

Modelling the transit method

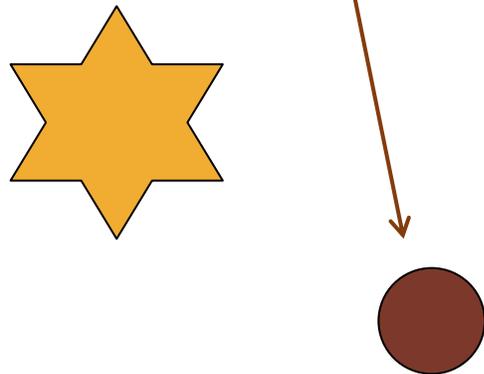
In this activity, you'll see how measuring the brightness of a star over time can show us if there's a planet orbiting that star.

You may need an adult to help you set this up and take the readings.

The equipment you will need:

- A lamp/light source (the star)
- A sphere (a planet) – for example, a tennis ball hanging on a string.
- A smartphone with light meter app (your space telescope)

Set up your equipment as shown here.



The best app for this is called Phyphox and it's free for Android. On iPhone, any free 'light meter' app can work OK. Make sure it gives you a number that changes as you point at brighter and darker places.

Top tip:
Test your system by making sure that when you put the ball in front of the lamp there is a good drop in the light level reading

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Follow these steps:

1. With the ball away from the experiment, note down the reading the lamp makes on the light meter.
2. Make a table where you can write down the light meter readings for different positions of the ball.
3. Move your ball in an 'orbit' of your star, making sure it moves directly across the front.
4. At several places in the orbit, write down the number from the light meter.
5. You could draw a graph to show your results, like the light curves for the Trappist planets shown on the webpage.

Top tip:
Once you start, the
phone and lamp
must never move!

Move the planet in orbit around the star and at several different positions, write down the light level.

What changes if you orbit faster?
Or use a smaller ball?

What is the problem if you move the phone far away? What does this mean for telescopes looking for exoplanets?

Top tip:
Make sure nothing blocks the light except the ball. (Keep your hands out of the way!)

