



LESSON PLAN

SUNLIGHT WARMS THE EARTH GRADES K-2

SUMMARY

Students will use a variety of materials to protect a piece of chocolate from melting. Duration: 45 minutes.



- K-PS3-1.** Make observations to determine the effect of sunlight on Earth’s surface.
- K-PS3-2.** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.*

Science & Engineering Practices	Connections to Classroom Activity
Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions	<ul style="list-style-type: none"> Students will design a shelter to protect their chocolate from melting. They will then place two pieces of chocolate outside; one in the sun and one in the shelter they design.
Disciplinary Core Ideas	Connections to Classroom Activity
PS3.B: Conservation of Energy and Energy Transfer Sunlight warms Earth’s surface. (K-PS3-1), (K-PS3-2)	<ul style="list-style-type: none"> Students will place a piece of chocolate directly in the sun and another piece in a shelter they create. They will then compare the rate of melting.
Crosscutting Concepts	Connections to Classroom Activity
Cause and Effect Events have causes that generate observable patterns. (K-PS3-1),(K-PS3-2)	<ul style="list-style-type: none"> Students will discover that the sunlight will melt chocolate faster if it is not protected.



ENGAGE

Show students a popsicle. Ask them what will happen to the popsicle on a warm day compared to a cool day. Students should suggest that the popsicle will melt more quickly on a warmer day. Ask students about other treats they have had that have melted on a warm day outside. Most likely students will suggest chocolate which will be a natural segue into the activity. If they don't mention chocolate, you can.



EXPLORE

Tell students that their job today is to use a variety of materials to create a shelter for a piece of chocolate to protect it from the sun. Give the students a certain amount of time to build their shelters; 20 minutes should be enough. After the shelters are created, ask students to discuss how they can test the effectiveness of their shelters. Most likely they will suggest taking them outside and testing them by putting the shelters in the sun. One good question to ask would be, "How will we know if you have a good shelter?" This will hopefully lead to having a non-sheltered piece of chocolate to compare the rate of melting. Students should progress to the idea of timing the melting. If students do not get to these ideas through discussion and questioning, you can suggest them.

Now it's time to let the students conduct the experiment. Find a nice sunny spot outside to set up the experiment. Make sure that the students are using two pieces of chocolate that are exactly alike. They should place one piece of chocolate on a paper plate in their shelter and another piece on a paper plate in direct sunlight. Students should make observations every 10 minutes or so, depending on the temperature and time of year. They can record observations through words or pictures in a science notebook.



EXPLAIN

After the students have experimented and recorded observations, return to the classroom and allow students to share out what they observed. Some questions to ask: Was anyone's shelter more effective than others? Why do you think so? What kinds of materials were more effective than others? Some conclusions they may draw: some colors are better than others (lighter) and some materials that are thicker were better because they provided more shade.



ELABORATE



WATCH THE GENERATION GENIUS SUNLIGHT WARMS THE EARTH VIDEO AS A GROUP

Then facilitate a conversation using the discussion questions.

MATERIALS

- Chocolate (chips or kisses work well)
- Paper plates
- A variety of materials (Foil, Felt/Fabric, Styrofoam, Cardboard, Clay, Toilet/Paper towel rolls, Popsicle sticks, Cotton balls, Science notebook)

DIY Activity

- 2 Plastic containers or ice cube trays
- 2 Small plastic toys
- Cardboard box
- Paper plates
- Freezer





EVALUATE

Students can play the online Kahoot! quiz game located below the video which provides downloadable scores at the end of the quiz game. Alternatively, you can use the paper quiz or the exit ticket questions. All these resources are located below the video in the Assessment section.



EXTENSION

Discuss how the color can impact how warm something is. Discuss different surfaces that they have walked on in the summer; black top or roads are hotter than concrete. This is partly due to the color. Discuss clothing; how does a black shirt feel in the sun compared to a white shirt? Which color would be best to wear in the summer?

