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Science Experiences That Come To You

Make a Sundial

Ingredients & Supplies:

- Stick
- Small rocks
- Chalk
- 1 cup of playdough (optional)
- watch or clock

Instructions:

What time is it? 8:00, 11:30, 2:15? How do you know? The clock, of course! What if you didn't have a watch or clock to tell you the exact time of day? Before people had watches and clocks to tell time, they used the Sun. We know that the Sun rises in the East and sets in the West. Depending on where the Sun is in the sky you can determine the time of day.

People made sundials to keep track of time. Sundials can be made with many different types of objects, but the most simple is with rocks. We have rocks all around us so this activity will be easy!

First, you need to collect at least 12 small rocks. These will be like the numbers on a clock. If you have some playdough, form it into a ball. Now find a skinny stick that you can put into the playdough. Make sure the stick is pointing straight up.

Find a sunny spot with a flat surface. This could be your lawn or sidewalk. (Make sure this is a spot that won't be in anyone's way because you'll want to leave it out for a couple of days!)

Place your playdough down with the stick pointing up. This will be the center of your sundial. Do you see the shadow that the stick casts? The shadow is pointing in one direction. Place your rock at the end of the shadow. This rock indicates the time of day. Look at your watch. What time is it? Try writing the time on your rock.

Great job setting up your sundial! Leave the playdough, stick and rock exactly where it is. Now you can go play, but make sure to come back to see your sundial in 20-30 minutes. You will notice that the shadow has moved! This



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means the Sun is in a different place and the cast shadow indicates a different time. Place another rock at the end of this shadow.

Keep track of your sundial for the next couple of days. Every time you come look, place another rock on the ground. By the end of your activity, you'll have a finished sundial!

The Science Behind It:

Sundials use a shadow to indicate the time of day. The object that casts the shadow is called a *gnomon*. This could be a thin rod, pointed metal, or even a stick.

Archaeologists have found Ancient Egyptian sundials as far back as 3500 B.C.! The first sundials were made from sticks. The gnomons were constructed from rocks and stones to form obelisks and pillars.

Ancient Romans also used sundials to measure the passage of time. Sundials were introduced to Rome in 250 B.C. A Sundial was built in the Roman Forum, the centralized meeting place. The wealthy began building sundials at their homes, and it became a status symbol.

The sundial enabled the Romans to divide the day into 12 hours to better mark time and meetings. The day was divided into *ante meridiem* (before midday) and *post meridiem* (after midday.) These divisions are now known as *a.m.* and *p.m.*

The "clock time" that is measured by watches does not precisely match the "solar year." "Solar time," which is measured by sundials, does not exactly match for 365 days. To fix this, Julius Caesar decided to add one day to the calendar every fourth year and "the Leap Year" was born.