

STEAM LESSON PLAN

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Grade Level Middle school (adaptable for lower and higher grades)

THEME Open Spaces

INSPIRED BY Thomas Cole, *Stony Gap, Kaaterskill Clove*

PROJECT TITLE: H₂O – FROM SOURCE TO YOU

DRIVING QUESTION

What are humans' impact on the environment and the environment's impact on humans?



Thomas Cole (American born England, 1801–1848), *Stony Gap, Kaaterskill Clove*, 1826–27, oil on panel, 17 7/8 x 25 3/8 in. Mr. and Mrs. Edwin S. Miller Bequest Fund, 1951.661

STUDENT LEARNING OBJECTIVES: Put these on the board or have students write them in a notebook/journal.

- I will **create** a new water vessel design.
- I will **respond** with my thoughts on how humans affect the environment through a visual collage.
- I will **present** my research on bottled water.
- I will **connect** with the world as I explore where water is bottled.

CONTENT STANDARDS

[NEBRASKA CONTENT AREA STANDARDS](#)

[IOWA CORE STANDARDS](#)

THE FOUR C'S FOR STEAM CAREER READINESS SKILLS

- **Critical Thinking:** students will need to consider the water bottling industry's impact on the environment.
- **Creativity:** students will demonstrate their creativity by designing a new water container
- **Collaboration:** students will work together to test water pH levels.
- **Communication:** students will visually communicate humans' impact on the environment through a collage.

VOCABULARY: asymmetry, background, balance, collage, environment, foreground, Hudson River School, Hydria, middle ground, pH (potential of hydrogen), vessel

RESOURCES: [Cole Teaching Poster](#); [Cole Pinterest board](#); NDE writing prompts; [Nelson Teacher Resource Center](#)

- Video – ["Bottled water pH level test," Stephanie Lee](#)
- Video – ["How Plastic Bottles are Made," How Its Made](#)
- Video – ["Water Bottling Plant," Kevin Binkley](#)
 - Preview all videos before sharing with students.
- Website – [Thomas Cole National Historic Site](#)

- Website – [International Bottled Water Association](#)
- Website – [Joslyn's Permanent Collection](#)
- Lesson Plan – [Numerous lesson plans on water.org](#)
- Teaching Poster – [Joslyn's Greek Vases](#)
- Article – ["How Bottled Water Works," Julia Layton, HowStuffWorks](#)

SUGGESTED MATERIALS: tracing paper, variety of bottled water, water-testing supplies, prints of Cole's landscapes, sculpture-making materials, magazines, and newspapers

PROCEDURE

Overview: Starting with Thomas Cole's *Stony Gap, Kaaterskill Clove*, students will learn about the bottled water industry tracing it from source to them. Along the way they will use their creativity in hands-on activities.

Engage: Give students a bottle of water, and show them Cole's *Stony Gap, Kaaterskill Clove*. Encourage them to make the connection between the two and generate a list of ideas.

Ask students...

- What do you see?
- Where is this place? Do you think it is a real place?
- What do you think it looks like today? Find images to compare with artwork.
- Why is water important to life?
- How is water represented in literature?

Deliverables: Tell students they will...

- map the globe identifying where water is collected and bottled.
- research bottled water and present findings.
- design a new vessel for water.
- create a collage demonstrating the impact of humans on the environment.

Art Talk: Have students look at how Cole structured his canvases. Give students tracing paper, and tell them to block out the main elements of the artwork. Discuss foreground, middle ground, and background, and have students label their drawing. Discuss how a composition can be asymmetrical yet balanced. Show students more Cole artworks and discuss similarities and differences. Have them record their thoughts on their traced image.

Ask students...

- How does Cole create the sense of space and time?
- Why did he divide the canvas as he did?
- How does he show scale?
- What do you notice about the sky?
- What is missing from the artwork?
- How is the human experience impacted by nature?

Landscapes during this time were tied to national identity. Ask students to consider what their idea of national identity is. Research other landscapes in Joslyn's collection and see if they can find one that fits with their definition. Then ask them to select one they identify with most.

Description of Activity: Study bottled water and determine how to improve its affect on the environment.

- While viewing Cole's image, have students imagine what it was like for settlers/explorers in this area. How has the scene changed since first discovered by Europeans?
- Now have students think about what it was like for people to go collect water from streams. Tell them to then contrast that with how we get our water today.
- Have students brainstorm and list brands of bottled water. Then have them research how many brands of water there are in this world.
- Provide them with a variety of different bottled water examples. First, look at the names of the product, and encourage students to consider how they got their name.
- Review how to read the label. Note where the water is gathered and bottled. Together, create a map of the world showing where this occurs. Consider researching bottled water from countries that do not import their product to the United States. Perhaps you can draw arrows or use string/pins from sources to the countries in which it is exported.
- Consider testing the water to see how accurate the labels are regarding pH. Students could also bring their water from home to be tested, too.
- Next, students will research the bottling plant. They could have a bottled water face off to determine which one is more environmentally friendly. Which is more critical – being a responsible environmentally friendly company or saving money? What is the effect of the bottling plant on animals? How does the bottling plant need to change to be more environmentally responsible?
- What is pollution, and how does it affect water sources? Explain that they will need to prove or disprove their ideas. For older students, discuss the controversy of pipelines running through areas close to water sources and what happens when leaks occur.
- Shift the focus to the vessel itself in which the water is sold. Which type is better for the environment? How does the recycling process work? What is the history of bottled water – when did this industry first make its appearance, and how has it evolved? Make connections to ancient times using the [Attic Black-Figure Hydria](#), ca. 530 B.C., attributed to The Affector (Greek, 6th century B.C.) from Joslyn's Greek vase collection.
- Now have students look at the various water bottle or container designs. Tell them to sketch out their idea for a new container for commercial water bottling plants. Provide students with materials to create a model or 3D print their bottle design.
- It is important to be aware that humans impact the earth – Cole was concerned about this and 200 years later, we are having the same conversation. How do scientists determine changes in the environment? Are they easy to see? For older students discuss climate change and consider having a debate. Think about how politics affect the environment and the care for it.

- Students can document their thoughts about this through a collage. Provide them with a beautiful landscape from one of the Hudson River School artists. Have them find images of what could destroy the landscape and place them on the landscape.

Closing: What is our "manifest destiny" today? After finding out how we've affected the environment in the last 200 years, what is next? What is your role in protecting the environment?

Assessment: 3-2-1 Reflection. Find out what students have learned by responding to the following:

- Share **three** things they learned from the lesson.
- Share **two** things they want to know more about.
- Share **one** question they have.

STEAM LESSON PLAN Joslyn Art Museum uses the Nebraska Department of Education's STEM Approach as a guide, but we took the liberty of adding the "**A**" to emphasize the **ARTS**.

NDE's STEM Approach reflects an integrated and interdisciplinary philosophy to teaching and learning that emphasizes collaborative school-based, work-based, family-based, and community-based experiences as a context for helping students to master key competencies within science, technology, engineering, and mathematics.

Teaching and learning resources, experiences, and example activities included within NDE's STEM Approach serve as a standards-based framework for supporting the engagement of students in hands-on, authentic, and contextual learning experiences that provide students with the opportunity to learn STEM content while promoting essential career readiness skills, including communication, creativity, collaboration, and critical thinking.

NDE's STEM Approach strives for compatibility with all content-areas, all grade levels, and all career clusters, not just those traditionally defined as STEM.