How does a Telescope Work?

A telescope makes faraway objects look closer and lets you see them better. This text explains how a telescope works.

Why do we need a telescope?

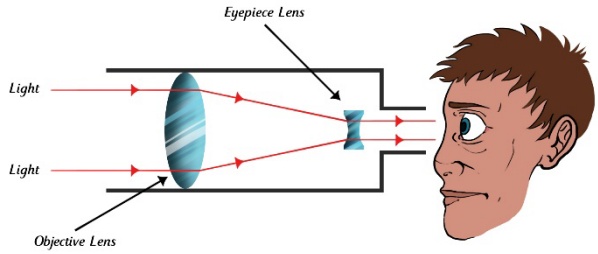
When things are faraway, the pupil of your eye does not allow enough light to enter, as a result the image takes up less space on your retina, making the image appear small and less detailed. A telescope improves your vision in two ways. Firstly, the large end of the telescope collects lots more light from the object you are looking at. Secondly, the eyepiece of the telescope magnifies the small image so that it uses more of your retina, allowing you to see a bigger, more detailed image.

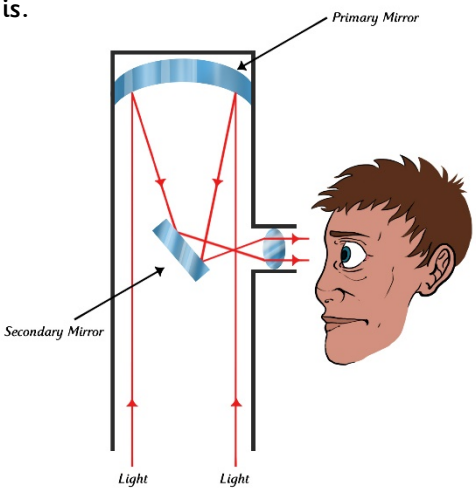
Optical telescopes

Optical telescopes observe visible light from space. Small ones allow amateur astronomers to study the night sky. In addition to this, there are some rather large optical telescopes positioned around the world. These are used by professional astronomers. There are two main types of optical telescope. The refractor telescope uses a glass lens, whilst the reflection telescope uses mirrors.

The refractor telescope

A refractor telescope collects light through a special lens called an objective lens. This lens is a convex lens that bends the incoming light rays to a focal point within the telescope. Next, the light travels along the telescope and through a second lens called an eyepiece. This lens takes the light from the focal point and spreads it across the retina of your eye, making the object appear bigger than it is.





The reflection telescope

A reflection telescope collects light through a convex mirror called a primary mirror. This reflects light back to a focal point. Then, another mirror is used to direct the light to the eyepiece. Finally, the eyepiece acts to make the object look bigger.

Bigger images

The smaller the objective lens or the primary mirror, the less light it can collect, consequently you see a smaller and less detailed image. The bigger the objective lens or the primary mirror, the more light it can collect, therefore you see a larger and more detailed image.

Did you know?

The Hubble Space Telescope is one of the most famous optical telescopes in the world. It was sent into space in 1990 and orbits the Earth at a speed of 5 miles per second. Every 97 minutes, Hubble completes a spin around the Earth, capturing images as it goes, as a result Hubble's images have helped scientists estimate the age of the universe at between 13 billion and 14 billion years old.

Text Marking

1. Underline the technical words in blue.
2. Draw a green line around the sub-headings.
3. Draw a pink line around the introductory statement.
4. Draw a purple line around the extra, interesting facts.
4. Underline the adverbials of time in yellow.
5. Underline examples of second person in red.
6. Underline the cause and effect conjunctions in brown.

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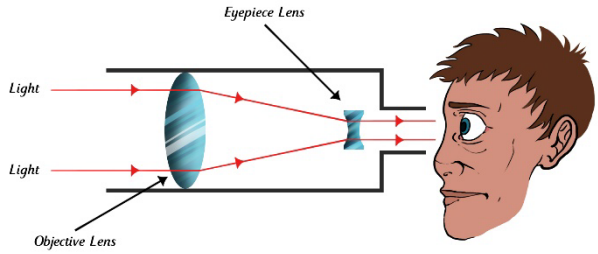

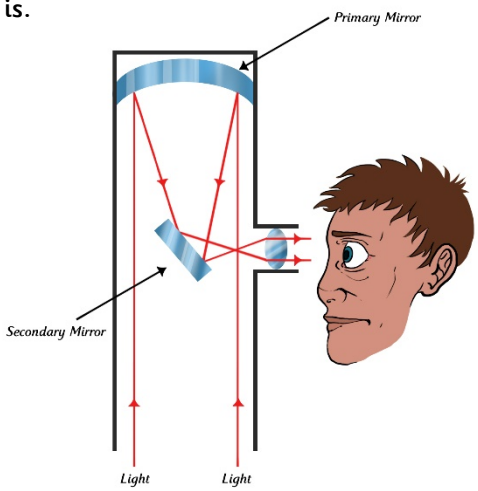

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