Year 8 – Geology – Revision Exercise Name: _____

You are required to know the followings:
1. The Structure and composition of the Earth
2. Differences between minerals and Rocks
3. Formation and structure of a Volcano
4. Formation of Igneous Rocks
5. Weathering and Erosion of Rocks
6. Formation of Sedimentary Rocks
7. Formation of Fossils
8. Formation of Metamorphic Rocks
9. Diagrammatic representation of the Rock Cycle

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1. Mineralogy, Petrology, Geology, Palaeontology

   a. _____ is the study of the Earth, its history, structure, composition and physical properties.

   b. _____ is the study of Rocks, its origin, formation, and mineral composition.

   c. _____ is the study of Fossil, its age, formation and distribution.

   d. _____ is the study of Minerals, their formation, crystal structures, properties.

2. What are the differences between Geology and Petrology?

   _____

   _____

3. What are the differences between Rocks and Minerals?

   _____

   _____

4. What are ores? Give a common ore for iron, and copper.

   _____

   _____

5. What are native minerals? Give two examples.

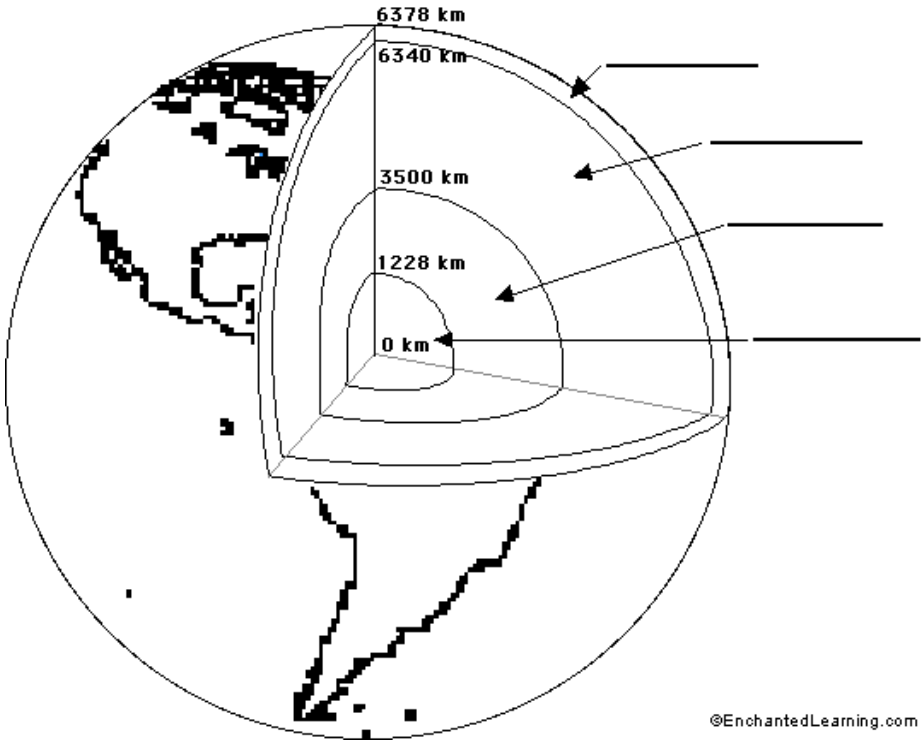
   _____

6. Give 3 special characteristics of minerals.

   _____

7. *Structure of the Earth*

Label the Earth with the following words: Outer core, crust, mantle, inner core



More about the Crust:

- Crust is from 0-100km thick.
- Continental crust – mountains and landscape; mainly made of granite
- Oceanic crust – the ocean floor; mainly made of Basalt
- The lithosphere - from the Greek for "rocky" sphere) is the solid outermost shell of a rocky planet.
- On the Earth, the lithosphere includes the crust and the uppermost mantle.
- The lithosphere is actually fractured millions year ago; forming more than 10 huge tectonic plates.

a. What is the diameter of the Earth?

_____

b. What is magma, where can you find it?

_____

c. How thick is the mantle?

_____

d. What is the main composition of the core?

_____

e. Why outer core is liquid and inner core is solid?

_____

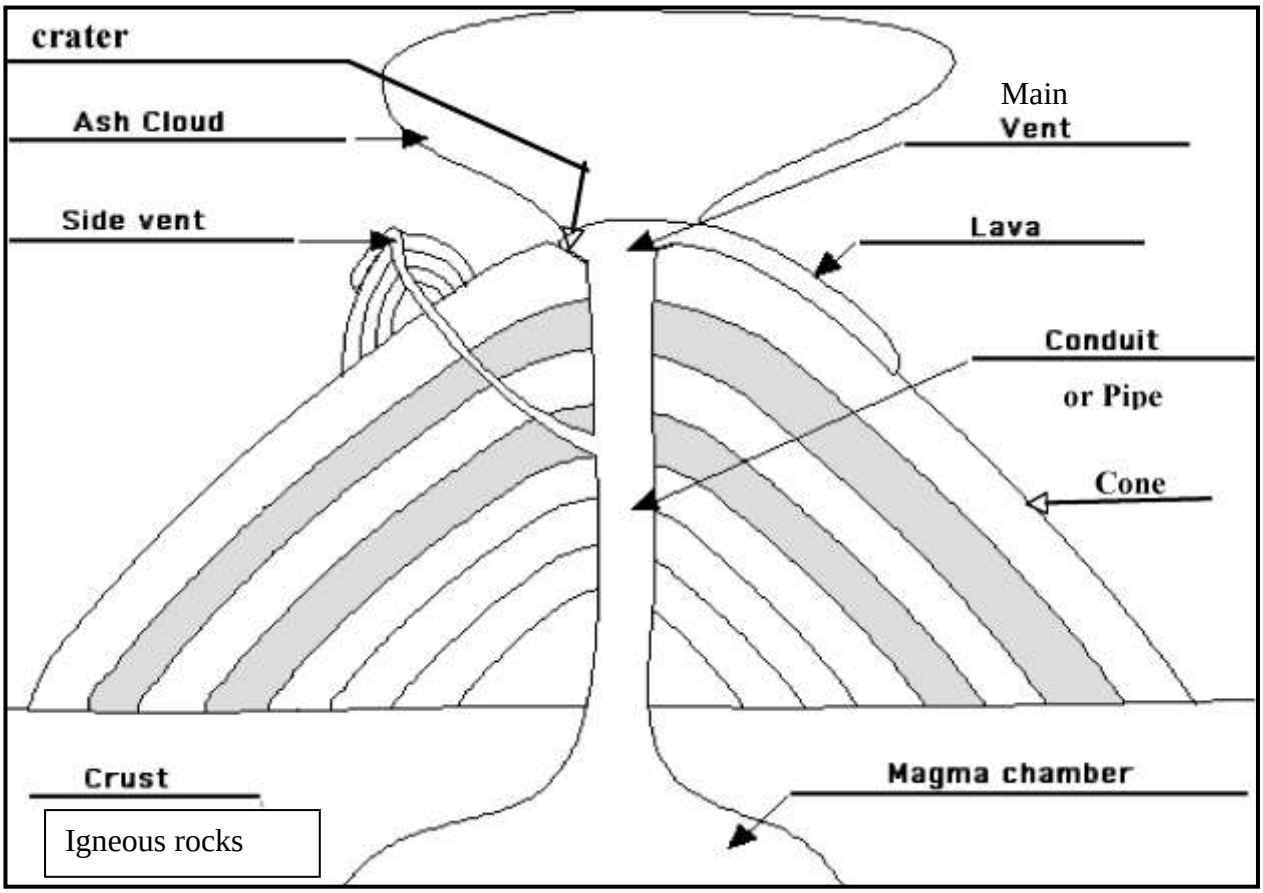
_____

f. The Earth crust is in fact made up of more than 10 giant plates, they are always in motion. What makes this to occur?

_____

8. *Structure of a Volcano*

Facts: There are 600 Active Volcanoes in the World; but no active or dormant ones in Australia !



a. A volcano constitutes a vent, a pipe, a crater, and a cone.

b. Molten rock (magma) is found in the _____ within the _____.

c. The _____ is an opening at the Earth's surface

d. The _____ (or conduit) is a passageway in the volcano in which the magma rises through to the surface during an eruption.

e. The _____is a bowl-shaped depression at the top of the volcano where volcanic materials like, ash, lava and gases are released.

f. Solidified lava, and ashes form the _____. Layers of _____, alternate with layers of ash to build the steep sided cone higher and higher.

g. _____ is the same as magma except it is found out the earth surface.

h. When magma and lava are cooled, they solidified into _____ rocks.

i. There are 4 main types of Volcanoes:

   i. An <u>active volcano</u> is a volcano that has had at least one eruption during the past 10,000 years. An active volcano might be erupting or dormant.

   ii. An <u>erupting volcano</u> is an active volcano that is having an eruption...

   iii. A <u>dormant volcano</u> is an active volcano that is not erupting, but supposed to erupt again.

   iv. An <u>extinct volcano</u> has not had an eruption for at least 10,000 years and

is not expected to erupt again in the future. Australia only has this type.

9. *Igneous Rocks*

Words: crystals, much larger, granite, magma, rocks, lava, fire, mineral, basalt, deep inside

a. All _____ on Earth were initially igneous in nature.
b. Igneous came from the word "Ignis" which means _____
c. Igneous rocks form as liquid _____ or _____ cools, forming crystal-structured rocks.
d. There are many different types of igneous rocks depending on where they are formed and their _____ composition.
e. Intrusive rocks - Igneous rocks that form _____ the Earth's crust with very high temperatures, might take thousands of years to cool down. This causes the crystals to be _____, such as in the case of granite.
f. Extrusive rocks – Igneous rocks formed on the surface cool down in just a matter of a few hours. The _____ in these rocks can be microscopically small or even none.
g. Identify these Igneous rocks: obsidian glassy rock; granite with coarse crystals; basalt with microscopic crystals; scoria without crystal but lots of air pores.

h. Continental crust is mainly made up of _____ (slow cooling with large crystals) and Oceanic crust is mainly made up of _____ (fast cooling with small crystals).

i. Suggest the formation of Scoria

_____

10. *Weathering and Erosion*

Words: temperature, sedimentary, chemical, breakdown, lichens, freeze, expand, crack. plants

a. They are important for the formation of _____ rocks

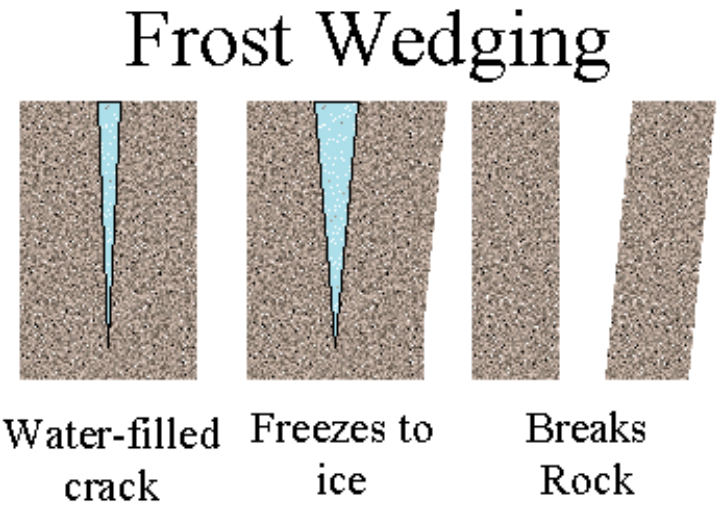
b. Weathering is the _____of solid rock on the earth's surface, producing loose debris and soil particles.

c. Weathering can be caused by physical, chemical and/or biological means.

d. Physical or mechanical weathering is caused by atmospherically controlled processes such as _____ or humidity changes.

e. The cool nights and hot days always cause things to _____ and contract. That movement can cause rocks easy to _____ and break apart.

f. The freeze-thaw process (frost wedging) occurs when the water inside of rocks _____ and expands. That expansion cracks the rocks from the inside and eventually breaks them apart.



g. _____
weathering is caused by decomposition of rocks by chemicals such as acids. This includes the effects of acid rain on limestones, or the decomposition of granite to clay. Oxidation of chemicals in rocks made them softer.

h. Biological weathering would include the effect of animals and _____ on the landscape. Roots and plants also push into the rocks and break them apart. They act like wedges and push the rocks apart. Little animals also help by burrowing and digging through the ground.

i. _____ (combinations of fungi and algae) which live on rocks secrete chemicals which can break down rocks.

11. *Formation of Sedimentary Rocks*

Words: pressure from sediment above, limestone, minerals in water, coal, conglomerate, sandstone, claystone, shale. Mudstone.

a. Erosion is the movement of rocks and/or weathering products by water, wind, ice or gravity down the slope and also by living organisms.
b. What is the difference between weathering and erosion?

_____

_____

c. The broken rock fragments and debris are moved away from the parent rocks and transported and deposited by wind, water, and glaciers to lakes and oceans.

d. They form sediment that accumulates with time (thousands of years) it becomes compacted and cemented eventually forming sedimentary rock. This process is known as Lithification.
e. Use the above information, use your own words to define "**lithification**"

_____

f. How does sediment being compacted and cemented?

_____

_____

g. Dead living things may be trapped in the sediment and eventually form _____.
h. Arrange the following processes in the formation of Sedimentary Rocks Transportation, Weathering, Lithification. Deposition, Erosion, Parent Rocks

i. Characteristics of Sedimentary Rocks: With layers; Relatively soft compared to other rock types; May have fossils, Mostly brown to gray.
j. Sedimentary rocks formed deep in the ocean but they can be uplifted and exposed and become weathered and eroded away after millions of years.

k. Examples of Sedimentary Rocks:

_____

l. _____ is a sedimentary rock consisting mainly of calcium carbonate that was deposited by the remains of marine animals. You may find some shells in the limestone

m. _____ is a fossil fuel created from the remains of plants that lived and died about 100 to 400 million years ago when parts of the earth were covered with huge swampy forests.

12. *Metamorphic Rocks*

Words: sedimentary, pressure, uplifting, Limestone, different, heat, change. Slate, layers

a. The word Metamorphic means "_____" .

b. Metamorphic rocks form deep within the Earth Crust, when _____and pressure are applied to either igneous rocks, or sedimentary rocks. The process is known as Metamorphism.

c. This high heat, and extreme pressure in essence cooks the rocks, changing their structure substantially.

d. The rocks are partially melted, and the chemicals within them are rearranged, so that the final rock is very _____ than the original rock. These might have taken many thousands of years to happen.

Quartzite (bending)

e. They are the hardest rocks due to the high _____ .

f. They have _____ of light and dark minerals, often curved or bent.

g. Metamorphic rocks can be exposed to the Earth surface by erosion and _____ of the rocks.

Schist

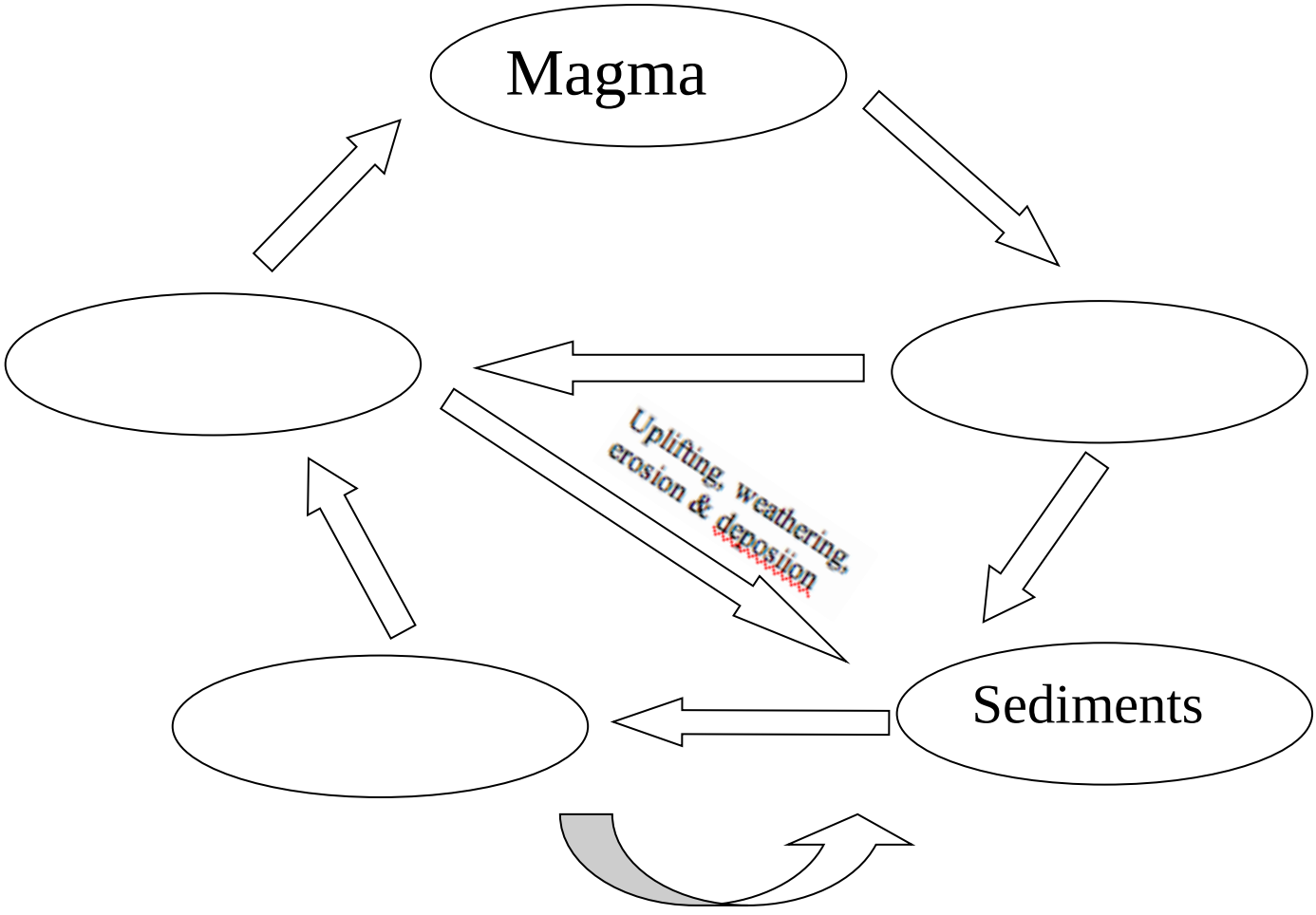
h. Examples of common Metamorphic rocks

`Original rock	Type	Final Metamorphic rock
	Sedimentary	Marble
Shale	Sedimentary	
Basalt	Igneous	Schist
Granite	Igneous	Gneiss
Sandstone		Quartzite

13. *Rock cycle*

Label the diagram with the following Words:

Metamorphic Rock	Melting due to high temperature	Cooling and Crystallisation	Weathering, Erosion and Deposition
Sedimentary Rock	Metamorphism by heat and pressure	Igneous Rock	Lithification (Compaction and Cementation)



Uplifting, weathering,
erosion & deposiion

a. Igneous rocks are formed from the cooling and crystallisation of _____.
b. Igneous rocks can undergo _____ and _____ and eventually form _____ under water.
c. _____: a process to convert sediments to rock, normally temperature and pressure are important.

d. Metamorphic rock: previously formed rock undergoes recrystallisation or structural rearrangement through _____ as a result of high _____ and extreme _____ .
e. Metamorphic and Sedimentary rocks can be exposed to the surface through _____ . The Cycle repeats – one rock becomes another rock.