

Make your own Sundial!

DID YOU KNOW THAT YOU CAN TELL TIME BY THE SUN? SUNDIALS ARE THE EARLIEST TOOLS USED TO TELL TIME AND YOU CAN MAKE ONE AT HOME.

Step 1: Making the Sundial

First flip over a paper plate and draw the number 12 on the edge. Then, put a pencil or a straw in the direct center of the paper plate. If needed, secure it with tape or play dough.

Step 2: Testing the Sundial

Choose a sunny day and take the sundial outside at noon. Carefully try to line up the shadow of the pencil with the number 12. Trace the shadow on your paper plate. Remember to weigh down your plate so that it doesn't fly away during the experiment.

Step 3: Check on the Sundial

Go outside every hour to observe the shadow on the sundial. If the shadow moved trace the new shadow's line. At the end of the line you traced write the new time. Keep doing this every hour until the sun goes down.

Step 4: Using the Sundial

Keep the sundial in the same position outside. Challenge yourself to only tell time by using the sundial in the future. Remember the number that the shadow is falling on is the current time. Find other materials to make sundials with, you can even use yourself, just make sure you stand in the same spot!

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AFTER YOU DID THE ACTIVITY, LEARN MORE BY READING AND ANSWERING THE QUESTIONS BELOW.

What makes a Shadow?

All light travels in a straight line unless something stops it. A shadow is made when light cannot pass through an object. The light surrounding the object makes an outline of the object on a surface further behind it. Experiment with making shadows, what makes the shadow bigger, what makes the shadow clearer?

Transparent, Translucent. Opaque

An object must be opaque to make a shadow. Light cannot pass through opaque objects. An example would be you and me and the pencil on your sundial. Objects can also be translucent, meaning some light can pass through. Or objects can be transparent, meaning all light can pass through, like windows.

Changing Shadows

You may have observed when making the sundial, that the shape of the shadow, in this case a pencil never changed. However, shadows can change in other ways. When the sun is high in the sky, around noon, the shadows are shorter. As the sun is going down the position in the sky changes and the shadows are longer.

The Sun in the Sky

To us it appears that the sun moves. We see it rise in the east and set in the west. However, it is actually the earth that moves. Everyday the earth does one full spin on its axis. When our location on the earth spins towards the sun we experience sunrise. When it spins away we experience sun set.

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ANSWER THE QUESTIONS BELOW

Name the three things you need to make a shadow?

- 1.
- 2.
- 3.

What makes a shadow clearer or more defined?

Name three examples each of opaque, transparent and translucent objects.

Opaque	Transparent	Translucent
1.	1.	1.
2.	2.	2.
3.	3.	3.

How can the sun's position in the sky change a shadow?

The sun rises in the _____ and sets in the _____.

How long does it take for the earth to do one complete spin on its axis?

Where is the earth located when we experience sunrise and the sunset?

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ANSWER SHEET

Name the three things you need to make a shadow?

1. A light source
2. An opaque object
3. A surface behind the object for the light to fall on

What makes a shadow clearer or more defined?

A shadow can become more defined by:

brightening the light source or moving the light source closer to the object

Moving the object closer to the light source

creating sharper contrast - turning off the lights or making the background white

Name three examples each of opaque, transparent and translucent objects.

Opaque

something that blocks the light source completely

Transparent

Something that does not block light at all

Translucent

Something blocks only some of the light

How can the sun's position in the sky change a shadow?

When the sun is overhead, the shadow is shorter. When the sun is lower in the horizon the shadow is longer.

The sun rises in the east and sets in the west .

How long does it take for the earth to do one complete spin on its axis?

A full day or 24 hours

Where is the earth located when we experience sunrise and the sunset?

During sunrise the earth is spinning towards the sun. During sunset the earth is spinning away from the sun.

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