EXPLORE

# HOW DO WE KNOW ABOUT SPACE ROCKS?

## SKY GAZING

### 30 MINUTES SET UP, THEN 5 MINUTES/NIGHT (OR AS CLOSE AS POSSIBLE) FOR 5 WEEKS

### SUMMARY

How do we know so much about space if only a handful of astronauts have ever left the planet? Most of our space knowledge comes from standing on the ground and looking – with our eyes, through optical telescopes and by measuring the energy waves we can't see as visible light with radio telescopes

Nicolaus Copernicus worked out that the Earth went around the sun and Galileo Galilei found out that other planets have moons too just by looking. There's some wonderful stories to be read about the human endeavours behind astronomy. In this activity, we're going to do the looking ourselves.

Since you can't see much of space in the day time, the data collection for this experiment will need to be done as homework. If students are invested in their predictions and prompted regularly to complete their chart, they'll have their own data to interpret at the end of the month.

### OUTCOMES

1. With guidance, students plan investigation and acurately observe and record data to plot the month's sky
2. Students compare data with predictions and use evidence for forming explantations.
3. Students understand tha Earth is part of a system orbiting a star and that it's rotation causes day and night.
4. Students understand that scienc einvolves making predictions and describing patterns and relationships

What can you see from your backyard?

### EQUIPMENT

- Weekly sky observing chart for each student, for five weeks, page 63
- Sky observing frame, page 62

## THE EXPERIMENT

**Plan:**

Students will record the patterns in the sky for one month. What should they be looking for? When will they need to be doing it? Agree on 3 sky diary foci (e.g. moon shape, Star patterns, sunset time, general notes) How will they keep the data 'fair'? (e.g. draw star patterns at the same time each night, standing in the same position at home)

Lead discussions in the difficulties of data collection – before starting and then at the end of week 1 once students have had a go.

How will they know they're always looking at the same area? (choose location, facing, make frame, line up frame with a close object (window, fence, tree trunk, not a star!)
Will they always see the moon? Always at night?

**Predict:**

Discuss with students what they think they will find out by making a sky gazing chart. What do they already know about patterns in the sky?

**Test:**

Students take home their sky diary on Monday and record what they see each night for a week. This can be a combination of written notes and drawings. Regularly discuss the sky diary to keep students on task and solve any problems early.

**Analyse:**

Each student examines their own diaries over the month and identifies patterns, then checks with a partner whether these patterns exist elsewhere. Have students predict what they would see in another week, month and 2 months.

**Communciation:**

Students write about what happened over time in the sky first as scientific notes and explanations, then creatively as a story to make it memorable. Discuss other cultures' stories about day and night.

## SUGGESTIONS FOR THE CLASSROOM

- Build up to it – get the students excited by the activity in advance and send a note home to parents about what the students will be required to do. For younger students, try a practise night and have students all bring in their sheets to discuss their results and their questions.
- Use this activity to help students understand Earth's rotation on its axis causes night and day. Discuss before and after the month of data collection why the stars move and where the sun goes each night. Model the earth's rotation with a ball while students play out the places of the sun and the moon.
- Have a practise night where students go home and find a good viewing spot and time that they can go back to each night, for example from the back door, just before bed time. Have students define the area they look at each night using land