

**DO ~~DON'T~~ TRY THIS
AT HOME!**

Fun in the Sun

The Sun is the source of energy that keeps you, me and all living things alive on Earth. The sun is the difference between day and night, and its energy gives us hot and cold. Have some fun outside with these sunny activities that are sure to brighten your day.



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AMAZING EXPERIMENTS!

Sundial

Use the sun to help you keep time with a sundial, one of the oldest forms of clocks.

Materials

- Sundial template (see next page)
- Scissors
- Tape
- A sharpened pencil
- A piece of Bristol board or cardboard (optional)
- A compass (optional)

Let's get to work!

1. Print the sundial template found on the next page and cut along the two dotted lines.
2. Fold along the dashed lines with the printed side on the outside of the fold.
3. Keeping the printed side facing you, fold along the solid latitude line that best represents your location. Use the list of latitudes for Canadian cities on the template – this will help you calibrate the angle of your sundial depending on where you live.
4. Tape the flaps made by the fold along the latitude line to the rest of the paper (see image).
5. With the sharpened end of the pencil, make a hole through the 'o' along the base of the semi-circle. Pass the pencil through about half way or until the paper can stand up on its own. The semi-circle is called the *dial plate*, and the pencil is called the *gnomon* (pronounced no-mon) of the sundial.
6. Be sure the gnomon makes a right angle with the dial plate. You may need to tape the end of the pencil to the paper to hold it in place.
7. To make the sundial more stable, you can tape the entire structure to a piece of cardboard or Bristol board.



TAKE NOTE!

Add one hour to your sundial time if it is Daylight Savings Time.

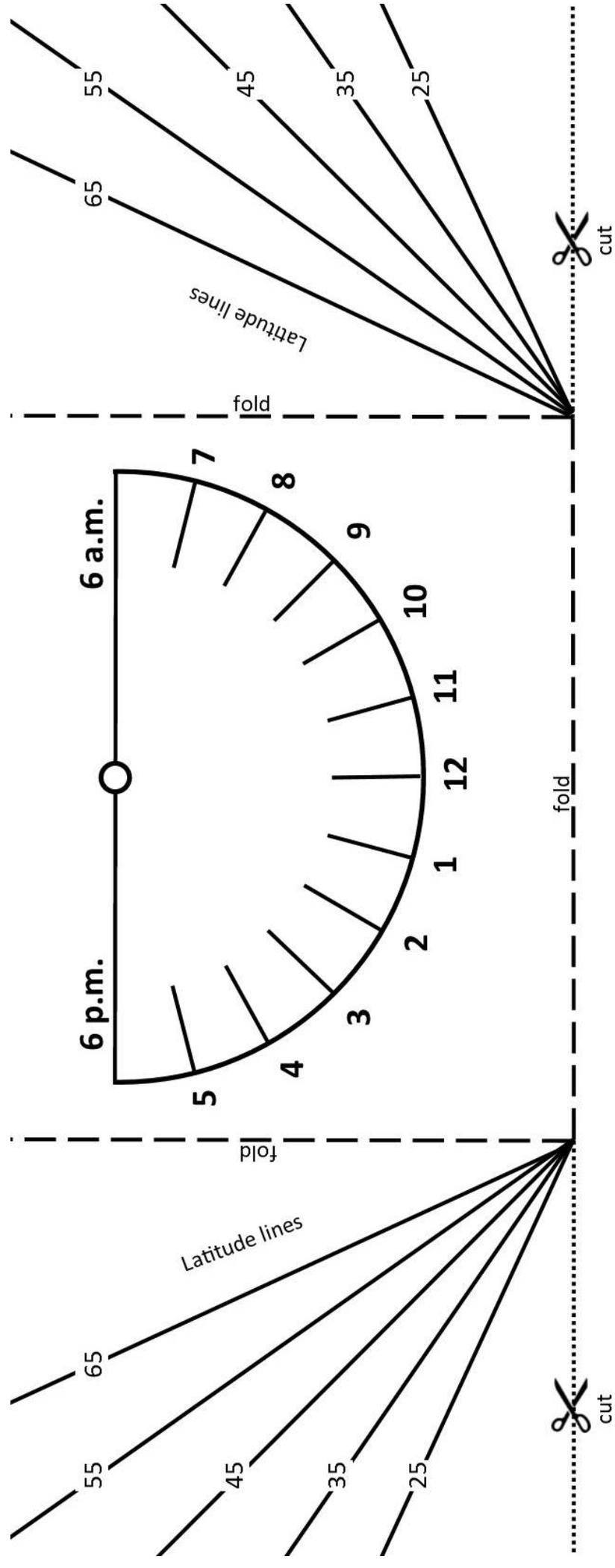
What time is it?

- Go outside on a sunny day, place your sundial on a horizontal surface and point the gnomon directly north (use your compass if you are not sure which way is north).
- The shadow of the pencil should indicate what time it is in Standard Time. Depending on the time of year, the shadow may fall on the underside of the dial plate, it should still indicate the correct time if you can see the numbers through the paper.

What happened?

As the Sun travels across the sky during the day, the angle of its shadow will change, so we can use it to tell the time. The Sun's light rays hit the Earth at different angles depending on how far north or south you live. The latitude lines increase the accuracy of the sundial no matter where you live in Canada.





Latitudes of Select Canadian Cities

Charlottetown	46° N	Regina	50° N
Edmonton	53° N	St. John's	47° N
Fredericton	46° N	Toronto	43° N
Halifax	44° N	Vancouver	49° N
Iqaluit	63° N	Victoria	48° N
Montreal	45° N	Whitehorse	60° N
Ottawa	45° N	Winnipeg	50° N
Quebec City	46° N	Yellowknife	62° N

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Build a Solar Still

The Sun is the source of all energy on our planet. Harness this energy by building a solar still to remove *contaminants* from water.

Materials

- Large bowl
- Small glass container that fits inside the large bowl
- Plastic wrap
- A small rock
- Water
- A *contaminant*, like dirt, salt or food colouring to add to the water

Let's get to work!

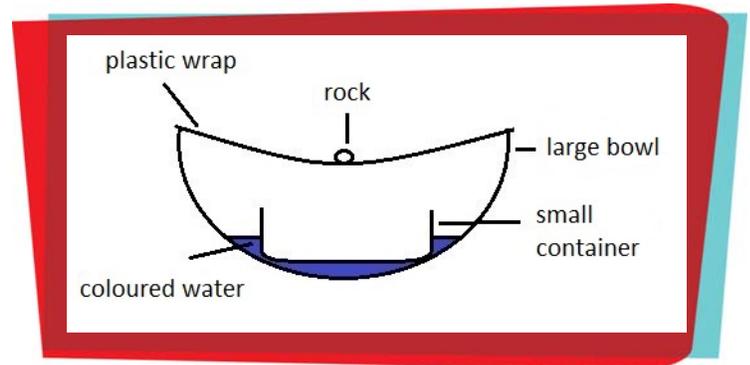
1. Add water to the large bowl, so that there is about 1 cm of water at the bottom.
2. Add the contaminant of your choice to the water (in our photo we use blue food colouring) and mix it in.
3. Place the smaller glass container in the centre of the larger bowl, sitting in the water.
4. Loosely cover the top of the large bowl with plastic wrap. If needed, you can tape the plastic wrap to the sides of the bowl to help it stay in place.
5. Place the small rock on the plastic wrap, so that it sits just above the small glass container in the middle.
6. On a sunny day, put the whole setup outside in the sun.
7. After 1 to 2 hours, clear water should accumulate in the smaller container. Depending on the time of year and the cloud cover, you may need to leave it out for longer.

TAKE NOTE!

Do not drink the collected water. It may still contain small amounts of the contaminants.

What happened?

The plastic wrap allows sunlight into the larger bowl but prevents heat from escaping. This causes the water to heat up and evaporate, leaving the food colouring or any other contaminant behind. The clean water vapour condenses (becomes liquid again) as it hits the plastic wrap, gathers at the dip in the plastic wrap (created by the rock) and then drips into the smaller container.



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Pinhole Sun Viewer

In this activity you will build a pinhole projector that will allow you to view the sun safely, even during eclipses!

Materials

- Shoebox or long box with a lid (the longer the better)
- Aluminum foil
- Scissors
- Safety pin or needle
- Tape
- White piece of paper

Let's get to work!

1. Use your scissors to cut a hole into the short end of the cardboard box.
2. Cut a piece of aluminum foil a bit larger than the hole in your box, and tape it tightly into place over the hole.
3. Carefully poke a pinhole into the centre of the aluminum foil.
4. Cut a viewing hole into the cardboard on the side of the box, at the opposite end of the pinhole (see photo of step 4). This will be where you look into the box, so be sure the hole is big enough for you to see in.
5. Tape the white piece of paper in place inside the box, on the end opposite the pinhole. This is the screen where the sun image will appear.



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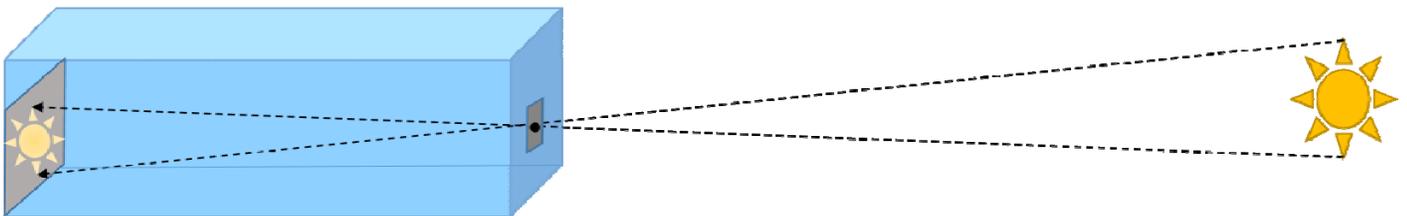
TAKE NOTE!

Never look at the sun directly with your bare eyes, it can cause serious damage.

- Put the lid on your shoebox, and decorate however you'd like with construction paper, markers or stickers.
- Go outside on a sunny day and point the pinhole side of your viewer towards the sun. Look through the viewer hole and adjust the angle until the white disk of the sun appears on the screen.

What happened?

The Sun's light rays travel in a straight line, lighting up everything they touch. When it hits the projector, only a very small amount of light is able to pass through the pinhole (see the diagram below). Inside the dark box, you see the small image of the Sun, as it appears in the sky. This same idea of light traveling through a pinhole is used in cameras too.



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SHOPPING LIST

- Large bowl
- Small glass container which will fit inside the large bowl
- Plastic wrap
- A small rock
- Water
- Dirt, salt or food colouring
- Sundial template
- Scissors
- Tape
- A sharpened pencil
- A piece of Bristol board or cardboard (optional)
- A compass (optional)
- Shoebox or long box with a lid
- Aluminum foil
- Safety pin or needle
- White piece of paper



MAY WE SUGGEST...

Video

Solar Eclipses

What is a solar eclipse, and what causes it? Learn about annular, partial and total eclipses of the sun with this video.

<http://ow.ly/NOyuG>

Web Link

Find star charts, sundial activities and more with these online resources.

<http://cstmuseum.techno-science.ca/en/education/star-charts-activity-templates.php>



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