

Earth and Space: The Beads on String Model

What to do in advance: You will need two small beads hanging by threads from a rod or pencil. One bead represents the Earth and the other the Moon. The beads need to be about 10 cm apart so that the scale is roughly correct. You will need the following hidden in a black bin bag: table tennis ball, tennis ball, football and a large inflated beach ball.

What to do with pupils: Tell them that we have reduced the Moon and Earth in size by the same amount (to scale) and then this is roughly how far apart they would be.

Hold the model up.



Question 1: *Is the Sun larger or smaller than the Moon?*

They will probably know that the Sun is bigger. Have the bag containing the variety of sized balls and bring them out one by one to see which one they think would be about the right size for the Sun:

- Table tennis ball
- Tennis ball
- Football
- Large beach ball

The really large beach ball is about right for the size of the Sun on this scale.

Question 2: *How far away does the beach ball need to be for this scale model?*

It can be thrown to the middle of the room, back of the room, etc. but this would not be far enough - it needs to be 40m away! It is important to estimate where this would be, e.g. the back of the car park or whatever.

It is also interesting to ask children what is between the Earth and the Sun. Admittedly, there are two other planets but these are also relatively tiny and are in constant orbit around the Sun. Children tend to have quite a crowded picture of space and think that there are other stars between us and the Sun. Mostly it is just empty space, no air – nothing at all.

Teacher File Resources: Practical Prompts for Thinking

Then ask them to think about all the myriad of stars seen in the night sky.

Question 3: *Where, on this scale, would our nearest neighbouring star be found?*

Ask for suggestions. They may say in a town 1 km away, or even 30 km away...

Incredibly, on this same scale with the Sun 40 m away from the Earth, the nearest star would be 4000 km away! So if the bead model is held up in a school in the UK, the model Sun is 40 away on the same scale, and the *nearest* neighbouring star would need to be in Canada! Such is the awesome scale of our universe.

