



WORKSHEETS

EXTREME EARTH

Maite Cózar | December 2009

EXTREME EARTH
Plates, earthquakes and volcanoes

 Maite Cózar

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WHAT ARE THE STATES OF MATTER & PROPERTIES?

Activity 1

Complete the words and tick the states of matter & properties of every object.

	Liquid	Solid	Hot	Cold	Hard	Soft
P_d_l_ck	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_ater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_ine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
__oons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
feat_ers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ora_g_ j_ice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_tone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lo__ipop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
exhaus_	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
lighte matche_	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



	Liquid	Solid	Hot	Cold	Hard	Soft
co__ee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
te__y bear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
pillo_	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m_g	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
oi_	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cro__ buns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n_ils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
fr_zen f_d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
bre_d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
sh_ving foa_	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m_reuny	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m_lk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i_e	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice cre_m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



WHAT ARE THE CHARACTERISTICS OF THE 3 LAYERS ?

Activity 2

Listen and watch the presentation. As you are listening fill in that chart with the main information.

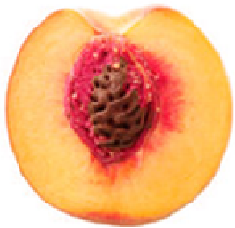
	how thick?	made of?	Properties & states?	Temperature ?
The crust				
The mantle Upper Lower				
The core Outer Inner				



COMPARE THE EARTH WITH A PEACH AND AN EGG

Activity 3

Compare the Earth with a peach. Fill the chart.



Peach

	Layers	Shape	States of matter	Temperature
Peach				
Earth				

Earth

- The peach and the Earth have both got _____ layers.

(Number)

- The peach is _____ and the Earth is _____.

(Shape)

- The peach is _____, _____ and _____. The Earth is _____, _____, _____ or _____ depending on the layer.

(States of matter)

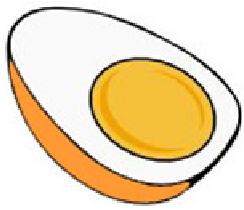
- The temperature of the peach is _____ while the temperature of the Earth gets _____ when approaching the centre. (How hot?)



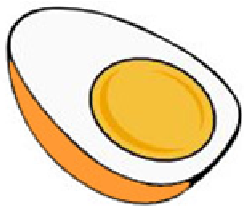
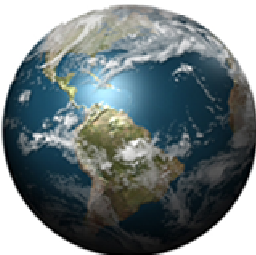
COMPARE THE EARTH WITH A PEACH AND AN EGG

Activity 4

Compare the Earth with an egg. Fill the chart and the text.



Egg

	Layers	Shape	States of matter	Temperature
				
				

Earth

- The egg and the Earth have both got _____ layers.

(Number)

- The egg is _____ and the Earth is _____.

(Shape)

- The egg is _____, _____ and _____. The Earth is _____, _____, _____ or _____ depending on the layer.

(States of matter)

- The temperature of the egg is _____ while the temperature of the Earth gets _____ when approaching the centre. (How hot?)

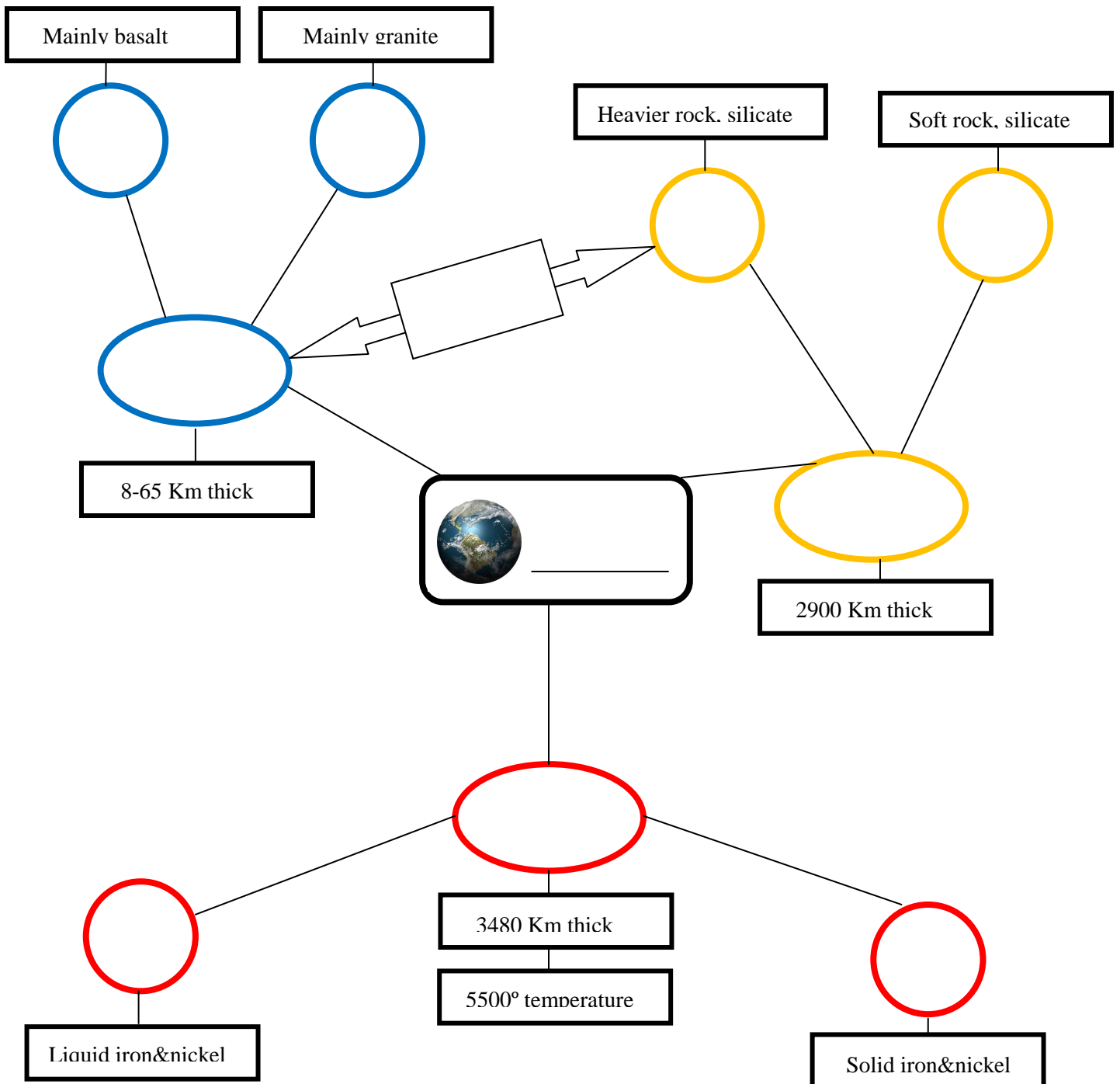


MIND MAP

Activity 5

Fill the mindmap with the words below:

The Earth, The Crust, The Mantle, The Core, Continental Crust, Oceanic Crust, upper Mantle, lower Mantle, inner Core, outer Core, Lithosphere





QUESTION TIME

Activity 6

Problem solving

- South Africa is freezing, Superman needs some magma from the centre of the Earth to warm South Africa.
- He needs to dig a hole to the inner Core.
- Superman is very fast, he can dig a hole at the speed of 500 kilometres per second.
- He's flying over the sea, 8km over the upper mantle.

How long would it take him to get to the core and come back?



©Superman & ©DC Comics



QUESTION TIME

Activity 7

Problem solving

- Shame!! Superman is saving people from an earthquake.
- Our second option is SuperBoy he's slower but he can do it!
- SuperBoy digs holes at the speed of 200 km/s.
- He's flying over the sea, 8km over the upper mantle.

How long would it take him to get to the core and come back?

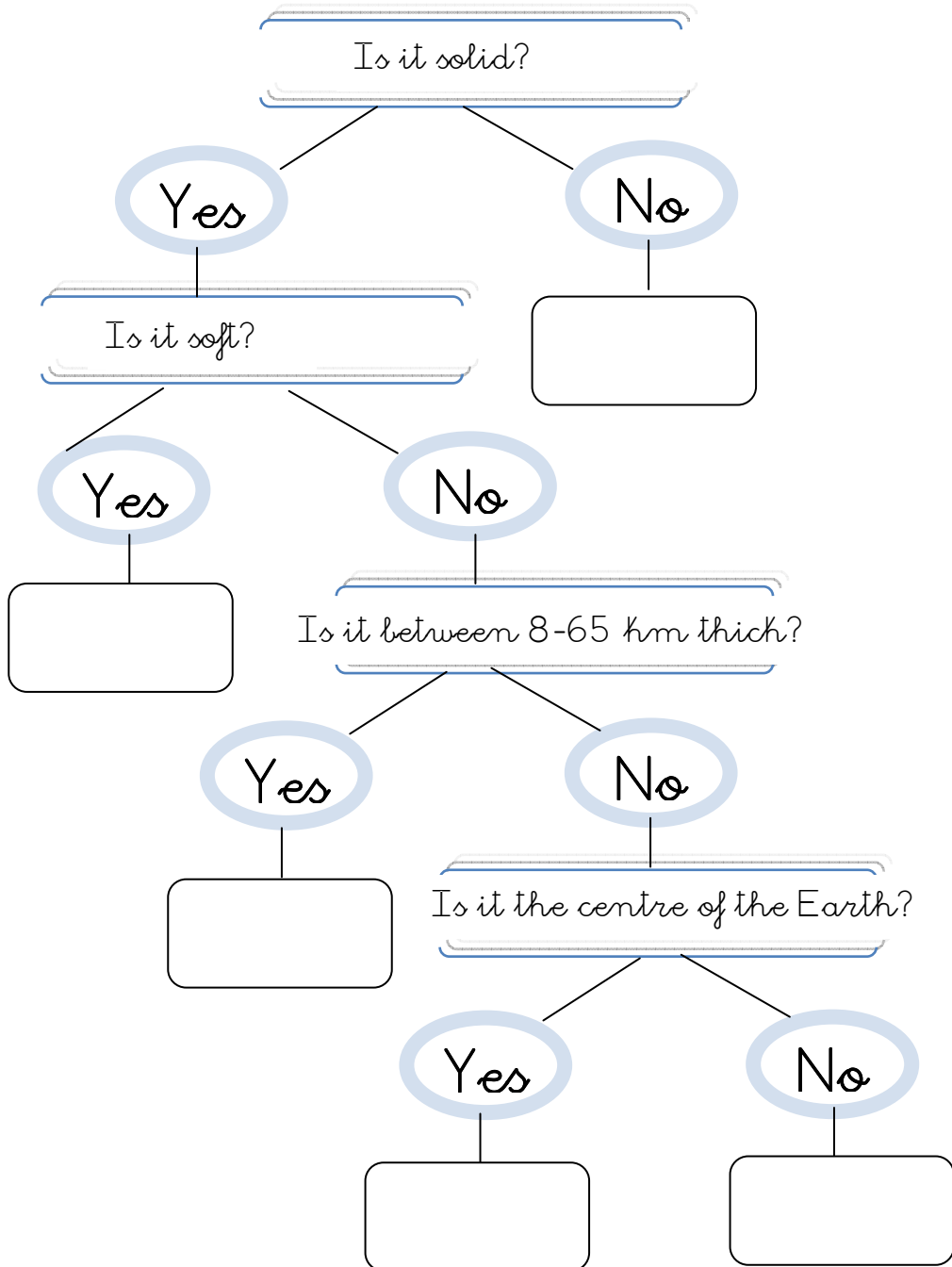




IDENTIFICATION KEY

Activity 8

Complete the identification key with the layers of the Earth.

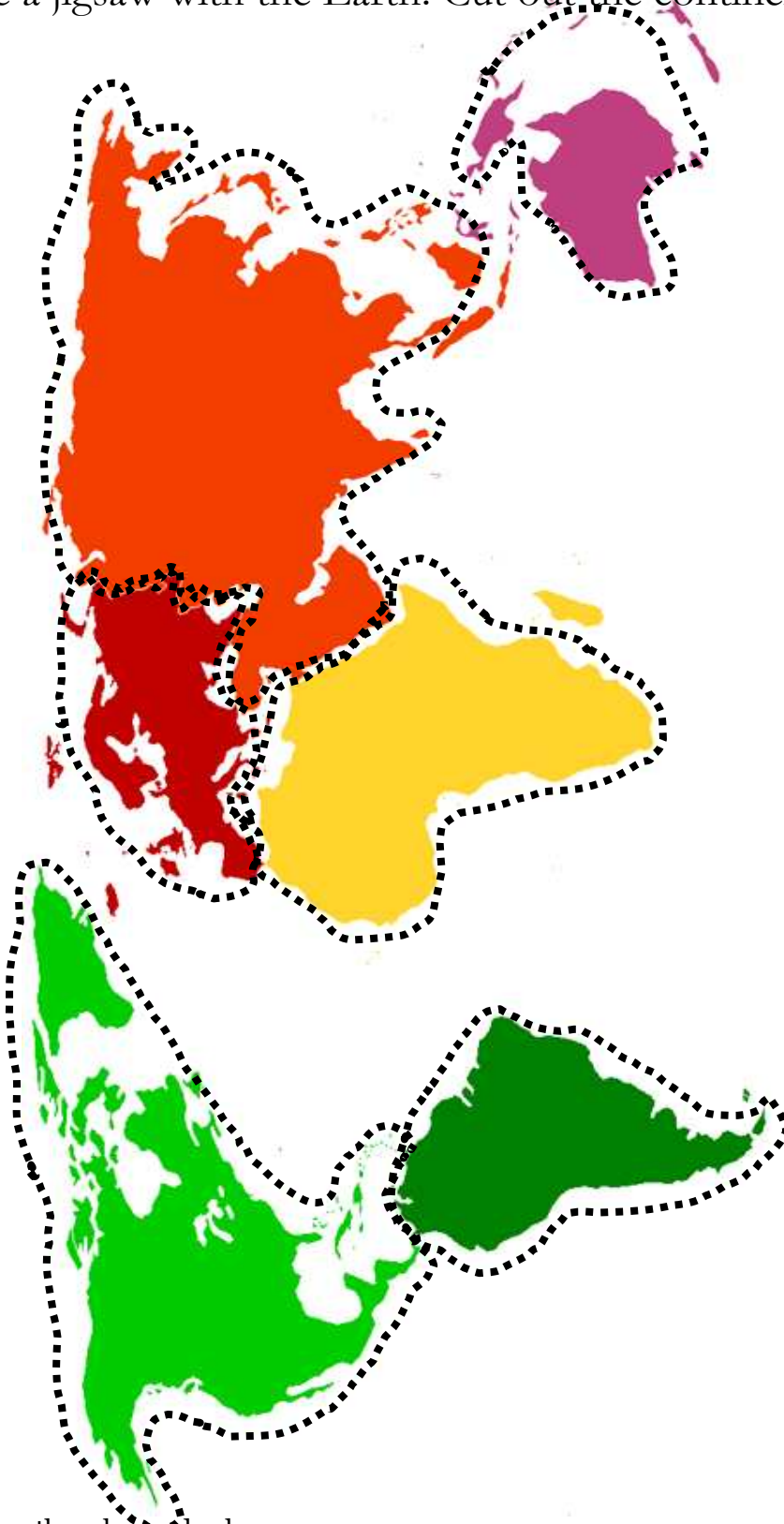




THE EARTH JIGSAW

Activity 9

Make a jigsaw with the Earth. Cut out the continents.





THE EARTH JIGSAW

Activity 9

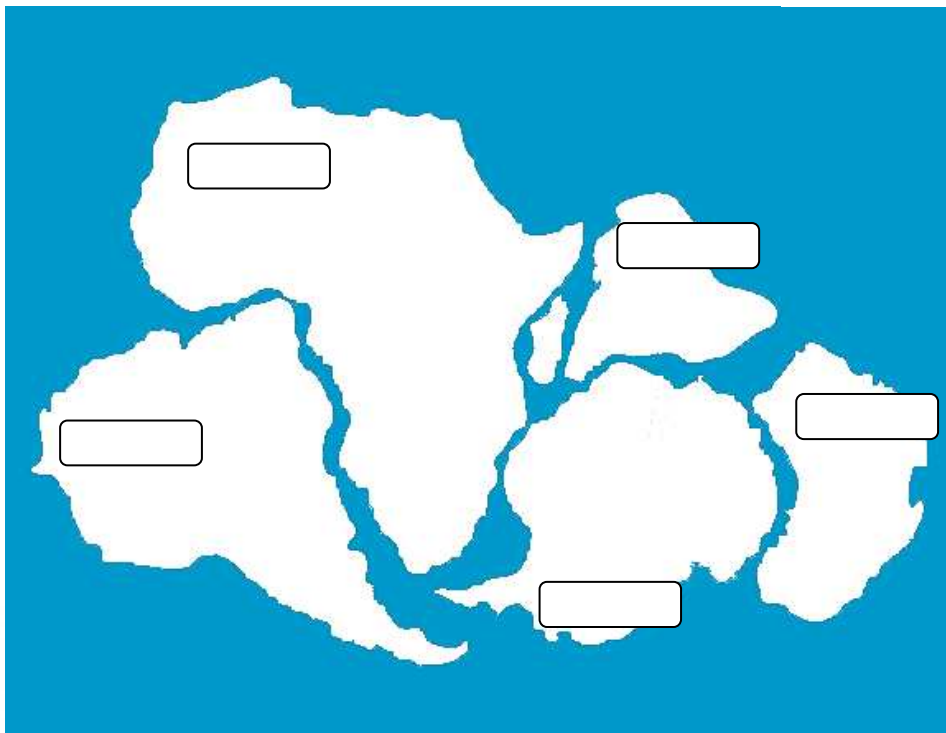
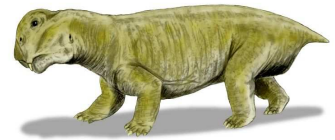
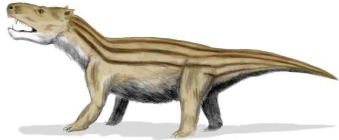
Make a jigsaw with the Earth. Paste the jigsaw here



THE FOSSILS ROLEPLAY

Activity 10

Draw a thick coloured line to show the continents where the fossil is found and label the continents.



Fill in the blanks with the words below.

**Glossopteris – Africa – India – Cynognathus – South America – Mesosaurus – Australia
Lystrosaurus – Antarctica**

We find _____ in Africa, India and Antarctica.

We find _____ in South America and Africa.

We find _____ in South America and Africa.

We find _____ in _____, _____,
_____ and _____.



DRAW THE PLATES

Activity 11

Draw and
label the
plates with
different
colours

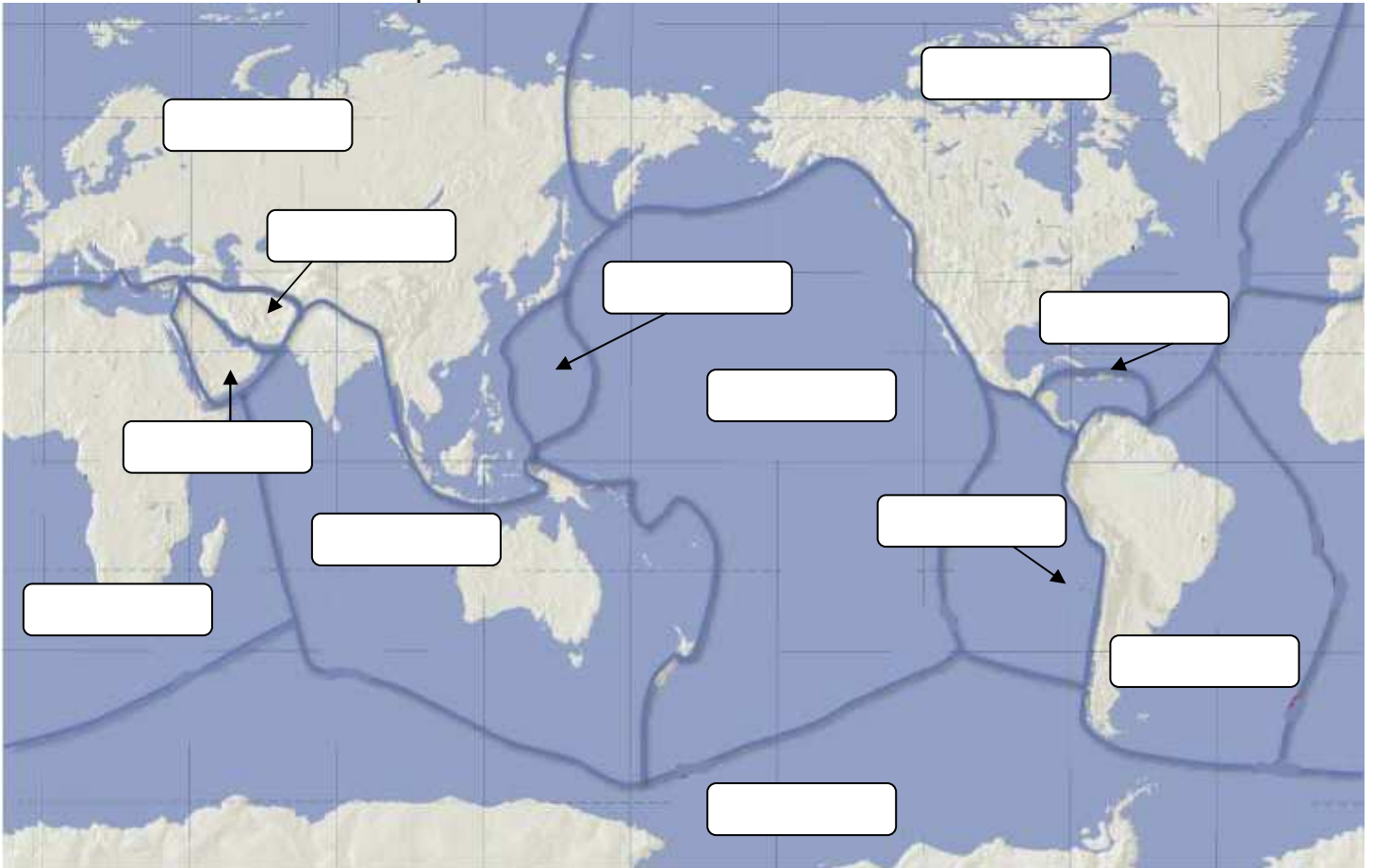




HOW MANY TECTONIC PLATES CAN YOU REMEMBER?

Activity 12

Label the tectonic plates



Fill in the blanks with the words below

Tectonic-Pacific-Antarctic-Eurasian-Iranian-Arabian-Caribbean-plates-moving-Pangea

The Earth surface is formed of _____. The plates of the Earth are _____ constantly. 175 millions of years ago the plates of the Earth were together and they formed the _____ continent. The plates of the Earth are called _____ plates. The _____, the _____ and the _____ plates are the biggest ones. The _____, the _____ and the _____ plates are the smallest ones.



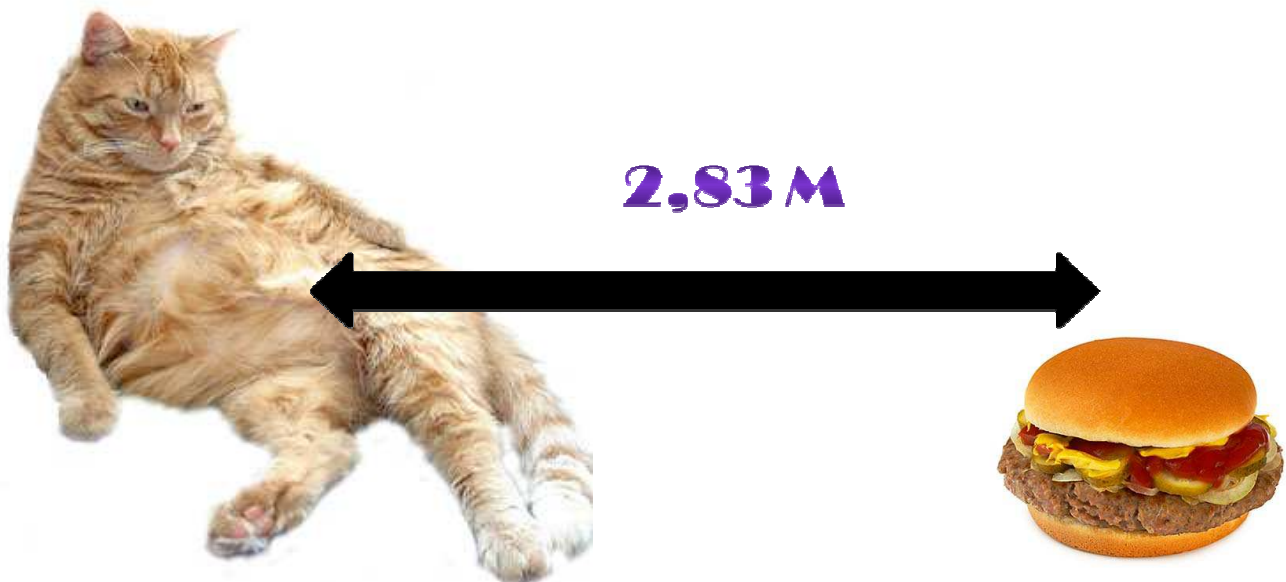
QUESTION TIME

Activity 13

Problem solving

- Belly wants to reach the hamburger taking advantage of the plates movement.
- Belly is from the United States of America. He lives on the _____ plate. His plate moves 1cm/year.
- There are 2,83m from Garfield to the hamburger.

How long would it take him to get to the hamburger?





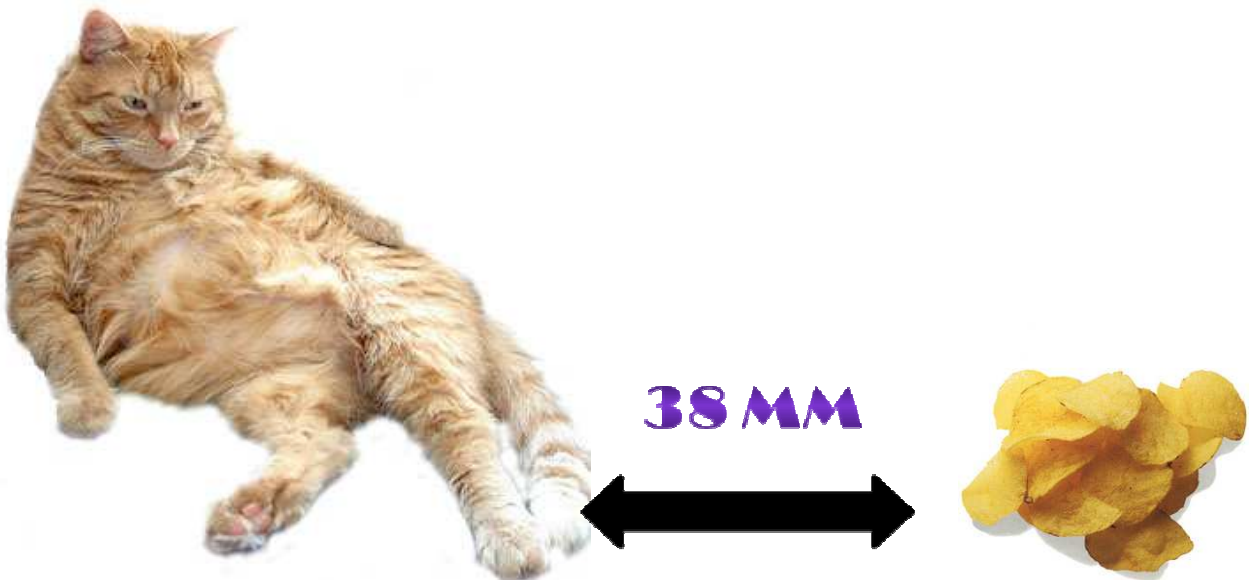
QUESTION TIME

Activity 14

Problem solving

- Belly wants to reach the crisps taking advantage of the plates movement.
- Belly is from the United states of America. He lives on the _____ plate. His plate moves 1cm/year.
- There are 38mm from Garfield to the chips.

How long would it take him to get to the crisps?





CONVECTION

Activity 15

Choose the word while you are listening to the teacher

- Light a _____ - match
- fire
- cigarette
- Put a _____ on the fire - sausage
- Guy Fawkes
- saucepan
- Fill the saucepan with _____ - spaghetti
- water
- courgettes
- Put some slices of _____ in the water - courgettes
- carrots
- watermelons
- *Do courgettes float or _____?* - sing
- fly
- sink
- Courgettes _____
- Wait for 5 minutes
- 1,2,3,4,5 minutes
- *What is happening to the water?*
- The water is _____ - boiling
- freezing
- flying
- Take the magic _____ - wand
- rabbit
- card
- Saucepan, saucepan, 1,2,3 _____, _____, disappear. - transparency
- teacher
- opacity
- *If the saucepan is not opaque, what does it look like now?*
- Now the saucepan is _____ - transparent
- blue
- magnetic
- We can see the water inside.
- *What is the water doing?*
- The water is moving up and down, up and down, up and down.
- The movement is called _____ - energy
- tecnotronic
- convection
- *What are the slices of courgettes doing?*
- The slices of courgettes are moving too with the energy of the water.





TRIOLECTATION

Activity 16

Dictate the missing words to your partners

- Light a fire
- Put a saucepan on the fire
- Fill the saucepan with water
- Put some slices of courgettes in the water
- *Do courgettes float or sink?*
- Courgettes float
- Wait for 5 minutes
- 1,2,3,4,5 minutes
- *What is happening to the water?*
- The water is _____
- Take the magic _____.
- Saucepan, saucepan, 1,2,3 _____, _____, disappear.
- *If the saucepan is not opaque, what does it look like now?*
- Now the saucepan is _____.
- We can see the water inside.
- *What is the water doing?*
- The water is moving up and down, up and down, up and down.
- The movement is called convection.
- *What are the slices of courgettes doing?*
- The slices of courgettes are moving too with the energy of the water.





TREODECTATEON

Activity 16

Dictate the missing words to your partners

- Light a fire
- Put a saucepan on the fire
- Fill the saucepan with water
- Put some slices of courgettes in the water
- *Do courgettes float or sink?*
- Courgettes float
- Wait for 5 minutes
- 1,2,3,4,5 minutes
- *What is happening to the water?*
- The water is boiling
- Take the magic wand.
- Saucepan, saucepan, 1,2,3 opacity, opacity, disappear.
- *If the saucepan is not opaque, what does it look like now?*
- Now the saucepan is transparent.
- We can see the water inside.
- *What is the water doing?*
- The water is _____ up and down, ___ and _____, _____ and _____.
- The movement is called _____.
- *What are the slices of courgettes doing?*
- The slices of courgettes are _____ too with the energy of the water





TREODECTATION

Activity 16

Dictate the missing words to your partners

- Light a _____
- Put a _____ on the fire
- Fill the saucepan with _____
- Put some slices of _____ in the water
- *Do courgettes float or _____?*
- Courgettes _____
- Wait for 5 minutes
- 1,2,3,4,5 minutes
- *What is happening to the water?*
- The water is boiling
- Take the magic wand.
- Saucepan, saucepan, 1,2,3 opacity, opacity, disappear.
- *If the saucepan is not opaque, what does it look like now?*
- Now the saucepan is transparent.
- We can see the water inside.
- *What is the water doing?*
- The water is moving up and down, up and down, up and down.
- The movement is called convection.
- *What are the slices of courgettes doing?*
- The slices of courgettes are moving too with the energy of the water.





EXPERIMENT TIME

Activity 17

Tectonic plates pushing into each other

We use Scientific methods

Materials/
Equipment

QUESTION

HYPOTHESIS

I predict that ...

OBSERVATION/
RECORDING

What happens is...

CONCLUSIONS

I was right!

I was wrong because ...

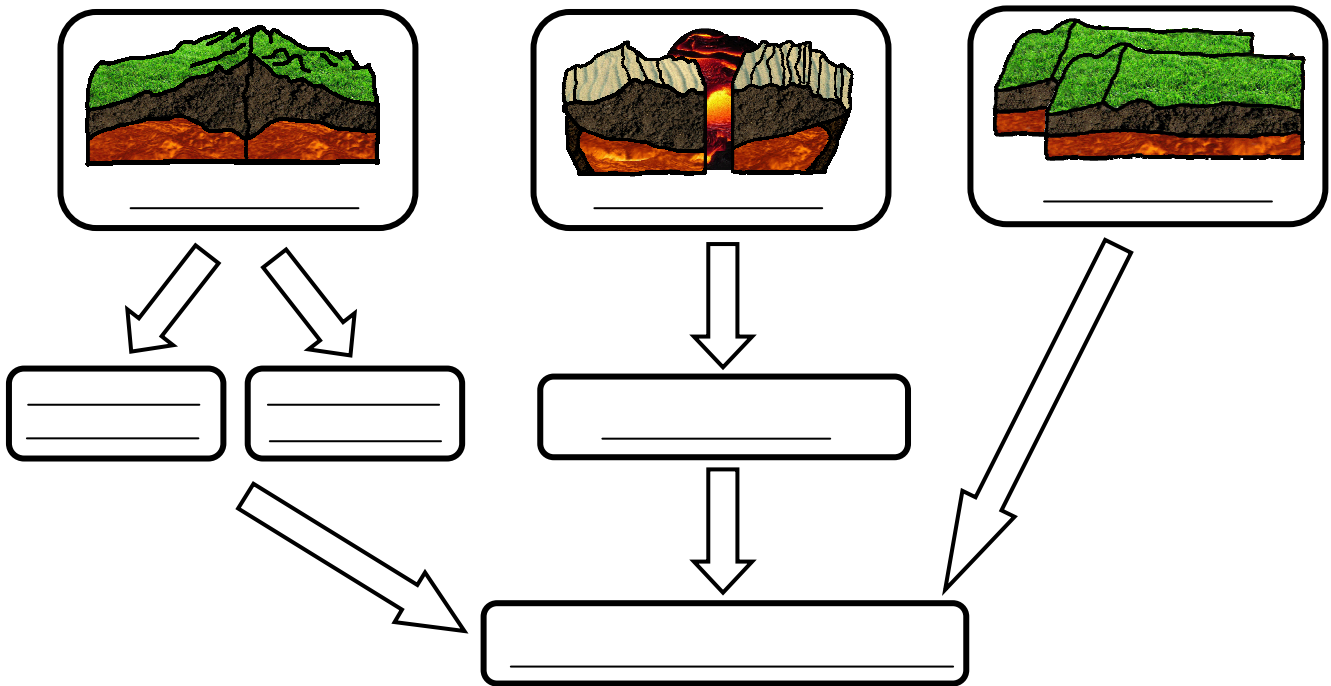


PUSHING ⇄ PULLING ⇄ SLIDING

Activity 18

Fill in the blanks with the words below

Sliding, pushing, pulling, new ocean floor, volcanoes, earthquakes, new mountains



Unscramble the words and complete the questions

push into each other
slide past each other
pull apart

- 1-What happens when Tectonic plates _____?
 - or new mountains are formed and earthquakes happen. (**ovlncoeas**)
- 2-What happens when Tectonic plates _____?
 - New floor is formed and earthquakes happen (**coean**)
- 3-What happens when Tectonic plates _____?
 - happen. (**ethrkqauaes**)



RECOUNTING

Activity 19

Fill in the rectangles



I knew that...

-
-
-

I now know that...

-
-
-

I still want to know...

-
-
-

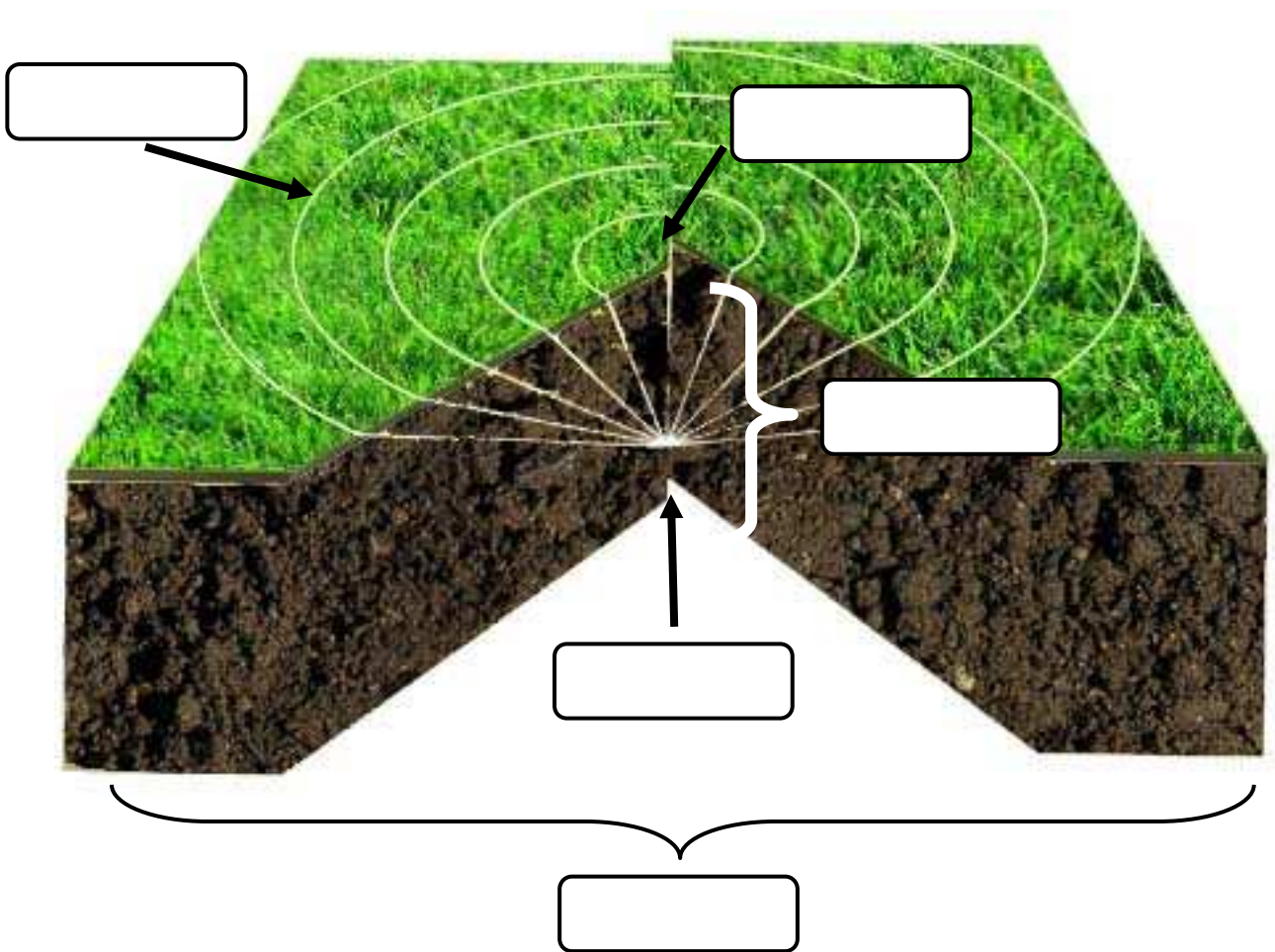


WHAT IS AN EARTHQUAKE?

Activity 20

Label the picture with the words below

Seismic waves-focus-epicentre-fault-earthquake



Order the words

(fault is crack in the Earth's crust)

(big one are small earthquakes Aftershocks after the)

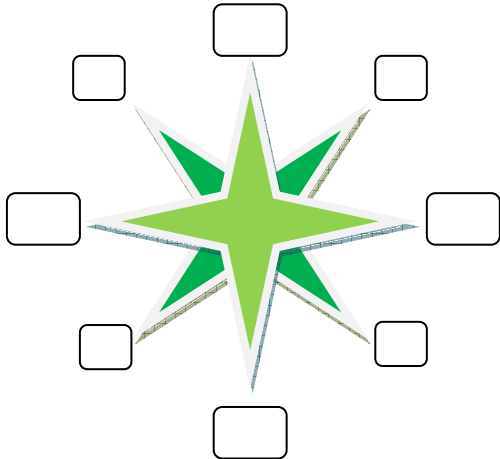


EARTHQUAKE IN _____

Activity 21

Locate the epicentre of an earthquake in Los Angeles (EUA)

FIRST FILL IN THE COMPASS ROSE



N-S-E-W-NE-NW-SE-SW

NEXT DRAW THE ARROWS ON THE MAP

- We had seismic movements in La Mirada North-South
- We had seismic movements in Huntington Beach East-West
- We had seismic movements in Corona NorthWest-SouthEast
- We had seismic movement in Anaheim NorthEast-SouthWest

FINALLY FOLLOW THE DIRECTIONS OF THE MOVEMENTS WITH LINES



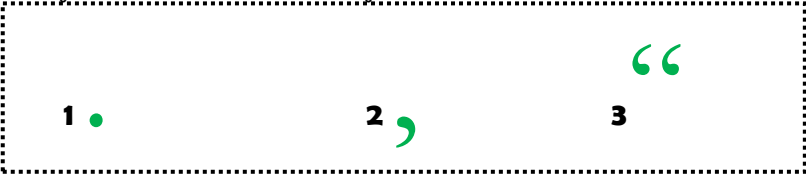


SEARCH FOR INFORMATION

Activity 22

Read the newspaper and search for the answers to the questions

- 1 Where is Tilly from?
 - 2 How many tourists did Tilly save?
 - 3 How did Tilly know there was a tsunami happening?
 - 4 When did Thai people light lamps to remember the catastrophe?
- 1 a year before the tsunami 2 one year after the tsunami 3 3 days after the tsunami
- 5 What sign is used in English to show thousands with numbers?



- 6 What did Tilly do at the tribute?
 - 7 Patiwat is a schoolboy who survived the tsunami floating on a raft for two days. What do you think a raft is?
- 1 a boat 2 a tree 3 any flat structure that floats on water
- 8 How could you say "you are very brave" if you couldn't speak Patiwat's language?
- 1 drawing 2 miming 3 singing

- 9 Could Patiwat speak English?
- 10 Tilly's teacher showed the class a video of a 1946 tsunami in Hawaii. Why do you think tsunamis happen in Hawaii?

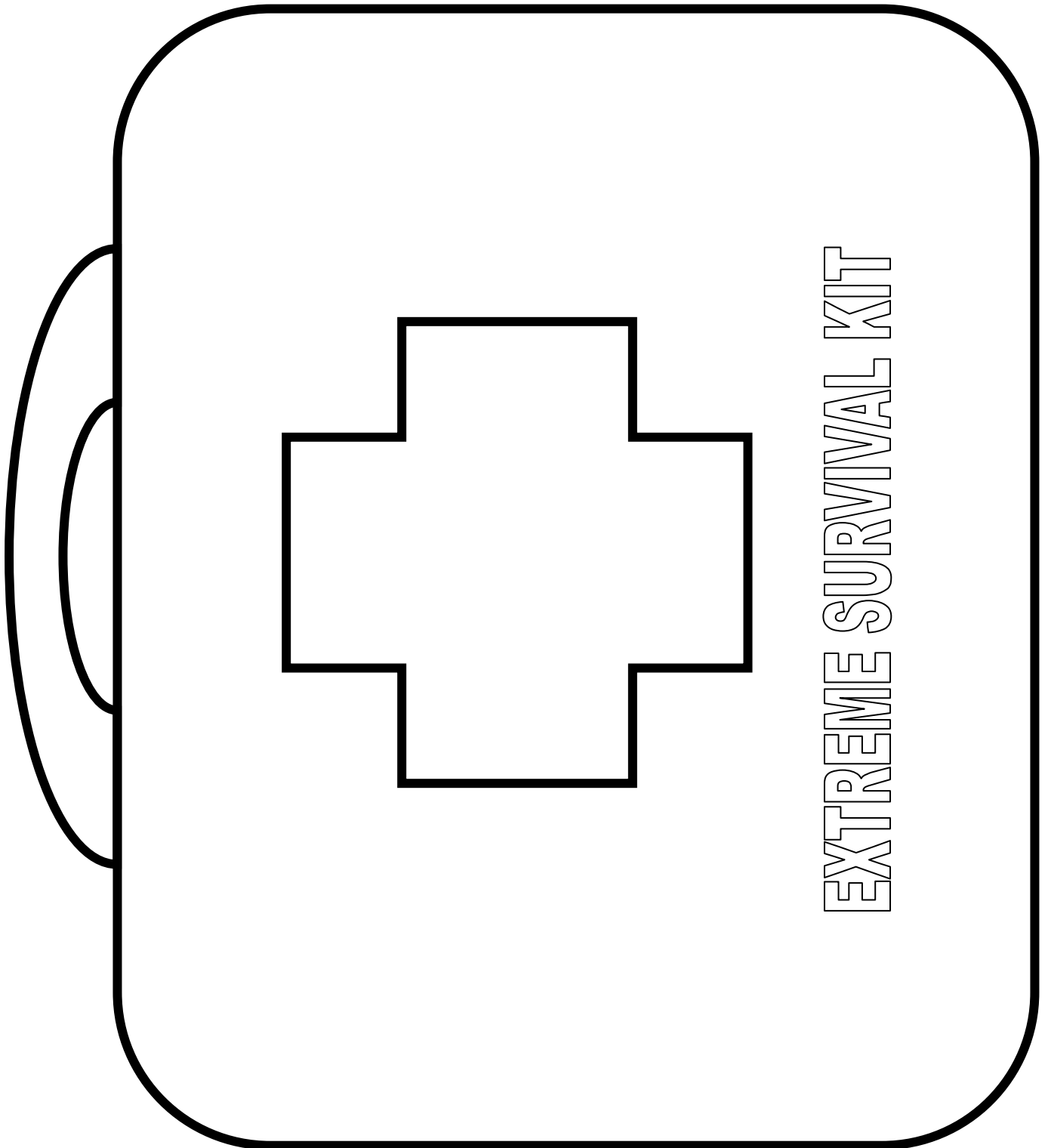




EXTREME SURVIVAL KIT

Activity 23

Start the Extreme Survival Kit. Colour the red cross to make it easy to recognize





EXTREME SURVIVAL KIT

Activity 23

Follow the Extreme Survival Kit with facts about tsunamis

Tsunamis

How to react

How to recognize



EXPERIMENT TIME

Activity 24 The seismoscope

We use Scientific methods

Materials/
Equipment

QUESTION

HYPOTHESIS

I predict that ...

OBSERVATION/
RECORDING

What happens is...

CONCLUSIONS

I was right!

I was wrong because ...



THE MERCALLI SCALE

Activity 25

Match the descriptions with the intensity



INTENSITY I



INTENSITY II



INTENSITY III



INTENSITY IV



INTENSITY V



INTENSITY VI

Only felt by instruments

It's difficult to stand up and bricks crack

People at rest feel it

Chimneys fall

General panic, animals run in confusion and there is a general damage in buildings

Most buildings destroyed

Hanging objects swing

Dishes rattle

Ground with large cracks


People are frightened and pictures fall off walls

Liquids in glasses slop out

Almost everything destroyed, rivers courses move and there are waves on ground surface.




INTENSITY VII



INTENSITY VIII



INTENSITY IX



INTENSITY X



INTENSITY XI



INTENSITY XII



EXTREME SURVIVAL KIT

Activity 26

Follow the Extreme Survival Kit with facts about earthquakes

Earthquakes

Dont's

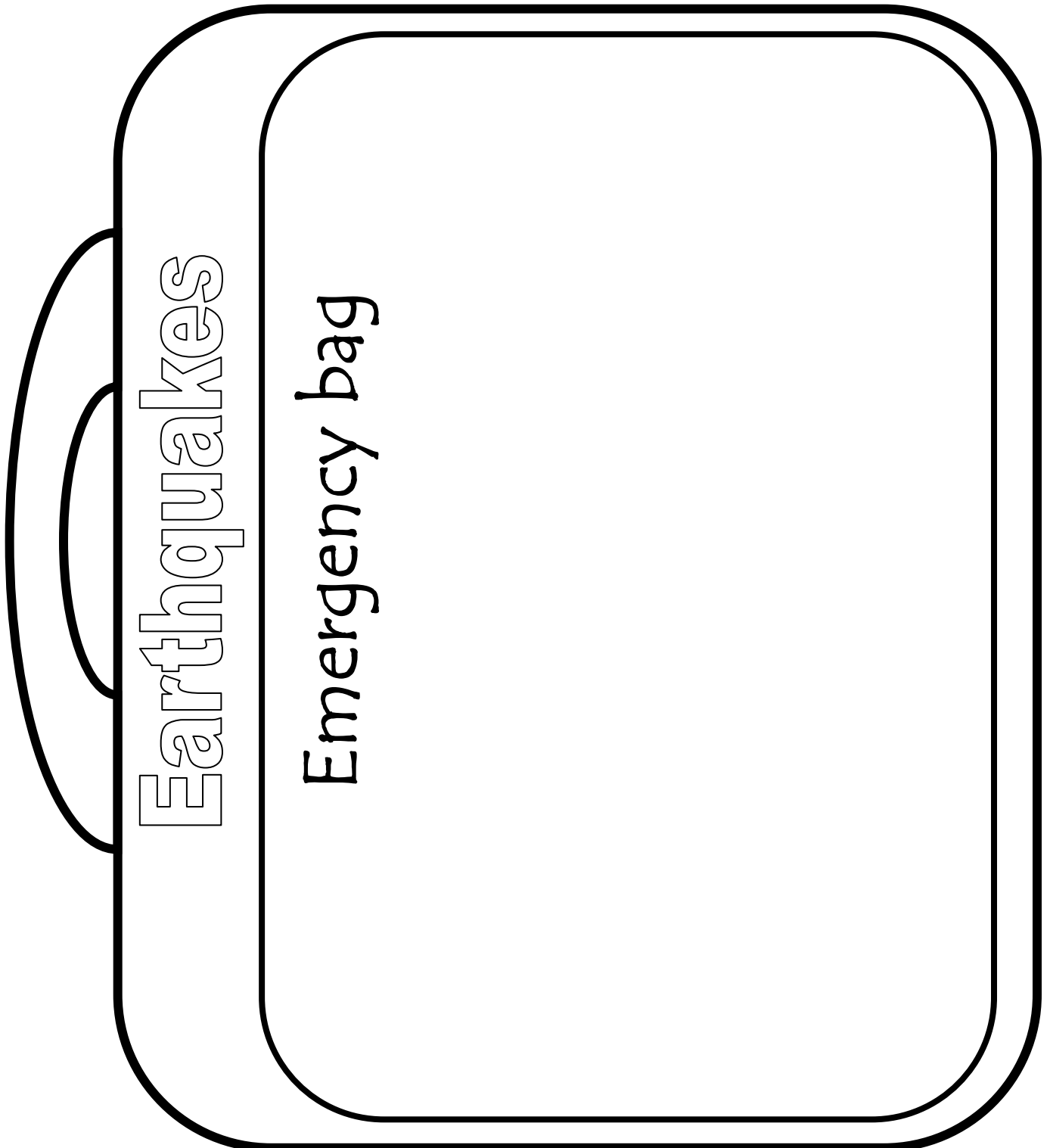
Do's



EXTREME SURVIVAL KIT

Activity 27

Follow the Extreme Survival Kit with facts about earthquakes





EXTREME SURVIVAL KIT

Activity 28

Follow the Extreme Survival Kit with facts about earthquakes

Earthquakes

How to respond

How to recognize



EXTREME VOLCANO MINIBOOK

Activity 29

Make the minibook and complete it.

--- Cut
 _____ Fold

The opening of the cone is a _____.

The hollow around is the _____.

Volcanic _____.

Pyroclastic flows are devastating.

Magma forms a tube called _____.

BY

Melted rock inside the mantle is _____.

Melted rock outside is _____.

EXTREME VOLCANO MINIBOOK

A volcano is melted _____ coming through the ground.



EXPERIMENT TIME

Activity 30

What is a caldera?

We use Scientific methods

Materials/
Equipment

QUESTION

HYPOTHESIS

I predict that ...

OBSERVATION/
RECORDING

What happens is...

CONCLUSIONS

I was right!

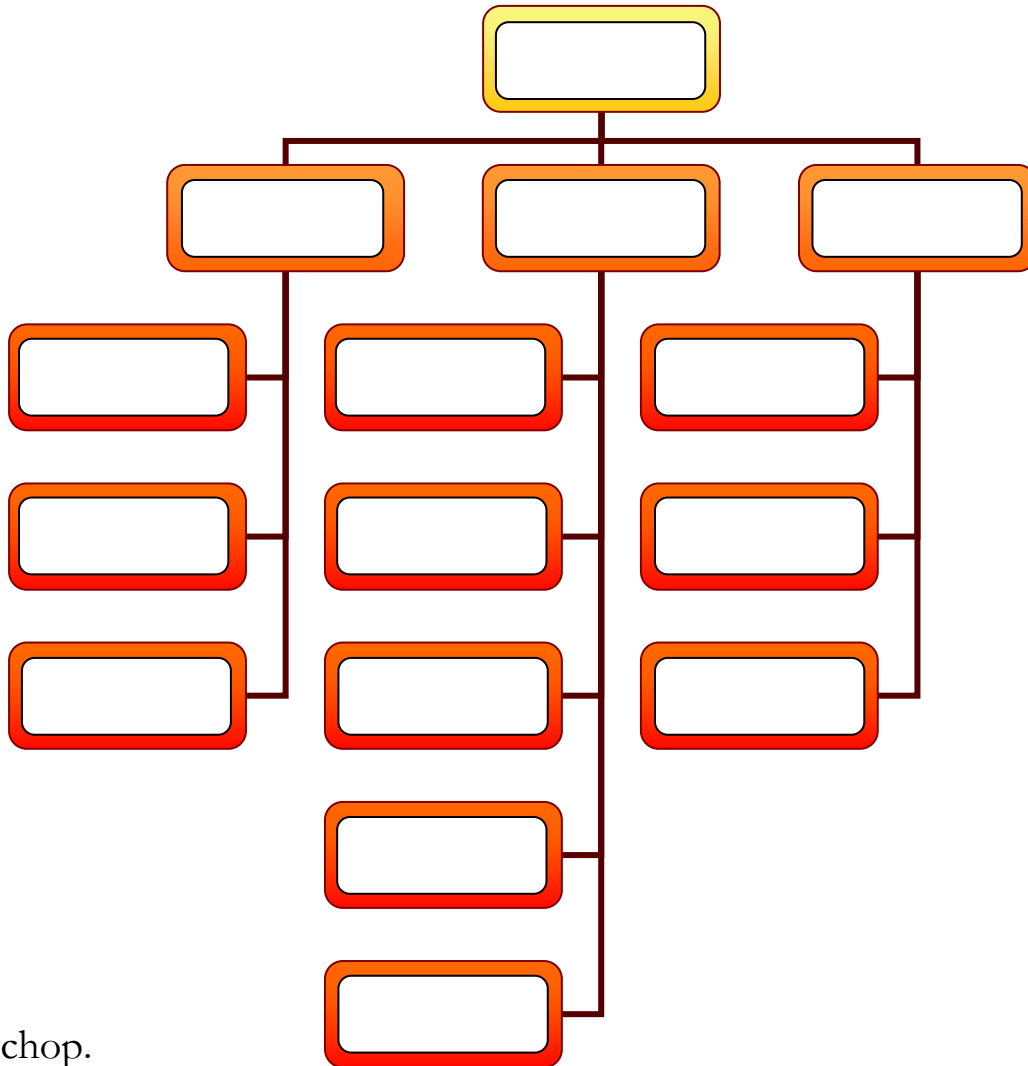
I was wrong because ...



VOLCANOES TREE DIAGRAM

Activity 31

Complete the volcanoes tree diagram. Write examples.



Wordchop.

Vol-	Cham-	Pres-	Mag-	Pi-
Co-	Ve-	-pe	-sure	-nt
-ma	Cra-	-cano	-ber	-h
-pe	As-	Erup-	La-	-ter
-tion	Pyro-	-va	Volca-	-clastic
-nologist	Hawa-	Mant-	-ian	-le



EXPERIMENT TIME

Activity 32

What is a geyser?

We use Scientific methods

Materials/
Equipment

QUESTION

HYPOTHESIS

I predict that ...

OBSERVATION/
RECORDING

What happens is...

CONCLUSIONS

I was right!

I was wrong because ...



LET'S TRAVEL THE WORLD!

Activity 33

Travel the world, Mars and the Moon with Google Earth.

The Continents.

The Tectonic plates, the boundaries and the oceanic spine in the Atlantic Ocean.

The Ring of fire, specially in Indonesia. Notice how many volcanoes you can see there.

Fernandina and the rest of the Galapagos Islands, Ecuador. See the Caldera in Fernandina.

Geysers in Mivatn, Iceland.

Old Faithful in Yellowstone park, the USA.

The Timanfaya in the Canary Islands, Spain. See the steam vents there.

See hot springs in Jigokudoni, Japan.

See bubbling mud in El Rincón de la Vieja, Costa Rica.

The volcanoes on the activity 31.

Tymocharis on the moon and Olympus Mons on Mars.

My idea!





EXTREME SURVIVAL KIT

Activity 34

Follow the Extreme Survival Kit with facts about volcanoes

Volcanoes

How to respond

How to recognize

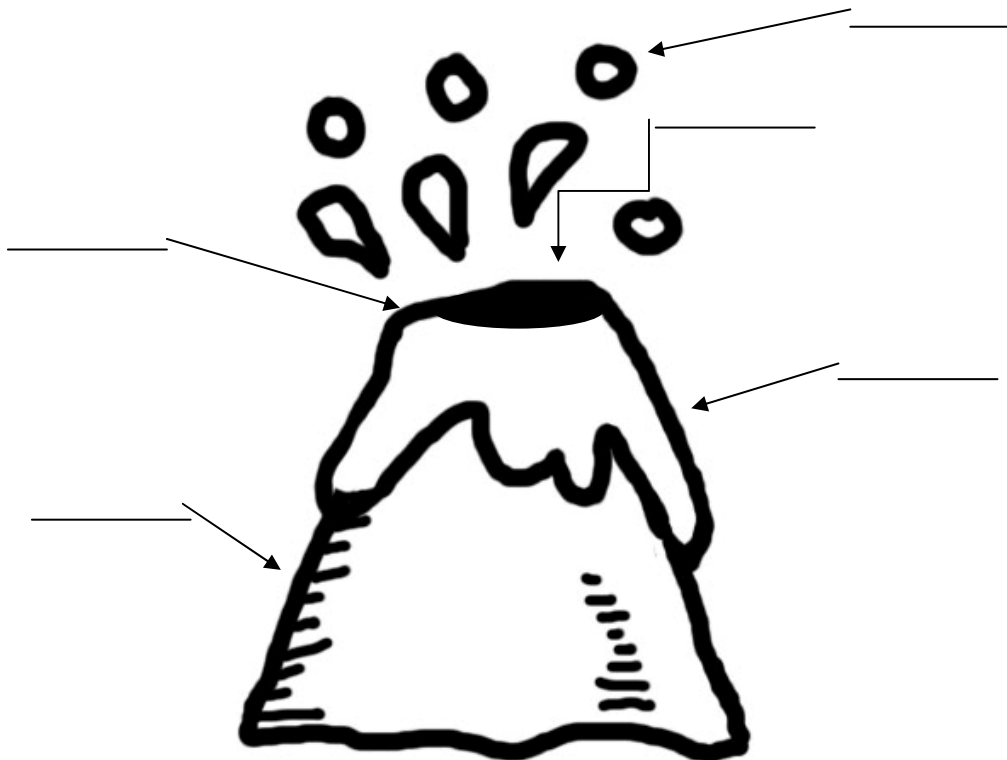


VOLCANO

Activity 35

Label the volcano with the words below:

volcanic cone, crater, magma, ash clouds, vent



Draw and label:

a magma chamber, a pipe and a pyroclastic flow.