



PLAYING WITH SHADOWS: MAKE A HUMAN SUNDIAL GRADES 1-3

Follow your shadow! Find out how the position of shadows are connected to the sun and time in this scientific experiment.

WHAT YOU'LL LEARN:

- How the earth rotates by tracing shadows throughout the day.
- Develop an understanding of the connection between shadows, the sun, and time.

CURRICULUM OUTCOMES:

- This is an easy hands-on way for students to learn about how shadows are created and how to measure the earth's rotation.
- Use senses and critical thinking to learn about shadows.
- Learn how to record changes and interpret data.
- Understanding how temperature and sunlight change throughout the day.



(Image extracted from rhythmsofplay.com)

MATERIALS

- Sidewalk chalk
- Camera (optional)
- Measuring tape
- Nature journal or notebook

This is a group outdoor activity, it can be done in outdoor spaces of the school, home, backyard, or nearby parks/trails. It also requires a safe space where there is open cement or asphalt for drawing.

WHAT TO DO:

Split the children into pairs and make sure that they are spread far enough, approximately 10-20 feet between each pair of students.

1. Place X on the spot where you want the students to stand, every time to their shadows are traced.
2. One student can stand and the other can draw the shadow. If time permits both students can draw each other's shadow, maintaining proper distance between their shadows.
3. Use sidewalk chalk to trace children's shadows at least 3 times a day. It could be morning, mid day, late afternoon, early evening
4. Have class describe their shadows each time they trace it.
5. Get them to record their observations in the nature journal/notebook or take a photograph.
6. Ask the class to note the general location of the sun in the sky and record in their journals
7. Depending upon the age students can also measure the length and width of the shadows and record in their journals.
8. Ask students to predict where their shadow would be next time.
9. At the end of the activity ask the students to compare their observations and formulate a hypothesis.
10. Discuss why shadow changes throughout the day and throughout the rest of the year.
11. Educator could explain later that the Earth spins on its axis in a day and makes its way around the sun in a year to produce changes we see in our shadows.

Optional questions to be asked during the experiment

- How do you think shadows are made?
- What are your observations about the shadows and the sun?
- Did the sun move? If yes which direction?
- Did your shadow move? If yes than in what direction?
- Are your tracings the same? If no, why not? If yes? Why?
- When was your shadow longest/shortest?
- Why was your shadow changing throughout the day?
- Do you think that your shadow also changes throughout the year?

ASSESSMENT:

- Learners could be evaluated on their cooperation with their team member while tracing the shadows, by demonstrating critical thinking to analyse and understand the concept and on clarity upon their presentation of their records and interpretations.

EXTENSIONS:

- This activity could be extended by conducting the experiment on or closer to summer solstice, fall equinox, winter solstice, spring equinox and record the differences

CREDIT/REFERENCES:

This activity has been modified from [Rhythms of Play](#) that was developed by Nell Regan