

## Kindergarten Lesson Plan - Finding Shade for Ozzy

**Suggested time:** 45 minutes

### Lesson Snapshot:

In this lesson, students will demonstrate proficiency in designing and building a sun shelter. Students will be challenged to select materials to design and build a structure that will reduce the warming effect of sunlight on an area. In addition, students will code routes to different types of sun shelters (i.e. tent, umbrella, hat, etc.).

The disciplinary core ideas provide natural opportunities for discussion centered around the key concept that sunlight warms Earth's surface.

The crosscutting concept of cause and effect is woven into this lesson as students evaluate examples and non-examples of sun shelters.

### Background Information:

The Sun is made mostly of hydrogen and helium gases, which produce an enormous amount of energy in the form of extreme heat and light. The Earth's location in the solar system is just close and far enough (about 93 million miles away) to receive the right amount of heat and light for life to exist on Earth. Without light from the Sun, life could not exist on Earth—no plants, animals, or humans could live.

Light from the Sun or sunlight shines down on the Earth's surface. Sunlight causes the Earth's surface to heat up. Certain surfaces and objects heat up faster than others from sunlight. Shade from natural objects such as trees and plants and human-made objects such as awnings, tents, and umbrellas can reduce warming caused by the Sun. Thicker objects and ones that are opaque (not "see through") are better sources of shade. The size and shape of objects and structures will also affect the size and shape of the desired amount of shade. Likewise, the position and angle of certain structures and objects affect the amount of shade as the Sun changes position in the sky during the day. Humans use various items to protect themselves from sunlight and heat including clothing, hats, sunglasses, and sunscreen.

**Fun Fact:** Did you know that the light from the Sun takes about 8 minutes and 20 seconds to reach the Earth? That's super-fast compared to other stars we can see in the night sky. Those stars are much farther away than the Sun—light years away. A light year is the distance that light can travel in one year—about 6 trillion miles! Now that's far!

### Science, Technology & Engineering, and Environment Literacy & Sustainability (STEELS) Standard(s):

- 3.2.K.C: Make observations to determine the effect of sunlight on Earth's surface.
- 3.2.K.D: Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.
- 3.5.K-2.M: Demonstrate essential skills of the engineering design process.
- 3.5.K-2.N: Analyze how things work.
- 3.5.K-2.O: Illustrate that there are different solutions to a design and that none are perfect.
- 3.5.K-2.Q: Apply skills necessary for making in design.
- 3.5.K-2.S: Apply design concepts, principles, and processes through play and exploration.
- 3.5.K-2.U: Explain that design is a response to wants and needs.
- 3.5.K-2.V: Explain that materials are selected for use because they possess desirable properties and characteristics.

### Connections to Other Standard(s):

- CC.1.5.K-2.A: Participate in collaborative conversations with peers and adults in small and larger groups.
- CC.16.2. K.C: Engage in reciprocal communication with adults and peers.
- CC.2.1 K.A.1: Know number names and write and recite the count sequence.



## Objective(s):

Students will select materials to design and build a structure that will reduce the warming effect of sunlight on an area.

Students will apply their knowledge of coding by routing their Ozobot to different sun shelters to protect it from the Sun's heat.

## Materials:

- Book: *The Lizard and the Sun* by Alma Flor Ada (bilingual English/Spanish)
- Art rolls
- Fabric swatches (nylon)
- Faux leaves
- Popsicle sticks
- Corrugated cardboard
- Chipboard
- Tape
- Model Magic (modeling clay)
- Scissors (1 per student)
- Pint berry baskets
- Small paper plate
- Ozobots (1 per student)
- Sorting cards (examples of “good” sun shelter and “bad” sun shelter, at the end of this file)
- “Finding Shade for Ozzy Map” (at the end of this file)
- Trays (1 per student)
- Design Template Worksheet (at the end of this file)
- Flashlights (4)
- Glue sticks (1 per student)
- Markers

## Advanced Preparation:

Gather materials that students will use to design and build their sun shelter for the Ozobot.

Print and cut out sorting cards.

## Suggested Implementation:

### Part 1: Shared Read Aloud

Read *The Lizard and the Sun* by Alma Flor Ada (bilingual English/Spanish)

#### Class Discussion Questions:

“What are ways the Sun affects the Earth’s surface?” (makes surfaces hotter/warmer)

“In the story, what happened when there was no Sun?”

“When the Sun came out, what did it do to the Earth?”

“What are some ways that you can tell that sunlight warms the Earth?”

“If the sunlight becomes too warm or hot, what can we do to make it cooler?”

### Part 2: Exploration

Distribute Ozobots and mats.

Provide time for free exploration with the Ozobot.

Discuss features of the Ozobot.



### Part 3: Design

Pose the question, “What makes a good shelter from the Sun?”

Distribute sorting cards, prompting students to sort cards into two piles (“good” sun shelter and “bad” sun shelter).

Discuss why certain tools and materials minimize the warming effect of the Sun (umbrellas, canopies– both natural and synthetic, tents, etc...).

Provide students with their Design Template Worksheet.

Each student will determine materials needed to design a shelter from the Sun (limiting student material selection to three materials).

Students will draw a prototype of their sun shelter prior to gathering materials.

Students will gather materials and build a sun shelter for their Ozobot.

### Part 4: Code

Students will glue “good examples” of sun shelters on their “Finding Shade for Ozzy Map”.

On map, students will use a marker to draw a path for Ozzy to follow by connecting the dots in number order.

Students will code Ozzy to each sun shelter with the destination being their designed sun shelter structure.

Using a flashlight to replicate the Sun, students will test the effectiveness of their sun shelter.

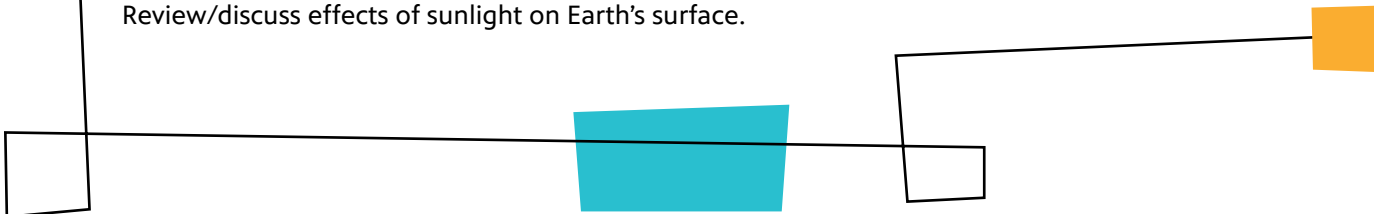
#### Class Discussion Questions:

“Does the placement of the Sun impact the shade covering?” Explore all angles (mimicking how the position of the Sun changes over the course of the day).

“How can we improve our sun shelter design to ensure that the Ozobot is protected from the Sun no matter its position in the sky? Would other materials work better?” (see Extension Activities)

### Part 5: Summation

Review/discuss effects of sunlight on Earth’s surface.



#### Extension Activities:

- Challenge students to redesign their structure to ensure shade at all “sun angles” and test again.
- Try testing class sun shelters outside on a sunny day and compare an ice cube melting in direct sunlight to an ice cube melting under their sun shelter.
- Conduct class research on different types of structures that reduce the warming effect of sunlight on an area.

#### PBS Resources and Links:

[A Thing or 2 about Making Shade | The Cat in the Hat Knows A Lot About That! | PBS LearningMedia](#) (video short: 1:30 minutes)

[The Sun Warms Earth | PBS LearningMedia & Peep and the Chilly Dam](#) (video short: 1:32 minutes)

[Sizzle Time! Plum Landing](#) (video short: 2:00 minutes)

[Sid the Science Kid-Sid’s Special Dad Day](#) (video: full episode 26:20)

#### Connections to Other Standard(s):

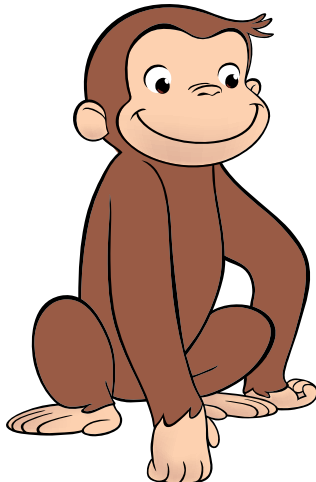
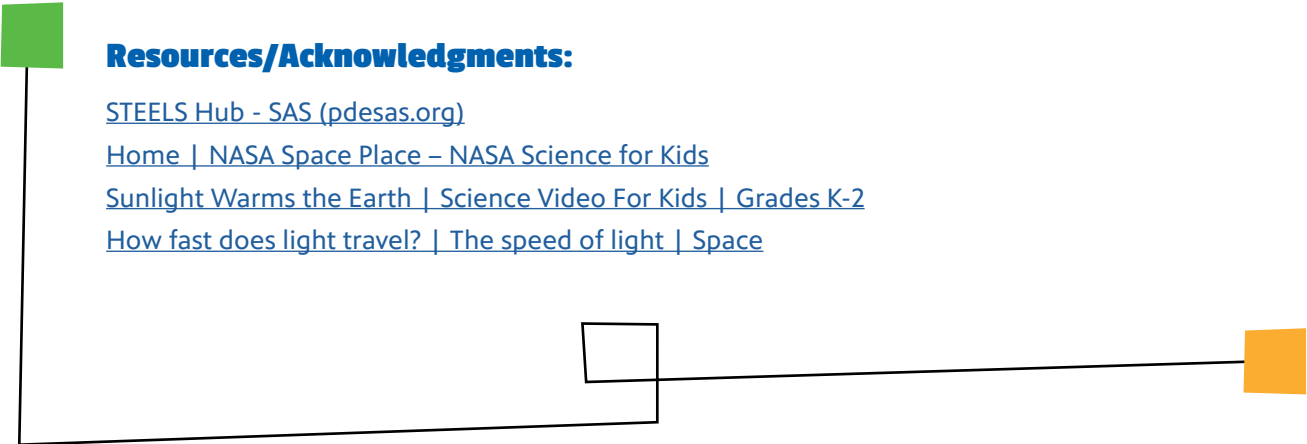
CC.1.4.K.U: With guidance and support, explore a variety of digital tools to produce and publish writing or in collaboration with peers.

CC.1.4.K.V: Participate in individual or shared research projects on a topic of interest.

CC.1.4.K-1.W: With guidance and support, recall information from experiences or gather information from provided sources to answer a question.

**Resources/Acknowledgments:**

- [STEELS Hub - SAS \(pdesas.org\)](http://pdesas.org)
- [Home | NASA Space Place – NASA Science for Kids](#)
- [Sunlight Warms the Earth | Science Video For Kids | Grades K-2](#)
- [How fast does light travel? | The speed of light | Space](#)

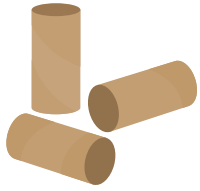


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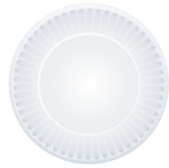


# Let's Build a Sun Shelter for Ozzy!

Circle 2 materials you will use to build your shelter:



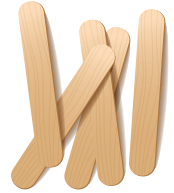
**Art Rolls**



**Paper Plates**



**Cardboard Pieces**



**Popcicle Sticks**



**Pint Berry Basket**

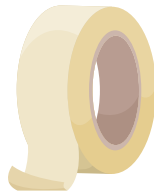


**Fabric Swatches**



**Leaves**

Circle 1 item you will use to attached your materials together:



**Tape**



**Model Magic**

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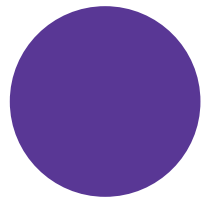
With these materials, draw a “prototype” of your sun shelter:

Name: \_\_\_\_\_

# Finding Shade for Ozzy Map

Draw a path for Ozzy by connecting the dots in number order to reach your sun shelter.

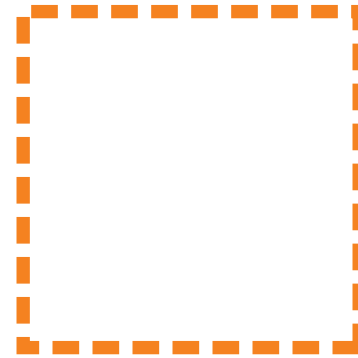
**Start Here**



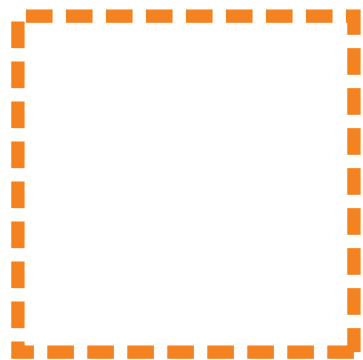
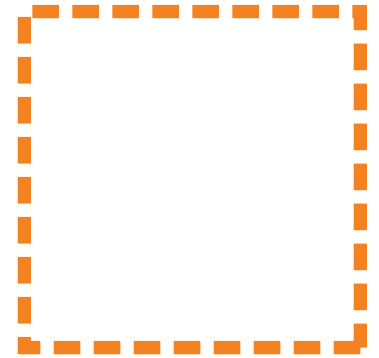
**2**



**4**



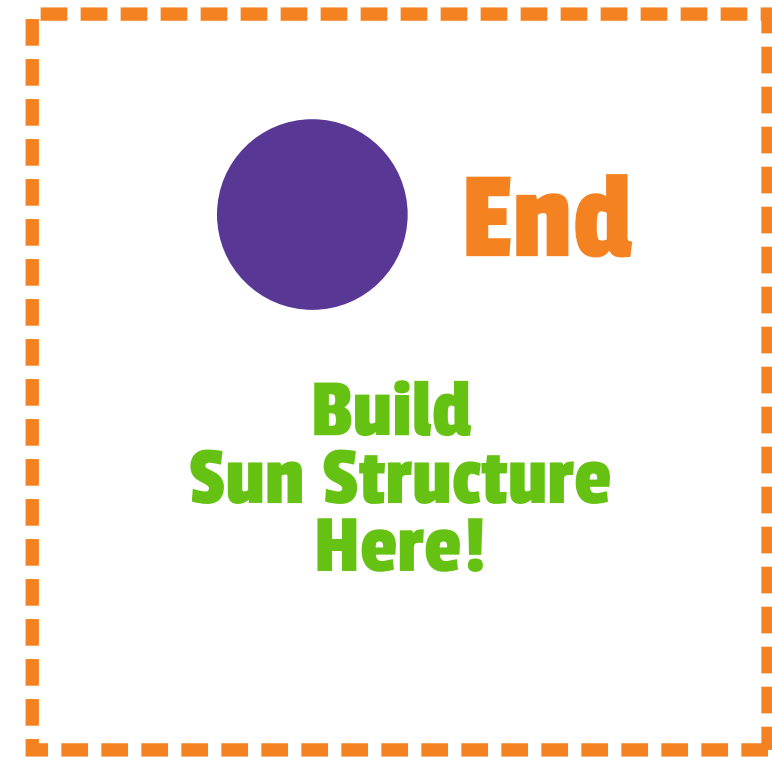
**5**



**1**



**3**



**End**

**Build  
Sun Structure  
Here!**

