the [Say Something Protocol](#) to discuss the article [How Entrepreneurs are Making Big Bucks with Food Trucks](#). If conducting the lesson asynchronously, students will read the article independently and record their article discussion points.

1. To introduce the next two days, students will read and discuss the article, [How Entrepreneurs are Making Big Bucks with Food Trucks](#) by using the [Say Something Protocol](#) to prepare for developing their **business plan** (if conducting the lesson synchronously). If conducting the lesson asynchronously, students will read the article independently and will record their article discussion points.

Remote Learning Tip: Student video recording platforms such as FlipGrid can be used for students to record their article reflections.

2. Follow the steps of the protocol as outlined in the linked document (Synchronous).

3. To focus student discussion, or to stimulate a specific type of thinking, the teacher may want to provide a stem for completion. (For example, “a question that comes to mind when I read this is...”)

Remote Learning Tip: For Synchronous discussion, it is effective for the teacher to post a timer displaying the full-time allotment for the discussion, so students can determine how long to converse, and how quickly to move on to the next section of the reading. Teachers may also divide the class into smaller breakout rooms to facilitate better student discussion.

Activity: Creating a Business Plan

Time Frame: 55 minutes

Class Size: Independent

Materials: Computers to create a business plan

Description: Students will research and create a **business plan** which should include the following. These details are also found in the Modified PT 3.1 Student Resource.

1. Cover Page: includes company name and logo.

2. Introduction/Overview (half page): includes an introduction to your company and idea, what products you sell, target audience/market, and the location of your food truck.
3. Company vision and mission statement (two paragraphs/sentences): includes a targeted mission statement and vision statement (could include the reason why people will shop at your food truck, e.g. fresh food, best smoothies, etc.
4. Company goals and objectives (two paragraphs): lists your company's short- and long-term goals and strategies to accomplish your goals.
5. Financial Overview (half page): discusses your company's menu, types of products and services (catering, delivery, retail, etc.), price of products and services, and expected daily, monthly, and annual revenue.
6. Marketing Overview (half page) discusses how you will market your products and services (e.g. flyers, social media, etc.), promotional ideas (e.g. coupons, specials, etc.), and defines your marketing strategy (e.g. specific food, location, gimmick, etc.)
7. Operational Overview (half page): discusses any legal or government issues in your city or state, Policies for customers, hours of operation and schedule, and location pattern for clients.
8. Conclusion Statement (two paragraphs): paraphrases why your food truck and company will be successful and identifies the strengths of your company

Note: Lesson adapted from CTE Online: Project Planner

<https://www.cteonline.org/curriculum/project/design-and-create-a-food-truck-pblproject/7PJ2wk#node/1>

The teacher will assist students as needed. The teacher should check to ensure student ideas and reflections are captured in the digital journal.

As a formative assessment measure, students will document the **engineering design process** in their digital engineering journal and develop reflection statements for the **improve** phase. (**IMPROVE**)

Day 10: Students will complete their food truck concept, menu, and **business plan**. Students will develop a digital presentation that presents their **business plan** and related products.

Students will complete their presentation and determine the best method of virtually giving the presentation.

1. Students will complete their food truck project and the **business plan**.
2. Students will develop their presentation outlining their **business plan** and associated documents and/or evidence in each section, e.g. food truck concept, menu, and **prototype**.
3. Students will determine the best method of virtually delivering the presentation.
4. Students will experiment with virtual presentation delivery options.

Day 11: Students will present their **business plans** to their classmates or members of the culinary and hospitality industry.

1. Students will give their presentations to their class or members of the culinary and hospitality industry.
 2. Students will reflect on their project and complete the project evaluation (Modified PT 3.1 Student Resources).
 3. The teacher will complete a teacher rubric for each student.
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Helpful Remote Tech Tools:

Screencastify - <https://www.screencastify.com/>
Kami - <https://www.kamiapp.com/>
Lumin - <https://www.luminpdf.com/>
SketchUp for Schools - <https://edu.sketchup.com/app/>
SeeSaw - <https://web.seesaw.me/>
ClassDojo - <https://www.classdojo.com/>
Google Jamboard - <https://jamboard.google.com/>
Flipgrid - <https://info.flipgrid.com/>
Nearpod - <https://nearpod.com/>

Helpful Remote Learning Tips:

Digital Design Journal: https://deseng.ryerson.ca/dokuwiki/design:online_design_journals
Virtual Exit Ticket: <https://ditchthattextbook.com/10-ideas-for-digital-exit-tickets-and-some-analog-ones-too/>
Digital Peer Feedback: [10 tools for effective peer feedback in the classroom](#)
Virtual Gallery Walk: [Virtual Learning How-To: Gallery Walk — TARA](#)
How to Voice Over a PowerPoint: [How to Do a Voiceover on PowerPoint](#)