

# BUILDING A TELESCOPE



## WHAT YOU'LL NEED

- ✓ Two cardboard tubes 20cm long, one narrower than the other
- ✓ A **convex lens** with a **focal length of 30cm**
- ✓ A **concave lens** with a **focal length of 5cm**
- ✓ Two pieces of corrugated card larger than the lenses
- ✓ Scissors, tape and glue

## BACKGROUND

A telescope is used to magnify distant objects by collecting light and other types of wave. Telescopes have been helping us to understand the universe since 1608.

You're going to make a simple telescope that uses two different types of lens to magnify distant objects, and then find out how this works.

## FIND OUT MORE

Have a look at the CREST website to find more projects to work on.  
[www.britishecienceassociation.org/crest-intro](http://www.britishecienceassociation.org/crest-intro)

## Part 1 Making a telescope

- 1 Draw around one of the lenses on a piece of corrugated card, and then cut out the circle you've drawn to make a hole in the card the same size as your lens. Fit the lens into this hole, using glue to hold it there if necessary.
- 2 Do the same with the other lens on the second piece of cardboard.
- 3 Trim the cardboard around the **convex** lens so that it's the same diameter as the **larger** outer tube, the cardboard should fit into the tube perfectly.
- 4 Trim the cardboard about the **concave** lens so that it's the same diameter as the **smaller** outer tube, the cardboard should fit into the tube perfectly.
- 5 Glue the rings on to the ends of the two tubes and slide the inner tube into the outer tube
- 6 Your telescope is complete! Look through the concave, eyepiece lens and focus on distant objects by sliding it towards to objective, convex lens.

## Part 2 How does your telescope work?

Your telescope uses a convex lens and a concave lens.

A convex lens is thicker in the middle than at the edge, and it **converges light towards its centre**.

A concave lens is thinner in the middle than at the edges and **diverges light away from its centre**.

Using the diagram below as a stimulus, research how the lenses in your telescope work to magnify distant objects.

Research how the telescope works and make a poster to explain it. Use the image below to help you.

