



## Using Cross Curricular Approaches Resource Package: Sample Lesson Plans

This document provides a sampling of lesson plans utilizing Cross Curricular approaches in a variety of ways. Additional Cross Curricular activity ideas and lesson plans related to specific curriculum areas are available with many of our Curriculum Topic Resource Packages. Cross Curricular lesson plans are also available as a Teacher Tool with many individual videos on our website.

### Sample Lesson 1: Create Your Own Timeline

**Type of Teacher Tool:** Individual/Differentiation

**Targeted Grade Level(s):** Lesson can be modified for grades 3-5, 6-8, or 9-12

**Targeted Curriculum Areas:** History combined with any other curriculum area of choice

#### Learning Objectives:

The learner will:

1. Create a video timeline of 5 to 10 events in a topic area of his/her own choice.
2. Research historic information in a topic area of his/her choice and determine information most important to include in the timeline.
3. Select and/or create images and/or videos to include in the timeline that he/she believes provide best accompaniment to each event in the timeline.

#### Featured National Standards:

1. National Center for History in the Schools  
HT.1.E: Interpret data presented in time lines and create time lines.

**Additional State and National Standards related to the content of our videos listed below for this lesson are also provided on the Educate.Today page where you find the video.**

#### Resources/Materials Needed:

1. The following Educate.Today videos are examples of timelines for students to use as models for the timeline they will create:  
Chronology 1: When Did that Happen? Fast  
Chronology 2: When Did That Happen? Fossils  
Chronology 3: When Did That Happen? Flying  
Chronology 4: When Did That Happen? Life as a Dog  
Chronology 5: When Did That Happen? Living Green  
Chronology 6: When Did That Happen? Eyes

©2019 Educate.Today

Chronology 7: When Did That Happen? Archaeology

Chronology 8: When Did That Happen? Time

Economics 4: When Did That Happen? Economics

Maps 8: When Did That Happen? Maps

Sample Video 52: Chronology 7: When Did That Happen? Archaeology

### **Teacher Instructions:**

1. Provide students the opportunity to create a video timeline on any topic of their choice or on a topic you are currently studying in class.
2. Have students view the videos listed above for examples of different ways to create video timelines.
3. Inform students their finished timeline should fall within a 2 to 3 minute time frame.
4. Have students select their topic and research as needed to determine 5 to 10 events to include in their timeline.
5. Students should write a script for their timeline choosing the most appropriate and pertinent information they believe should be included for each event.
6. Students should select and/or draw images and/or create videos or animation to visually represent each of their chosen events.
7. Students should complete their timeline using video, PowerPoint, animation, or similar visual medium of their choice including edited narration, transitions, and other elements as needed.

### **Extension Activity Options:**

1. Have students consider submitting their timeline for publication on our Educate.Today website. If a student is interested, have them contact us via the Typeform questionnaire available [here](#).

### **Assessment/Evaluation Options:**

1. In terms of content, the timeline could be assessed on any or all of the following:
  - a. Accuracy of information presented
  - b. Importance of information presented in relationship to the topic chosen
  - c. Placement of events in proper chronological sequence
2. In terms of aesthetics, the timeline could be assessed on any or all of the following:
  - a. Appropriateness and clarity of images chosen to depict an event
  - b. Clarity and interest generated by the script
  - c. Interest generated by the narrative style
  - d. Clarity provided and interest generated for a viewer as he/she watches the video timeline

## Sample Lesson 2: Traveling on the River

**Type of Teacher Tool:** Whole class, small group

**Targeted Grade Level(s):** 5-8

**Targeted Curriculum Areas:** Transportation, physics, engineering, STEM

### Learning Objectives:

The learner will:

1. Explain the basic operation of a dam and lock system.
2. Know that dam and lock systems are used to aid in river navigation.
3. Know that engineers use Pascal's law when designing dam and lock systems.
4. Create a drawing of a lock and dam to demonstrate understanding of the principles involved.

### Featured National Standards:

1. NGSS: Next Generation Science Standards - Science
  - Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. (Grades 6 - 8 )
2. Common Core State Standards - Math
  - Write, read, and evaluate expressions in which letters stand for numbers. (Grade 6 )
3. International Technology and Engineering Educators Association - Technology
  - Knowledge gained from other fields of study has a direct effect on the development of technological products and systems. (Grades 6 - 8 )
  - The design and construction of structures for service or convenience have evolved from the development of techniques for measurement, controlling systems, and the understanding of spatial relationships. (Grades 6 - 8 )

### Resources/Materials Needed:

1. Educate.Today Videos
  - [Environment 19: Rivers and Transportation of Goods](#)
  - [Transportation 21: How Locks and Dams Work on the Mississippi River](#)
  - [Transportation 22: Using Locks and Dams to Maintain Navigational Channels](#)
  - [Transportation 23: How Barges Go Through Locks and Dams](#)
2. KWL chart on the board (Included at the end of this document)
3. Visual of How Dams and Locks systems work (Included at the end of this document)
4. Materials for completing the drawings: paper, pencils, rulers, erasers, and vocabulary definitions.

### 5. Vocabulary covered:

- dam: A barrier to obstruct the flow of water, especially one made of earth, rock, masonry and/or concrete, built across a stream or river.
- engineer: A person who applies her/his understanding of science and mathematics to creating things for the benefit of humanity and our world.
- gravity: An invisible force of a mass being attracted to another mass. For example, the Earth's mass pulls you down so you stay on the ground instead of flying away.
- lock: An enclosed chamber in a waterway with watertight gates at each end, for raising or lowering vessels from one water level to another by admitting or releasing water.
- Pascal's law : A hydrostatics principle that says that for all points at the same absolute height in a body of a fluid, the pressure is the same, even if additional pressure is applied on the fluid at some place.

Pascals Law:  $P = \rho gh$

$P$  = Pressure (Pa = N/m<sup>2</sup>)

$\rho$  = Density of Fluid (Water = 1000 kg/m<sup>3</sup>)

$g$  = Gravity (9.81 m/s<sup>2</sup>)

$h$  = Depth (m)

- pressure: The exertion of force upon a surface by an object, fluid, etc., in contact with it. Expressed as force per unit area.

### Teacher Instructions:

Pose the question: What is a lock and dam system? Have you heard of or seen a system like this? What do you know about it? Record the discussion answers in the K (Know) column of the chart. Move to the W (Want to know) column of the chart and record their responses. For example: they may want to know why a lock and dam is necessary, how the water moves into the chambers...)

1. View the Educate.Today videos that explain how the Melvin Price system of dams and locks operate.
2. Display the Visual and discuss the system, as demonstrated in the Transportaton-21 video. (Boats and ships get through a waterway by going into a lock, which is a big chamber in the water with moveable gates at each end, then waiting as a valve is opened and the water from that lock flows into the next lock (or next body of water if just one lock), raising or lowering the boat automatically. The boats continue into the next lock, and so on, until they reach the end of the dam and lock system. A series of locks enable river vessels to "step" up or down a river or canal from one water level to another. )
3. Class Discussion: Ask students the following questions. Listen to their answers and record them in the L (Learned) column them on the board. Make sure the vocabulary is part of the discussion.
  - What is the purpose of a dam and lock system? (Answer: To raise and lower boats between stretches of water of different levels on waterways.)

- How is gravity involved in dam and lock systems? (Answer: Gravity is a factor in how boats move through dam and lock systems by how it moves and drains water, which raises and lowers the boats in the locks.)
  - In what situations might construction of a lock improve river or canal navigation? (Possible answers: Locks help commercial boats and barges navigate past sandbars, rapids, waterfalls, temporarily low water, changing riverbed elevations and dams.)
  - If we didn't have dam and lock systems, how might we move boats through these waterway obstacles? (Possible answer: We could design and build boatlifts, and some places have boatlifts. But, locks make more sense for big ships [imagine cruise ships, ocean tankers, cargo ships] and barges; locks let water and gravity do the heavy work of moving the vessels.)
  - What must engineers consider about water pressure so the dam and lock systems they design are safe, strong and reliable? (Answer: As the elevation of water behind a dam increases, its height and density causes increasingly high pressure at the bottom of the dam. Water pressure also affects the walls and gates of locks. Engineers must estimate and take this pressure under consideration in order to make dam and lock structures watertight and strong enough to stand up to the water pressure forces.)
4. Review Pascal's Law and discuss how it applies to the lock and dam system.  
Pascal's law describes how water at a given depth exerts the same (equal) pressure in all directions. Something else we know about water pressure — the deeper the water, the greater the water pressure. For example, at a depth of five meters from the surface, the water pressure is half as great as it is at a depth of 10 meters from the surface.
  5. Engineering Drawings: Once students understand how lock and dam systems work, ask them to create preliminary drawings as if they were a team of engineers designing a system for their municipality client. Require that the drawings illustrate where along a river the dam and lock structure will be built, the dimensions of the structure and the number of locks in the structure. For an added challenge; constrain the students' designs, tell them that the river is 50m wide and 8m deep, and the largest vessel permitted to pass through is 10m long. Or consider introducing the challenge of preserving the existing natural environment to allow animal and plant species to survive.

### **Extension Activity Options:**

1. Students could create a working model of a simple lock and dam system to show how components work together.
  - a. The model could be made of cardboard or recycled items such as shoeboxes, plastic cartons, etc. It need not hold water.
2. Students could find ways to demonstrate Pascal's Law with everyday objects by experimenting and explaining their reasoning.

- a. Some possibilities include using a clear plastic quart bottle with holes punched at different levels, or showing how a small hole in a ketchup packet allows the ketchup to be pressed out no matter how you squeeze it.

### Assessment/Evaluation Options:

1. Drawings should clearly illustrate understanding of the principles listed in the vocabulary, as well as showing creative problem solving and teamwork capabilities. Consider using a rubric like the sample below to evaluate the student's work.

## Engineering and Design Process Intermediate Rubric

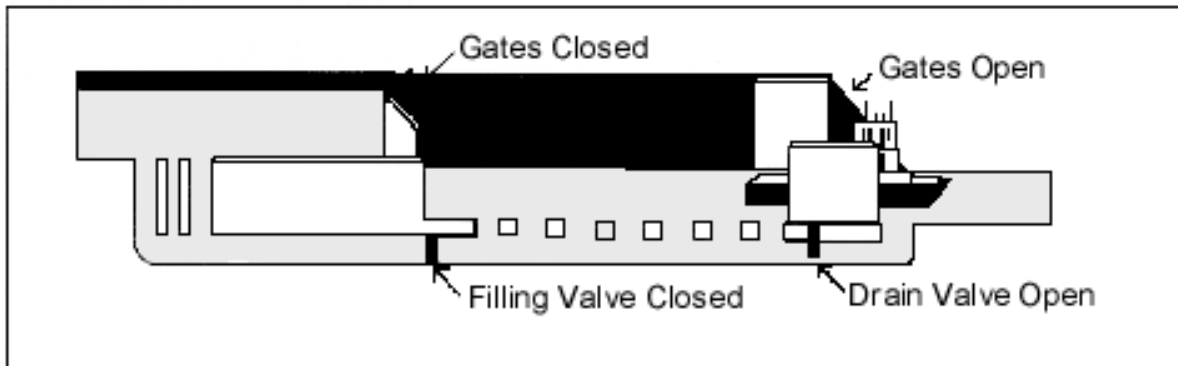
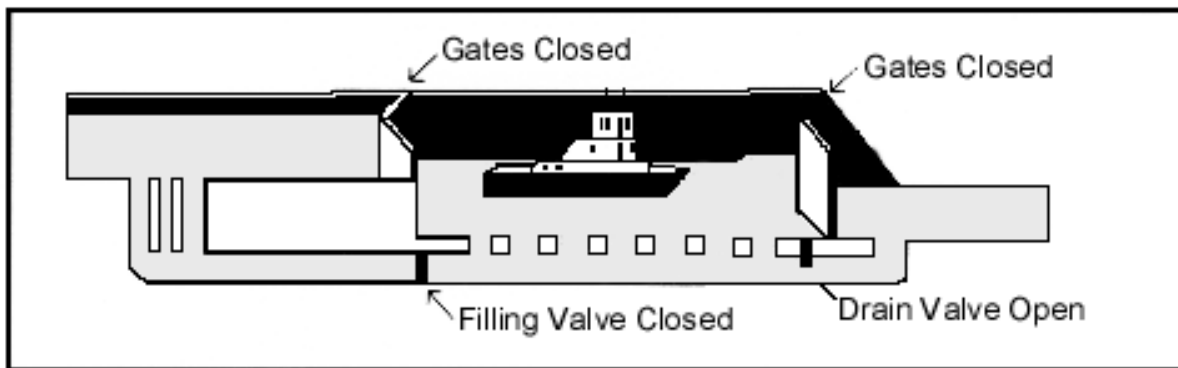
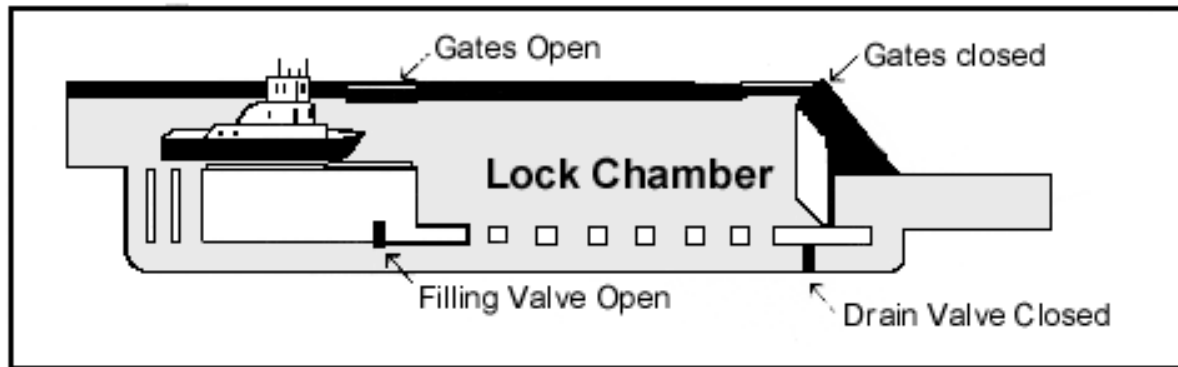
Student's name: \_\_\_\_\_ Date: \_\_\_\_\_

Project: \_\_\_\_\_ Average: \_\_\_\_\_ out of 4

<p><u>Key</u></p> <p><b>Beginning</b>- experiences difficulty even with teacher prompting  <b>Developing</b>- inconsistent and/or requires teacher prompting  <b>Accomplished</b>- consistent with little to no teacher prompting  <b>Exemplary</b>- consistent and independent</p>	Student Evaluation	Teacher Evaluation
<b>Ask</b>		
Carefully consider the investigation guidelines.		
Thoughtfully discuss multiple relevant and interesting questions for further exploration.		
Determine multiple team or individual goals in response to your questions.		
<b>Imagine</b>		
Without teacher guidance, generate and explore numerous ideas, responses, or solutions.		
Independently generate clever, unique, or unusual ideas.		
Work with teammates to imagine many different possible solutions to the team's questions and the design challenge.		
Independently perceive and accept the team's many differing positions and points of view.		
<b>Plan</b>		
Critically evaluate the purpose of every detail of the design.		
Keep detailed records and sketches of design possibilities, plans, and revisions.		
Conduct research and use prior knowledge as a foundation for prototype plans.		
<b>Create</b>		
Persevere to create a functioning prototype.		
Creatively and responsibly use materials and resources.		
<b>Improve</b>		
Without teacher guidance, self-critique the prototype and analyze all design flaws.		
Suggest multiple solutions to problems, or multiple ways to improve the efficiency or quality of the prototype.		

Source: <https://www.slideshare.net/cmitton/engineering-design-rubric>

## How a Dam and Lock System Works



To move a ship or boat going downstream to a lower water level, the lock is filled by opening the filling valve. Then the drain valve and upstream and downstream gates are closed so the chamber water level rises to the upstream level. Then upstream gate opens and the boat moves in. To lower the boat, the gates are closed behind it, the filling valve is closed, and the drain valve is opened. The higher water in the lock chamber drains to the downstream level in a few minutes. Then, the downstream gate is opened and the water vessel moves out on the lower water level. The process is reversed for a ship or boat going upstream.

Source: US Environmental Protection Agency, Gulf of Mexico Program, <http://www.epa.gov/gmpo/edresources/locks.html>

Name \_\_\_\_\_ **K.W.L Chart** Date \_\_\_\_\_

Topic \_\_\_\_\_

What I Know	What I Want to Know	What I Have Learned

www.timvandevall.com | Copyright © 2014 Dutch Renaissance Press LLC.



### Sample Lesson 3: Sharing Insights Through a Newspaper Article

**Type of Teacher Tool:** Individual Assignment

**Targeted Grade Level(s):** 4-5, 6-8, 9-12

**Targeted Curriculum Areas:** Language Arts, curriculum area of chosen video

**Learning Objectives:**

The learner will:

1. Write a news article to help a reader understand key concepts and information in the video.

**NATIONAL STANDARDS**

CCSS.ELA-Literacy.RI.9-10.1

Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

CCSS.ELA-LITERACY.W.4.2, 5.2, 6.2-12.2

Write informative/explanatory texts to examine a topic and convey ideas and information clearly

CCSS.ELA-LITERACY.W.4.2.A and 5.2

Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension

CCSS.ELA-LITERACY.W.6.2-12.2

Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content

CCSS.ELA-LITERACY.W.4.2.E-10.2.E

Provide a concluding statement or section related to the information or explanation presented.

CCSS.ELA-LITERACY.W.11-12.2.F

Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic)

**Resources/Materials Needed:**

Any video(s) from the Educate.Today website chosen by you or self-selected by a student

**Teacher Instructions:**

1. Students watch the video.
2. As they watch, have students pick an idea, concept, or interview that they are interested in writing an article about.
3. Have students re-watch the section they will be writing about and take notes for a newspaper article on the who, what, where, when, why, and how.
4. Students should make a basic newspaper article story outline:
  - a. Lead sentence to grab and hook the reader

©2019 Educate.Today

- b. Introduction to give where and when the story is happening.
  - c. Opening Quotation (optional) from someone in the video to give the reader what people in the video were thinking.
  - d. Body to provide the main information of the article.
  - e. Closing quotation or Conclusion to sum up the article or make the information memorable.
- 5. Students write the article in a way that helps the reader understand the key ideas and information.
  - 6. Students write an attention-grabbing headline for the article.

**Assessment/Evaluation Option**

- 1. Student writes a lead that introduces information in an interesting way.
- 2. Student writes in a logical sequence with transition words.
- 3. Student uses appropriate vocabulary.
- 4. Students answer the who, what, when, where, why, and how questions in the article.

**Extension Assignment**

- 1. Students write an editorial piece for a newspaper giving an opinion about a concept in the video.

### **Sample Lesson 4: Linking Music to History—Researching and Developing a Musical Performance**

**Type of Teacher Tool:** Whole Class, Small Group, and/or Individual/Differentiation

**Targeted Grade Level(s):** 5-8, 9-12

**Targeted Curriculum Areas:** Social Studies, Culture, Music

#### **Learning Objectives:**

The learner will:

1. Engage in critical and creative thinking.
2. Engage in interdisciplinary activities connecting music activities to history.
3. Create a musical performance that relates to specific historic events and/or eras using compositions written for specific historic or cultural events. Students can create independently or in small groups.

#### **National Standards:**

Social Studies GLE/Component 5>TS7A.a. Identify, select, analyze, and evaluate resources to create a product of social science inquiry

Social Studies GLE/Component 5.R16.D.a. Analyze the preservation of cultural life, celebrations, traditions, and commemorations over time.

Social Studies Indicator/Proficiency 6-8.AH.2.G.A Analyze diverse cultures to explain the ways they adapted to their various environments

National Arts Standards AS#11 Relate artistic ideas and works with societal, cultural and historic context to deepen understanding

#### **Resources/Materials Needed:**

1. Any history video(s) from the Educate.Today website chosen by you or self-selected by a student
2. Access to computers for research

#### **Teacher Instructions:**

1. Choose a time in history to study and view videos applicable from Educate.Today or allow students to choose their own time in history and video(s) to view
2. Student(s) may take notes about information in the video to use as part of their presentation.
3. Students will search the Internet to identify music (vocal and/or instrumental) written specifically for a cultural or historic event (i.e., the American Civil War) and compile a list that could be performed by the class.
4. Students, working in small groups or independently, will determine which song they wish the class to perform and make a short presentation to the class lobbying for their choice. Information in the presentation should include appropriate and relevant information learned in the videos they viewed, the musical composition chosen, and reasons why they believe it would be the best choice to be performed by the class.

©2019 Educate.Today

5. After viewing student presentations, the teacher, or class as a whole, will select a song or songs for the class to present to an audience.

**Assessment/Evaluation Options**

1. Evaluate student presentations on the accuracy of the historic information presented and appropriateness of the song selected.
2. Students could choose to perform their song for the class.

**Extension Activity:**

1. Have the class rehearse the chosen song(s) from step 5 in Teacher Instructions, rehearse the song(s) and perform for an audience of parents, other students, teachers, etc. Include historic information as part of the presentation that places the song(s) in historic and/or cultural context based on what students learned in the videos they watched.
2. Create an atmosphere similar to the time in history of the songs performed with props, costumes, etc. and have students present their songs as a concert or a fair or festival of the time.

## Sample Lesson 5: Expressing Understanding Through Drama

**Type of Teacher Tool:** Small Group or Individual/Differentiation

**Targeted Grade Level(s):** Grades 3-5, 6-8, or 9-12

**Targeted Curriculum Areas:** Language Arts, Drama, curriculum area of chosen video

### Learning Objectives:

The learner will:

1. engage in critical and creative thinking.
2. engage in interactive activities and discussion about the subject of the video(s) chosen for this activity
3. develop an answer for themselves to the question: “How can we better understand...? (the subject of the video(s) chosen for this activity)

### National Standards:

#### National Core Arts Standards Theatre

THCr2-6 b Contribute ideas and accept and incorporate the ideas of others in preparing or devising drama/theatre work.

Select, organize, create characters, and scenes in a clear and compelling presentation in

Additional applicable standards can be determined by the video(s) chosen for this activity.

### Resources/Materials Needed:

Any video(s) from the Educate.Today website chosen by you or self-selected by a student

### Teacher Instructions:

1. Have the group or individual students watch a video(s) selected by you on the topic you are studying in class or have students choose videos to watch on that same topic
2. As they watch the video(s), have the group take notes on:
  - a. interesting and/or important information they learn in the video.
  - b. people or objects in the videos that could become characters in a play scene.
  - c. themes or conflicts they have identify.
3. After viewing the video, the group should share notes and begin to write a play scene that expresses what they learned:
  - a. Characters could be individuals and/or objects seen in the video or people created specifically for the play
  - b. Location for the scene could be the location in the video or another appropriate location of the group’s choice.
  - c. Dialogue the characters speak should include information learned in the video(s) that the group believes is vital to making sure others, who watch their scene but have not watched the video(s), understand the important concepts, ideas, themes, etc. the students learned while watching the video(s).
  - d. Conflict in the scene could be related to the important ideas/concepts/themes of the video(s) or added by the group as they write their play.

- e. The tone and style of the scene could be realistic, fantasy, historical, humorous, serious, musical, or whatever the group believes is best to make sure the audience understands the important and interesting information they want to share from the video(s).
- f. The length of each group's scene will vary depending on the video(s) selected and information shared.

**Assessment/Evaluation Options:**

1. Have students develop a list of criteria for evaluating their own scene on any or all of the following:
  - a. clarity of information presented.
  - b. accuracy of information
  - c. dramatic execution of their scene
  - d. the ideas that best explain the ideas/concepts/themes learned in the video
  - e. other criteria of their own
2. Read the scenes yourself and/or have the scenes read by other groups in the class using the criteria created by the group that wrote the scene.
3. Read the scenes yourself and evaluate how well the scene reflected the information presented in the video(s) viewed by each group.

**Extension Activity:**

1. Have groups perform or read aloud their scenes for the rest of the class or another audience.
2. Have the audience discuss the content of the scenes performed and select which ideas were best represented.

## Sample Lesson 6: Create Your Own “Where is That?” Video

**Type of Teacher Tool:** Individual/Differentiation

**Targeted Grade Level(s):** Lesson can be modified for grades 3-5, 6-8, or 9-12

**Targeted Curriculum Areas:** Geography and History combined with any other curriculum area of choice

### Learning Objectives:

The learner will:

1. Create a video highlighting 4 to 5 geographic locations related to a topic area of his/her own choice.
2. Research a topic area of his/her choice and determine 4 or 5 geographic locations that are important to understanding the topic.
3. Select and/or create images and/or videos to include in the video that he/she believes are the best images for showing each geographic location selected.

### Featured National Standards:

1. National Council for the Social Studies  
3.2.2: Research, organize, analyze, synthesize, and evaluate information from atlases, data bases, grid systems, charts, graphs, maps, geospatial technologies, and other tools to interpret relationships among geographic factors and historic events.

**Additional State and National Standards related to the content of our videos listed below for this lesson are also provided on the Educate.Today page where you find the video.**

### Resources/Materials Needed:

1. The following Educate.Today videos are examples of “Where is That?” videos for students to use as models for the video they will create:  
 Geography 1: Where is That? Weather  
 Geography 2: Where is That? Invention  
 Geography 3: Where is That? Economics  
 Geography 4: Where is That? Trains  
 Geography 5: Where is That? Fast  
 Geography 6: Where is That? Archaeology  
 Geography 8: Where is That? Time  
 Maps 10: Where is That? Maps  
 Sample Video 61: Geography 1—Where is That? Weather

### Teacher Instructions:

1. Provide students the opportunity to create a “Where is That?” geography video on any topic of their choice or on a topic you are currently studying in class.
2. Have students view the videos listed above for examples of different ways to create their video.
3. Inform students their finished video should fall within a 2 to 4 minute time frame.

4. Have students select their topic and research as needed to determine 4 to 5 geographic locations that played or currently play a significant role in their topic.
5. Students should write a script for their video choosing the most appropriate and pertinent information they believe should be included for each location.
6. Students should select and/or draw images and/or create videos or animation to visually represent each of their chosen locations.
7. Students should complete their video, PowerPoint, animation, or similar visual medium of their choice including edited narration, transitions, and other elements as needed.

**Extension Activity Options:**

1. Have students consider submitting their video for publication on our Educate.Today website. If a student is interested, have them contact us via the Typeform questionnaire available [here](#).

**Assessment/Evaluation Options:**

1. In terms of content, the video could be assessed on any or all of the following:
  - d. Accuracy of information presented
  - e. Importance of information presented in relationship to the topic chosen
  - f. Clarity of rationale provided for choice of each location
2. In terms of aesthetics, the video could be assessed on any or all of the following:
  - e. Appropriateness and clarity of images chosen to depict an event
  - f. Clarity and interest generated by the script
  - g. Interest generated by the narrative style
  - h. Clarity provided and interest generated for a viewer as he/she watches the video