

THE STRUCTURE OF THE EARTH

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Main Objectives:

1. To know that the Earth is made up of several layers: core, mantle and crust.
2. To know that the crust is also made up of several layers: lithosphere, hydrosphere and atmosphere.
3. To know that the crust of the Earth is constructed of many different sections called tectonic plates.
4. To know that the continents and oceans sit on these plates and that the movement of the plates is the cause of volcanoes and earthquakes.

Useful Websites:

www.geography4kids.com

This site has general information about the topic with some useful diagrams and photos.

<http://videos.howstuffworks.com>

This is a great site! It contains many interesting videos lasting no more than 15 minutes each on a range of topics associated with this unit. Open the page and search "formation of the earth", then click "videos".

<http://www.kidsgeo.com>

This site has a number of things to offer - information, songs and games. Some of the information on this site may lend itself to a deeper study of the topic.

<http://kids.yahoo.com/science>

This is Yahoo's kids site and has interesting videos and activities children can do to reinforce their knowledge and understanding of the topic. Its search engine will find other child friendly sites.

<http://kids.nationalgeographic.com/kids>

Another fabulous site that could teach this unit for you. Just click on "videos" and search "earth structure". You will have plenty to choose from.

<http://www.youtube.com>

Search "structure of the earth" for some interesting videos.

<http://www.enchantedlearning.com/label/geology.shtml>

Printable worksheets to label and colour on earth structure, volcanoes etc.

<http://www.fema.gov/kids/volcano.htm>

An interesting and useful site with loads of facts about volcanoes and a "things to do" section.

<p>Earth</p>	<p>n. The third planet in the solar system and the only one with life.</p> <p>"The Earth has a great variety of living things."</p>
<p>core</p>	<p>n. the central part if the Earth made up of two parts: the inner core, probably made of solid iron and nickel and a molten (liquid) outer core.</p> <p>"The Earth's core is incredible dense."</p>
<p>mantle</p>	<p>n. the portion of the Earth, about 2900 km thick, between the crust and the core.</p> <p>"The outer mantle is made of molten rock and minerals."</p>

<p>crust</p>	<p>n. the outer layer of the Earth, about 35 km deep under the continents and 10 km deep under the oceans.</p> <p>"The Earth's crust is made up of tectonic plates."</p>
<p>lithosphere</p>	<p>n. the crust and upper mantle of the Earth.</p> <p>"The lithosphere is constantly changing due to the action of erosion, Earthquakes and volcanoes."</p>
<p>hydrosphere</p>	<p>n. the water on or surrounding the surface of the globe, including the water of the oceans and the water in the atmosphere.</p> <p>"The oceans are part of the hydrosphere."</p>

<p style="text-align: center;">atmosphere</p>	<p>n. the gaseous envelope surrounding the Earth; the air.</p> <p>"The Earth's atmosphere is a very thin layer of gas that protects us from the harmful rays of the Sun and the vacuum of space."</p>
<p style="text-align: center;">volcano</p>	<p>n. a vent in the Earth's crust through which lava, steam, ashes, etc., are expelled, either continuously or at irregular intervals.</p> <p>"Mt. Vesuvius is a dormant volcano."</p>
<p style="text-align: center;">Earthquake</p>	<p>n. a series of vibrations induced in the Earth's crust by the abrupt rupture and rebound of rocks in which energy has been slowly accumulating.</p> <p>"Japan frequently suffers Earthquakes."</p>

<p>tectonic plate</p>	<p>n. the two sub-layers of the Earth's crust (lithosphere) that move, float, and sometimes fracture and whose interaction causes continental drift, Earthquakes, volcanoes, mountains, and oceanic trenches.</p>
<p>continental drift</p>	<p>n. the lateral movement of continents resulting from the motion of crustal plates.</p> <p>"Continental drift has caused the surface of the Earth to change over long periods of time."</p>
<p>geology</p>	<p>n. the science that deals with the dynamics and physical history of the Earth, the rocks of which it is composed, and the changes that the Earth has undergone or is undergoing.</p> <p>"Someone who studies geology is called a geologist."</p>

Earth

core

mantle

crust

lithosphere

hydrosphere

atmosphere

earthquake

volcano

geology

continental
drift

geologist

troposphere

mesosphere

stratosphere

exosphere

thermosphere

Glossary

atmosphere n. the gaseous envelope surrounding the Earth; the air.

continental drift n. the lateral movement of continents resulting from the motion of crustal plates.

core n. the central part of the Earth made up of two parts: the inner core, probably made of solid iron and nickel and a molten (liquid) outer core.

crust n. the outer layer of the Earth, about 35 km deep under the continents and 10 km deep under the oceans.

Earth n. The third planet in the solar system and the only one with life.

earthquake n. a series of vibrations induced in the Earth's crust by the abrupt rupture and rebound of rocks in which energy has been slowly accumulating.

geology n. the science that deals with the dynamics and physical history of the Earth, the rocks of which it is composed, and the changes that the Earth has undergone or is undergoing.

hydrosphere n. the water on or surrounding the surface of the globe, including the water of the oceans and the water in the atmosphere.

lithosphere n. the crust and upper mantle of the Earth.

mantel n. the portion of the Earth, about 2900 km thick, between the crust and the core.

tectonic plate n. the two sub-layers of the Earth's crust (lithosphere) that move, float, and sometimes fracture and whose interaction causes continental drift, Earthquakes, volcanoes, mountains, and oceanic trenches.

volcano n. a vent in the Earth's crust through which lava, steam, ashes, etc., are expelled, either continuously or at irregular intervals.

Can you name
the layers of
the Earth?

What is the
lithosphere?

What is the
hydrosphere?

What are the
tectonic
plates?

Explain how an
earthquake
occurs.

How is a
volcano
formed?

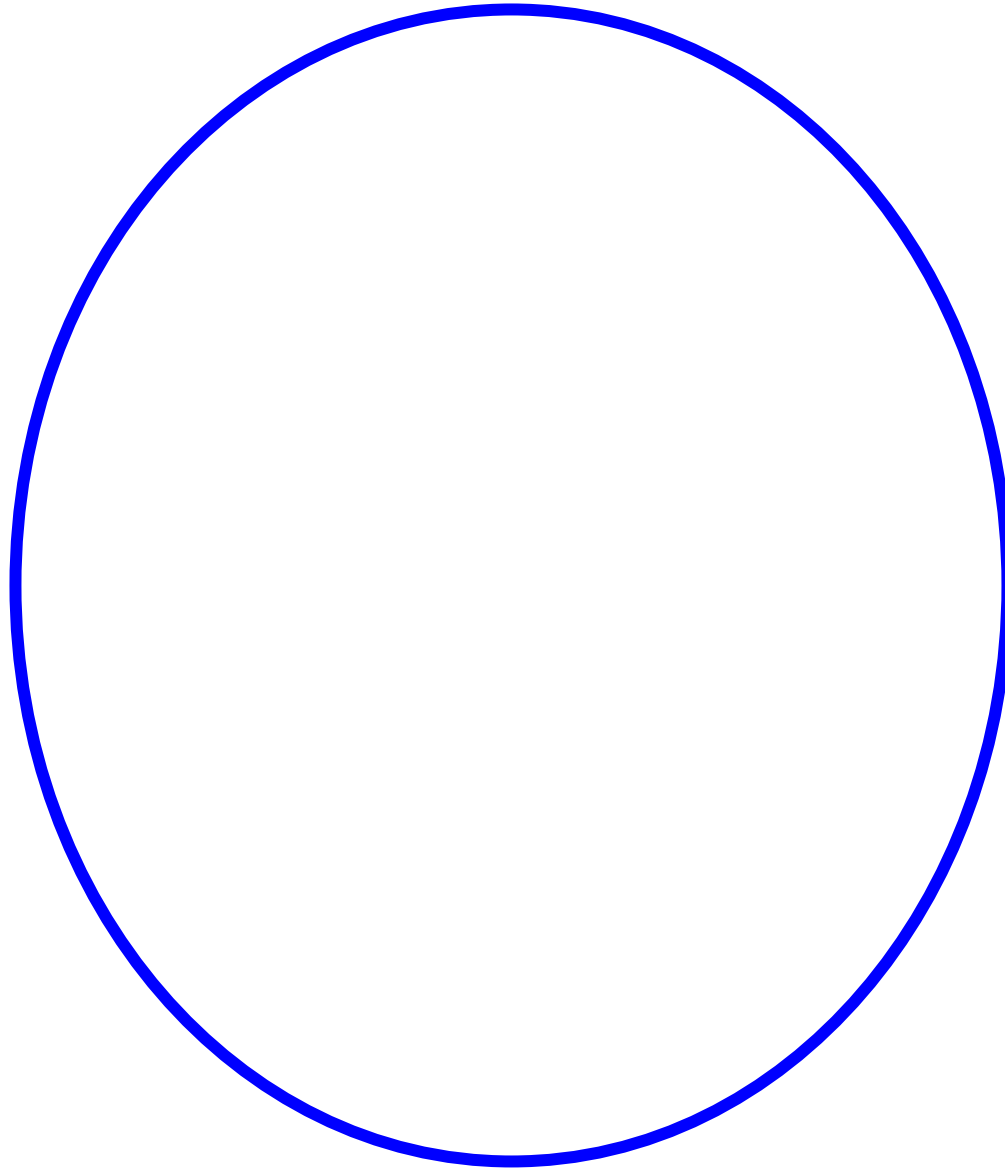
Can you name the
three types of
volcano?

What is the
"Ring of Fire?"

Where would you
find the nearest
fault line to the
Iberian Peninsula?

Prior learning diagram:

Draw and label a cross-section diagram of the Earth's structure in the circle below:



Hands-on Activities 1

The Structure of the Earth

Main Objectives:

1. To know that the Earth is made up of several layers: core, mantle and crust.
2. To know that the crust is also made up of several layers: lithosphere, hydrosphere and atmosphere.

Resources needed:

- Digital projector and PC
- Ppt The structure of the Earth
- Internet connection
- Pupil worksheet 1.1
- Pupil worksheet 1.2
- Scissors, glue and coloured pencils or crayons.

Introduction

To introduce this unit, show the children the short film using the link below (or click on the hyperlink on the powerpoint presentation).

<http://magma.nationalgeographic.com/ngexplorer/0603/quickflicks/>

Use the word wall cards to reinforce the vocabulary learnt throughout this lesson. Place them on the board as the narrator introduces them.

Development

Follow the PowerPoint presentation to the end naming each part of the Earth's structure. After completing this part, distribute the two activity sheets: in activity sheet 1.1 the children will construct a 2d model of the Earth's structure; activity sheet 1.2, is a schematic diagram to aid children in organising their ideas. The children should work independently, following the instructions to complete their model. These could then be displayed around one done by the teacher and enlarged to A3.

Plenary

Go back the link above, or click on the hyperlink on the ppt.

Use the quiz to reinforce today's lesson.

Hands-on Activity 2

Plate tectonics, Volcanoes and Earthquakes

Main Objectives:

1. To know that the crust of the Earth is constructed of many different sections called tectonic plates.
2. To know that the continents and oceans sit on these plates and that the movement of these plates is the cause of volcanoes and earthquakes.

Resources needed:

- Internet connection
- Digital projector
- PowerPoint The Surface of the Earth
- A2 card, glue, pens etc.

Introduction:

Use the PowerPoint to introduce the children to ideas taught throughout this activity. It is important that they realise that the surface of the Earth is in constant movement and that this causes volcanoes and Earthquakes to occur. Use slides 1 - 6.

Development:

Use slides 7 - 10 to explain how volcanoes and earthquakes occur. Try to relate the occurrence of these phenomena to the movements of the plates. Emphasise the destructive power of these forces of Nature. Once the children have finished with the PowerPoint, explain the task to them.

Task:

The children will create a poster project in pairs, either about how volcanoes are formed or about how earthquakes occur.

They need to find information about the topic and present it in an informative way in their own words. The second part of the project involves them researching one volcano or earthquake in detail. A prompt sheet is provided to help them structure their report.

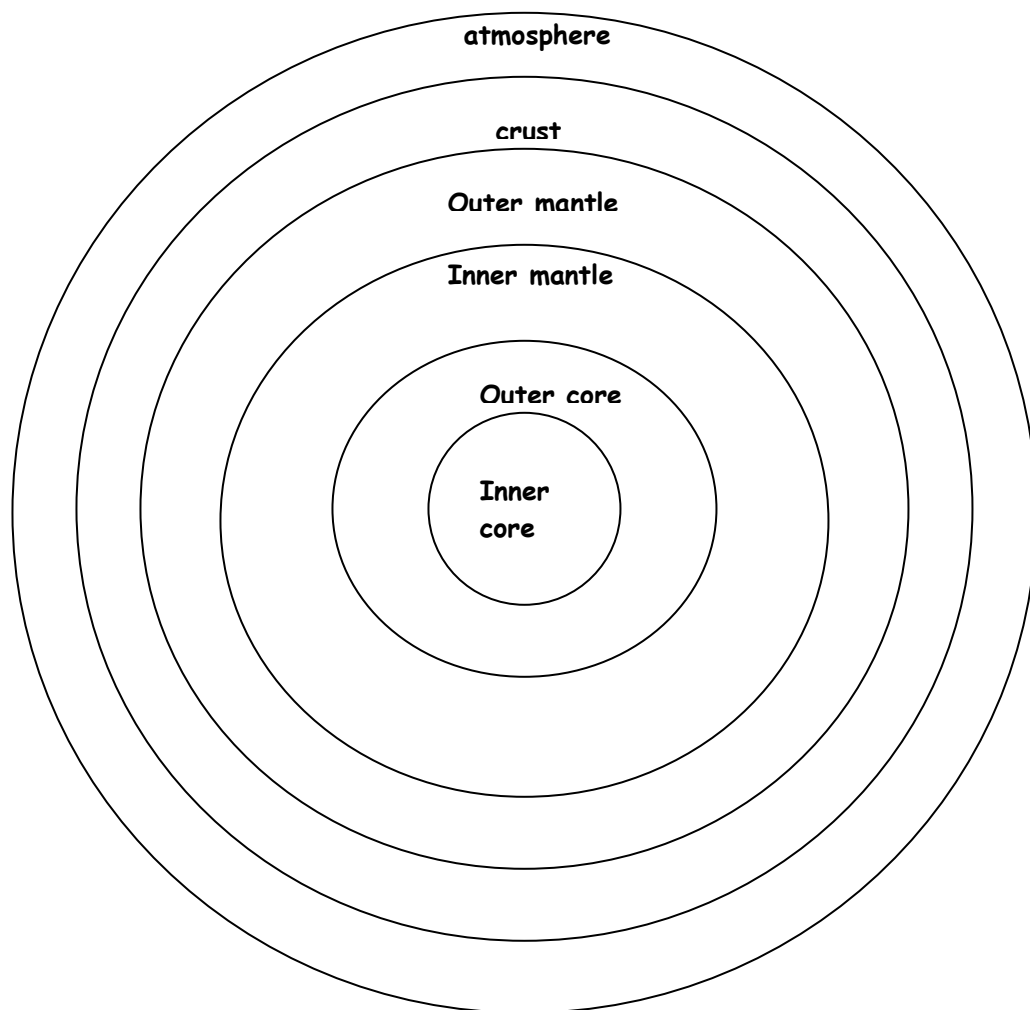
Plenary:

Once the children have finished their poster, display them around the class alongside the word-wall cards and the key questions. Ask each pair to talk about their project to the class.

Back
Glue the inner
structure on
the reverse of
the circle.

FOLD HERE





Instructions

1. Cut out the entire shape on p. 1 and colour the ocean area blue and the atmosphere light blue.
2. Cut out the entire shape on p. 2 and colour:
Inner core = yellow
Outer core = orange
Inner mantle = dark red
Outer mantle = light red
Crust = brown
Atmosphere = light blue
3. Glue the inside structure to the reverse of the circle as shown.
4. Fold your model along the fold line.

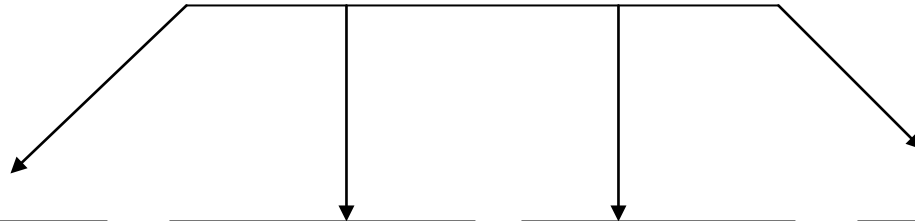
Name: _____

Pupil sheet 1.2

THE STRUCTURE OF THE EARTH

The Earth is the _____ planet in this solar system.

It has a _____ structure consisting of



C

which consists of 2 parts, the

I _____ C _____

Which is solid iron and nickel and

O _____ C _____

Which is liquid.

M

which consists of 2 parts, the

I _____ M _____

and the molten

O _____ M _____

which forms part of the lithosphere.

L

formed by the

O _____ M _____

And the

C _____

the part we live on and which contains the land masses and oceans.

A

Is made up of 5 layers of gas which protect us from the harmful rays of the Sun and the vacuum of Space.

Pupil sheet 2.1

Project planning sheet

My project is about volcanoes / earthquakes.

How are _____ formed / occur?

Here are some diagrams I will use:

My focus project will be about _____

Which is a volcano / earthquake:

Structure your project using these questions:

Where did this happen?

When did this happen?

What effect did this have on the people who live in the area?

What effect did this have on the environment?

Are there any pictures you could present or photos from the internet you could use?

Reading Comprehension

Earthquakes

In recent years, there have been some really big earthquakes.

April 2009: Around 150 people are killed in central Italy when an earthquake struck in a city called L'Aquila. More than 50,000 people were left homeless by the quake.

May 2008: Around 87,000 people are thought to have been killed in China by an earthquake in the Sichuan region of the country. As many as five million homes were destroyed in the quake which measured 7.5 on the Richter scale, and was the biggest to strike the country for 30 years.

August 2007: More than 450 people are killed in Peru by a quake measuring 7.9 on the Richter scale.

May 2006: More than 3,000 people are killed by an earthquake that struck the Indonesian island of Java. More than 200,000 people were left without shelter quake, which measured 6.2 on the Richter scale.

December 2004: Some 300,000 people are killed when an earthquake in the Indian Ocean measuring 9.0 on the Richter scale sends huge waves called tsunamis crashing into several Asian countries. The worst countries affected were Indonesia, Sri Lanka, India and Thailand.

December 2003: Over 50,000 people are killed in a quake in Iran, which measured 6.3 on the Richter scale.

May 2003: Over 1,000 people are killed and nearly 7,000 hurt in a quake in Algeria, which measured 6.7 on the Richter scale.

March 2002: Thousands die in a remote area of Afghanistan after an earthquake measuring 6.0 on the Richter scale.

January 2001: 30,000 people die and more than 50,000 are injured by an earthquake measuring 7.9 on the Richter scale in Gujarat, India.

January 2001: 1,000 people die in a 7.2 earthquake in El Salvador.

Source: Newsround 14th May 2009

Answer these questions:

1. In May 2008, there was an earthquake in China. What did the Earthquake measure on the Richter scale?

2. How many people lost their lives in the earthquake?

3. More than 3000 people were killed in an earthquake that hit the Island of Java in May 2006. What does it mean that 200,000 people were left without shelter?

4. Approximately, how many people have died in earthquakes since 2001?

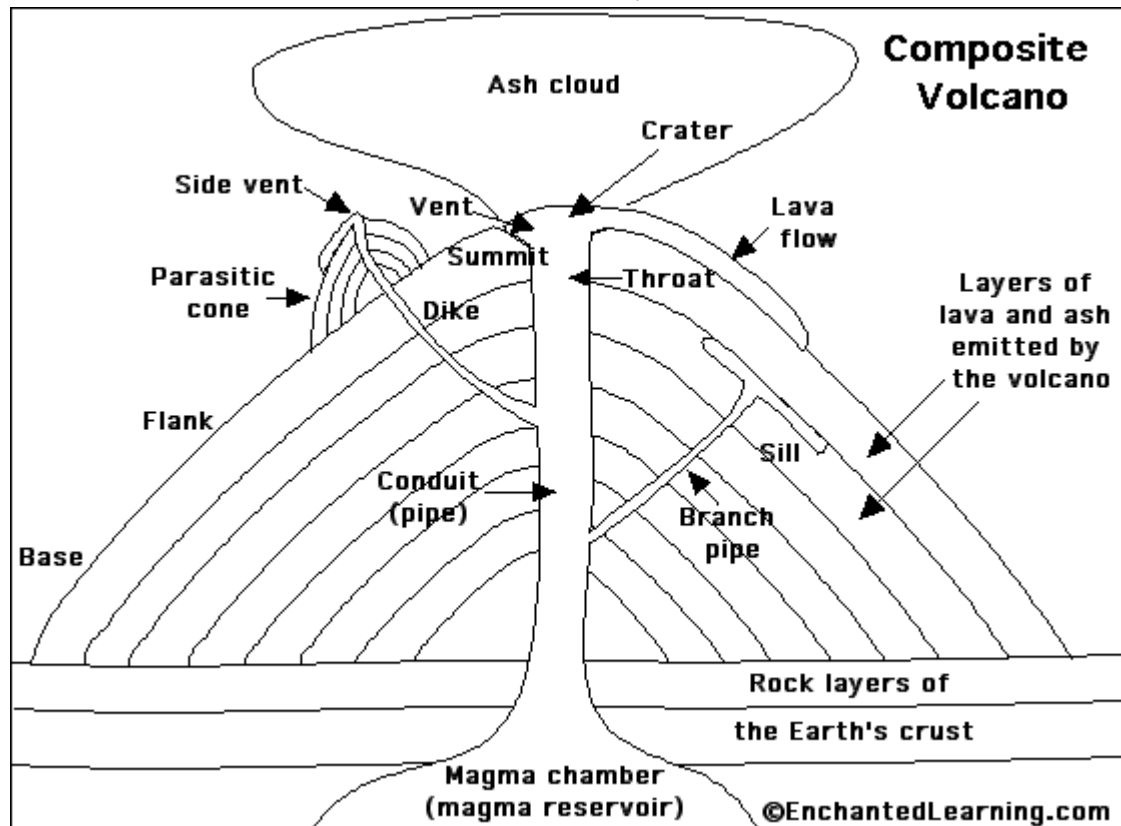
5. Create a graph to show the number of people killed in each earthquake.

6. Which was the most powerful earthquake in the last decade?

7. Which earthquake has caused the most damage?

Final Activity

Volcano Quiz



Circle the right answer:

1. What is the name of molten rock that erupts from volcanoes? **MAGMA - LAVA - VENT**

2. What is the name of molten rock within the Earth's crust? **MAGMA - LAVA - VENT**

3. What is the name of the tube through which molten rock flows? **PARASITIC - CONDUIT - BASE**

4. In which part of the Earth would you find a magma reservoir? CRUST - PARASITIC - CONDUIT

5. Composite volcanoes are made up of layers of lava and _____. CONDUIT - ASH - MAGMA

6. What is the name of a smaller vent-structure on the side of some volcanoes? SUMMIT - MAGMA RESERVOIR - PARASITIC CONE

7. What is the name of the bowl-like opening of a volcano? SILL - CRATER - ASH

8. Are ash clouds emitted from sills? YES - NO

9. What is the name of an opening through which molten rock and gases escape from a volcano? CONDUIT - VENT - FLANK

10. The sides of a volcano are called its flanks. YES - NO

Volcano Quiz Answers

1. What is the name of molten rock that erupts from volcanoes?

LAVA

2. What is the name of molten rock within the Earth's crust?

MAGMA

3. What is the name of the tube through which molten rock flows?

CONDUIT

4. In which part of the Earth would you find a magma reservoir?

CRUST

5. Composite volcanoes are made up of layers of lava and _____.

ASH

6. What is the name of a smaller vent-structure on the side of some volcanoes? **PARASITIC CONE**

7. What is the name of the bowl-like opening of a volcano?

CRATER

8. Are ash clouds emitted from sills? **NO**

9. What is the name of an opening through which molten rock and gases escape from a volcano? **VENT**

10. The sides of a volcano are called its flanks. **YES**