

Activity

EQUIPMENT

Magnifying glass or lens with one convex side (long-sighted eyeglasses will work fine). Choose a lens that's gently rounded. Try looking through several and choose the one that puts the most distance between it and an object seen in focus through it.
Masking tape
A chair or stool and some books or boxes
White paper
A pencil
A watch or clock with a second hand

SUGGESTED CLASS LEVEL

5th – 6th

PREPARATION

Find a place where sunlight casts clear shadows on the ground. It can be indoors or outdoors.

BACKGROUND INFORMATION

The Earth turns all the time, that's what makes the Sun appear to move across the sky.

TRIGGER QUESTIONS

Is it safe to look directly at the Sun? (NO!).
How can we see the Sun if we can't look directly at it?
Have you ever used a magnifying glass to focus sunlight?

CONTENT STRAND

Observing, measuring, predicting

CROSS-CURRICULAR LINKS

Geography
Maths (measuring)

ACTIVITY

Tape the handle of the magnifying glass to the seat of the chair so that the lens extends over the edge and place it in sunlight.
Put the paper where the light passing through the lens shines on the ground.
Raise the paper closer to the lens or you may need to raise the magnifying glass higher (set it on a stack of books on top of the chair, taping the magnifying glass to the top book instead of the chair) until you get a sharp circle of light, then use books or boxes to prop up the paper or the chair (caution – a sharp focus of the sunlight will set fire to the paper, tape the paper in place so wind cannot move it).
If you do this in winter, when the Sun is low in the sky, tilt the magnifying glass and prop the paper up at an angle to get a clear circle of light.
Draw a tight circle around the spot of light (which is an image of the Sun itself), then use your watch to time how long it takes for the light to completely leave the circle.
Does the time for the light to move out of the circle change at different times of day? At different times of year?

SAFETY

Do not focus the sunlight to a tiny point – it will start burning through the surface (paper, cardboard, plastic, skin).....NEVER look through the magnifying glass at the Sun.

Activity

DID YOU KNOW

Solar energy is often collected with lenses or reflectors. The sunlight moves so fast that solar collectors need to keep changing the direction that they point.
<http://www.kids.esdb.bg/solar.html> for more info about solar collectors

FOLLOW-UP ACTIVITY

Try different lenses to produce larger images of the Sun. This makes a simple solar telescope.

Look for dark spots on the image of the Sun – these are sunspots.

Calculation for older students: When the light moves completely out of the circle you have drawn, the Earth has travelled $\frac{1}{2}^\circ$ of its 360° rotation. Take the number of seconds it took for the light on the paper to move out of the circle, and multiply it by 720. Work out the length of the day in hours by dividing that number by 3600.