ECLIPSE CLASSROOM ACTIVITIES

EXPLORING SHADOWS

OBJECTIVES

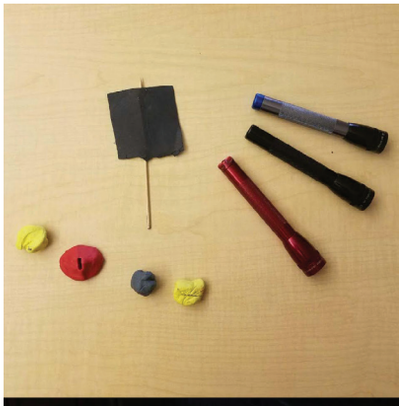
- Engage in exploration, and critical thinking to better understand how shadows are created.
- Form an understanding of how shadow detail and size are correlated to distance from light source.
- Understand how eclipses are formed, and how eclipse shadows compare to regular shadows.
- Draw a diagram of how light is distributed from the light source and how light gets projected onto the background paper, and present their explanation to the class.

TIME FRAME/PREPARATION

- After you set up the materials, the initial activity should take around 20 min: About 5 minutes to compile findings and formulate small presentations, and about 2-3 minutes per group to explain their findings to the class. Save time for the teacher to recap and lead discussion of the science at the end.
- This activity can be done independently but works especially well with groups of 2 to 3 students.

MATERIALS NEEDED PER GROUP

- Flashlight x 3
- Play dough
- BBQ Skewers
- Tape (any kind)
- 2 Sheets of Paper; one normal-sized sheet, one large sheet
- Beaker holder (metal)
- Ruler/Yardstick
- Scissors



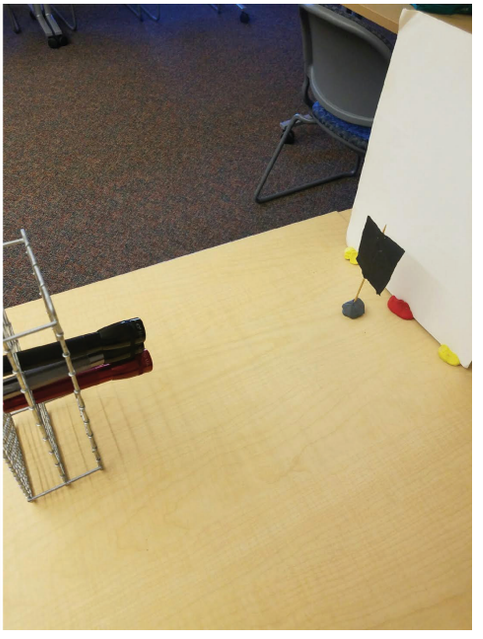
LET'S GET STARTED

It’s time to look at shadows in a controlled environment to learn more about how they are created. What you will be exploring today is the impact that distance has on the effects of shadows. You will be detailing and thoroughly outlining your experiment, using the scientific method. This means that you need to have a title, an introduction, a hypothesis, materials, results, conclusion, and discussion section in your write up. Once you have that outlined, you will begin your experiment.

STEP-BY-STEP

1. Cut out a square from the first sheet of paper, around 2 inches (L) by 2 inches (W), and tape it to the top of your BBQ Skewer.
2. Formulate 4 Play Dough blobs, and use one of them to stand your BBQ Skewer up vertically so the small paper square is standing up
3. Use the other 3 Play Dough blobs to stand up the large piece of paper
4. Stand the beaker holder up vertically so that the ONE flashlight can fit into it sideways
5. Face the flashlight into the standing sheet of paper
6. Introduce the BBQ Skewer as the object blocking the path of the flashlight
7. Lay down your Ruler/Yard Stick so it goes from the standing sheet of paper to the beaker holder
8. Turn on the Flashlight
9. Turn off the lights
10. Explore the effects of moving the blocker closer and further from the light source and take notes of what you observe





FURTHER EXPLORATION - RECORD OBSERVATIONS FOR EACH

- Use two flashlights at a time
- Rearrange how the flashlights are inserted
- Use all three flashlights at once
- Change the shape of the blocker

SCIENTIFIC METHOD PRACTICE

Title: *Be Creative...*

Introduction: *What do you know about shadows and light?*

Hypothesis: *What do you think you will observe and why?*

Materials:

Results: *Write or draw your observations here*

Conclusion: *Conclude something from your findings...*

Discussion: *Talk about the implications of what you learned, & what you'd like to test further...*

NOTES FOR TEACHERS

From here, you can discuss why there is gradation on shadows, and why they are more detailed when closer to the light source and less detailed when farther from the light source.

*NGSS STANDARDS FULFILLED

- Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed. (HS-ETS1-2)
- Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs. (MS-ETS1-4)