



Me and My Shadow

As the earth rotates around the sun, the intensity of UV rays change. That is why it is warmer in the summer and cooler in the winter. The intensity of the sun's rays also varies each day. The sun's rays are stronger in the middle of the day (angle of the sun more directly overhead) and than in early morning or late afternoon. This is because UV (sunlight) rays travel in straight lines.

Estimated Time

20 minutes at 3 different times

Learning Objective

Students will understand how their shadow changes as the earth orbits the sun and how to determine what time of day the sun's rays are the strongest.

Supplies

- Chalk
- Sticky note paper
- Ruler
- Worksheet to record findings

Activity

- 1) Have students predict the size of their shadow before going outside
- 2) Take class outside to chart their shadows.
- 3) Make a place on the sidewalk or blacktop for the student to stand.

- 4) Student stands with toes on line.
 - 5) Have another student mark the top of the head the first student's shadow on the sidewalk or blacktop.
 - 6) Measure the distance between the two marks and record. * Complete this measurement for each student.
 - 7) Discuss what time they are going to do the second measurement.
 - 8) Ask the students to predict whether their shadow will be longer, shorter, the same or no different.
 - 9) Have the students enter their prediction on their worksheet.
 - 10) Complete this exercise at three different times of the day, morning, midday and afternoon.
 - 11) Discuss how the length of their shadow can remind them to practice sunsafe behaviors.
- * The shorter their shadow, the more intense the UV rays and the more important it is to seek shade.*

Questions and Answers

- What would make your shadow grow or shrink? *Sunlight travels in straight lines so as it rises from the horizon, the number of rays that reach the ground increase until the sun is directly overhead.*
- When is your shadow the longest? *Early in the morning and late in the afternoon. Also your shadow is longer as you come nearer the north and south poles.*
- When is it the shortest? *Becomes shorter as it gets closer to noon. It also becomes shorter as you get nearer the equator.*



- Is there a time of day that you have no shadow? *When the sun is directly overhead at noon you don't have a shadow.*

Tell your students the shadow rule! *No shadow, seek shade.*

Activity Extenders

Math

Have students graph the times of day vs. shadow length.

Language Arts

Read the class the following folklore story and ask them to write a myth about how we learn to wear white to protect our skin and keep us cooler in the summer.

Title: Spider and the Sun

Tribe: Cherokee

Region: Tennessee, North Carolina

In the beginning there was only darkness and people kept bumping into each other. Fox said that people on the other side of the world had plenty of light but were too greedy to share it. Possum went over there to steal a little piece of the light. He found the Sun hanging in a tree, lighting everything up. He took a tiny piece of the Sun and hid it in the fur of his tail. The heat burned the fur off his tail. That is why possums have bald tails. Buzzard tried next. He tried to hide a piece of Sun in the feathers of his head. That is why buzzards have bald heads. Grandmother Spider tried next. She made a clay bowl. Then she spun a web (Milky Way) across the sky reaching to the other side of the world. She snatched up the whole sun in the clay bowl

and took it back home to our side of the world.(From Starlore of Native America)

<http://sol-center.stanford.edu/folklore/folklore.html>

<http://www.ac.wvu.edu/~skywise/legends.html#contents>