

# EXPEDITIONS ANYWHERE

TEACHER'S GUIDE



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Pitsco has a clear mission statement: Leading education that positively affects learners. That is a statement we truly believe in and what motivates our employees every day. The company was started in 1971 by three teachers in a garage; it's truly an American success story. From that small beginning, we have grown into a company that serves three million students worldwide every year.

Our founder and CEO, Harvey Dean, was the student who needed to be actively engaged in his learning. He then became the teacher who enabled his students to create, tinker, build, and experience the content rather than memorize it. This is the core reason why hands-on education has always been our focus. All Pitsco STEM solutions are hands on. STEM is content in motion. It is creativity, critical thinking, communication, grit, and persistence, fueled by daring to fail in order to succeed. For nearly 50 years, Pitsco has seen the effectiveness of hands-on learning and the engagement it brings to students. Even though times are changing, the power of hands-on learning has not diminished.

As of August 2020, the COVID-19 pandemic has changed many aspects of "normal" life. Education had to pivot from an in-school setting to a remote online setting, which exposed gaps in student learning opportunities. A spotlight has been shown on educational inequity, access to educational technology and Internet is an issue, and the list goes on. There have been a multitude of discussions and proposed plans to address the upcoming school year, but a three-tiered approach has emerged that is almost universally being implemented in all states.

- Face-to-Face Instruction
  - Students and teachers are at the physical school building and respect social distancing guidelines.
- Blended Instruction
  - This is a combination of both face-to-face and remote online instruction.
- Remote Online Instruction
  - All instruction is provided via an online platform. The student and teacher are in different locations.

There are no doubt challenges associated with each of these approaches, but hands-on learning can play a major role in solving these challenges. Pitsco knows the power of hands-on learning, but research also supports this method. Studies have found that students who do not experience hands-on learning are 1.5 times more likely to fail a course than students who experienced hands-on learning opportunities. Hands-on education gives students choices by providing the freedom and creativity to solve problems in a manner they have designed and choose to implement. Hands-on learning increases students' responsibility to learn by having them engage in an authentic experience rather than only listen to a teacher lecture about a concept. Hands-on learning better engages the brain. When students are involved with tactile or kinesthetic learning, both hemispheres are required to process the information. As a result, students overwhelmingly recall a hands-on learning experience versus a traditional teacher-delivered lecture. When the hands-on activity is authentic, it also opens the doors to careers associated to that activity. For example, in a bridge building activity, students are not just introduced to the concepts an engineer would be responsible for but also act as the environmental scientist who performs the impact study of the bridge.

Hands-on experiences create student-driven learners who become self-directed workers. A hands-on activity is, by design, student centric and not teacher directed. In that environment, the teacher becomes a facilitator of learning and supports and guides students as they strive to complete the task. Employers increasingly want employees who demonstrate initiative and skill when communicating, working collaboratively, and creatively solving unexpected problems. The ownership students take over their projects in school is the foundation for the ownership they will take over their projects in their careers.

## Introductory Information

Remote adult helpers should be provided with a copy of the Summary document for each title.

## Suggestions for Remote Classrooms

- Students will sometimes need access to the alternate Resource, Resource Anywhere, which includes a video demonstration in lieu of the classroom activity. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.

Courses

- / Expeditions Professional Development Tutorials
- / Expeditions @Home recommendations

1. Introduction
2. Expeditions Access at Home
3. Student Login Options
4. Assignment Modifications
- 5. Expeditions Content Adjustments**

- If all students are completing this Resource remotely, the in-class Resource should be toggled to Off and the Exploration Anywhere should be toggled to Required.

● 02	Experimentation	REQUIRED
● T2.1	Types of Instruments	REQUIRED
● R2.1.1	Percussion	OFF
● R2.1.2	Percussion Anywhere	REQUIRED
● R2.1.3	Wind	REQUIRED
● R2.1.4	Strings	REQUIRED
● R2.1.5	Scientific Method: Is This a Good Experiment	OPTIONAL

- If some students are completing the Resource in class and some are completing the Resource Anywhere, both resources should be toggled to Optional.

<input checked="" type="radio"/> D2	Experimentation	REQUIRED
<input checked="" type="radio"/> T2.1	Types of Instruments	REQUIRED
<input checked="" type="radio"/> R2.1.1	Percussion	OPTIONAL
<input checked="" type="radio"/> R2.1.2	Percussion Anywhere	OPTIONAL
<input checked="" type="radio"/> R2.1.3	Wind	REQUIRED
<input checked="" type="radio"/> R2.1.4	Strings	REQUIRED
<input checked="" type="radio"/> R2.1.5	Scientific Method: Is This a Good Experiment	OPTIONAL

- If all students are completing this Resource in class, the in-class Resource should be toggled to Required and the Resource Anywhere should be toggled to Off.

<input checked="" type="radio"/> D2	Experimentation	REQUIRED
<input checked="" type="radio"/> T2.1	Types of Instruments	REQUIRED
<input checked="" type="radio"/> R2.1.1	Percussion	REQUIRED
<input checked="" type="radio"/> R2.1.2	Percussion Anywhere	OFF
<input checked="" type="radio"/> R2.1.3	Wind	REQUIRED
<input checked="" type="radio"/> R2.1.4	Strings	REQUIRED
<input checked="" type="radio"/> R2.1.5	Scientific Method: Is This a Good Experiment	OPTIONAL

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 1
    - Observations
    - Domains, Kingdoms, Phyla, and More
  - Destination 2
    - Bacteria
    - Plantlike Protists
    - Animallike Protists
    - Fungus-Like Protists
  - Destination 3
    - How Antibiotics Work
      - Prerequisite Resource: Bacteria
  - Destination 4
    - Use Your Microscope
      - Prerequisite Resource: Build a Microscope
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 2
    - Monerans Under the Microscope
    - Protists Under the Microscope
  - Destination 3
    - Antibiotic Resistance
    - Community Immunity
  - Destination 4
    - Build a Microscope
    - Improvement
      - Prerequisite Resources: Build a Microscope, Use Your Microscope

## Suggestions for Remote Classrooms

- No modifications will be needed for the Lesson Resources.
- Micrograph images of the specimens that the students are supposed to view on the digital microscope are provided as PDF files in Synergy. You may print them out and provide them to students, or, if students have the capability, you can provide them with the PDF files, and they can print out the images themselves.
- The following Activity Resources cannot be completed in a remote situation and should be toggled to Off in Synergy, or they should be set to Optional and students should be instructed to skip them.
  - Destination 3
    - Antibiotic Resistance
  - Destination 4
    - Improvement
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *Observations*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Domains, Kingdoms, Phyla, and More*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

### Destination 2

Resource Name: *Bacteria*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Monerans Under the Microscope*

- Materials List:
  - Bacteria types printout
  - Logbook
- Modification Recommendations: Students will need to be directed to use the printed materials instead of a digital microscope.

Resource Name: *Plantlike Protists*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Animallike Protists*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Fungus-Like Protists*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Protists Under the Microscope*

- Materials List:
  - *Euglena* micrograph
  - *Paramecium* micrograph
  - *Candida albicans* micrograph
  - Logbook
- Modification Recommendations: Students will need to be directed to use the printed materials instead of a digital microscope.

### Destination 3

Resource Name: *How Antibiotics Work*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Antibiotic Resistance*

- Materials List:
  - None
- Modification Recommendations: The equipment for this activity cannot be sent home. This Resource should be toggled to Off for remote learning.

Resource Name: *Community Immunity*

- Materials List:
  - Two-sided counters or similar two-sided object
  - Game piece or something use as a marker
  - 2 dice
  - Logbook
- Modification Recommendations: Provide students with two dice each or have them use an online dice simulator to simulate the dice rolls. Students should be instructed to use any two-sided object to replace the counters (coins, cards, pictures) and something that can be placed on top of one of those as the marker (coin, game piece, saltshaker).

### Destination 4

Resource Name: *Build a Microscope*

- Materials List:
  - Small lens
  - Piece of foam core
  - Onion skin
  - Light source
  - Paper
  - Transparent tape
  - Logbook
- Modification Recommendations: Provide students with the small lens and the piece of foam core. The piece of foam core needs to be only a 5" x 5" square. Students will need to provide their own light source. This can be a flashlight, lamp, or similar device; they should be instructed to not use sunlight. Students will need to provide a layer of onion skin from between two layers of an onion; this is thin enough to allow light to pass through and observed. If they need to dye it, they can use any dark-colored marker to stain the layer.



Resource Name: *Use Your Microscope*

- Materials List:
  - Microscope created in the Build a Microscope Resource
  - Logbook
- Modification Recommendations: None. Students will need only Synergy, the materials, and web access.

Resource Name: *Improvement*

- Materials List:
  - None
- Modification Recommendations: The equipment for this activity cannot be sent home. This Resource should be toggled to Off for remote learning.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 3:
    - Birds
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 1
    - Populations of Living Things
    - Determining Population Dynamics
  - Destination 2
    - Ancient Plants
    - Flowering Plants
  - Destination 3
    - Build an Artificial Nest
      - Prerequisite Resource: Birds

## Suggestions for Remote Classrooms

- No modifications will be needed for the Lesson Resources.
- Micrograph images of the specimens that the students are supposed to view on the digital microscope are provided as PDF files in Synergy. You may print them out and provide them to students, or, if students have the capability, you can provide them with the PDF files, and they can print out the images themselves.
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *Populations of Living Things*

- Materials List:
  - Blue-green algae with grid printout
  - Logbook
- Modification Recommendations: Students will need to be directed to use the printed materials instead of a digital microscope.

Resource Name: *Determining Population Dynamics*

- Materials List:
  - Beads or similar objects such as dried beans of two types
  - Bag
  - Scoop
  - Logbook
- Modification Recommendations: Students can substitute beads with anything small that they have a lot of, such as two different kinds of beans, small pasta, or any other similarly sized object. They need a bag they cannot see through such as a brown paper bag. They can use a large spoon as the scoop.

### Destination 2

Resource Name: *Ancient Plants*

- Materials List:
  - Fern Sporangia Early printout
  - Fern Sporangia Mature printout
  - Logbook
- Modification Recommendations: Students will need to be directed to use the printed materials instead of a digital microscope.

Resource Name: *Flowering Plants*

- Materials List:
  - Buttercup Bud Carpel Complete printout
  - Buttercup Bud Anther Complete printout
  - Logbook
- Modification Recommendations: Students will need to be directed to use the printed materials instead of a digital microscope.



## Destination 3

Resource Name: *Birds*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Build an Artificial Nest*

- Materials List:
  - Recycled materials for birdhouse
  - Logbook
- Modification Recommendations: Students should be instructed to use recycled materials they have available to them in their remote situation to build their artificial nest.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 1
    - Pathway Selections
  - Destination 2
    - Artfully Technical
    - Eye for Detail
      - Prerequisite Resource: Proper Introduction
    - Storied Paths
      - Prerequisite Resources: Proper Introduction, Eye for Detail
    - Director Decisions
      - Prerequisite Resources: Proper Introduction, Eye for Detail, Storied Paths
    - Story Time
      - Prerequisite Resources: Proper Introduction, Eye for Detail, Storied Paths, Director Decisions
  - Destination 3
    - Presenting a Path
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 2
    - Proper Introduction
  - Destination 3
    - Tales to Tell
      - Prerequisite Resources: Proper Introduction, Eye for Detail, Storied Paths, Director Decisions, Story Time

## Suggestions for Remote Classrooms

- No modifications will be needed for the Lesson Resources.
- Students can utilize a personal camera or device (such as a Chromebook) to complete the activities using the camera included with the Expedition.
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *Pathway Selections*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

### Destination 2

Resource Name: *Artfully Technical*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Proper Introduction*

- Materials List:
  - Digital camera
  - Logbook
- Modification Recommendations: Students should be instructed to complete the activity using their own device's camera to video record themselves.

Resource Name: *Eye for Detail*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Shared Paths*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.



Resource Name: *Director Decisions*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Story Time*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

### Destination 3

Resource Name: *Tales to Tell*

- Materials List:
  - Digital camera
  - Logbook
- Modification Recommendations: Students should be instructed to complete the activity using their own device's camera to video record themselves.

Resource Name: *Presenting a Path*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 1
    - Planetary Motion
  - Destination 2
    - Getting From Earth to Mars
    - Planning Your Model
  - Destination 3
    - Evaluate Other Bases
      - Prerequisite Resources: Providing Shelter, Getting Oxygen, Getting Water, Getting Food
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 1
    - Our Universe
  - Destination 3
    - Providing Shelter
    - Getting Oxygen
    - Getting Water
    - Getting Food

## Suggestions for Remote Classrooms

- No modifications will be needed for the Lesson Resources.
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *Our Universe*

- Materials List:
  - Paper tape (50 cm)
  - Ruler or other measuring device
  - Logbook
- Modification Recommendations: Students will need only Synergy, materials, and web access. You will need to cut the paper tape into strips at least 50 cm long before distributing them to students.

Resource Name: *Planetary Motion*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

### Destination 2

Resource Name: *Getting From Earth to Mars*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Planning Your Model*

- Materials List:
  - Logbook
- Modification Recommendations: Students will need only Synergy and web access. You need to inform them about what materials they will use to construct their models in the Providing Shelter, Getting Oxygen, Getting Water, and Getting Food Resources. You can divide the consumable materials up among students and send them home with the students to use, or you can tell students to use materials they have available at home. One thing they will need is an intact cardboard box upon which they will construct their model.

## Destination 3

Resource Name: *Providing Shelter*

- Materials List:
  - Model construction materials
  - Logbook
- Modification Recommendations: None. Students will need only Synergy, the materials, and web access.

Resource Name: *Getting Oxygen*

- Materials List:
  - Model construction materials
  - Logbook
- Modification Recommendations: None. Students will need only Synergy, the materials, and web access.

Resource Name: *Getting Water*

- Materials List:
  - Model construction materials
  - Logbook
- Modification Recommendations: None. Students will need only Synergy, the materials, and web access.

Resource Name: *Getting Food*

- Materials List:
  - Model construction materials
  - Logbook
- Modification Recommendations: None. Students will need only Synergy, the materials, and web access.

Resource Name: *Evaluate Other Bases*

- Materials List:
  - Logbook
- Modification Recommendations: Students will need only Synergy and web access. Students are to evaluate and provide feedback to other students about their models. Students in a remote situation will need to provide photographs and descriptions of their models for the other students to evaluate. You need to choose how students will see other students' work. You should also provide instructions on how students are to give feedback so that it can be shared with each group.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 1
    - Health Overview
  - Destination 2
    - Basic Biochemistry
  - Destination 4
    - Imagining Possible Fixes
    - Design Your Solution
      - Prerequisite Resource: Imagining Possible Fixes
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 2
    - Levels of Organization
  - Destination 3
    - Looking at Cells
    - Looking at Lung Tissue
    - Modeling the Respiratory System

## Suggestions for Remote Classrooms

- No modifications will be needed for the Lesson Resources.
- Micrograph images of the specimens that the students are supposed to view on the digital microscope are provided as PDF files in Synergy. You may print them out and provide them to students, or, if students have the capability, you can provide them with the PDF files, and they can print out the images themselves.
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *Health Overview*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

### Destination 2

Resource Name: *Basic Biochemistry*

- Materials List:
  - Nutrition labels
  - Logbook
- Modification Recommendations: Students will need to gather nutrition information for the food they eat for a week to complete this activity.

Resource Name: *Levels of Organization*

- Materials List:
  - Human Blood Smear printout
  - Human Esophagus printout
  - Mammal Muscle Types printout
  - Mammal Cerebellum printout
  - Logbook
- Modification Recommendations: Students will need to be directed to use the printed materials instead of a digital microscope.

### Destination 3

Resource Name: *Looking at Cells*

- Materials List:
  - Stratified Squamous Epithelial Cell printout
  - 1 mm at 4X printout
  - 0.1 mm at 10X printout
  - 0.01 mm at 40X printout
  - Logbook
- Modification Recommendations: Students will need to be directed to use the printed materials instead of a digital microscope.



Resource Name: *Looking at Lung Tissue*

- Materials List:
  - Lung Tissue printout
  - 1 mm at 4X printout
  - 0.1 mm at 10X printout
  - 0.01 mm at 40X printout
  - Logbook
- Modification Recommendations: Students will need to be directed to use the printed materials instead of a digital microscope.

Resource Name: *Modeling the Respiratory System*

- Materials List:
  - Plastic bottle (1 L)
  - Large red balloon
  - Small blue balloon
  - Scissors
  - Masking tape
  - Logbook
- Modification Recommendations: Students will need to be directed to use the scissors or another sharp object instead of the hand drill and bit to make a hole in the side of their lung model when instructed. They will need to observe their model both before and after making the hole rather than relying on a partner's model for data.

## **Destination 4**

Resource Name: *Imagining Possible Fixes*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Design Your Solution*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- Included with the BridgePak are copies of the *Pitsco Bridge Book*. Students should be provided a copy of this; instruct them to refer to it if they have questions while completing the Resources at home.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 1
    - Bridging the Gap
    - Questions That Need Answers
  - Destination 2
    - Bridge Types
    - Sketch Possible Bridges
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscope](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 2
    - Bridge Forces
    - Choosing a Final Design
      - Prerequisite Resource: Sketch Possible Bridges
  - Destination 3
    - Build the Sides
      - Prerequisite Resources: Bridging the Gap, Questions That Need Answers, Bridge Types, Sketch Possible Bridges, Choosing a Final Design, Bridge Forces
    - Build the Roadway
      - Prerequisite Resources: Bridging the Gap, Questions That Need Answers, Bridge Types, Sketch Possible Bridges, Choosing a Final Design, Bridge Forces, Build the Sides
- Final Assembly
  - Prerequisite Resources: Bridging the Gap, Questions That Need Answers, Bridge Types, Sketch Possible Bridges, Choosing a Final Design, Bridge Forces, Build the Sides, Build the Roadway
- Destination 4
  - Safety First
    - Prerequisite Resources: Bridging the Gap, Questions That Need Answers, Bridge Types, Sketch Possible Bridges, Choosing a Final Design, Bridge Forces, Build the Sides, Build the Roadway, Final Assembly
- Test the Bridge
  - Prerequisite Resources: Bridging the Gap, Questions That Need Answers, Bridge Types, Sketch Possible Bridges, Choosing a Final Design, Bridge Forces, Build the Roadway, Final Assembly, Safety First
- Evaluating Your Design
  - Prerequisite Resources: Bridging the Gap, Questions That Need Answers, Bridge Types, Sketch Possible Bridges, Choosing a Final Design, Bridge Forces, Build the Sides, Build the Roadway, Final Assembly

## Suggestions for Remote Classrooms

- No modifications will be needed for the Lesson Resources.
- Included with the BridgePak are copies of the *Pitsco Bridge Book*. Students should be provided a copy of this; instruct them to refer to it if they have questions while completing the Resources at home.
- The following Activity Resources cannot be completed in a remote situation and should be toggled off in Synergy, or they should be set to Optional and students should be instructed to skip them.
  - Destination 4
    - Safety First
    - Test the Bridge
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *Bridging the Gap*

- Materials List:
  - Logbook
- Modification Recommendations: Students will work individually instead of in pairs, so they will not need to define their role in a group, but they still need to go through the Resource to learn the responsibilities for finishing the project. Notify them that they will work individually instead of as a team. Students will need Synergy and web access.

Resource Name: *Questions That Need Answers*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

### Destination 2

Resource Name: *Bridge Types*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Bridge Forces*

- Materials List:
  - 2 sticks (24")
  - Ruler or other measuring device
  - Timber Cutter or other sharp object
  - Logbook
- Modification Recommendations: Students will need two consumable sticks for this activity and a way to cut them; they could use a knife from home. Scissors are not recommended as they tend to crush the ends of the sticks, making them difficult to glue correctly. Students will need Synergy and web access.

Resource Name: *Sketch Possible Bridges*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Choosing a Final Design*

- Materials List:
  - Grid graph paper (1/8")
  - Ruler (for both measuring and straight edge)
  - Logbook
- Modification Recommendations: Students will work individually instead of in pairs, so they will not need to work with a partner to choose a final design. Notify them that they will work individually instead of as a team. Students will need Synergy and web access.

## Destination 3

Resource Name: *Build the Sides*

- Materials List:
  - 10 sticks (For this activity, if you have resources available, consider sending two additional sticks home with your students.)
  - Glue
  - Ruler or other measuring device
  - Timber Cutter or other sharp object
  - Foam board or cardboard sheet (larger than bridge sides)
  - T-pins
  - Masking tape
  - Binder clips
  - Sandpaper
  - Waxed paper
  - Logbook
- Modification Recommendations: If it is not possible to send Builder's Boards, Perf Inserts, and Accu-Fixtures home with the students, they will need a sheet of foam board or cardboard to use with T-pins to hold their bridge pieces in place as they are glued. Students can use a knife from home for cutting the sticks. Scissors are not recommended as they tend to crush the ends of the sticks, making them difficult to glue correctly. The materials for this Activity Resource will be used in the Build the Roadway and Final Assembly Activity Resources; students will need these materials only once. Do not duplicate these materials for the other Resources.

Resource Name: *Build the Roadway*

- Materials List:
  - Materials provided during the Build the Sides Resource
- Modification Recommendations: If it is not possible to send Builder's Boards, Perf Inserts, and Accu-Fixtures home with the students, they will need a sheet of foam board or cardboard to use with T-pins to hold their bridge pieces in place as they are glued. Students can use a knife from home for cutting the sticks. Scissors are not recommended as they tend to crush the ends of the sticks, making them difficult to glue correctly.

Resource Name: *Final Assembly*

- Materials List:
  - Materials provided during the Build the Sides Resource
- Modification Recommendations: If it is not possible to send Builder's Boards, Perf Inserts, and Accu-Fixtures home with the students, they will need a sheet of foam board or cardboard to use with T-pins to hold their bridge pieces in place as they are glued. Students can use a knife from home for cutting the sticks. Scissors are not recommended as they tend to crush the ends of the sticks, making them difficult to glue correctly.

## Destination 4

Resource Name: *Safety First*

- Materials List:
  - None
- Modification Recommendations: This Resource should be toggled off for remote learning.

Resource Name: *Test the Bridge*

- Materials List:
  - None
- Modification Recommendations: This Resource should be toggled off for remote learning.

Resource Name: *Evaluating Your Design*

- Materials List:
  - Logbook
- Modification Recommendations: The Structures Testing Instrument and electronic balance scale are used to test student bridges. You will need to have students turn in their bridges. You will then need to test them and provide the results to students so they can do the evaluation. You can make this a video or live video event.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 1
    - Communication Essentials
  - Destination 2
    - What Is Graphic Communication?
    - Graphic Communication Components
    - Printing History
  - Destination 3
    - What Is Telecommunication?
- Destination 4
  - Evaluation
    - Prerequisite Resource: Meeting the Challenge
  - Improvements
    - Prerequisite Resources: Meeting the Challenge, Evaluation
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 2
    - Orthographic Sketching
    - Isometric Sketching
      - Prerequisite Resource: Orthographic Sketching
    - Oblique Sketching
      - Prerequisite Resources: Orthographic Sketching, Isometric Sketching
  - Printing a Design

- Destination 3
  - Build an Analog Communication System
  - Build a Digital Communication System
- Destination 4
  - Meeting the Challenge

## Suggestions for Remote Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resource cannot be completed in a remote situation and should be toggled to Off in Synergy, or it should be set to Optional and students should be instructed to skip it.
  - Destination 3
    - Build a Digital Communication System
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *Communication Essentials*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Destination 2

Resource Name: *What Is Graphic Communication?*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Graphic Communication Components*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Orthographic Sketching*

- Materials List:
  - Simple three-dimensional object to draw
  - Logbook
- Modification Recommendations: Students will need a simple three-dimensional object to draw. Wooden alphabet blocks work well, but any object they can acquire in their remote location will work.

Resource Name: *Isometric Sketching*

- Materials List:
  - Simple three-dimensional object to draw
  - Logbook
- Modification Recommendations: Students will need a simple three-dimensional object to draw. Wooden alphabet blocks work well, but any object they can acquire in their remote location will work.

Resource Name: *Oblique Sketching*

- Materials List:
  - Simple three-dimensional object to draw
  - Logbook
- Modification Recommendations: Students will need a simple three-dimensional object to draw. Wooden alphabet blocks work well, but any object they can acquire in their remote location will work.

Resource Name: *Printing History*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Printing a Design*

- Materials List:
  - Potato
  - Knife (to carve the potato)
  - Something to use for ink
  - Sheet of paper
  - Logbook
- Modification Recommendations: Students will need a potato and something to carve it with; any sharp kitchen knife will work. They will need a medium to print with and a piece of paper to print onto. The medium can be food coloring, a colored powder, or a different substance if you cannot provide them with a stamp pad.

## Destination 3

Resource Name: *What Is Telecommunication?*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Build an Analog Communication System*

- Materials List:
  - 2 paper cups
  - String (10 ft long)
  - Logbook
- Modification Recommendations: None. Students will need only Synergy, the materials, and web access.

Resource Name: *Build a Digital Communication System*

- Materials List:
  - None
- Modification Recommendations: This Resource requires materials that cannot be sent to students. It should be set to Off in Synergy, and students should be instructed to skip this portion of the logbook.

## Destination 4

Resource Name: *Meeting the Challenge*

- Materials List:
  - Logbook
- Modification Recommendations: Students should be instructed to find a partner in their remote situation for finishing this activity or be given a partner they can work with virtually from the class.

Resource Name: *Evaluation*

- Materials List:
  - Logbook
- Modification Recommendations: Students will need only Synergy and web access. To evaluate students virtually, you will need to provide students the message they will transmit to their intended recipient.

Resource Name: *Improvements*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 1
    - Sustainable Farming
    - Organic vs Traditional
    - Soil Origins
  - Destination 2
    - Mechanization
    - Green Technology
    - Biotechnology
    - Planning a Farm
  - Destination 3
    - Buying Local
    - Urban Farms
    - Gardens and Greenhouses
    - Greenhouse Questions
    - Greenhouse Ideas
    - Greenhouse Plan
    - Greenhouse Improvements
      - Prerequisite Resource: Greenhouse Creation
  - Destination 4
    - Water Cycle
    - Aral Sea Disaster
  - Destination 5
    - Analyzing Data
    - Planning Improvements
    - Garden Conclusions
      - Prerequisite Resource: Glove Gardening
    - Transplanting Radishes
      - Prerequisite Resources: Glove Gardening, Garden Conclusions

- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 1
    - Usable Farm Land
    - Seed Germination
    - Glove Gardening
  - Destination 3
    - Greenhouse Creation
  - Destination 5
    - Greenhouse Experiment
      - Prerequisite Resources: Greenhouse Creation, Greenhouse Improvements

## Suggestions for Remote Classrooms

- No modifications will be needed to the Lesson Resources.
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *Sustainable Farming*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Organic vs Traditional*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Soil Origins*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.



Resource Name: *Usable Farm Land*

- Materials List:
  - Clay
  - Logbook
- Modification Recommendations: Instruct students to use whatever object they have available in a remote situation to cut the clay, such as a butter knife. Divide and distribute the clay evenly among students.

Resource Name: *Seed Germination*

- Materials List:
  - Radish seeds (minimum of five)
  - Aluminum weighing dish
  - Tissue or paper towels
  - Plastic cup
  - Logbook
- Modification Recommendations: You will need to create consumable kits that contain radish seeds, the aluminum weighing dish, and tissue or paper towels unless you feel students will be able to provide some themselves in their remote situation. Students should be instructed to use a plastic cup instead of a beaker.

Resource Name: *Glove Gardening*

- Materials List:
  - Glove
  - Radish seeds (minimum of eight)
  - Soil (A small resealable bag of soil will be sufficient, or you can have students collect soil from their location to use.)
  - Tape
  - Sheet of paper
  - Logbook

- Modification Recommendations: Students will need to be instructed to make a funnel from a sheet of rolled up paper to place the soil in the glove. They should use this funnel to add soil to each finger of the glove; in each finger, they should place about 2 inches of soil, one radish seed, and then an additional 1/2 inch of soil on top. To add water, students can use one of two methods: add 1/2, 1, 1-1/2, and 2 teaspoons respectively to the fingers of the glove, or add the water a drop at a time to each glove; 20 drops of water are equal to 1 milliliter. Students should find somewhere to tape their glove for the duration of the Expedition at their remote location. They will need to record the room temperature as the temperature. If they cannot measure room temperature, have them use an Internet source to find the temperature of their location.

## Destination 2

Resource Name: *Mechanization*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Green Technology*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Biotechnology*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Planning a Farm*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Destination 3

Resource Name: *Buying Local*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Urban Farms*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Gardens and Greenhouses*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Greenhouse Questions*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Greenhouse Ideas*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Greenhouse Plan*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Greenhouse Creation*

- Materials List:
  - 50 straws
  - 50 pipe cleaners
  - Plastic wrap (3 feet)
  - Transparent tape
  - 3 sheets construction paper
  - Ruler or other measuring device
  - Scissors
  - Logbook
- Modification Recommendations: Notify students that they will work individually instead of in pairs. You will need to put together the kit of materials for each student to utilize at their remote location.

Resource Name: *Greenhouse Improvements*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Destination 4

Resource Name: *Water Cycle*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Aral Sea Disaster*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Destination 5

Resource Name: *Greenhouse Experiment*

- Materials List:
  - 2 thermometers
  - Clay
  - Model greenhouse built in a previous activity
  - Logbook
- Modification Recommendations: The digital thermometers are probably not possible to send home due to cost. But an inexpensive alternative is available from Pitsco ([Classroom Thermometer 59405](#)) that would allow you to send the thermometers home with the students. Instruct students to conduct this experiment where sunlight is available, as the lamp and ring stand will not be sent with the other materials.

Resource Name: *Analyzing Data*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Planning Improvements*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Garden Conclusions*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Transplanting Radishes*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
  - The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
    - Destination 1
      - Keeping Time
      - What About Time?
    - Destination 2
      - Time Passages
        - Prerequisite Resource: Timely Materials
    - Destination 3
      - Time-Sensitive Materials
        - Prerequisite Resources: Timely Materials, Time Passages
      - Clock Management
        - Prerequisite Resources: Timely Materials, Time Passages, Time-Sensitive Materials
      - Time-Out
        - Prerequisite Resources: Timely Materials, Time Passages, Time-Sensitive Materials, Clock Management
    - Destination 5
      - Passing Time
        - Prerequisite Resources: Timely Materials, Time Passages, Time-Sensitive Materials, Clock Management, Time-Out, Clockwork
    - Destination 6
      - Decision Time
        - Prerequisite Resources: Timely Materials, Time Passages, Time-Sensitive Materials, Clock Management, Time-Out, Clockwork, Passing Time, One More Time
  - Budget Time
    - Prerequisite Resources: Timely Materials, Time Passages, Time-Sensitive Materials, Clock Management, Time-Out, Clockwork, Passing Time, One More Time, Decision Time
  - Time to Shine
    - Prerequisite Resources: Timely Materials, Time Passages, Time-Sensitive Materials, Clock Management, Time-Out, Clockwork, Passing Time, One More Time, Decision Time, Budget Time
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.
- Destination 2
    - Timely Materials
  - Destination 4
    - Clockwork
      - Prerequisite Resources: Timely Materials, Time Passages, Time-Sensitive Materials, Clock Management, Time-Out
  - Destination 5
    - One More Time
      - Prerequisite Resources: Timely Materials, Time Passages, Time-Sensitive Materials, Clock Management, Time-Out, Clockwork, Passing Time

## Suggestions for Remote Classrooms

- No modifications will be needed to the Lesson Resources.
- Materials for the clock building will need to be divided up and provided to students. You can instruct the students to use materials they have available to them at their remote location, but you will still need to provide them with the items necessary to build a clock.
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *Keeping Time*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *What About Time?*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

### Destination 2

Resource Name: *Timely Materials*

- Materials List:
  - Clock movement kit
  - Building materials
  - Logbook
- Modification Recommendations: None, students will need only Synergy, the materials, and web access.

Resource Name: *Time Passages*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

### Destination 3

Resource Name: *Time-Sensitive Materials*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Clock Management*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Time-Out*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access. Students are to get feedback about their clock. You can instruct them to get feedback from the other people in their remote location or share their clock virtually to get feedback.

### Destination 4

Resource Name: *Clockwork*

- Materials List:
  - Clock movement kit
  - Building materials
  - Logbook
- Modification Recommendations: You can instruct the students to use materials they have available to them at their remote location, but you will still need to provide them with the items necessary to build a clock.

### Destination 5

Resource Name: *Passing Time*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access. Students are to get feedback about their clock. You can instruct them to get feedback from the other people in their remote location or share their clock virtually to get feedback.

Resource Name: *One More Time*

- Materials List:
  - Clock movement kit
  - Building materials
  - Logbook
- Modification Recommendations: You can instruct the students to use materials they have available to them at their remote location, but you will still need to provide them with the items necessary to build a clock.

## **Destination 6**

Resource Name: *Decision Time*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Budget Time*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Time to Shine*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 1
    - Challenge Descriptions
    - KWL Chart
    - Brainstorming Solutions
  - Destination 2
    - Forces on a Rocket
    - Calculating Rocket Altitude
  - Destination 3
    - Propulsion Experiments
    - Initial Launch Tests
    - Interpreting Data
  - Destination 4
    - Rocket Stabilization
    - Rocket Turbulence
    - Types of Recovery Systems
    - Designing Your Rocket
  - Destination 6
    - Engineering Rocket Challenge
    - Comparing Results
    - Making Improvements
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscope](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 1
    - Rocket Materials
  - Destination 2
    - Create an Altitude Scope
    - Altitude Scope Practice

- Destinations 3 and 6
  - On the Launch Range
- Destination 5
  - Building Your Rocket

## Suggestions for Remote Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resources cannot be completed in a remote situation and should be toggled off in Synergy, or they should be set to Optional and students should be instructed to skip them.
  - Destination 2
    - Create an Altitude Scope
    - Altitude Scope Practice
  - Destinations 3 and 6
    - On the Launch Range
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *Challenge Descriptions*

- Materials List:
  - Logbook
- Modification Recommendations: Students will work individually instead of in pairs, but they still need to go through the Resource to learn the responsibilities for finishing the project. Notify them that they will work individually instead of as a team. Students will need Synergy and web access.

Resource Name: *Rocket Materials*

- Materials List:
  - Modified Engineering Rocket Kit
    - Plastic bottle
    - Ping-Pong balls
    - Plastic inserts
    - Extension tubes
    - 2-liter Transition Cone Template
    - "Transition Cone and Fin Pattern Sheet"
    - Fin material (two different sizes)
    - Sandpaper
    - 1 kite string (5 feet long)
    - Parachutes
    - Hole reinforcements (1 strip of 6)
    - 1 piece crepe paper (5 feet long)
    - Protractors
    - Wood sticks
    - Klean Klay
    - Washers
    - Transparent tape (Students will need to use this to hold on the fins instead of the cool-melt glue. If possible, duct tape or packing tape is a better solution.)
  - Optional items if enough can be procured to include in kit
    - Cool-melt glue gun
    - Oval glue slugs
    - Safety glasses
    - 10-meter windup tape measure
    - The Pumper
    - Scissors
    - Permanent markers
  - Logbook

- Modification Recommendations: Before the Expedition starts, you are instructed to put the Engineering Rocket Kits together. The teacher's guide instructs you how to distribute items, but in a remote-learning situation, there will not be enough items for all students in a class. Do not put the following items in the kit unless you can procure enough for every student: cool-melt glue gun, oval glue slugs, 10-meter tape measure, tape dispenser, The Pumper, scissors, permanent markers, and safety glasses. The Pumper is not necessary to complete the activities, but it is listed as an option for students; notify them it will not be available. To create enough kits for individuals, consumables should be divided in half. Kite string and crepe paper should be cut into five-foot lengths with one length of each placed in each kit. Hole reinforcements should be cut into strips of six; provide one strip in each kit. Students will need Synergy and web access.

Resource Name: *KWL Chart*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Brainstorming Solutions*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Destination 2

Resource Name: *Forces on a Rocket*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Calculating Rocket Altitude*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.



Resource Name: *Create an Altitude Scope*

- Materials List:
  - None
- Modification Recommendations: This Resource should be toggled off for remote learning.

Resource Name: *Altitude Scope Practice*

- Materials List:
  - None
- Modification Recommendations: This Resource should be toggled off for remote learning.

### Destination 3

Resource Name: *On the Launch Range*

- Materials List:
  - Logbook
- Modification Recommendations: This Resource should be toggled off for remote learning.

Resource Name: *Propulsion Experiments*

- Materials List:
  - None
- Modification Recommendations: Students can plan their own investigation in this Activity Resource. However, it might be worth telling students at this time that a predetermined experiment will be conducted by you in the next Activity Resource and the data will be provided for them. Students will need Synergy and web access.

Resource Name: *Initial Launch Tests*

- Materials List:
  - Logbook
- Modification Recommendations: You can conduct a predetermined experiment such as testing the amount of water in the bottle on video and provide the data for students to analyze. Otherwise, you can provide them with the following simulated data for them to analyze related to the volume of water in the rocket and the maximum height of the rocket in the test launch.

Volume of Water (milliliters)	Height of Rocket (feet)
200	83
400	132
600	164
800	163
1,000	158
1,200	133
1,400	100
1,600	64

Resource Name: *Interpreting Data*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

### Destination 4

Resource Name: *Rocket Stabilization*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Rocket Turbulence*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Types of Recovery Systems*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Designing Your Rocket*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Destination 5

Resource Name: *Building Your Rocket*

- Materials List:
  - Modified Engineering Rocket Kit
  - Logbook
- Modification Recommendations: Students will not be provided a glue gun to attach the nose cone and fins to their rocket. Instead, they can use alternative adhesives such as glue dots or tape to hold the pieces of the rocket together.

## Destination 6

Resource Name: *On the Launch Range*

- Materials List:
  - Logbook
- Modification Recommendations: This Resource should be toggled off for remote learning.

Resource Name: *Engineering Rocket Challenge*

- Materials List:
  - Completed student rockets
  - Logbook
- Modification Recommendations: You will need to launch the rockets for the students in a remote situation. You will have to arrange a way for students to deliver the completed rockets to you; you will collect and provide the data to students for them to complete the data table in their logbook. You could livestream the launch as an event for the students to see the rocket launches.

Resource Name: *Comparing Results*

- Materials List:
  - Logbook
- Modification Recommendations: All student data will need to be analyzed and the launches completed before this can be completed.

Resource Name: *Making Improvements*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 1
    - What Are We Doing?
    - Did You Hear That?
    - String Waves
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?
  - Destination 2
    - Percussion Anywhere (**does not need to be completed if students complete the Percussion Resource in class**)
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?, String Waves
    - Acoustics Anywhere (**does not need to be completed if students complete the Acoustics Resource in class**)
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?, String Waves, Percussion, Wind, Strings
  - Destination 4
    - Looping
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?, String Waves, Percussion, Wind, Strings, Acoustics, The Process, Improve, Solo, Ensemble
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 2
    - Percussion (**does not need to be completed if students complete the Percussion Anywhere Resource remotely**)
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?, String Waves
    - Wind
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?, String Waves, Percussion
    - Strings
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?, String Waves, Percussion, Wind
    - Acoustics (**does not need to be completed if students complete the Acoustics Anywhere Resource remotely**)
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?, String Waves, Percussion, Wind, Strings
  - Destination 3
    - The Process
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?, String Waves, Percussion, Wind, Strings, Acoustics
    - Improve
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?, String Waves, Percussion, Wind, Strings, Acoustics, The Process
  - Destination 4
    - Solo
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?, String Waves, Percussion, Wind, Strings, Acoustics, The Process, Improve
    - Ensemble
      - Prerequisite Resources: What Are We Doing?, Did You Hear That?, String Waves, Percussion, Wind, Strings, Acoustics, The Process, Improve, Solo

## Suggestions for Remote Classrooms

- No modifications will be needed for the Lesson Resources.
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *What Are We Doing?*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Did You Hear That?*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *String Waves*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

### Destination 2

Resource Name: *Percussion*

- Materials List:
  - Logbook
- Modification Recommendations: Students will need Synergy and web access. **The Percussion Anywhere Resource demonstrates the activity for this Resource. It will need to be toggled on for students working remotely. If all the students in a class are working remotely, this Resource should be set to Required. If you have a mix of in-class and remote students in a class, both Resources should be toggled on and set to Optional so that students can navigate them correctly.**

Resource Name: *Wind*

- Materials List:
  - 6 straws
  - Tape
  - Scissors
  - Ruler or other measuring device
  - Logbook
- Modification Recommendations: Students will need Synergy and web access. Students can use the online tuner found in the Activity Resource.

Resource Name: *Strings*

- Materials List:
  - 16 Skill Sticks
  - Rubber band
  - Ruler
  - Logbook
- Modification Recommendations: Students will need Synergy and web access. Students can use the online tuner found in the Activity Resource.

Resource Name: *Acoustics*

- Materials List:
  - Logbook
- Modification Recommendations: Students will need Synergy and web access. **The Acoustics Anywhere Resource demonstrates the activity for this Resource. It will need to be toggled on for students working remotely. If all the students in a class are working remotely, this Resource should be set to Required. If you have a mix of in-class and remote students in a class, both Resources should be toggled on and set to Optional so that students can navigate them correctly.**

## Destination 3

Resource Name: *The Process*

- Materials List:
  - Materials provided during the Wind and Strings Resources
  - Encourage students to utilize items that can be found at home such as paper tubes from wrapping paper, paper towels, and toilet paper; sticks or scrap pieces of wood; bottles or jars; metal cans; or any items that they feel can be utilized for an instrument.
- Modification Recommendations: Students will need Synergy and web access. Students can use the online tuner found in the Activity Resource.

Resource Name: *Improve*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access. Students can ask a parent, sibling, or any other person to review their work.

## Destination 4

Resource Name: *Solo*

- Materials List:
  - Student instrument
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Ensemble*

- Materials List:
  - Student instrument
  - Logbook
- Modification Recommendations: For students to complete this type of performance remotely, they will have to collaborate online. If you do not wish for the students to do this, then you will need to toggle this resource to Off in Synergy and direct the students to complete the performance for the Solo or Looping Resource instead.

Resource Name: *Looping*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 1
    - Choosing a Pathway
    - Interest Profiler
  - Destination 2
    - Brain Power
    - Making It Official
  - Destination 3
    - My Future Choices
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 2
    - Working with Your Hands
    - The Art of Working

## Suggestions for Remote Classrooms

- No modifications will be needed for the Lesson Resources.
- Specific modifications for Activity Resources follow.

### Destination 1

Resource Name: *Choosing a Pathway*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Interest Profiler*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

### Destination 2

Resource Name: *Working with Your Hands*

- Materials List:
  - Nut and Bolt Test Kit
  - Logbook
- Modification Recommendations: Students will require a Nut and Bolt Test Kit to complete this Resource. There are three options when implementing remote instruction:
  - Put together additional sets of nuts and bolts of similar sizes using a sorting bin (such as a flat cardboard box divided into sections) that you have available from other sources, such as a local hardware store.
  - Have students navigate past the activity and not fill out the test results portion of the Working with Your Hands section of their logbooks, but have them complete the career research portion.
  - Turn off the Resource and have students skip the Working with Your Hands section of the logbook.

Resource Name: *Brain Power*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *The Art of Working*

- Materials List:
  - Tangrams printout
  - Scissors
  - Logbook
- Modification Recommendations: A tangrams PDF file is located in Synergy that you can print out and give to students that will replace the Tangoes set. Students should be instructed to cut the pieces out prior to starting this Resource.



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Resource Name: *Making It Official*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## **Destination 3**

Resource Name: *My Future Choices*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Suggestions for Blended Classrooms

- No modifications will be needed for the Lesson Resources.
- Included with the TowerPak are copies of the *Student Guide to Model Tower Building*. Students should be provided a copy of this; instruct them to refer to it if they have questions while completing the Resources at home.
- The following Activity Resources require only Synergy, web access, and the student logbook to be completed, so they are suited for the at-home portion of the instruction.
  - Destination 1
    - Spanning the Sky
    - Questions That Need Answers
  - Destination 2
    - Tower Types
    - Sketch Possible Towers
- The following Activity Resources require materials and equipment to be completed and should be conducted in the classroom. You might need to toggle the settings on some Resources to Optional in order for students to be able to access them out of order. See the video in [Thinkscape](#) related to toggling assignments as Required, Optional, or Off.
  - Destination 2
    - Tower Forces
    - Choosing a Final Design
      - Prerequisite Resource: Sketch Possible Towers
  - Destination 3
    - Build the Tower
      - Prerequisite Resources: Spanning the Sky, Questions That Need Answers, Tower Types, Tower Forces, Sketch Possible Towers, Choosing a Final Design
    - Final Assembly
      - Prerequisite Resources: Spanning the Sky, Questions That Need Answers, Tower Types, Tower Forces, Sketch Possible Towers, Choosing a Final Design, Build the Tower

- Destination 4
  - Safety First
    - Prerequisite Resources: Spanning the Sky, Questions That Need Answers, Tower Types, Tower Forces, Sketch Possible Towers, Choosing a Final Design, Build the Tower, Final Assembly
  - Test the Tower
    - Prerequisite Resources: Spanning the Sky, Questions That Need Answers, Tower Types, Tower Forces, Sketch Possible Towers, Choosing a Final Design, Build the Tower, Final Assembly, Safety First
  - Evaluating Your Results
    - Prerequisite Resources: Spanning the Sky, Questions That Need Answers, Tower Types, Tower Forces, Sketch Possible Towers, Choosing a Final Design, Build the Tower, Final Assembly, Safety First, Test the Tower

## Suggestions for Remote Classrooms

- No modifications will be needed for the Lesson Resources.
- Included with the TowerPak are copies of the *Student Guide to Model Tower Building*. Students should be provided a copy of this; instruct them to refer to it if they have questions while completing the Resources at home.
- The following Activity Resources cannot be completed in a remote situation and should be toggled to Off in Synergy, or they should be set to Optional and students should be instructed to skip them.
  - Safety First
  - Test the Tower
- Specific modifications for Activity Resources follow.



## Destination 1

Resource Name: *Spanning the Sky*

- Materials List:
  - Logbook
- Modification Recommendations: Students will work individually instead of in pairs, so they will not need to define a role, but they still need to go through the Resource to learn the responsibilities for finishing the project. Notify them that they will be working individually instead of as a team. Students will need Synergy and web access.

Resource Name: *Questions That Need Answers*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

## Destination 2

Resource Name: *Tower Types*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Tower Forces*

- Materials List:
  - 2 wood sticks (24")
  - Ruler or other measuring device
  - Timber Cutter or other sharp object
  - Logbook
- Modification Recommendations: Students will need two consumable wood sticks for this activity and a way to cut them; they could use a knife from home. Scissors are not recommended as they tend to crush the ends of the wood sticks, making them difficult to glue correctly. Students will need Synergy and web access.

Resource Name: *Sketch Possible Towers*

- Materials List:
  - Logbook
- Modification Recommendations: None. Students will need only Synergy and web access.

Resource Name: *Choosing a Final Design*

- Materials List:
  - Grid graph paper (1/8")
  - Ruler (for both measuring and straight edge)
  - Logbook
- Modification Recommendations: Students will work individually instead of in pairs, so they will not need to work with a partner to choose a final design. Notify them that they will work individually instead of as a team. Students will need Synergy and web access.

## Destination 3

Resource Name: *Build the Tower*

- Materials List:
  - 10 wood sticks (For this activity, if you have resources available, consider providing two additional sticks.)
  - Glue
  - Ruler or other measuring device
  - Timber Cutter or other sharp object
  - Foam board or cardboard sheet (larger than tower sides)
  - T-pins
  - Masking tape
  - Binder clips
  - Sandpaper
  - Logbook
- Modification Recommendations: If it is not possible to send Builder's Boards, Perf Inserts, and Accu-Fixtures home with the students, they will need a sheet of foam board or cardboard to use with T-pins to hold their bridge pieces in place as they are glued. Students can use a knife from home for cutting the sticks. Scissors are not recommended as they tend to crush the ends of the sticks, making them difficult to glue correctly. The materials for this Activity Resource will be used in the Final Assembly Activity Resource; students will need these materials only once. Do not duplicate these materials for the other Resources.

Resource Name: *Final Assembly*

- Materials List:
  - Materials provided during the Build the Tower Resource
- Modification Recommendations: If it is not possible to send Builder's Boards, Perf Inserts, and Accu-Fixtures home with the students, they will need a sheet of foam board or cardboard to use with T-pins to hold their bridge pieces in place as they are glued. Students can use a knife from home for cutting the sticks. Scissors are not recommended as they tend to crush the ends of the sticks, making them difficult to glue correctly.

## Destination 4

Resource Name: *Safety First*

- Materials List:
  - None
- Modification Recommendations: This Resource should be toggled to Off for remote learning.

Resource Name: *Testing the Tower*

- Materials List:
  - None
- Modification Recommendations: This Resource should be toggled to Off for remote learning.

Resource Name: *Evaluate Your Results*

- Materials List:
  - Logbook
- Modification Recommendations: The Structures Testing Instrument and electronic balance scale are used to test student towers. You will need to have students turn in their towers. You will then need to test them and provide the results to students so they can do the evaluation. You can make this a video or live video event.





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