

STARDOME OBSERVATORY & PLANETARIUM FACTS, RESOURCES AND ACTIVITIES ON...



HELLO EARTH!

Earth is the third planet from the Sun and with a diameter of around 12,000 km, it is the largest of the four inner, rocky, planets of our Solar System and the fifth largest planet in the entire Solar System. Earth is also the only planet that we know of, that has any form of life. We've divided Earth's history into two parts - before and after life.

Earth began forming some 4.6 billion years ago from a vast, swirling disk of debris left over from the formation of the Sun. Gravity slowly pulled the dust and gas of the debris cloud into clumps which then pulled in more and more material, growing ever larger. These clumps would go on to become asteroids and small planets known as planetesimals. Gravity continued to pull things together; over time the planetesimals and asteroids collided and merged with one another, growing larger again. Those that grew the largest became the planets of our Solar System, including Earth.

All of the collisions that created Earth left our planet very hot. The Earth was so hot that much of it was molten. This let light materials such as silicon, carbon and oxygen float toward the surface of the Earth while heavy materials, metals such as iron, gold and uranium sank toward the centre of the Earth. These heavy materials are still at the centre of the Earth and form the Earth's core. Some of the stuff that makes up the core is radioactive and generates a lot of heat. Because of this radioactivity, the core of Earth remains as hot as the surface of the Sun and, in part is still molten, even though the rest of the Earth has cooled substantially.

It's a good thing that the Earth has a hot, partially molten core. Due to a process called the dynamo effect, the molten core of the Earth makes a magnetic field which covers our planet and protects it from harmful radiation from the Sun known as the solar wind. If Earth didn't have this protective force field, life may never have had a chance to develop on our planet!

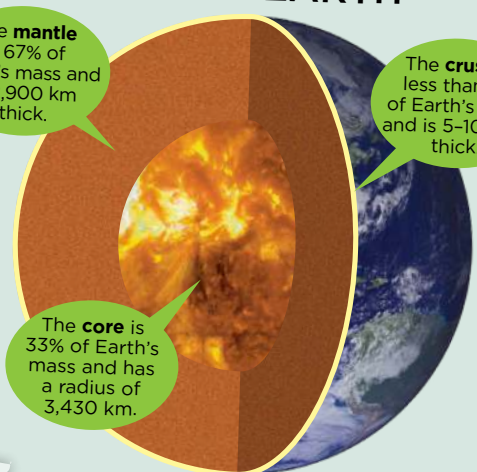
The Earth largely finished forming within 10 to 20 million years. After another few hundred million years its surface had cooled down enough that one of the most famous features of our planet came to be: water! Liquid water

THE COMPOSITION OF THE EARTH

The **mantle** is 67% of Earth's mass and is 2,900 km thick.

The **crust** is less than 1% of Earth's mass and is 5-100 km thick.

The **core** is 33% of Earth's mass and has a radius of 3,430 km.



While we know that the Earth is over 4 billion years old, finding the exact age is very difficult because the rocks used to date Earth formed slowly from the molten mass.

specifically. Water is very common in the Solar System but is usually found as ice. Because Earth is nicely placed in our Solar System it isn't so far from the Sun that all its water freezes into ice, nor is it so close to the Sun that all its water boils away. It's not too hot and not too cold, and is called 'The Goldilocks Zone'.

In part two we'll look at life forming on Earth - bacteria, jellyfish, dinosaurs, and humans!

Download a FREE Earth poster here...

www.stardome.org.nz/wp-content/uploads/2015/03/Stardome_Education-Planet-Posters-2014_Earth.pdf

DISCUSSION POINTS

How did the Moon form?

Is Earth still changing?
How do we see changes in the Earth's surface?

SCIENCE CONTENT/ CURRICULUM LINK

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