

## Unit Title: Keeping It Cool With Solar

### Lesson #2: Making Shade

#### AUTHOR:

Mark Lewin

Teacher Contact: [mlewin@eesd.net](mailto:mlewin@eesd.net)

CE Editor Contact: [CEbrightfutures@b-e-f.org](mailto:CEbrightfutures@b-e-f.org), 503-553-3949

#### DESCRIPTION

This lesson is designed for one 30-minute session. After reviewing the hot/cool playground spots from Lesson 1, Students will be asked, “On a hot day, which materials might keep the ground the coolest?”. Students will be given tissue paper, photocopy paper, and construction paper. Students will go outside in the sun and explore which type of paper will allow the least light through. Students will graph the results on a worksheet.

#### GRADE LEVEL(S)

This lesson focuses on first grade. However, the unit integrates K-2 ETS standards.

#### SUBJECT AREA(S)

shade, light, investigation, paper

#### ACTIVITY LENGTH

One 30 minute session.

#### LEARNING GOAL(S)

1. Students will analyze the effect different types and colors of paper have when placed in the path of sunlight.

#### CONTENT BACKGROUND



## STUDENT BACKGROUND

- Ask and/or identify questions that can be answered by an investigation.
- Students should be familiar how to make a simple graph from results of an investigation.
- Students should be able to tell apart the effect of opaque and transparent paper when it is in the path of light.

## EDUCATOR BACKGROUND

- Remind student NOT to look in the sun.
- The educator should be able to create a graph that primary students can add to and discuss, or use this graph: [https://drive.google.com/file/d/1-IUQueFBIdYm7\\_4XhGaoo4a18Ai1uFby/view?usp=sharing](https://drive.google.com/file/d/1-IUQueFBIdYm7_4XhGaoo4a18Ai1uFby/view?usp=sharing)
- the educator should know the difference between opaque and translucent, and explain the difference in terms of blocking and allowing sunlight.,

## MATERIALS NEEDED

### HANDOUTS/PAPER MATERIALS

- “Sunlight through the forest” worksheet
- Graph - Lesson 2 - Graph for Letting the Light Through

### CLASSROOM SUPPLIES

- Per pair of students:
  - Tissue paper - one light, one medium, one dark color.
  - construction paper - one light, one medium, one dark color.
  - Printer paper - one light, one medium, one dark color.

### ACTIVITY SUPPLIES (PER GROUP OF 3-4 STUDENTS)

- None

## LESSON PROGRESSION

### PLANNING AND PREP

This lesson is one half-hour period. Print or project sunlight through the forest photo. Print or project graph for each student. Having the variety of paper grouped and ready to pass out to each pair will help in lesson flow. Have student pairs pre-selected.

### LESSON SEQUENCE

1. *(5min) Phenomenon: Show students phenomenon of sun and trees creating shade. Ask them about the amounts of light they see, where they see it, and perhaps where they have seen the sun appear this way before.*
2. *(5 min) Show students different types of paper. If we brought this out in the sun, which type of paper will block the sunlight the most? Which will block the sunlight the least?*
3. *(10 min) Have students go outside and determine which paper blocks the sun the most to which paper blocks the sun the least.*

4. (5 min) Have students line their papers from blocking the sun most to blocking the sun least. They can do this individually or in groups. Ask them to share their conclusions with a neighbor.
5. (5 min) As a group or in pairs, graph the order of the students' papers on the worksheet.

## ASSESSMENT AND EXTENSIONS

### FORMATIVE ASSESSMENT

Using evidence from the graph, have students explain their reasoning for which paper has the greatest effect on sunlight.

### SUMMATIVE ASSESSMENT

Have students draw a color paper that has the greatest effect on sunlight using crayons.

Rubric for 1-PS4-3 is here: <https://www.themespark.net/@mlewin/rubric/Vy8s1aSpl>

### LESSON EXTENSIONS

Show this video that introduces the vocabulary terms transparent, opaque, and translucent:  
<https://www.youtube.com/watch?v=YuUICNzfoBw>. Have students sort the papers from their materials from most translucent to most opaque.

Take students on a schoolyard walk and have them collect leaves. Have students organize leaves for their effect on sunlight and have students ask why plants might help effect sunlight on the earth.