SCIENCE, TECHNOLOGY, ENGINEERING & MATH



DAYLIGHT and TIME: BUILDING a SUNDIAL (3-5)

The SCIENCE of a SUNDIAL:

- A **sundial** is a chronometer (timepiece) that tells time using the shadow of a point cast by the sun on to a plate marked with the hours of the day.
- A **gnomon** is the pointer piece of the sundial. It comes from ancient Greek meaning "pole" or "indicator."
- The sundial must be **oriented** differently depending on the hemisphere. In the *northern hemisphere*, the noon marking should align with the north, while in the *southern hemisphere*, noon should be aligned south.
- When the sun is at its highest point of the day (midday), the shadow is the shortest. When the sun is lower, in the afternoon, the shadow is the longest. It is important to keep in mind that the sun's height is also affected by the seasons.
- Until the early 1800s, the **sundial** was humankind's main way of keeping time!

LITERACY CONNECTION:

Mary Pope Osborne's Magic Tree House series takes young Jack and Annie on many adventures. In <u>Vacation Under the Volcano</u>, they travel to ancient Pompeii and use a sundial to tell time (before a volcano erupts!).

ACTIVITY: SUNDIAL

Materials: paper plate, pencil or stick, clay (optional), 12 rocks/paperclips,

compass, clock TIP: Don't have a compass? You can make one with a few simple items!

- 1. Choose a sunny area to set up your sundial.
- 2. Push the pencil through the <u>center</u> of the plate.
- 3. Put the stick or pencil in the ground (or in a large piece of modeling clay, if your space is on a concrete or wooden surface).
- 4. Using the compass, angle the pencil slightly north.
- 5. Visit your sundial each hour to mark the shadow's location at that time. TIP: Use rocks, pennies or paperclips to mark each hour

EXPLORE: Other planets in our solar system do not travel at the same speed as earth. Calculate your 'space age' on these planets using the following formulas:

Mercury \rightarrow Multiply your age by 4

Mars \rightarrow Divide your age in half

Venus \rightarrow Divide your age in half, then multiply the answer by 3

Jupiter \rightarrow Divide your age by 12 (you would be a baby – either 0 or 1!)

For step-by-step instructions, watch the video at: Sundial STEM Activity

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