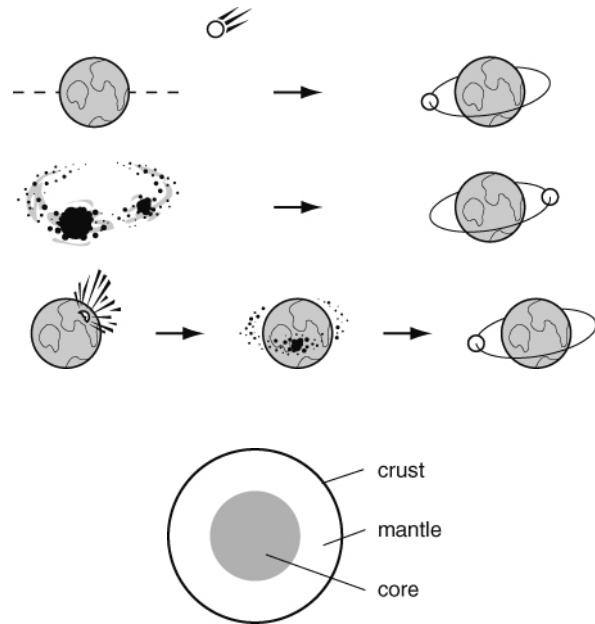


The Moon is very close to the Earth but looks very different. For centuries, astronomers have been interested in how the Moon was formed. There have been lots of theories to try to explain the origin of the Moon.

A The Moon could have been a passing asteroid that was captured by the Earth's gravity. In this case, the Moon and the Earth could be made of quite different materials.

B The Earth and Moon could have formed together as gravity pulled parts of the same cloud of dust and gas together. If this is what happened, the Earth and Moon would be made of similar materials.

C While the Earth was forming there were a lot of other bodies flying around the Solar System. One of these could have hit the Earth and thrown up a lot of material. If this material stayed in orbit instead of falling back to Earth, gravity could have made all the bits join up to form the Moon. The Moon would consist of similar materials to the Earth's mantle.



It was difficult for astronomers to work out which theory was the most likely explanation until the Apollo missions in the 1970s. The Apollo astronauts brought back samples of moon rock, which showed that the Moon contained very similar materials to the Earth's mantle. The astronauts also set up instruments to measure moonquakes, which told scientists that the Moon has a very small iron core. Its core would be smaller than the Earth's anyway because the Moon's diameter is only 27% of the Earth's, but scientists found that the Moon's core is much smaller than they expected.

- 1 What *two* pieces of evidence do scientists have that could help them to decide which theory is correct?
- 2 **a** Draw scale diagrams to show the Earth and the Moon at their correct relative sizes. (*Hint: draw a circle to represent the Earth. Multiply its diameter by 27 and then divide by 100 to find the diameter your Moon circle should be.*)
 - b** The Earth's core has a radius approximately half of the Earth's radius. Draw the core on your diagram of the Earth.
 - c** What do you think scientists predicted the size of the core of the Moon would be before they had evidence from moonquakes? Explain your answer.
 - d** Roughly estimate the size of the Moon's core and add it to your Moon diagram.
- 3 Describe each of the three different theories put forward to explain the origin of the Moon. For each theory describe the evidence for and against it. Present your answer as a table.
- 4 Which theory do you think is the best model for how the Moon formed? Justify your answer.

I can...

- recall some different theories about the origin of the Moon
- describe the evidence for and against each theory
- select the best theory and justify my selection.