SHINE LESSONS

Curriculum Introduction

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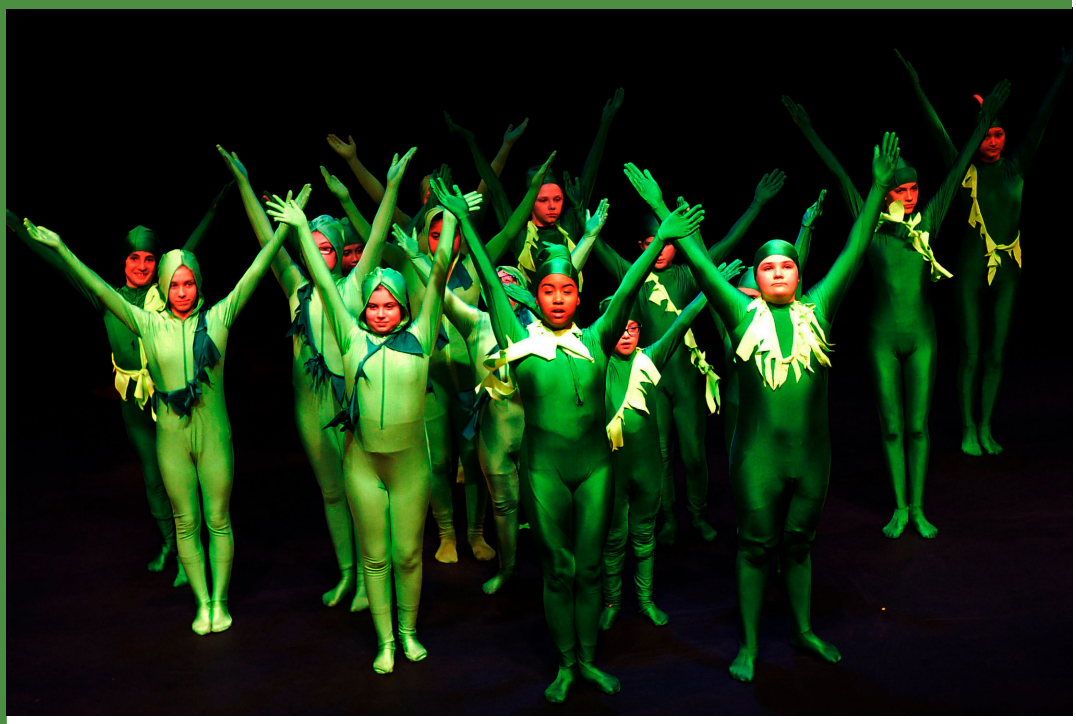

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This lesson strives to address NGSS, Colorado 2020 and JeffCo Generations standards and goals, cited at the bottom of the lesson, by communicating science through embodied expression

Shine, The Musical
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Inside the Greenhouse

University of Colorado Boulder

Description

Students warm up by considering how embodied communication compares to written communication. They then watch the trailer for *Shine* and read through the script to get a sense of the play. Next, students are introduced to Drawdown and climate solutions so they can see that the lessons move toward pathways to climate action in the second half of the curriculum. This lesson is meant to serve as a broad overview to orient students.

Concepts

1. Embodied expression is a unique and powerful form of communication (embodying concepts is beneficial to learners)
2. Students can help guide actions on climate change and have access to impactful solutions

Outcomes

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

1. Identify forms of embodied expression and consider what makes embodied expression unique
2. Discuss Drawdown climate solutions with peers and list examples of climate actions.

Outline

I. Set Up (5 min.)
II. Introduction (10-15 min.)
  a. Behavior Guidelines
  b. Learner Level Assessment
III. Watch the *Shine* performance trailer and read through the script as a class (20-25 min.)
IV. Explore Drawdown solutions (10-15 min.)
V. Additional Resources
  a. Sources
  b. Vocabulary
VI. Standards Addressed

I. Set Up (5 min.)

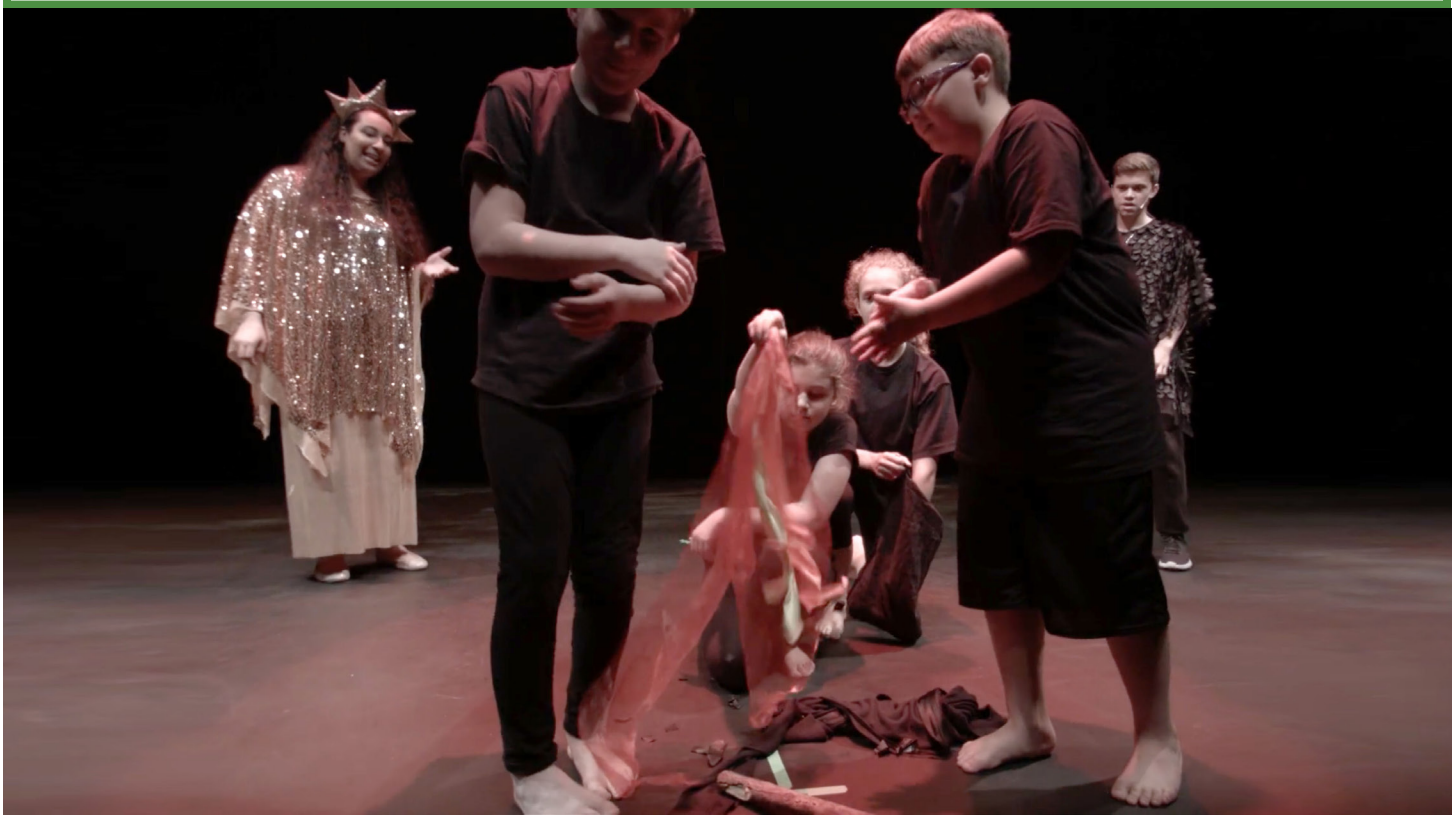
This lesson requires a screen, projector, and internet connection. Students will also need colored markers, crayons, or colored pencils and paper for the introductory activities.

Background: Traditionally, many curriculums focus on introducing a problem and then eventually showing students possible solutions. However, this sometimes means that students can be overwhelmed by the problem itself and consider the solutions as an afterthought. In order to avoid that possibility, this introductory lesson provides an overview of where the next 12 lessons are headed and lets students know that after delving into climate change, we will focus on pathways to action that honor youth as authors of knowledge and initiators of action in their own communities.

II. Introduction (10-15 min.)

Behavior Guidelines: Many of the activities in this curriculum involve movement and embodied expression. It's important to create a classroom space in which students feel allowed to represent ideas in with their bodies regardless of how it looks to others. The first few lessons of this curriculum can set the tone for the rest of the lessons. Consequently, it's important to mention before getting started that students should support rather than judge classmates and feel free to move in ways that are appropriate in a classroom and support their unique expression. This may already be established as a classroom rule and can just be extended to these activities. If not, please refer to the **Classroom Management Guidelines for Embodied Lessons** included with this curriculum before beginning lesson two. Ensure that all students are ready to participate and clear on expectations.

Learner Level Assessment: Writing and Speaking versus Acting and Drawing



Activity: Students will go through two rounds of communicating to each other in different ways and then share out about their experience with different methods.

In the first round, we will focus on how we give and receive information through speaking and writing. Ask students to spread out, get into pairs, and stand across from each other. Make sure each pair has supplies to draw with and paper. Ask the student wearing the darker shirt (student #1) to go first. Ask student #1 to share with their partner what their favorite animal is and what they love most about that animal for 45 seconds. After that time, ask student #2 to record what they had heard from their partner by taking notes. Switch partners so that student #2 can share what their favorite animal is for 45 seconds and what they love most about that animal, after which student #1 takes notes on their own sheet of paper.

In the second round, we will concentrate on giving and receiving information through acting and drawing. Let students know that it is okay if they don't understand perfectly what their partner is trying to communicate. There is no "getting it wrong." Ask everyone not to speak their answers so that the class can focus on drawing, this is a silent activity. To begin, student #2, using only physical actions and no words, shares with their partner what their favorite season is—fall, winter, spring, or summer—and what they love doing outside during that season. They will have 30 seconds to communicate that with only actions to their partner—those watching also need to keep silent and not guess out loud. After 30 seconds, ask student #1 to draw what they think their partner was trying to communicate. After about a

minute, switch partners and ask student #1 to use only physical actions share with their partner what their favorite season is—fall, winter, spring, or summer—and what they love doing outside during that season. Give students 30 seconds to communicate that with only actions to their partner. After 30 seconds, it is student #2's turn to draw what they saw.

Optional: Gallery Walk (depending on your classroom space and timing, it can be fun to share these drawings as a group. This additional step will add about 5 minutes.) Once done, ask students to gather in a circle so that they can share their drawings. First, ask everyone to hold their drawings and stand in a circle facing inwards. Next, ask everyone whose partner loves fall most to step inside the circle facing the outside of the circle, hold their drawing up, and walk around the inside of the circle slowly, showing each their drawing. Do the same for each of the seasons one at a time.

Assessment (Outcome 1)*: As a group, ask students to consider the following questions one at a time. This can be done in partners, small groups, or as a full class. If you work as a full class, it can be helpful to do this assessment as a brainstorming activity and write the answers on the board as students provide them.*

Discussion Questions

- What are written and spoken words especially good at doing? (or In what ways are written and spoken words good at communicating?)
- What does acting and performing communicate especially well?
- Which one provided more detail? What kind of detail?
- What do you enjoy about embodied expression?
- What is gained by expanding the ways in which we communicate together?
- Why do we use words so much more than actions to communicate? What is gained? What is lost?
- What are different ways that you communicate?

III. Watch the *Shine* performance trailer and read through the script as a class (20-25 min.)

Let students know that in the next 12 lessons, the class will be learning about climate change through lessons based on a musical performance called *Shine*. Here's a short description to share with students: "*Shine* is a mini-musical performance to help students create climate solutions for their community. It brings together climate science, acting, and art into a funny and powerful story. *Shine* spans 300 million years of geological time to convey how humans, energy, and climate are connected."

After reading the description, show the class the trailer for *Shine* which can be found here: **http://www.insidethegreenhouse.org/shine**

Now that students have an idea of what *Shine* is, rotate through roles and read through act one as a class. Please note that the script included here emits songs, but that the curriculum involves learning the music of *Shine* in class. The script below is to familiarize students with the story. In the next lesson, students will watch the *Shine* performance to experience a full staged production. Print out or project this script so students can take part in the readthrough. Once act one is complete, we'll focus on Drawdown solutions for act two.

***Shine* script (without songs):**

Characters:
Sol - Represents the sun and is a satisfied, wise, nurturing guardian over all life on Earth. Sol's warm rays provide all the energy the Earth needs to grow and thrive. Sol's light is source of nearly all energy on earth.

Foss - Sol's younger sibling. Foss stands for fossil fuels, so it is packed with powerful energy (originally from the sun). Foss can't wait to unleash that power and create progress … but, at what cost?

Other plant, animal, and human characters appear throughout the play but have few speaking roles outside of the songs.

Sol: The weirdest thing happened about 300 million years ago. I was just shining down on this planet like I do on all my planets–I have eight–and then these ancient plants and animals start doing this musical number. Yes, a musical number. Weird, right? I think, yeah, I'm down with this. Life is getting more and more animated on this planet. I can adjust. This dance number is kind of interpretive, but it looks like the ancient plants are taking in CO2 from the atmosphere to photosynthesize my energy to store it up as carbon. I think they are dancing the different parts of photosynthesis. They need my energy from the Sun. They take up water through their roots. That excites their cells. They breathe in CO2 from the atmosphere. They grow. They get eaten by ancient animals; so now the animals have my energy in them too. And then they all die, both the plants and the animals. And this keeps happening over and over again. They get covered up by hundreds, sometimes thousands, of feet of mud and rock and sand. They turn into fossils. This goes on for millions of years. I assume they're just down there decomposing. And then, Wham! This person bumps into me. And I say, Whoa. Who are you?

Foss: I'm your brother.

Sol: I don't have a brother.

Foss: You do now.

Sol: What? How can that be?

Foss: Yeah, I'm another form of energy. Like in your family, your brother.

Sol: What do you mean? I'm energy. I'm the sun. For your information, energy can neither be created nor destroyed. So, I can't have a new energy brother.

Foss: Back to school, sis. Energy can't be destroyed, but it can be transformed from one form into another.

All those fossils of decomposing plants and animals that stored all that solar energy from you, remember them? They formed fossil fuels. Pow! I was born. I'm a new form of energy on this planet. You could call me fossil fuels, but I'd really prefer something a bit flashier, like Foss! What do you think?

Sol: What have I done?

Foss: It's no big deal, it's not like I'm going anywhere. I'm mostly stuck under the ground. See? All those bumps underground? That's most of me.

Sol: Okay, this really is not what I expected, but I could get used to having some family. I guess the company's not bad. So, new energy brother, come with me.

Foss: What do we do now?

Sol: I just shine. Millions of years go by, and I just keep on shining. That's what I do.

Foss: What do I do?

Sol: I don't know. What can you do?

Foss: That's just it, I don't know, but I was hoping for a bit more action. (Sighs, then asks restlessly,) What time is it?

Sol: It's Triassic Period, about 231 million years ago.

Foss: Whoa. What is that?

Sol: Those are new. Dinosaurs, let's call those dinosaurs.

Foss: Cool. (The dinosaur exits into extinction. Foss pauses, slumps) What time is it now?

Sol: About 2.8 million years ago.

Foss: What's that?

Sol: That's a new one too. Humans. Yep. Let's call them humans.

Foss: What is that human doing?

Sol: I don't know. Wait. That human is breaking up sticks and rubbing them together.

Foss: What's that red stuff?

Sol: Smart. Those humans are using energy from me that's stored up in wood from a tree to make heat energy. Clever. These humans are fun to watch.

Foss: What's that black stuff?

Sol: Oh that's just carbon being released into the atmosphere. But there's not very much, so it's not a big deal.

Foss: What's that noise?

Sol: Oh, I forgot to tell you, you're going to like this if you want some action. Sometimes life on this planet does musical numbers. The ancient plants and animals were just doing one about 297 million years ago. It's cool. Wanna join in?

Foss: Not really my style. I'll wait for the next one.

Sol: Could be a while.

(The Harvest Song begins and Foss transforms it into his own song about using fossil fuels to change the world)

Sol: Are you always going to spoil everything?

Foss: Come on, you had fun. Admit it, you liked my funkier beat.

Sol: It was alright. Okay, I guess it was kind of fun.

Foss: You guess? You loved it. That number was dragging before I came in. Come here, sis. Bring it in. (They embrace and laugh.) Hey, we're bonding.

Sol: I guess we are.

Foss: It's nice.

Sol: Yeah, it's nice. *(Sit together.)* Look, the humans all seem to be settling into a clump.

Foss: I think they're bonding too.

Sol: You're right; they're forming a community.

Foss: They can do that now since they figured out how to make enough food to stay in one place. I wonder what they call themselves.

Sol: Hey, it looks like they're working together.

Foss: It drives me crazy how everything on this planet happens so slow. Whatever they are trying to do is going to take forever just using human energy. There's probably a faster way to do this.

Sol: This is good. They're figuring it out. Look, they're working together making a machine to weave fabric, a loom. They're going to weave who they are as individual humans into a community using a human loom.

Foss: This might be where I could come in. My purpose. I can help these machines and cities go faster, with more power!

Sol: Careful. You're an energy form. They're just humans. They might not be able to handle you. You've got millions of years' worth of my solar energy packed into you.

Foss: Relax. I'm just trying to help them.

Sol: But you don't know what's going to happen if you let loose.

Foss: Progress, that's what going to happen. And progress is not such a bad thing. These humans seem to want it. I'm right beneath their feet–coal, oil, and natural gas. Look at all the toil and struggle these humans have to go through just to meet their basic needs to eat and be warm. You've seen it; they have so much potential. They're clever. Just imagine what they could create with my power to fuel their ideas.

Sol: Slow down. These folks seem to have found a really nice balance just using solar energy and biomass.

Foss: Yeah, but that's not for everybody. Let's see what they want.

Sol: Somebody could get hurt.

Foss: And somebody could be jealous of her brother.

(In the next musical number, Foss makes everything go faster and faster with his energy)

Foss: Sis, look! It's like an Industrial Revolution! So much growth and change in just 150 years. All because of me!

Sol: *(Sol picks up some carbon)* And this is all because of you too. Look at all this carbon you've released.

Foss: Yeah, but you said it was no big deal when the humans were burning wood.

Sol: That was such a small amount; look at all this.

Foss: *(Listening to the soundtrack of the storm.)* Hey sis, what's that noise?

Sol: I've seen this before. The climate is changing on this planet again.

Foss: What? Why?

Sol: The carbon cycle, you disrupted the natural carbon cycle.

Foss: What now?

Performer 1: This is where we are now as a human community. Our use of fossil fuel energy is impacting our climate and those who did the least to cause it are being hurt by it the most.

Performer 2: In the face of these challenges, how do we want to prepare? What story do we want to tell for our city? How do we plan to get from this point in history to a resilient future? That part of the story will now be told.

(This is the end of the student read-through)

IV. Introducing Drawdown (10-15 minutes)

Act 2

In act two, students answer the questions asked at the end of act one by focusing on local actions to respond to climate change. Present students with the Drawdown solutions posted on enactingclimate.org. These solutions have been adapted from the original set at Drawdown.org so that they are accessible to fifth grade students and above. Project the top ten solutions to the class and ask if they are surprised by any of them. Project solution number one, Reduced Food Waste, and ask students to read through the solution. Discuss any questions the students have.

Assessment (Outcome 2): *After reading through Reduced Food Waste, ask students to write down three ways food waste could be reduced at school. Create a combined list of all the possibilities on the board.*

Let students know that for the first half of the curriculum, they will be going through *Shine* the musical and for the second half, they will be focused on climate solutions that they can help to initiate.

V. Additional Resources

a. Sources

Information on the impact of embodied learning:

Abrahamson, D. "Embodied Spatial Articulation: A Gesture Perspective on Student Negotiation between Kinesthetic Schemas and Epistemic Forms in Learning Mathematics." Proceedings of the 26th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, vol. 2, Preney, 2004, pp. 791–97.

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

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

Rohd, M. (1998). Theatre for Community Conflict and Dialogue: The Hope is Vital Training Manual. Portsmouth, NH: Heinemann.

b. Vocabulary

Embodied Expression- Using the physical body to communicate an idea or emotion

Performance- The intentional presentation of a form of entertainment or communication to an audience

Communication- The movement of ideas and/or emotion from one person to another

VII. Standards Addressed

a. Next Generation Science Standards Addressed

4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

b. Colorado Academic 2020 Standards Drama and Theatre Arts

Perform

- Select, analyze, and interpret artistic work for presentation
- Convey meaning through the presentation of artistic work

Critically Respond

- Perceive and analyze artistic work
- Interpret intent and meaning in artistic work