

Lesson 2 Comparing planets

AGES 7–9

Objectives

- To appreciate the different sizes of the planets.
- To appreciate the different distances of the planets from the Sun.

Subject references

Science

- Explore an environmental context that is of interest. (NC: KS2 Breadth of study 1a)

Mathematics

- Use suitable measuring instruments. (NC: KS2 Ma3 4b)

Resources and preparation

Make a photocopy of page 54 for each child and cut it in half. Each child will also need: a pencil, card, a ruler, a pair of compasses, scissors, space on a wall to display their solar system, colour pictures of the planets and/or a photocopy of page 53 (the NASA website <http://pds.jpl.nasa.gov/planets> is a useful resource for children to look at). You will also need: access to the playground or school field, sports tapes, a large yellow ball and teaching assistants.

Starter

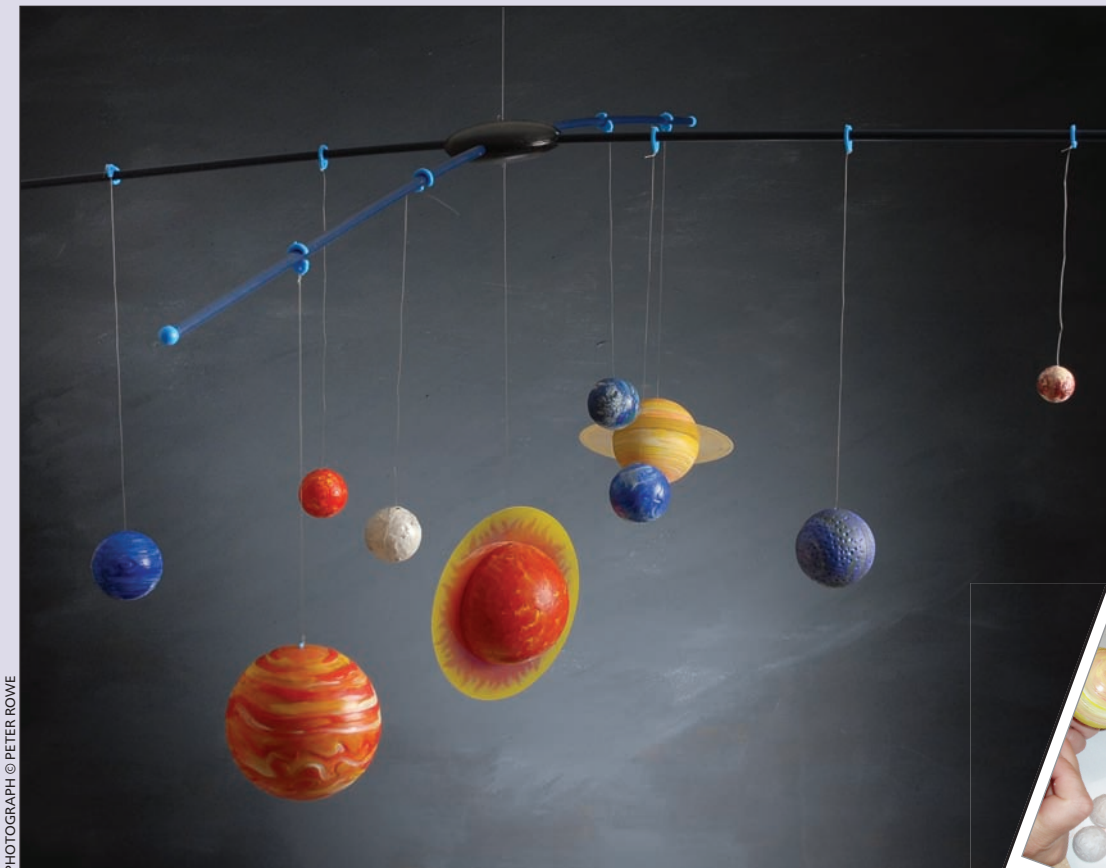
Many children pride themselves on their knowledge of space and the planets, so challenge them to a quiz to see what they know. Issue the top half of photocopiable page 54 and let the children try the test. Go through the answers with them (see page 48) to see how well they did. Then tell the children that they are going to make a model of the solar system to help them remember and understand some of the facts.

What to do

- Tell the children that they are going to make the planets all to the same scale, and issue the lower part of page 54.
- Point out that the scale used has the diameter of Earth as one unit. This means that other Earth-sized planets also have a diameter of one unit but large planets may have a diameter of four, ten or eleven units. Smaller planets are 0.2 and 0.4 of the unit. Explain that if, for example, you decided to use a scale where the diameter of the Earth were 10cm it would mean that the diameter of Jupiter would be 110cm. Show the children how much card would be needed to make such a large planet.
- Tell the children to make their planets to the scale of the Earth's diameter as 2cm.
- When the children have drawn and cut out the circles, they should use pictures of the planets (or photocopiable page 53) to help them colour the planets appropriately.
- Talk about Saturn's rings. The diameter of the outer ring is two-and-a-half times the diameter of the planet. So, if the suggested



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scale is used, the outer ring would have a diameter of 25cm. As Saturn moves around in its orbit the rings sometimes tip towards and away from the Earth and at certain times the edges of the rings can be seen. They could be represented by a thin ellipse around the planet or when the rings are horizontal in a view from the Earth, an 'end on' view could be represented by a very thin strip of paper.

Differentiation

- More confident learners could work in groups to make a solar system mobile: use the information in table C, on photocopiable page 54 to calculate a scale for the distances between each planet and the Sun.
- Less confident learners could use the information about moons in the Extension of Lesson 1 in this theme, and add the moons to their wall displays. They should put the moons in orbits in line with the equator of the planet. Teaching assistants could check this with the tilt of the equator by looking at the tilt column on page 55.

Assessment

The children can be assessed on the accuracy of their measuring, cutting out and colouring in of the planets. They could be assessed on how they work in a group in the Plenary session.

Plenary

- Tell the children that they are going to make another scale model of the solar system, but this time they will use a scale to set out the distances of the planet (see photocopiable page 54). Explain that they will use their planet scaled models they have just made, but help them to understand that their planet models are to a different scale from the distance scale so that they can be more easily seen.
- Organise the children into three groups of ten (one child in each group will be the Sun) and let them decide among themselves which planet each one will take outside for their group's model of the solar system. Let the children use a sports tape to measure out the distances of their planets from the Sun. If you have enough space, the children could follow orbital paths (circular, for simplicity) around the Sun.

Outcomes

- The children know about the range of sizes of the planets in the solar system.
- The children know about the order in which the planets are arranged around the Sun.

