

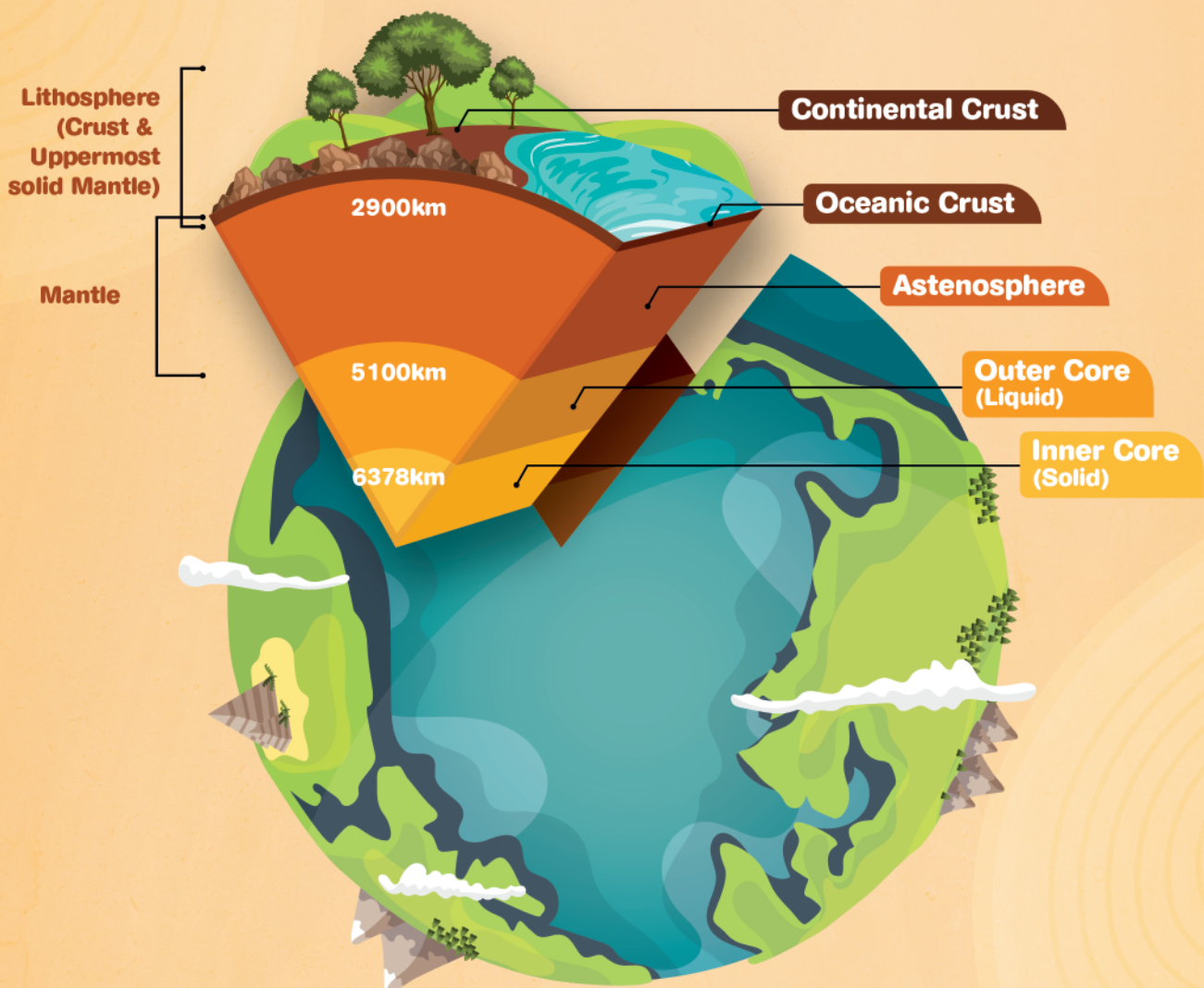


Layers of the Earth



Complete your
Young Scientist
badge here!

Earth, like an onion, has layers within it. Let's do a deep dive into the layers of the earth, exploring what they are made of and what they do for the planet.



The layers of the earth are labelled as such due to their composition, what they are made up of.

Crust – granite and basalt rocks

Mantles – silicate materials

Core – Iron and nickel

Another labelling scheme is by the properties of the material in the layer.

Lithosphere – Rigid and solid

Asthenosphere – Viscous and mostly molten

Outer core – Under high pressure but not enough to be a solid

Inner core – highly pressurised into a solid

The crust and parts of the upper mantle make up the lithosphere (lithos is Greek for rocky) and is broken up into tectonic plates which floats on the lower mantle. There are 2 types of tectonic plates: oceanic and continental plate. Oceanic plates are mainly made of denser, dark mafic rocks like basalt. Continental plates are mainly made of less dense, lighter felsic rocks like granite. Singapore is on a continental plate and you can find granite deposits in Singapore like at Bukit Timah.

The rest of the upper mantle and the lower mantle is made of viscous, almost molten rock that the lithosphere floats on. This is the asthenosphere. As the plates move around on this layer, they will interact with each other, this creates the different major landforms we see like mountain ranges, rift valleys and volcanos. The plates are moved by convection currents of the molten rocks in the asthenosphere. Currents of hot molten rocks push up and outwards within the asthenosphere that push the floating plates along.

The outer and inner core of the earth is mainly made of iron and some nickel. The only difference between the 2 is that the inner core is solid while the outer core is liquid. The heat from the core also helps to drive the convection currents of the asthenosphere. It is generally believed that the heat from the core and asthenosphere comes from leftover heat of the earth's formation as well as decay of radioactive elements like uranium.

ACTIVITY:

How to visualise the layers in the earth? Make your own!

Materials needed:

Small deep aluminium/glass tray
Jelly powder
Food colouring (yellow and orange)
Food flavouring of choice
Nata de coco
Oreos (or any other cookies)
Cooking pot and stove



STEP 1:

Line the bottom of the tray with the nata de coco.



STEP 2:

Follow the instructions of the jelly powder packet and mix in the food colouring and flavouring.

- 4g of jelly powder to 100ml of water
- Colour and flavouring to taste



STEP 3:

Bring the mixture to boil



**STEP 4:**

Pour the mixture into the tray carefully, making sure not to disturb the previous layer.

**STEP 5:**

Place tray into the fridge for an hour or till the jelly layer hardens.

**STEP 6:**

Repeat steps 3–6 for the other layers, working from the bottom up.



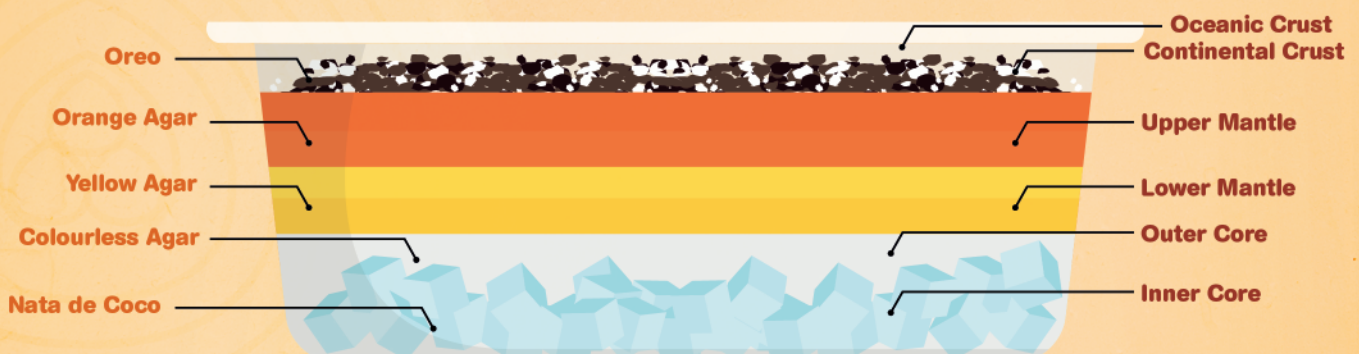
Voila!

STEP 7:

Top with Oreos. Sprinkle crushed Oreos for better effect.

**THINK:**

Which layer of the earth do each of the food items represent?

**BONUS ACTIVITY**

Use a straw to core through all the layers and you can lay it on a plate outside of the tray! This is how scientists study the layers of soil and ice underneath us.