

Hi, this is Steve Nerlich from Cheap Astronomy www.cheapastro.com and this is *Class 2R's questions about the Solar System*.

Mrs Robert teaches a class of students in year 2, who are around 6 or 7 years old – and since they are in Mrs Robert's class they are Class 2R - at Nelson First School in Norwich, Norfolk, England. They have been doing a project on *Space and the Solar System*. So they decided to send Cheap Astronomy a list of questions to help things along. We hope these answers are helpful.

1. Why is space black?

Our eyes see the colour black when there's no light. Space is very empty apart where there are stars - so in between the stars it looks black.

2. How are stars made?

A big cloud of gas and dust collapses into a dense sphere because of its own gravity. In the middle it gets so hot that the gas starts to 'burn' and the star lights up. It's doesn't burn like a fire though, it's something called fusion.

3. How were the planets made?

Some of the big cloud of gas and dust that collapsed to form the Sun got left behind. So instead of becoming part of the Sun, some little bits of left-over cloud became the planets.

4. Why are some planets bigger than the Earth, and some smaller?

The biggest planets (Jupiter, Saturn, Uranus and Neptune) are just balls of gas. The smaller planets (Mercury Venus, Earth and Mars) are made of rock. The gas planets are bigger because there was a lot more gas than dust in the big cloud from which the solar system formed. That smaller amount of dust made the smaller rocky planets.

5. Why do the planets orbit the Sun ?

Over 99% of everything that is in the solar system is in the Sun. It is so big that its gravity pulls everything else towards it.

6. Why do the planets spin?

The big cloud of gas and dust that collapsed to form the Sun and the solar system began spinning as it collapsed inwards and everything in the solar system has kept that spin. This is why all the planets orbit the Sun in the same direction - and why the Sun and all the planets spin in that same direction (except Venus and Uranus which have been hit by things in the past).

7. Does the Sun spin like the planets?

Yes. It spins once every 27 days - and in the same direction (see Question 6)

8. If the Earth spins; why don't we get dizzy?

You have to spin on one spot to get dizzy. The Earth's spin just moves us all around in a big circle once a day.

9. Why can we see the Sun from Earth if it's so far away?

It's very big (you could fit 1 million Earths inside the Sun) and it's very bright (so bright that you mustn't look straight at the Sun - you will hurt your eyes).

10. Would Mercury be too hot to live on?

Yes - the temperature on Mercury in daytime is about 750 degrees Fahrenheit (or we say 400 degrees Celsius in Australia).

11. Why does Venus spin slowly and the "wrong" way?

We think it got hit by a large object when the solar system was forming. This might have sent it spinning the wrong way - or it might have flipped Venus upside down - so it still spins like it used to, but it looks like the wrong way because it's upside down.

Also, both Venus and Mercury spin slowly because they are closer to the Sun than the other planets - the Sun's very strong gravity slows their spin down.

12. How was the Moon made?

We think that a large object hit the Earth when the solar system was forming - over 4 billion years ago. The explosion blew out lots of rock and debris that went into orbit around Earth - and all that rock and debris later clumped together to form the Moon.

13. Why does the moon orbit the Earth and not the Sun?

The Moon is much closer to the Earth than the Sun so the Earth's gravity pulls the Moon to the Earth more strongly than the Sun's gravity can pull it towards the Sun. The Moon is about 360 thousand kilometers away from Earth - the Sun is about 150 million kilometers away.

14. Why does the moon not spin?

It's too close to the Earth - the Earth's gravity has locked it into position so that it can't spin. This is why we only ever see the same one side of the Moon from the surface of the Earth.

15. Why is Jupiter so cold?

Jupiter is much further away from the Sun (800 million kilometers). Its cloud tops are -238 degrees Fahrenheit (or -150 Celsius).

16. Why does Jupiter have a solid core, and not be gas all the way down?

There's more and more pressure as you go deeper down into Jupiter's gas layers. Towards the centre of the planet, the pressure becomes so intense that the gas is squeezed into a solid.

17. How many moons does Jupiter have?

Today (I just checked on the Internet) we know it has 64. But we expect we will keep finding more as we look more closely at Jupiter with better cameras and telescopes.

18. Why does Saturn have rings around it, and none of the other planets?

No-one knows for sure. We think that there used to be a moon of Saturn that broke apart and spread out into the rings we see today. Some of the other big planets have little rings, but you can hardly see them. We don't really understand why Saturn is so different.

Thanks for listening. This is Steve Nerlich from Cheap Astronomy, www.cheapastro.com – and you have also been listening to Duranee and Julia. Cheap Astronomy offers an education website where the children of today can be the scientists of tomorrow. No ads, no profits, just good science. Bye.