

Transcript for **Where did the moon come from?**

Let me take you back to the earliest days of our planet, four and a half billion years ago. At this time, the Earth had no moon. It was orbiting the Sun alone, and it was being assaulted by rocks and comets.

Today, there are no scars left from this cosmic pinball but to get a sense of the damage that was done, I've come to the Arizona desert to a great hole in the ground.

This is a beautiful crater, a near-perfect circle a mile in diameter. It was formed when a meteor crashed into the Earth a mere fifty thousand years ago. That's nothing on the timescale that we're talking about. But, it's amazing how much damage that one passing rock can cause. The early Earth was bombarded with rocks; it must have been mayhem. And then along came something much, much bigger.

Another planet the size of Mars drifted into the path of Earth. It was on a collision course.

It hit the Earth with a glancing blow. Imagine the power released by such a collision!

The impact sent a mass of liquid rock into orbit. This debris coalesced into a ball and the moon was formed, just fourteen thousand miles away from the early Earth. This was the closest point it could have been. Any closer, and gravity would have pulled the debris crashing back to Earth and there'd be no moon.

Today the moon is just a rock, reflecting the sun's light, but back then it was a molten sphere burning brightly. It must have looked amazing: an enormous orange disc in the sky.

Imagine the scene: the first moonrise over the early Earth. Our world was no longer alone. It had a huge, powerful neighbour, and ever since this has been a very different type of planet.