EXPLORATION 2

Hands On!

Engineer It • Plan and Build Shade

Activity Guide, pages 80–82

TIME ESTIMATE

60 min

SHORT ON TIME?

Times for testing shade could be adjusted to less than the suggested hour.

POSSIBLE MATERIALS

- ☐ construction paper
- ☐ tape or glue
- ☐ craft sticks
- ☐ safety scissors
- ☐ crayons
- ☐ rocks

PREPARATION

You may also choose to complete this activity as a whole group. Place the materials in the center of the table so children can share.

INVESTIGATIVE PHENOMENON

Structures can provide protection from the sun's heat and light.

Phenomenon Explained Children explore the investigative phenomenon by building shade and placing rocks under it.

Ask a Question After observing the photograph or video, children should ask a question about what makes good shade.
Sample question: Why would some shade be better than other?

STEP 1 Children should discuss their questions with a partner or teacher. Before building their shade, they should plan what they think it should look like.

STEP 2 Children should discuss how they will build the shade and draw a model of it. **Sample answer:** Children should decide things like how big the shade should be or how "thick" it should be.

STEP 3 Children build the shade.

STEP 4 Children place the shade in a sunny place. They place one rock in the sun and one rock under the shade.

STEP 5 After one hour, children describe how each rock feels. **Sample answer:** The rock in the sun feels warmer than the rock in the shade.

- **Make a Claim** Children's claims should explain that the shade caused the rock there to be cooler. **Sample answer:** The rock in the shade was cooler than the rock in the sun.
- **Evidence** **Sample answer:** My evidence is that the rock in the shade felt cooler than the rock in the sun.

FORMATIVE ASSESSMENT

MAKING SENSE OF PHENOMENA

Children gain an understanding that shade blocks the light and heat from the sun as they explore the **investigative phenomenon**. They should connect the idea back to the **anchoring phenomenon** that the people in the tent feel cooler than the ones in the sun.

REMEDIATION If children struggle to connect the **investigative phenomenon** back to the **anchoring phenomenon,** talk about shadows and what causes them. Shadows appear when light is blocked, just like shade blocks heat and light from the sun.

Activity Outcome

Children should design shade that can provide protection from the sun's heat and light.

Performance Indicators	
	discuss with a partner how to design the shade and draw a sketch
	build the shade and test it
	make a claim that shade can provide protection from the sun's heat and light

MAKING SENSE OF PHENOMENA IDEA ORGANIZER

After completing Exploration 2, children can fill in the **Idea Organizer** to summarize the connection between designing shade to protect a rock from the sun and the anchoring phenomenon that the people in the tent feel cooler than the ones in the sun.

SOCIAL EMOTIONAL LEARNING

How did you and your partner decide on roles for this activity?

Before children answer the question, review the steps of the activity and encourage them to think about how discussing roles would help in doing the activity. Some could be making a sketch while others are gathering materials.