



Wanna produce a musical?

Grab and Go Curriculum Materials for *Shine*

Adaptable for K-12 schools, youth groups, and faith organizations, compiled by Beth Osnes with Shira Dickler.

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Introduction: *Shine* is a mini-musical performance for youth engagement in resilience planning. It weaves together climate science and artistic expression into a funny and powerful story. *Shine* spans 300 million years of geological time to convey how humanity, energy, and climate are interrelated. **To familiarize yourself with this project, I recommend watching the two-minute trailer at <http://www.insidethegreenhouse.org/shine/> before reading this.**



Full Production: *Shine* can be used in its entirety (20-25 minutes) to actively engage students in issues related to energy, climate, and resilience. *Shine* can be mounted with a group of youth and performed for an audience within one intensive day of creative immersion and continual rehearsal and preparation. The entire production can also be mounted over the course of a few days or a few weeks. If using the choreography as created by Arthur Fredric (http://www.insidethegreenhouse.org/shine/shine_choreography.html), it is advisable to give yourself several rehearsals for each module depending on the aptitude and experience of the performers. If you would prefer a much easier and more accessible choreography for each module, view the video recording of *Shine* (formerly titled *Sol-Her Energ-He*) at <https://www.youtube.com/watch?v=gsnbX8gLfq0>.

Modules: *Shine* is also designed in sections that can be used independently to engage students in just a particular issue or theme. These are intended to be viewed as independent modules to explore various themes addressed by each section. What follows is a rich description of each of these various modules.

Included in the description of each is:

- Themes explored
- Suggested warm up activity
- Artistic activity (completes with a list of materials needed)
- Description of the movement in that section (along with a link to a video demonstrating that movement)
- Discussion and research questions

It is highly recommended that you have students watch the video recording of *Shine* (22 minutes) available at <http://www.insidethegreenhouse.org/shine/> so they understand the context in which each module fits (or at least the portion they are focusing on).

Consult the Script for *Shine* available at <http://www.insidethegreenhouse.org/shine/> for access to the lines used for each module.

Learning Goals for youth participants of *Shine* include:

Subject Area Learning Goals:

- Understanding the relationship between energy and climate (Science)
- Placing the earth's production of fossil fuels and the impact of human-use of fossil fuels into scale within the last 300,000,000 years of geological history (Geology)
- Understanding how our energy-use is impacting climate (Science)
- Placing all this within the context of human history and society (Sociology, History, Civics)
- Understanding effective climate communication by critically engaging with the script for Act One, and by inviting youth to author Act Two, dramatizing local solutions towards a positive climate future (English, Media, Science, Civics)
- Understand how music, movement, and theatre can convey various aspects of climate and energy science (Music, Theatre, Dance)

Participatory Performance Learning Goals:

- Embodied learning
- Nuanced understanding of themes through physical participation in dramatic metaphors
- Youth empowerment
- Civic engagement
- Collaboration with others to effectively communicate youth-authored solutions to an audience
- Students as authors of knowledge and partners in public display

The over-arching goal of this project is to create a performance experience for youth that guides them through an embodied exploration of the climate legacy they have inherited. *Shine* further works to inspire and equip youth to create local solutions for inclusion in their city's plan for resilience. One of the objectives for achieving this goal is to have youth immersed in artistic excellence and the preeminent science on climate and energy, through the process of rehearsing Act One, authoring Act Two, and performing the show before their larger community.

Description of Modules:

Act 1

Module 1.

Ancient Plants and Animals Capes and *Long Time Comin'* song, (http://www.insidethegreenhouse.org/shine/shine_music.html), Dinosaur and First Fire Use pages 1-7 in the script for *Shine* (available at <http://www.insidethegreenhouse.org/shine/>) for this module.



Learning Goal: To understand fossil fuels within geological time.

Themes explored:

1. **Carboniferous Period** “The Carboniferous period, part of the late Paleozoic era, takes its name from large underground coal deposits that date to it. Formed from prehistoric vegetation, the majority of these deposits are found in parts of Europe, North America, and Asia that were lush, tropically located regions during the Carboniferous (<http://www.nationalgeographic.com/science/prehistoric-world/carboniferous/>).”
2. **Expansion of Ancient Plants and Animals on Land** “Carboniferous coal was produced by bark-bearing trees that grew in vast lowland swamp forests.

Vegetation included giant club mosses, tree ferns, great horsetails, and towering trees with strap-shaped leaves. Over millions of years, the organic deposits of this plant debris formed the world's first extensive coal deposits—coal that humans are still burning today

(<http://www.nationalgeographic.com/science/prehistoric-world/carboniferous/>).

“Oil and natural gas were created from organisms that lived in the water and were buried under ocean or river sediments

(https://fossil.energy.gov/education/energylessons/coal/gen_howformed.html).

- 3. Photosynthesis** “Many people believe they are “feeding” a plant when they put it in soil, water it, or place it outside in the Sun, but none of these things are considered food. Rather, plants use sunlight, water, and the gases in the air to make glucose, which is a form of sugar that plants need to survive. This process is called photosynthesis and is performed by all plants, algae, and even some microorganisms. To perform photosynthesis, plants need three things: carbon dioxide, water, and sunlight (<https://ssec.si.edu/stemvisions-blog/what-photosynthesis>).

Photosynthesis has a direct relationship with historical carbon levels and climate change (<http://www.columbia.edu/~vjd1/greenhouse.htm>).
- 4. Formation of Fossil Fuels** “Fossil energy sources, including oil, coal and natural gas, are non-renewable resources that formed when prehistoric plants and animals died and were gradually buried by layers of rock. Over millions of years, different types of fossil fuels formed -- depending on what combination of organic matter was present, how long it was buried and what temperature and pressure conditions existed as time passed. Today, fossil fuel industries drill or mine for these energy sources, burn them to produce electricity, or refine them for use as fuel for heating or transportation. Over the past 20 years, nearly three-fourths of human-caused emissions came from the burning of fossil fuels (<https://energy.gov/science-innovation/energy-sources/fossil>).

Suggested Warm Up Activity: “Running Through Mud”

Objective: Warm the group up and generate energy

Relevance of Activity to Theme: guides students in experiencing various ways that life moves in different environments

Activity: Ask the group to move around the room using the entire space. Give instructions to the group that will change the way they are moving:

- Walk quickly
- Walk slowly
- Walk on the heels of your feet
- Hop on one leg
- Walk as if barefoot on sharp rocks
- Move forward as though you are in the water
- Walk as if you were moving through mud
- Walk like you are on ice

Artistic Activities:

Costumes for Ancient Plants and Animals:

Create body “cap” of ancient plants and animals—a piece of Tyvek that can reach from the student’s shoulders to the floor in length and that extends in width approximately from one elbow to the other (about 36”/45”), cut the corners of the rectangle to round the four corners. Cut arm holes near the top so the student can put their arms through and wear the cape on their back. Have students decorate the backs with the design of an ancient plant or animal that they research and chose to be in the performance. (In the accompanying video (<http://www.insidethegreenhouse.org/shine/>), green full-body Lycra suits were worn by the plants and only the animals wore the capes.)



Materials Needed:

- Pieces of Tyvek (about 36”/45”) for each student to make a “cape” of their ancient plant or animal (Tyvek is better than paper since it will not likely rip when the students move in their capes)
- Longer pieces of Tyvek to cut out and design dinosaur (can represent a dinosaur in any other way too)
- Multiple wide-tip colored water-based markers
- Scissors
- Cut up black tissue paper into small pieces (to serve as the black carbon released from humanity’s first fire)
- Red scarf or tissue paper (to serve as the flame for the fire)

*Also needed for this section is a huge piece of brown cloth that will be spread over the ancient plants and animals once they die, approximately 20/24 feet or something to approximate that if possible.

Description of Movement in this Section:

First, students will create a physical representation of the historical stages explored in this scene, including: ancient plants and animals exploring the planet/ photosynthesis/ animals eating plants/ animals dying and getting covered up by dirt and mud and sand/ animals and plants being compressed to form fossil fuels (under brown cloth). While under the brown cloth, students will remove their plant or animal costume and roll out

from under the cloth, leaving the “fossil” beneath the cloth. On cue, several students will act as a dinosaur walking across stage. Then, two “humans” will come out and act out lighting a fire with sticks. A student with a red scarf can wave it over the sticks as the fire. As the fire is lit, another student can release carbon as small pieces of black tissue paper into the air.

Discussion/Research Questions:

1. How do plants and animals leave behind fossils?
2. How do plants get their energy to grow?
3. How do you think “fossil fuels” got that name?
4. Why does the burning of fossil fuels release carbon?

Module 2.

Harvest Song/ Foss Folks song

(http://www.insidethegreenhouse.org/shine/shine_music.html)

Use pages 7-11 in the script for *Shine* (available at <http://www.insidethegreenhouse.org/shine/>) for this module.

Learning Goal: To understand how human communities form based on Agriculture.

Themes explored:

1. **Agriculture** “The history of agriculture is the story of humankind's development and cultivation of processes for producing food, feed, fiber, fuel, and other goods by the systematic raising of plants and animals. Prior to the development of plant cultivation, human beings were hunters and gatherers. The knowledge and skill of learning to care for the soil and growth of plants advanced the development of human society, allowing clans and tribes to stay in one location generation after generation. Archaeological evidence indicates that such developments occurred 10,000 or more years ago (http://www.newworldencyclopedia.org/entry/History_of_agriculture).”
2. **Settlement of Cities Due (in part) to Grain Storage** “The concept of the ‘urban revolution’, first identified by V. Gordon Childe (1892-1957 CE), describes a series of social changes that brought about the development of the earliest cities and states. These changes (such as the origin of social classes and the production of an agricultural surplus) provided the social context for the earliest cities. Once class-structured state societies took hold in a region, individual cities rose and fell in response to a variety of forces (<http://www.ancient.eu/city/>).”
3. **Rural vs. Urban Attitudes towards the Earth/Environment** Although there are many factors influencing attitudes towards the Earth and the environment, this section portrays an exaggerated attitude on the part of Foss who disregards the rural harvest grown by his sister’s energy because he prefers the fast-paced life

of an urban lifestyle largely powered by his energy source, fossil fuels. This behavior is influenced as much by sibling rivalry as it is rural/urban attitudes, yet there are findings that suggest that those who live in the “rural context present more attitudes of environmental responsibility and greater consistency on expressing behavioral intentions compatible with the protection of the environment

(https://www.researchgate.net/publication/232522875_Rural-Urban_Differences_in_Environmental_Concern_Attitudes_and_Actions)." This section is not intended to assert superiority of rural over urban or vice versa, but rather to dramatize both the tension that can result from different attitudes, and the harmony that can be achieved.

Suggested Warm Up Activity: “1 by 2 by Bradford”

Objective: Fostering concentration and working together

Relevance of Activity to Section: demonstrates aspects of human development, how one behavior can be replaced by another in a human agreement

Activity: Have everyone partner up. Start by telling each pair to count to three, but by alternating numbers (person A says 1, person B says 2, A says 3, B says 1, A says 2 and so on). After a minute of that, tell the groups to continue doing this, but replace 3 with a sound. Let all the groups practice that for a minute, and then tell them they now need to replace 1 with a movement. After a minute or so of practicing that, tell each group that they now have to replace 2 with a movement and sound. Let the pairs continue for another minute, and encourage them to experiment with changing the tempo, volume, and energy levels.

Artistic Activities:

Properties: Harvesters create stalks of plants out of rolled newspaper by taking four half pieces of a full-sized newspaper. Begin rolling one piece from the narrow end. When half way done rolling the first piece of newspaper, slip the end of another piece into the roll and include it. Then when half way done rolling the second, slip in the end of



a third piece into the roll and include it. Repeat for the fourth piece in the same way. Once completed, gently place a rubber band around one end of the rolled-up papers, careful not to make it so tight that it crumbles the paper. Take a strong pair of scissors and cut about three or four vertical slits into the other end, extending the cuts to about half the length of the roll. In performance when the Harvesters want to represent having

the plant grow, they can reach into the center of the roll and gently pull out a center strip, which should result in a flowering of the plant. Take care not to pull too far so that the entire structure falls apart. Rehearse making these and pulling them out. If more color is desired, a colorful piece of tissue paper can be added over the second, third, and fourth piece of newspaper and rolled in.

Costumes: Foss followers- Create sashes to wear across their chests that identify themselves as being aligned with Foss. Youth participants can be encouraged to design sashes in whatever way they envision to communicate their allegiance with a fossil fuel-based lifestyle. Once designed, these can be fitted to each participant by stapling the sash so it hangs securely across the chest. Foss followers can don sunglasses to accentuate their look.

Materials Needed:

- Tissue paper, yellow, orange, and green, for rolling into the plant stalks and for cutting up into small pieces for seeds
- Newspaper
- Rubber bands
- Scissors 4”/40” strip of Tyvek for each “Foss follower sashes” (or another type of fabric)
- Stapler
- Wooden bowl or side purse (to hold tissue paper “seeds”)



Description of Movement in this Section:



Youth participants will demonstrate the following activities based on the group they are a part of, Harvesters or the Foss followers. Harvesters dramatize tilling soil, planting (using tissue paper seeds), and having their plant stalks grow. Foss followers knock these stalks out of their way as they enter and follow Foss’s lead in the dance that follows. Both groups in the second part of the song demonstrate how the two approaches to life can both clash

and coexist with vitality. (consult the video labeled *Harvest* at http://www.insidethegreenhouse.org/shine/shine_choreography.html for a bird’s eye view of this movement)

Discussion/Research Questions:

1. What grain allowed for your city to form? Corn, wheat or rice?
2. What are some of the characteristics of communal-based agricultural practices?
3. How does the introduction of fossil fuels change these?
4. Do you live in a rural or an urban community? How does where you live influence your attitude towards the environment?

Module 3.

Weaving song (http://www.insidethegreenhouse.org/shine/shine_music.html)

Use pages 12-16 in the script for *Shine* (available at <http://www.insidethegreenhouse.org/shine/>) for this module.

Learning Goals: To understand how human communities are formed and what distinguishes them.

Themes explored:

1. **Fabric of Community** Humanity, wanting to protect itself from the weather, began weaving cloth during Neolithic times. Soon, they introduced technology to help them do it more effectively, eventually using fossil fuels to fuel weaving machines.
<http://www.historyworld.net/wrldhis/PlainTextHistories.asp?ParagraphID=cas>
2. **Early Machines Using Energy** Textiles are associated with the very beginning of the Industrial Revolution—the social shifts that follow the development of weaving can elucidate the many changes occurring in human society during this rapidly changing time. Weaving went from being a family activity that used human power and a loom, to a skilled craft, to a mechanized process done in factories (<http://www.weavedesign.eu/weaving-history>).
3. **How Communities Come Together and Distinguish Themselves** Design of fabric can be associated with different communities, “with patterns produced in different parts of the world showing distinctive local features (<https://www.britannica.com/technology/textile>).” Fabric produced through weaving is just one of many aspects of a community that can make it unique and distinguishable from other communities.

Suggested Warm Up Activity: “Instant Images”

Objectives: Communication, tackling an issue, and building a discussion

Relevance of Activity to Section: Focuses on visual and physical representations of issues

Activity: Decide on a theme to work on with the group related to the lesson unit. Everyone stands in a circle facing outwards. The leader shouts out a key word that is related to the issue, counts to three, and then claps. On the clap, the players turn into the circle and make frozen images of the word using their bodies. After giving everyone a few minutes to look at each other's image, ask for volunteers to talk about their images and why they choose them. This helps facilitate discussion on a certain issue and lets the players express themselves through their bodies

Artistic Activities:

Properties: Students will decorate long pieces of paper with images that represent their city, making up the "fabric of their communities" when woven together, students can draw on the paper images such as monuments, schools, nationalities, religions, sports, bodies of water, businesses, popular pastimes, favorite foods, types of transportation, flags, etc.

Materials Needed:

- Set of 8, 20-foot x 1-foot strips of paper in various colors
- Multiple wide-tip colored water-based markers (avoid tempura paint as it will make the paper strips difficult to roll again after being decorated)

Description of Movement in this Section:

Performers will create a human loom by doing the following: (consult the video labeled *Weaving* at http://www.insidethegreenhouse.org/shine/shine_choreography.html for a bird's eye view of this movement)

- Arrange 16 performers into a square, with 4 along each side. The students on the top and left sides (8 in total) will each have a roll of paper. If you do not have enough performers, you can ask people in the audience to volunteer to do the more passive roles in this weaving process—have these volunteers simply be the ones to receive the roll of paper, rather than the ones who walk through to hand off the end of the roll of paper.
- Performers holding rolls will weave them together, alternating between the top and left sides. Performers will hand the end of the rolls to their partners on the opposite sides.
- Once the weaving is complete, students on the bottom will kneel down and slant the fabric at an angle so allow spectators to see the finished product.

Discussion/Research Questions:

1. What are some characteristics of the community you live in? What brings people together? What are some common fabric patterns?
2. What different strands have been woven together to create your community?
3. What distinguishes your community from other communities?

Module 4.

Progress song (http://www.insidethegreenhouse.org/shine/shine_music.html)

Use pages 16-19 in the script for *Shine* (available at <http://www.insidethegreenhouse.org/shine/>) for this module.

Learning Goal: To understand the impact of increased use of fossil fuels on climate and thereby on human communities.

Themes explored:

- 1. Mining Fossil Fuels** Since fossil fuels are formed by being compressed by rock and mud and sand, they are naturally found underground and need to be mined from the ground to be used. There are many types of mining in response to how deep the fossil fuels are and where they are found.
<http://techalive.mtu.edu/meec/module19/Page1.htm>
- 2. The Industrial Revolution** “The Industrial Revolution, which took place from the 18th to 19th centuries, was a period during which predominantly agrarian, rural societies in Europe and America became industrial and urban. Prior to the Industrial Revolution, which began in Britain in the late 1700s, manufacturing was often done in people’s homes, using hand tools or basic machines. Industrialization marked a shift to powered, special-purpose machinery, factories and mass production. The iron and textile industries, along with the development of the steam engine, played central roles in the Industrial Revolution, which also saw improved systems of transportation, communication and banking. While industrialization brought about an increased volume and variety of manufactured goods and an improved standard of living for some, it also resulted in often grim employment and living conditions for the poor and working classes (<http://www.history.com/topics/industrial-revolution>).”
- 3. Use of Fossil Fuels to Power Machines** “The new form of mineral-intensive economy pioneered in Britain during the late 1700s, and imitated in the U.S. and beyond in the centuries since, encountered no such limits. Instead of drawing upon limited flows of energy through surface ecosystems, mineral-intensive economies accessed much greater supplies of energy by extracting ancient stocks of energy from beneath the earth in the form of coal, petroleum, and natural gas. Fossil fuels essentially enabled Americans to harness the power of ancient suns. Coal-powered technologies magnified the strength, stamina, and precision of American workers, making the U.S. labor force the most productive in the world” (<http://teachinghistory.org/history-content/beyond-the-textbook/23923>).
- 4. Disruption of Carbon Cycle through Carbon Emissions from Fossil Fuel Use** “Without human interference, the carbon in fossil fuels would leak slowly into the atmosphere through volcanic activity over millions of years in the slow carbon cycle. By burning coal, oil, and natural gas, we accelerate the process, releasing

vast amounts of carbon (carbon that took millions of years to accumulate) into the atmosphere every year. By doing so, we move the carbon from the slow cycle to the fast cycle. In 2009, humans released about 8.4 billion tons of carbon into the atmosphere by burning fossil fuel”

(<https://earthobservatory.nasa.gov/Features/CarbonCycle/page4.php>).

5. **Who is Impacted the Most by Climate Change?** “Many women around the world must adapt their lives to a changing climate. Increases in extreme weather conditions—droughts, storms, and floods—are already altering economies, economic development, and patterns of human migration, and are likely to be among the biggest global health threats this century. Everyone will be affected by these changes, but not equally. Vulnerability to climate change will be determined by a community or individual's ability to adapt. Studies have shown that women disproportionately suffer the impacts of disasters, severe weather events, and climate change because of cultural norms and the inequitable distribution of roles, resources, and power, especially in developing countries (<http://www.prb.org/Publications/Articles/2012/women-vulnerable-climate-change.aspx>).”

Suggested Warm Up Activity: “Machine”

Objective: have a physical experience of industry and power

Relevance of Activity to Section: provides a physical experience of how machines and fossil fuels help to power a city

Activity: One person comes to the center of the circle and repeats a mechanical sound and movement. One at a time, everyone else joins in with their own sound and movement in such a way that each movement is interrelated to one other person, thus making a human machine. Then create another machine by asking them to think of themselves as the different parts of their city that help it function, such as trash removal, police, schools, hospitals, and water treatment. With that in mind, create another machine meant to represent their city.

Artistic Activities:

Properties: Students will decorate large black banners as flags that represent the many ways in which their city uses fossil fuels (example: heating homes and businesses, power plants, transportation, street lights, buses). Both sides of the flags will be decorated and taped to 5' wooden poles.



Materials Needed:

- 4 - 9 pieces of black Tyvek cut in rectangles 36"/45"
- Multiple wide-tip colored water-based markers
- 4 – 9, 5-foot wooden poles
- Black duct tape (for affixing banners to poles)

Description of Movement in this Section:

During this section, the Foss Follower (performers who are not playing the role of weavers) will do the following: (consult the video labeled *Progress* at http://www.insidethegreenhouse.org/shine/shine_choreography.html for a bird's eye view of this movement)

- Hold flags and circle around the weavers (who are still holding the fabric of community).
- Portray the march of progress with strength and determination, pantomiming the digging up of the fossil fuels.
- Once the storm starts, performers circle the weavers as though caught up by the wind of the storm, allowing the flags to represent the strong winds, all the while the movement of the performers becomes more erratic.
- At the last “clang” of the storm, two or three performers should rip through the fabric of community destroying it.
- One of the weavers is hurt and falls to the ground into Foss’s arms just as the storm stops. Foss looks up to Sol and asks “what now?” to complete the final tableau of Act 1.

Discussion/Research Questions:

1. What are some ways that you use fossil fuels in your life? What are the benefits you receive from this?
2. Are any fossil fuels mined in or near your community? What extraction method is used?
3. What type of industry is powered by fossil fuels in your area?
4. Can you imagine what it would be like to survive in your area without access to fossil fuels?
5. How does the release of carbon from this industry impact climate?
6. Who in your community is most vulnerable to a changing climate and why?



Act 2

Module 5.

Performance of Youth-Authored Solutions through Skits and Final Celebratory Song *Shine* (http://www.insidethegreenhouse.org/shine/shine_music.html)

Use pages 19-21 in the script for *Shine* (available at <http://www.insidethegreenhouse.org/shine/>) for this module.

Learning Goal: To understand how to communicate and celebrate solutions to local climate, energy, and societal challenges.

This module will have a different format than sections from Act 1 since this section is to be authored by youth participants. Rehearsing and performing Act 1 is designed to prepare and inspire youth participants to author solutions for Act 2. Alternately, a teacher who is only using this module may choose to simply have students watch the video of Act 1 (full performance available at <http://www.insidethegreenhouse.org/shine/>) and then guide their youth in creating their own skits that express local solutions that they identify. Skits could be performed theatrically live or created as short videos, animation, or using puppets. What follows are some suggestions for guiding youth in identifying solutions as a group, in creating skits based on those solutions, and considerations for effective communication of solutions. Many more approaches can be developed beyond these. Discuss options with your performers-- matching the method to the needs, personality, talents, and preferences of the youth with whom you are working.

Guiding Youth in Identifying Solutions in Groups:

To ensure that each participant's idea within each group will be heard and considered, ask each group to sit in a circle, close their eyes, and each silently think of a solution to a local challenge regarding climate, energy or resilience. Ask each person to share their idea in just one sentence with their group, noting that the group will be choosing just one idea, but that they don't have to decide yet. After each has shared, ask the groups to consider if any common theme emerged or if they see a natural way of synthesizing the solutions that were shared. Ask them to consider which solution might lend itself best to being acted out for the audience. Give groups about two to five minutes to come to consensus on a solution they would like to enact for their skit.

Enacting a Skit as a Narrated Statue (process takes about 20-30 minutes to create and share these skits depending on how many youths are in the group):

This is a method for creating a skit that can be achieved in a limited amount of time. Divide students into groups of four. Each group will be using their bodies to create a statue that conveys their solutions in an active and interesting way. One person in the group will stand to the side of the statue to narrate for the audience what solution is being communicated by this statue. Give each group about four minutes to create their

statue or movement, and to decide who will narrate and what that spokesperson will say. Each group can perform their solution for the rest of the groups to receive positive feedback and constructive suggestions for expressing their solution even more clearly. Provide another two minutes for groups to reconvene to integrate any suggestions they received.

Generating a Skit Using Image Theatre (process takes about 40-70 minutes depending on how many youths are in the group):

Once each group has decided on an issue for their skit, ask them to create three distinct images using their bodies: 1) an image of the problem, 2) an image of the solution to the problem, and 3) the transitional image, or an image of the action that got them from the problem to the solution. By “image” I mean a frozen scene made up of their bodies that physically communicates each prompt. Ask them to portray a specific manifestation of the problem. For example, if the problem is homelessness, the image of the problem might be a single old woman sitting on the sidewalk reaching up for spare change as two other people walk by her with their chins up and their gaze avoiding her. The solution might be an image of this old woman in a cooperative living residence making a meal with other residents. The transition from the problem to the solution might be an image of neighborhood residents in the office of their mayor advocating for housing for the homeless.

Once each group creates their three images, have them take turns sharing these with the others, one group at a time. First, they show the image of the problem, then the solution, and finally the transition. They are not allowed to use any words when presenting these nor are they allowed to announce what their issue is. Once each group is done, ask the others to reflect back to the group what they saw. This gives each group a chance to hear what physicality communicated clearly and what might need more description or clarification. Then give them time to create a skit based on the same issue that is about one to two minutes in length. Urge them to be playful with the creation of their skits, not to over-think them, but, rather, to get on their feet and actively work through the creative process. To support this, only give them ten minutes to create their skits as a group, after which time they each will share their skit to receive positive feedback for constructive suggestions for improvement. Beginning with the Image Theatre exercise can assist in emphasizing the embodied aspect of their communication.



Considerations for Effective Skits:

Research shows that when communicating solutions to climate and energy related issues, it is useful to:

- Keep it local- framing at the city/community level
- Appeal to people's already held values
- Focus on a single issue
- Emphasize the positive
- Identify co-benefits to climate and energy solutions
- Frame the solution as an opportunity¹

Final Song: *Shine* (http://www.insidethegreenhouse.org/shine/shine_music.html)

Importance of Celebrating at the End in Song and Dance:

It is a tradition in cultures throughout the world to end public gatherings with an inspirational song and dance that ensures the sustainability of the energy and commitment necessary to follow through with the issues addressed at the gathering. If you leave humming the final tune, that may help you carry the spirit of commitment with you into your daily life. It may infect you with the inspiration build into the event purposefully by its organizers. Participating in the final number can give you an experience of connection and joy which allows you to feel the value of your community, which in turn, will hopefully strengthen your resolve to act on its behalf. Shared cultural expression unites us, allows us to feel who we are as a community, and communicates who we are beyond our borders.

Choreographing *Shine*:

After rehearsing and performing the already-established choreography of Act 1, the choreography for this song can be handed over to the ensemble of youth performers. The lyrics of the song *Shine* lend themselves easily to simple yet expressive movements. Encourage students to decide upon movements that are accessible to everyone in the group and that are not too complex so that joy and release can be experienced while performing. (consult the video labeled *Shine* at http://www.insidethegreenhouse.org/shine/shine_choreography.html for a bird's eye view one version of this movement)



Additional Discussion Questions

There is a professionally produced video recording of the entire performance of *Shine* that is 22 minutes in length and is available at <http://www.insidethegreenhouse.org/shine/>. The following questions could be used to facilitate a discussion after viewing the video of *Shine* or for the use with one of the modules described above.

1. Science-based questions

- How do plants and animals leave behind fossils?
- How do plants get their energy to grow?
- How do you think “fossil fuels” got that name?
- What are some of the characteristics of communal-based agricultural practices?
- How does the introduction of fossil fuels change these?
- What is the carbon cycle? How can it be “disrupted” as discussed in the show?

2. Literature-based questions

- Why is “Foss” considered the brother of “Sol”?
- What does Sol think of carbon emissions at the beginning of *Shine*? How does her perspective change throughout the script?
- How do the “Foss Followers” feel about the Harvesters and their lifestyle and vice versa?
- Why does Foss’s idea for progress make Sol so concerned?
- How is metaphor used in this play? Can you identify examples of literary metaphor and dramatic metaphor?
- What is the effect of having anthropomorphized characters? How does this impact your understanding of the scientific concepts presented?

Additional Notes on “Performance in a Day”:

If you are planning on mounting and performing *Shine* in a single day, here are some suggestions that may contribute to the success of your experience. Before youth arrive for the day, lay out all the supplies for the art projects that need to be accomplished, such as the capes, strips of paper for the weaving, the fossil fuel flags, cutting the tissue paper, and making the plants stacks out of rolled paper. These can be decorated during breaks and by students not rehearsing a specific portion. Some of these tasks can be done before this day if possible. You may want to create two sets of the strips of paper for the weaving so that you have one set for rehearsal that you leave undecorated, and one to use for the performance that is decorated. If possible, fully rehearse the actors portraying Sol and Foss before the day of production so that additional focus can be given to the ensemble. If that is not possible, try and get the scripts to those actors before so they can become familiar with their lines and their characters. It is also beneficial for the facilitators to familiarize themselves with all the aspects of the

production and have a rehearsal prior to the day of production to determine how each part will be facilitated. Many questions about how to facilitate *Shine* will likely be answered by reading the detailed accounts in Chapter 3 of the book *Performance for Resilience: Engaging Youth on Energy and Climate through Music, Movement, and Theatre* (Osnes 2017) of how *Shine* was produced in different communities along the tour.

Reference Notes:

Markowitz, Ezra, Caroline Hodge, and Gabriel Harp. 2014. "Connecting on Climate: A Guide to Effective Climate Change Communication." New York: Center for Research on Environmental Decisions, Columbia University.

Osnes, Beth. 2017. *Performance for Resilience: Engaging Youth on Energy and Climate through Music, Movement, and Theatre*. Palgrave Pivot. Cham, Switzerland: Springer International Publishing.

¹ (Markowitz, Hodge, and Harp 2014)

For more detailed instructions for creating properties and costumes, go to the link for



at <http://www.insidethegreenhouse.org/shine/>

Apply to Inside the Greenhouse for Costume and Property Borrowing:

Please feel free to contact Beth Osnes with Inside the Greenhouse to discuss the possibility of borrowing a set of costumes and properties used on the tour of *Shine* that are represented in these photos above. We request a deposit and the cost of shipping. Schools and organizations with limited resources can apply for coverage of shipping costs and negotiation of deposit. Beth.osnes@colorado.edu



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