

Notes/Reflections:

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Embodying Science • Heating and Cooling •



Watch your students' understanding of heating and cooling grow using theatrical techniques!

Students will explore heating and cooling through pantomime. By enacting the effect of sunlight on a snow man and growing seed, students will learn scientific information kinesthetically.

Essential Question: How can the process of acting increase comprehension in other subject areas?

Process

Stop, Go

- Walk the space as I tell you when I say go:
 - Go – normal
 - Go – cold
 - Go – hot
 - Go – in a desert
 - Go – in Alaska
 - Go – in the snow
 - Go – in the rain

Discussion:

I noticed that you were sometimes cold and sometimes hot. Why? What made things go from cold to hot? What makes things hot? What makes the air hot? Why does the air get cold? If I put the ice in the sun it melts, why?

Play The Snow Man

- Ask how many students have ever seen a snowman melt when the weather suddenly turns warmer. What happens to the snowman? Does it change its shape? How?
- Ask the students to imagine themselves as large white snowmen with hats and canes and then to listen carefully as you give them the following directions:
 - The sun begins to shine, and for the first time, your body feels warm.
 - You grow warmer and warmer, and your hat slips - and slides- and falls off.
 - Now you feel the sun shining on your shoulders. Your arms and legs are melting. Your cane slips from your hand and falls to the ground.
 - Your legs no longer hold you up, and you, too slide down. Finally, you are completely melted and become a puddle.
- Question the players:
 - What did it feel like when the sun began to shine on your head? Your shoulders? Your legs and body?
 - How did your body feel when you became a puddle?
 - What happens to the water after a snowstorm, when all the snow melts?

Apple Seed Pantomime

(Be sure to narrate this story slowly enough, and with appropriate pauses, so that the students are able to fully experience their own physical discoveries as they enact the story.)

- Everyone find your own personal space on the floor and make yourself as small as possible.
- You are an apple seed, crammed tightly into your hard seed pod, and buried under the cold ground. It is winter, and you are barely awake. Above you, snow covers the ground. It is totally dark under the ground.
- Now it is spring. The earth around you is growing a little warmer, and you start to feel more awake. The snow above you melts and the water soaks into the earth around you. It feels good. The earth feels warmer, and you seem to be able to pull energy out of the soil.
- It is time to come out of your seed pod. You feel strong and energetic. Using all your strength, you push up against your seed pod and break through, like a bird breaks out of the egg. You reach upwards into the warm earth with your tendrils. The earth around you is moist, and you soak in the life-giving moisture. You don't know why, but you know you want to push upwards.
- Finally, with one great push, you emerge from the soil and see, for the first time, the SUN!
- The sun's energy flows into you and you feel stronger and stronger. You stretch upwards and outwards until you are a healthy seedling. The gentle spring rains nourish and refresh you. Just take a moment to enjoy it. (Pause here)

Materials

- Music
- Music player

Vocabulary

Pantomime

Conveying a story by body movements or facial expressions only

- Now let's move ahead a few years. You have grown into a strong young sapling--a tree about the size of a young person. You have beautiful green leaves that soak up the sun and make you strong. But you want to grow taller. You want to be a tree. So you summon all your energy and you push out and up. As the years go by you become a strong, handsome apple tree. You stand proud in the sun and enjoy your own strength and beauty.
- Now it is fall. You have grown succulent, nourishing apples all over your strong branches. The apples contain seeds which might someday become new apple trees. The apples are heavy. Your branches are strong, but there are so many apples. You feel weighed down. You feel as if your branches might break.
- Here come some children. You can't talk to them, but you know they are coming for the apples. They have bushel baskets. They are laughing and singing. The children pick your apples, and your branches feel light. You know they will take them away and eat them. You know they will throw away the seeds, and that some of those seeds might grow to be new apple trees.
- Almost all of your apples are gone. But you know you will grow more next year. You feel grateful to those children. You hope they will enjoy the apples. (Pause here)
- Now it is winter. All of your leaves have fallen. But you know you will grow more next spring. Now it is time to rest. You rest. The End.

Discussion

- Discuss how the sun made the apple grow. What happens in winter? Why does the tree lose its leaves?
- What if the seed had been dropped in a shady spot where there was very little sun? Show me. Be the seed and wait for there to be enough sun for the seed to grow.
- What if the seed had been dropped in Alaska? Show me.
- What if the seed had been dropped in the ocean? Show me,
- Now we begin to see that seeds need the sun in order to grow. What if no seeds ever grew? What would happen?
- Imagine a world where there is nothing growing. You are an animal- a tiger, or a snake, or a lizard, or a bear. What do you eat? Show me. I see you killing some of the other animals for food, what happens when they are all gone??

Conclusion

The sun provides all heat and energy for the world. It is stronger some times of the year than it is other times. But this just means that it is not as warm but we still have light and heat.

Assessment:

The teacher will monitor for participation and involvement. Students who seem to hesitate or just "follow" will be noted.

Georgia Performance Standards

SCIENCE

GRADE 3

S3P1: Students will investigate how heat is produced and the effects of heating and cooling, and will understand a change in temperature indicates a change in heat.

c. Investigate the transfer of heat energy from the sun to various materials.

THEATRE ARTS

GRADE 3

TAES3.3: Acting by developing, communicating, and sustaining roles within a variety of situations and environments

National Standards

SCIENCE

NS.K-4.2: As a result of activities in grades K-4, all students should develop understanding of:

- Light, heat, electricity, and magnetism

THEATRE ARTS

Standard 2: Acting by assuming roles and interacting in improvisations

Standard 5: Researching by finding information to support classroom dramatizations