



Shadow Play Sundial Activity

Recommendations: For students in Kindergarten to Grade 4. Outdoor activity. Adult supervision recommended.

Purpose: Learn about shadows, passing time, and planetary movements.

Materials:

- Chalk
- A wide area of cement/pavement/asphalt that is exposed to the sun all day
- A sunny day
- If a paved area is not available to you, see gather 3-6 sticks instead of chalk and see Dirt Alternative at **Step 3**.

How It Works:

Step 1: Check the weather forecast. Any rain will wash away your markings and overcast skies will obscure the sun, meaning you would have to scrap the activity and try again another day.

Step 2: Mark an 'X' or trace the student's feet in the middle of the wide area that will be open to the sun all day. This will be the exact spot you return to throughout the activity.

Step 3: Have a sibling or parent trace the outline of the student's shadow. Next to or at the head of the shadow, write what time it is. Prompt the student to make observations about their shadow: *is it long and thin? short and round?*

Dirt Alternative: Mark the end (*head*) of the student's shadow with a small stick rather than trace the whole outline. Still prompt them to describe and record the shadow's shape. Time can be recorded along with observations using pencil and paper.

Step 4: Go play and come back a couple hours later. Have the same student stand exactly in the same spot, facing the same direction as before and have an adult or sibling trace the new shadow. Again, write the time of day next to or at the head of the shadow.

Step 5: Repeat Step 4 at least three times throughout the day. You can trace a new shadow every couple of hours or simply once at morning, noon, and evening light. Prompt the student to make new observations each time. Do they notice any patterns?

Step 6: At the end of the day there will be a series of shadow tracings varying in size in a clockwise rotation. This is your sundial! To further learning, prompt the student to think about

why the shadow moves over time. They were standing still, so is it the sun moving or the Earth moving?

Extensions:

- To learn more about sundials and make a more permanent sundial out of materials at home, check out this video: <https://www.youtube.com/watch?v=SeSexM-wVzA>
- Indoors, you can make a model earth out of play dough, stick a straw or skewer through it to make an axis and then place a small twig or toothpick in the surface. This represents a person standing on the Earth. Then, spin the Earth on its axis around a lamp representing the sun. Watching the shadows of the toothpicks will help the student understand the big picture of what was happening with their shadow outside.

