



LESSON 8

Fossil Fuel Flags

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This lesson strives to address NGSS, Colorado 2020 and JeffCo Generations standards and goals, cited at the bottom of the lesson, by communicating science through embodied expression

Shine, The Musical
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Description

Students consider energy choices made historically and in their own community and create fossil fuel flags as representations of those choices that will be used as props in lesson 9.

Concepts

1. The transition to fossil fuels changed the way we used energy and our impact on climate
2. Properties (or "props") can serve as communication aids in performance and dance

Outcomes

Upon Completion of this lesson, students will be able to:

1. Describe the benefits and drawbacks of using fossil fuels
2. Create props that communicate ideas and roles effectively



Outline

- I. Set Up (15 min.)
- II. Introduction (20 min.)
 - a. Behavior Guidelines
 - b. Learner Level Assessment
- III. Scattergories Fossil Fuel Brainstorm (10 min.)
- IV. Create the Flags (30 min.)
- V. Follow-up Activities
 - a. Classroom flags
 - b. Behind the flag
- VI. Additional Resources
 - a. Sources
 - b. Vocabulary
- VII. Standards Addressed

I. Set Up (15 min.)

In this lesson, we'll be creating the props for the next song, the fossil fuel flags. Gather the materials before the lesson begins.

Materials Needed

- Two 11"X17" pieces of white printer paper per student
- Tape
- Black markers

II. Introduction (20 min.)

Behavior Guidelines: This lesson involves embodied learning. Please review the "Guidelines for Embodied Lessons in the Classroom" included in this curriculum.

Learner Level Assessment:

Begin with a warmup activity to help students get into their bodies. For this exercise, ask students to stand and find a little space to themselves (they should be able to stretch out their arms without touching another student). Next, ask them to "wake up" the space around them as if it had been sleeping. This may involve jumping, waving arms, clapping, reaching, making sounds, or any other movements or noise that students feel accomplishes the task. Spend at least a couple minutes with this activity until all students have settled into their movements and sounds.





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Be a tool

From within this 'woken' space, students will embody the movements of tools to consider energy use and impact. We'll begin with manual tools (human powered), then power tools (mostly fossil fuel powered).

Ask students to think of a screwdriver, and then make the shape of the tool with their bodies as if their feet were the driver bit. Then, ask them to do the motion of the tool as if they were being turned to tighten a giant screw in the floor beneath their feet. Have students include the sound the screwdriver might make when turning the screw. Next, ask students to think of themselves as an electric drill turning the same screw in the floor and do the associated movement (this will likely involve fast spinning, be careful!). Have students add the sound of the drill to their movement. Follow the same instructions for the following pairs to add both sound and movement to each (spend a few minutes on each tool so that students can feel how much more energy is expended with power tools): Sledge hammer/jackhammer (breaking the floor), hand saw/power saw (using arms as saw blades cutting an invisible board in front of them). Ask the students if they can think of other examples and give instructions to the class on how to perform them.

Assessment (Outcome 1): *Ask students to describe the difference between the two types of tools and develop a compare/contrast table. This can be done in small groups and shared, or as a class depending on time. Which one was faster? Which jobs would be done by each type of tool? Which required more energy? Where would the energy come from to run these tools? Create a list on the board that you can leave for the rest of the lesson. As a class, discuss the energy sources for these tools step by step on the board to establish that power tools generally get their energy from fossil fuels and manual tools are human powered.*

III. Scattergories Fossil Fuel Brainstorm (10 min.)

We'll play two rounds of Scattergories to brainstorm possibilities for illustrating the fossil fuel flags for this lesson. So, please keep the list created in both rounds on the board for students to refer to when illustrating their flags along with the compare/contrast list created in the last activity.

Divide students into groups of two to five. Explain the game: They will be given a category and their goal is to create a list of five items that they don't think any other group will think of in that category. They will only be given points for unique answers. Each round, they will only have two minutes to brainstorm. At the end of the round, have one representative come up and write the group's answers on the board.

Example: (This will also be the category you use for the first round)





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Machines that use fossil fuels:

Group 1:	Group 2:	Group 3:
Cars	Television	Cars
Washer/Dryer	Xbox	Chainsaw
Chainsaw	Computer	Xbox
Jackhammer	Cars	Lightbulb
Lightbulb	Buses	Cellphone
Points: 2	Points: 3	Points: 1

In this round, group two wins because they have the most unique answers. You can keep track of scores through the rounds or start over each round. Some answers may spark some debate though in this round, because the electric items could run off fossil fuels or renewables. If there is a debatable answer, the teacher should ask the group that provided the answer to specify what they meant and based on their answer decide if they get the point.

In the next round, ask students to brainstorm items that were made with fossil fuels that you could find in the school. This round has lots of room for interpretation, but nearly all synthetic items were made using fossil fuels. If a student includes an item that doesn't contain fossil fuel but was made using them, it's up to you whether or not to include it. This may bring up interesting discussions!

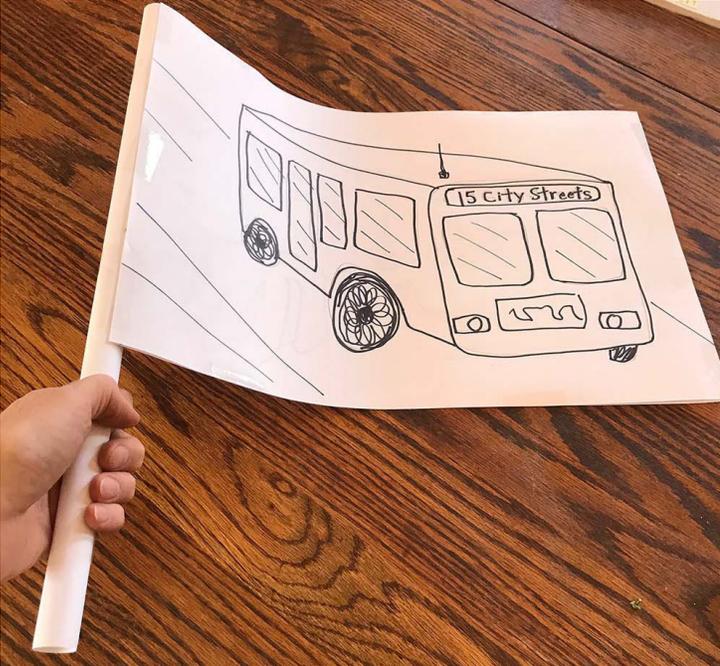
Assessment (Outcome 1): *Students identify machines and items that use fossil fuels in their communities and schools.*

IV. Create the Flags! (30 min.)

Using the lists from the Scattergories rounds, ask students to draw one machine or item that uses fossil fuel on an 11"X17" piece of construction paper. This should be something that is used in their community and, optimally, something that they use. Remind students that this could be large or small, a water treatment facility/public bus/ coal power plant or a motor scooter/computer/ electric pencil sharpener. Using a black marker will symbolize oil and fossil fuel. Challenge students to only use black in their drawings and grey shading. They may want to first draw in pencil and then go over the lines with marker. These drawings will be turned into flags that represents the character Foss in *Shine* and should symbolize his belief that fossil fuels enable humanity to advance more quickly with less effort. If students finish early, they can complete a second drawing- although they will eventually choose one.

Once all students have finished their work, ask them to find a partner who's drawing they like. Each pair should then tightly roll up a blank piece of construction paper lengthwise so that they create a roughly 1/2" by 17" tube. Tape the tube at multiple points so it does not unravel. Next, ask students to tape their two drawings together facing outward and tape their completed flag to the tube so that it can be waved back and forth.

Assessment (Outcome 2): *Students create a flag that will be used as a symbol for Foss' values by the followers of Foss in the next lesson. Ask each pair to present their flag to the class and explain the choices that they made.*



V. Follow-Up Activities

a. Classroom Flags

In this lesson, students created flags that symbolized Foss' values. Flags have been used throughout history as symbols of communities and groups. Ask students to make another set of flags that exemplify the values, ideas, and students that make up their class. Display these flags in the hall with a description of what they symbolize for the school to see or work together to create a choreography to present the flags to the school and/or community through performance.

Assessment (Outcome 2): *Students create a flag that will be used as a symbol for their class and display their flags for the school to see.*

b. Behind the flag

We see flags in our classrooms, schools, and communities but rarely take the time to consider the symbols, ideas, and designs they depict. Ask students to form groups of two to four. Each group will choose one flag they are familiar with. It could be a state or national flag or a flag representing a group. Student groups should work as a team to research their flag and create a short (2-4 minute) skit on the history of their chosen flag. Students should select props to use in their skit that help them convey the ideas they hope to communicate. It's okay if groups choose the same flag, their skits and props should be different depending on the story they choose to tell.

Assessment (Outcome 2): *Students create a skit and use props to communicate the history of a flag of their choice.*



VI. Additional Resources

a. Sources

Script of *Shine*: http://www.insidethegreenhouse.org/shine/assets/shine_script.pdf

Music of *Shine*: http://www.insidethegreenhouse.org/shine/shine_music.html

Choreography of *Shine*: http://www.insidethegreenhouse.org/shine/shine_choreography.html

Osnes, B. (2017). *Performance for resilience: Engaging youth on energy and climate through music, movement, and theatre*. Cham, Switzerland: Palgrave Macmillan.

b. Vocabulary

Tool: A device used to do work.

Symbol: An item, idea, or representation that is used to represent something else. Often, the symbol provides a simple visual version of a complex idea.

Flag: A visual symbol that represents a group or idea.

Fossil fuel energy: Energy created by burning fossil fuels such as coal, oil, natural gas

Property (prop): An object, often used to represent something it is not, for dramatic effect by an actor.

VII. Standards Addressed

a. Next Generation Science Standards Addressed

4-PS3-2 Energy

Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

4-ESS3-1 Earth and Human Activity

Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

5-ESS3-1 Earth and Human Activity

Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

b. JeffCo Generations Skills

Civic & Global Engagement: Students take active roles in their communities, are prepared to be participatory citizens in our constitutional republic, and are engaged with issues of local, national, and global concern.





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Self-Direction & Personal Responsibility: Students take initiative, are inquisitive, entrepreneurial, and curious. They persevere through challenging situations, take calculated risks, and stand accountable for their actions. They continually advocate for their own needs as well as the needs of others.

Communication: Students learn to effectively communicate in written, digital, artistic, and oral forms. Students learn to explore and articulate their own points of view, while respectfully exploring and understanding the perspectives of others.

Collaboration & Leading by Influence: Students learn to work together, harnessing the power of teamwork, and learn the importance of influence to motivate others to get things accomplished.

Agility & Adaptability: Students learn to change in response to dynamic situations, environments, and complex problems. Students adjust to disruptions, ambiguity, and uncertainty in themselves, their organizations, and their communities - and thrive in spite of the obstacles.

Colorado Academic 2020 Standards Drama and Theatre Arts

Create

- Create characters from scripts or improvisation using voice, gestures and facial expressions
- Design a scene through an inventive process, and perform the scene

Perform

- Participate collaboratively with partners and groups
- Demonstrate safe use of voice and body to communicate characters

Critically Respond

- Develop selected criteria to critique what is seen, heard, and understood
- Examine character dynamics and relations

