Part into either igneous, metamorphic or sedimentary rocks.

PART 1: The EarthPART 2: The History Of Theories

(A)(SOURCE 1) http://content. blackgold. ca/ict/Division4/Science/Div.

%204/changingearth/images/rock_cycle_800x609. jpg The illustration above is on the rock cycle diagram.

The counter clockwise arrows show the development of the rock cycle. First, igneous rock forms from magma; the rock is uplifted, weathered, and eroded on the earth’s surface, forming sedimentary rocks.

The sedimentary rocks are buried within the earth’s crust.

That’s where pressure and temperature change the sedimentary rocks into metamorphic rock. Some metamorphic rock melt, starting the cycle again.

Essentially, any rock type can be melted, weathered, or metamorphosed to make any other rock type. Rocks can be re-made into the same type of rock, for instance, a metamorphic rock can be metamorphosed. The method in which rocks are formed is dynamic and complex. The rocks are made of minerals and are formed into either igneous, metamorphic or sedimentary rocks.

Igneous rocks are moulded when rocks are melted and cooled. Magma slowly cools inside the earth’s crust and the upper mantle, which is also known as the lithosphere, forming granite-like rocks.

Magma that cools quickly is erupted onto the surface of the earth; and this is how volcanic rocks are formed. Whereas igneous rocks are made when the earth’s plate boundaries diverge, move apart. When lava rises, it fills the gap in between the plates, building part of the earth’s crust. Igneous rocks are formed when plate boundaries converge too. The subducting plate boundary

melts as it sinks into the earth’s crust. The melt rises and overlies the plate boundary forming volcanoes. Minerals in each type of rock help identify and name the rock.

The rock’s texture and size, etc, are used in identification. Where there is high temperature and pressure, the lithosphere forms. If the pressure and temperature of the lithosphere is high, metamorphic rocks will melt and turn in to magma.

There are a lot of metamorphic rocks at convergent plate boundaries, but can also be formed in areas where there is high temperature and pressure. Sedimentary rocks are formed on the surface of the earth. These rocks are formed in 2 different ways: 1)Formed by pieces of rocks or skeleton fragments, which are then cemented together to form layers.

2)Chemical mechanisms such as precipitation and evaporation.
There are various settings associated with the formation of sedimentary rocks; these can include oceans, lakes, deserts and glaciers.
These rocks form at all types of plate boundaries of the earth, the thickest sedimentary rock build-up at convergent plate boundaries.
The rock cycle is strongly linked with the cycle of plate tectonics, in that most rocks form at the earth’s plate boundaries. The divergent and convergent plate boundaries are known for being the main setting where igneous and metamorphic rocks are mostly formed. Sedimentary rocks can form anywhere on the surface of the earth, the thickest build-up layers are linked to the convergent plate boundaries, where volcanoes and mountain

ranges form. Sedimentary rocks cover most of the ocean floor, and are associated with fossils.

(SOURCE 2) https://sciencing. com/plate-tectonics-affect-rock-cycle-5410576. html Geologists researched that when the earth was forming, the heat in the inner core was radioactive, and minerals were trapped as the earth formed. Eventually, theses minerals released heat as the radioactive atoms decayed. The earth's inner core is well insulated by the overlying rock, from where the heat could not escape which meant the temperature increased in order for the rock to melt.

Once the rocks have melted, parts of the metal has already flowed towards the centre of the earth. The low-density minerals float towards the earth's surface, and this is how they solidify into the earth's crust.
(SOURCE 3) https://www. wired. com/2012/12/why-do-rocks-melt-volcano/ (B)THEORY OF CONTINENTAL DRIFT
The first ever realistic maps of Europe and America were drawn in the 1600's. Since then, many people have doubted about the jigsaw puzzle fit of the Atlantic coastlines of South America and Africa. In 1912, Alfred Wegener, a German scientist, published a theory to explain the jigsaw fit in a book titled " The Genesis of the Continents and the Oceans". Wegner specified that all the continents were once joined.

The map (?) shows the linked continents Wegener called Pangaea, (all the land) in Greek. Wegener supposed that Pangaea began breaking up and drifting apart many millions of years ago. He claimed that the jigsaw fit of the continents was not an

accident, but the result of the splitting of Pangaea.

He supposed that the continents slowly drifted over the ocean floor until they reached their positions present today.

EVIDENCE FOR CONTENTAL DRIFT Animal's fossils were discovered in South America and Africa. Wegner was convinced by the finding of fossils, that the continents were once linked, connected.

Explorers and scientists found rocks that were made from glacial sediments at the equator, but this interfered with the theory, because glacial sediments at the equator, no glaciers exist.

Wegner believed that the land mass drifted to a warmer region of the earth.

Wegener's evidence was thought-provoking, but it did not prove that continents moved.

Scientists rejected Wegner's theory because he could not explain why or how the continents moved. PLATE TECTONIC THEORY The earth's crust is split into 13 major and approximately 20 total lithospheric plates.

Each lithospheric plate is composed of a layer of the oceanic or continental crust, which is apparent to the outer layer of the mantle.

The crust and upper region of the mantle, contain the lithospheric plates, and are considered to be approximately 100km thick.

Lithospheric plates move on top of the asthenosphere (outer shape deforming region of earth's mantle). (SOURCE 4) http://www.

encyclopedia.

com/science/encyclopedias-almanacs-transcripts-and-maps/lithospheric-plates PLATE BOUNDARIES The plates move apart, collide, or slide past each

other, and are found at mid-ocean ridges. New crust forms at the spreading boundaries. For instance, Iceland, an island in the north Atlantic, developed at the spreading boundary along the Mid-Atlantic Ridge. When Pangaea broke, it separated along the Mid-Atlantic Ridge and took 200 million years for the Atlantic to grow to its' present size.

Spreading boundaries are also called divergent boundaries, and form where two plates bump into each other.

The edge of one plate sinks into the mantle under the edge of another plate. That's where the mantle absorbs the edge of the sinking plate, and heat and pressure create volcanoes and earthquakes.

Pressure along colliding plates may fold rock layers into huge mountain systems, for instance, the Himalayas in India.

Colliding boundaries are also called convergent, consuming or subducting boundaries. Ditches, also known as trenches border the Pacific Ocean, where the Pacific plate is sinking. The size of the plate decreases as it sinks into the trenches. The Pacific Ocean is shrinking slowly, and the loss of crust in the trenches stabilities the formation of new crust in the mid-ocean ridges. People who live near the fault, the fault being cracks in the earth, must expect earthquakes. Sliding boundaries are also called translational or transform boundaries. The theories and evidence provided above, assist evaluating the theory of the earth's structure movement and the changes.

So, to value, Alfred Wegener proposed that the continents were once joined in a large continent called Pangaea, as wells as,•Wegener used rock layers, fossils, and changes of climate as evidence for continental drift. •The mid-

ocean ridge is a mountain chain 65, 000km long in the oceans of the world. • Magma rises from the mantle creating new ocean crust at the mid-ocean ridges. •The plate tectonic theory states that the rigid outer part of the earth is broken into a number of pieces called plates., the plates move apart, collide, or slide past one another.

•The flow of material in the mantle by convection and/or plumes (upwelling of abnormally hot rock within the earth's mantle) may cause plate movement. •Hot spots are regions on the surface of the earth that lie directly over a plume.(SOURCE 5) http://www. oesd. noaa. gov/TERK/tsunami_ready_educationcd/emedia_chap2.

pdf PART 3: Preventing Damage (A)Seismology is the study of seismic waves, the broadcast of waves through the earth, their sources and their effects. Seismic waves aren't only occurred from earthquakes, but from other natural and man-made happenings.
For instance, a person stomping on the ground can generate a seismic wave that can be picked up by a sensitive seismometer, an instrument to measure the motion of the ground.

Earthquakes are caused by the release of built-up pressure inside the Earth's crust. The image (?) shows how the earthquake energy is released in seismic waves. These waves spread out from the focus. The waves are felt most strongly at the epicentre, becoming less strong as they travel further away.

The most severe damage caused by an earthquake will happen close to the epicentre. http://www. bbc.

co. uk/schools/gcsebitesize/geography/natural_hazards/earthquakes_rev1. shtml The size or magnitude of earthquakes and other seismic events is measured using the Richter Scale (used to rate the magnitude of an earthquake, that is the amount of energy released during an earthquake). Earthquakes larger than magnitude 4 on the Richter Scale occur each year around the globe. A magnitude of 4, suggests that the earthquake is a light earthquake, which can cause minor damage, such as, windows and doors to rattle, but no significant damages. The instruments used to measure seismic waves are seismometers, which are sensors converting ground motion into electrical voltage. A seismic event generates 2 types of seismic waves, 1)Body waves travel through the interior of the earth.

2)Surface waves travel along the surface of the earth. Both types of wave are looked at during analysis to collect specific information on a particular event. OBJECTIVES OF SEISMIC MONITORINGThe objective of seismic monitoring is to detect and locate underground nuclear explosions. Data collected from seismic monitoring is used to differentiate between an underground nuclear explosion and the numerous natural and man-made seismic events, these can occur every day, such as earthquakes and mining explosions.

Seismic technology is extremely efficient in suspecting nuclear explosions, this is because the waves travel so quick, that an activity creating these waves, can be registered by seismic stations, to the be distributed around the world in a matter of minutes. fThere are 2 types of body waves originating from a seismic event, 1)P-waves are primary or compressional

waves that alternately compress and expand the ground in the direction of the wave’s propagation, and these waves can move through any material. 2)S-waves are secondary waves in the ground that move perpendicular to the direction of the wave’s circulation, and S-waves can only move through solids as this kind of movement is impossible in liquid or gaseous materials. https://www. ctbto. org/verification-regime/monitoring-technologies-how-they-work/seismic-monitoring/ Scientists monitor the lithosphere, because this layer is under constant motion, but it moves slow and steady. These movements are responsible for the movements of the tectonic plates.

It is understood that the movement occurs due to the generation of the heat from the mantle to the crust. The massive difference in the temperatures of the mantle and the crust cause these numerous ruptures to occur. However, some suggest it is due to an external impact on the crust itself. The movement of these plates, or rubbing of these plates against each other, produces friction and is the cause of earthquakes.

The different sounds can help explain various aspects of the earthquake sequence, including the main shock and nearby aftershocks. For example, this graph (?) is the recording of a Japanese earthquake which was taken near the coastline of Japan between Fukushima Daiichi and Tokyo. The initial blast of sound is the 9. 0 main shocks.
As Earth’s plates slipped dozens of meters into new positions, aftershocks occurred. These plate adjustments will likely continue for years.

https://www. sciencedaily. com/releases/2012/03/120306142506. htm(B)To help minimise the impact of changes to the earth’s structure in populated areas, scientists should build new infrastructure, away from earthquake-prone areas. This will help decrease economical damage and lower the death rates caused by an earthquake.

New infrastructure can be designed to tolerate strong shocks by using latest technology available.

Earthquake resistant designed buildings do not completely guarantee a perfect safety against collapse or serious damage as many of the aspects involved in the design of structures have large doubts. Linking to the idea of new infrastructure, the specialists can implement strategies on the populated locations and set a certain limit on the height of new buildings. But this can be an issue because the use of land in LEDC’s is in high-rural areas, and it’s more difficult to improve the situation because of the compact areas, etc. https://www. strukts. com/2012/06/earthquake-resistant-construction/ Factors Affecting The Impact Of An Earthquake•Distance from the epicentre, the effects of an earthquake is more severe at its centre.

•The higher on the Richter scale, the more severe the earthquake is.•Level of development, MEDCs are more likely to have the resources and technology for monitoring, prediction and response, whereas LEDC’S will not have the resources needed to prepare themselves for an occurring earthquake.•Population density, the more densely populated an area, the more likely there are to be deaths and casualties.

The Effects Of An Earthquake In LEDC’s – Populated Areas/Countries•Communication systems may be underdeveloped, so the population may not be well educated about what to do in the event of a volcanic eruption or an earthquake.•Construction standards tend to be poor in LEDC’s, which means homes and other buildings may suffer serious damage when a disaster occurs.•Buildings collapsing can cause high death tolls.•Evacuation and other emergency plans can be difficult to put into action due to limited funds and resources.

http://www. bbc. co. uk/schools/gcsebitesize/geography/natural_hazards/earthquakes_rev4. shtml Individuals can educate themselves and others on what to do in the event of an earthquake, drills.
For instance, in Haicheng, China, scientists identified changes in the ground level, leading to signs of an earthquake, authorities were informed and people started to evacuate the city. 90, 000 people were saved from the 7. 3 magnitude that destroyed 90% of the city. People can also make emergency plans, these are drawn up, and supplies such as bottled water, medicines, and tinned food are stockpiled by individuals or the local area.