



Knowledge Organiser

Geology

GCSE Geology Eduqas

YEAR 10 & 11

2022-2024

Geology

GCSE Eduqas

NAME: _____

TUTOR GROUP: _____

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| 1 | The Rock Cycle | Substances with a definite chemical composition and atomic structure, formed by the inorganic processes of nature. | Key term - Minerals |
| 2 | | Aggregates of minerals that are formed through sedimentary, metamorphic, and igneous processes. | Key term - Rocks |
| 3 | | Remains or traces of ancient plants and animals (older than 10,000 years), that have been preserved in the rock record. | Key term - Fossils |
| 4 | | What is the age of the Earth? | ~4.5 By |
| 5 | | Which famous Scottish geologist became known as the 'Father of Geology'? | James Hutton |
| 6 | | During Hutton's early years, when was the Earth believed to have been formed? | 4004 BC (First day of creation - James Ussher) |
| 7 | | Which process occurs when there is a breakdown of the rocks in situ? | Weathering |
| 8 | | Which process occurs when weathered material is removed through physical action? | Erosion |
| 9 | | Which process occurs when weathered/eroded material is moved by water, wind, ice, or gravity? | Transportation |
| 10 | | Which process occurs when sediment is laid down when the transporting agent loses energy? | Deposition |
| 11 | | How did Hutton begin to understand the processes of weathering, erosion, transportation, and deposition? | Digging drainage ditches (Slighhouses Farm) |
| 12 | | Which process occurs when sediment is covered by younger layers of sediment accumulating above? | Burial |
| 13 | | Which two processes occur during the diagenesis of sedimentary rocks? | Compaction and cementation |
| 14 | | Describe the temperature and pressure conditions during diagenesis. | Low |
| 15 | | Which process occurs as a result of heat and pressure being applied? | Metamorphism |
| 16 | | Which process occurs when minerals change into new crystalline metamorphic minerals? | Recrystallisation |
| 17 | | What process occurs in the lower crust/upper mantle when temperatures rise to a specific level (rock type dependent)? | Partial melting |
| 18 | | Where does molten rock accumulate within the crust? | Magma chamber |
| 19 | | What name is given to magma that reaches the surface? | Lava |
| 20 | | What process occurs during the cooling of magma or lava, therefore allowing solid mineral crystals to form? | Crystallisation |
| 21 | | What type of igneous rock forms above the surface? | Extrusive |
| 22 | | What type of igneous rock forms below the surface? | Intrusive |
| 23 | | Where did Hutton find evidence for igneous rocks (granite) as once being molten? | Glen Tilt |
| 24 | | Where did Hutton find evidence for linking together crystal size and cooling rates in igneous rocks? | Glass bottle factory |
| 25 | | Which process occurs when subsurface rocks are returned to surface by tectonic forces? | Uplift |
| 26 | | Where is Hutton's unconformity? | Siccar Point |
| 27 | | How many years does that particular unconformity (gap in geological time) represent? | ~80 My |
| 28 | | Which theory outlines that Earth's features are as a result of slowly acting processes such as erosion? | Gradualism |
| 29 | | Which theory outlines that Earth's features are as a result of a series of violent events such as meteorite impacts? | Catastrophism |
| 30 | | How did Hutton describe the processes that he observed? | Cyclic |
| 31 | | What was Hutton's defining quote that summarised his view of Earth's cyclic system? | "No vestige of a beginning, no prospect of an end" |

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| 32 | The Rock Cycle | Which younger Scottish geologist (born the year Hutton died), proposed the strict theory of uniformitarianism? | Charles Lyell |
| 33 | | Which simple phrase can be used to express the theory of uniformitarianism? | The present is the key to the past |
| 34 | | Name the three eras of the of the Phanerozoic eon. | Palaeozoic, Mesozoic, Cenozoic |
| 35 | | Name the three periods of the Lower Palaeozoic. | Cambrian, Ordovician, Silurian |
| 36 | | Name the three periods of the Upper Palaeozoic. | Devonian, Carboniferous, Permian |
| 37 | | Name the three periods of the Mesozoic. | Triassic, Jurassic, Cretaceous |
| 38 | | Name the three periods of the Cenozoic. | Palaeogene, Neogene, Quaternary |
| 39 | | What do we call an event where species vanish much faster than they are replaced (75%), in a short amount of geological time (<2.8 My)? | Mass Extinction |
| 40 | | How many major mass extinction events have there been during the Phanerozoic? | 5 |

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| 1 | Planetary Geology | Name the 4 layers of the Earth (in order). | Crust, Mantle, Outer Core, Inner Core |
| 2 | | Which layer is liquid (Fe and Ni), has a density of 10-12 g/cm ³ , and generates the Earth's magnetism? | Outer core |
| 3 | | Which layer is solid (Fe and Ni), has a density of 12-15 g/cm ³ , and is the source of Earth's internal heat? | Inner core |
| 4 | | Which layer is solid (silicates), with a semi-plastic upper layer, and has a density of 3.3-5.5 g/cm ³ ? | Mantle |
| 5 | | How can the crust be divided into 2 sections? | Oceanic and continental |
| 6 | | What is the average density of the oceanic crust? | 2.9 g/cm³ |
| 7 | | What is the average density of the continental crust? | 2.7 g/cm³ |
| 8 | | What type of crust is thicker? | Continental |
| 9 | | What name is given to the cold and rigid outer layer of the crust and uppermost mantle? | Lithosphere |
| 10 | | What name is given to the weaker layer in the upper mantle that is solid but has the ability to flow (rheid)? | Asthenosphere |
| 11 | | What is the name given to the boundaries between layers where there is a distinct change to chemical composition and physical properties? | Discontinuity |
| 12 | | What is the name of the discontinuity between the crust and the mantle? | Moho |
| 13 | | What is the name of the discontinuity between the mantle and the outer core? | Gutenberg |
| 14 | | What is the name of the discontinuity between the outer core and the inner core? | Lehmann |
| 15 | | What is the 2nd planet from the Sun? | Venus |
| 16 | | What is the 6th planet from the Sun? | Saturn |
| 17 | | What name is given to the 4 planets closest to the Sun? | Terrestrial planets |
| 18 | | What name is given to the 4 planets furthest away from the Sun? | Gas giants |
| 19 | | What planetary feature lies between the terrestrial planets and the gas giants? | Asteroid belt |

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| 20 | Planetary Geology | How many moons do the terrestrial planets have in total? | 3 (Earth = 1, Mars = 2) |
| 21 | | Which planet has the most moons? | Jupiter (>70) |
| 22 | | When was the Solar System formed? | 4.5 Bya |
| 23 | | Which process concentrated the material (gas and dust) to form the Sun and the planets? | Accretion |
| 24 | | Which ancient planet did the early Earth collide with 4.4 Bya to form the Moon? | Theia |
| 25 | | Name 4 features of the Earth that the Moon doesn't have. | Atmosphere, wind, flowing water, and erosion |
| 26 | | In what year was the first Apollo mission to the Moon? | 1969 |
| 27 | | Despite having no active plate tectonics, the Moon still experiences 'Moonquakes' - why is this? | Shrinkage due to cooling |
| 28 | | Why did lava that erupted during periods of volcanism on the Moon spread much further than it would on Earth? | Weak gravity |
| 29 | | What name is given to the darker areas of the Moon (basaltic)? | Maria (16%) |
| 30 | | What name is given to the lighter areas of the Moon (anorthosite)? | Terrae - highlands (84%). |
| 31 | | What are the sinuous rills that can be seen on the Moon's surface? | Lava tubes |
| 32 | | Which key geological principle allows geologists to interpret landforms and processes on Mars? | Uniformitarianism |
| 33 | | Give 3 pieces of evidence for water on Mars. | River bed deposits (conglomerates), canyons, deltas |
| 34 | | What features are present at Mars's poles, that are also present on Earth (Antarctica)? | Ice caps |
| 35 | | Which sedimentary structure on Mars shows evidence wind-driven erosion, transportation, and deposition? | Cross bedding |
| 36 | | What is the largest volcano in the Solar System? | Olympus Mons, Mars (shield) |
| 37 | | Which gas makes up approximately 95% of the Martian atmosphere? | Carbon dioxide |
| 38 | | What are 3 different types of meteorite found on Earth? | Iron, Stony iron, Stony (carbonaceous chondrite) |
| 39 | | Which layers of the Earth are they representative of? | Iron = core, Stony iron = mantle, Stony = crust |
| 40 | Give 3 reasons why meteorites and their impact craters are harder to find on Earth than on the Moon and Mars. | Vegetation, erosion/transportation, water | |

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| 1 | Minerals | What are the 3 key features of a mineral? | Naturally occurring (inorganic processes), definite chemical composition, internal atomic structure |
| 2 | | What are the 8 most abundant elements in the Earth's crust? | O, Si, Na, K, Mg, Ca, Al, Fe |
| 3 | | Which mineral group form the majority of the Earth's crust? | Silicates |
| 4 | | Which mineral is the most common and can be found in all rock groups? | Quartz |
| 5 | | What identification technique refers to the ability of a mineral to reflect light? | Lustre |
| 6 | | What piece of equipment would you use to find out a colour of a mineral's powder? | Streak plate |
| 7 | | How many planes of cleavage does mica have? | 2 |
| 8 | | What are the two different types of Mica? | Muscovite and Biotite |
| 9 | | Which mineral is 6 on Moh's scale of hardness? | Feldspar |
| 10 | | What are the two different types of Feldspar? | Plagioclase and Orthoclase |
| 11 | | Which are the hardest and softest on Moh's scale? | Diamond (hardest), Talc (softest) |
| 12 | | What test could be done to identify calcite? | Acid reaction (effervesces) |
| 13 | | How do you calculate the density of something? | Mass/Volume |
| 14 | | What units do use for density? | g/cm³ |
| 15 | | Name metallic minerals that are ores of iron and lead. | Haematite and Galena |
| 16 | | Mineral forming processes - S HREC. | Solidification (crystallisation from magma/lava) |
| 17 | | Mineral forming processes - S HREC. | Hydrothermal activity (veins/accumulation at smokers) |
| 18 | | Mineral forming processes - S HREC. | Recrystallisation (metamorphism) |
| 19 | | Mineral forming processes - S HREC. | Evaporation (salts) |
| 20 | | Mineral forming processes - S HREC. | Cementation (precipitation from pore waters) |

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| 1 | Sedimentary Processes and Products | Name the 3 types of mechanical weathering. | Freeze-thaw, Exfoliation, Pressure release |
| 2 | | Name 2 types of chemical weathering. | Carbonation, Hydrolysis |
| 3 | | Name 2 types of biological weathering. | Root action (plants and trees), Burrowing (animals) |
| 4 | | Name the 4 processes of erosion. | Hydraulic action, Abrasion, Attrition, Solution (Corrosion) |
| 5 | | Name the 5 agents of transportation. | Gravity, Fluvial (rivers), Marine (sea), Ice (glacial), Aeolian (wind) |
| 6 | | Name the 4 processes of transportation of weathered material. | Traction, Saltation, Suspension, Solution |
| 7 | | How would you use to describe the grain shape sediment that has undergone minimal erosion and transportation? | (Very) angular to sub-angular |
| 8 | | How would you use to describe the grain shape sediment that has undergone high levels of erosion and transportation? | (Well) rounded to sub-rounded |
| 9 | | What are the 2 scales that grain size is measured on? | Phi (Φ), Wentworth-Udden |
| 10 | | What is the sediment type that has a grain size of greater than 2mm? | Gravels, pebbles, cobbles, boulders |
| 11 | | What is the sediment type that has a grain size between 2 and 0.0625mm? | Sand (coarse to fine) |
| 12 | | What are the finest types of sediment? | Silt and clay |
| 13 | | What term is used to define the degree to which particles within a sediment are the same size? | Sorting |
| 14 | | What is the equation for calculating the co-efficient of sorting from a cumulative frequency curve? | $\Phi_{84} - \Phi_{16} / 2$ |
| 15 | | How would you describe the sorting of a sediment that has a value of greater than 1? | Poorly sorted |
| 16 | | How would you describe the sorting of a sediment that has a value between 0.5 and 1? | Moderately sorted |
| 17 | | How would you describe the sorting of a sediment that has a value of less than 0.5? | Well sorted |
| 18 | | What other form of data presentation can be used to present the sorting of sediment? | Histograms |
| 19 | | What type of sediment would be poorly sorted? | Glacial (Till) |
| 20 | | What type of sediment would be well sorted? | Dune (desert) sand |
| 21 | | What are the 3 controls on grain shape, size, and sorting? | Agent of transportation, transportation length (time), depositional environment |
| 22 | | What is the process that changes sediment into rock? | Diagenesis (compaction and cementation) |
| 23 | | What are the 3 most common minerals that cement the sediment (grains) together? | Quartz, Calcite, Haematite (iron minerals) |
| 24 | | Which key term refers to the amount of pore space within a rock? | Porosity |
| 25 | | Which key term refers to the ease at which fluids can pass through a rock? | Permeability |
| 26 | | What type of sedimentary rocks are comprised of fragments of older rocks (eroded)? | Clastic |
| 27 | | What type of sedimentary rocks are formed from accumulations of plants and organisms? | Organic (biological) |
| 28 | | What type of sedimentary rocks are formed by the precipitation and evaporation of minerals? | Chemical |

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| 29 | Sedimentary Processes and Products | What type of climate are glaciers commonly found in? | Polar/Arctic (high latitudes) - also at high altitudes |
| 30 | | What do geologists call the scratches found on the bedrock caused by abrasion on the underside of the glacier? | Striations |
| 31 | | What are the names of the rivers that carry sediment and meltwater away from the glacier? | Braided (fluvio-glacial) streams/rivers |
| 32 | | What name is given to the sediment sequence that forms at the bottom of a glacial lake? | Varve |
| 33 | | Describe the processes that occur on the inside and outside bends of meanders. | Outside = erosion, Inside = deposition |
| 34 | | Name the term given to the movement of the river channel over time. | Lateral migration |
| 35 | | Name 2 rock types that can form as a result of an alluvial fan deposit. | Arkose (>25% Feldspar), Breccia/Conglomerate |
| 36 | | What sedimentary structure is likely to occur because of intense evaporation after a flooding event? | Desiccation (mud) cracks |
| 37 | | Where do deltas form? | Rivers meet the seas/lakes |
| 38 | | What name is given to smaller channels that flow off the main river channel in a deltaic environment? | Distributary channels |
| 39 | | In what type of climate does vegetation grows in abundance in a deltaic environment? | Hot/humid (tropical) |
| 40 | | What fossil fuel forms due to the compaction of vegetation in a deltaic environment? | Coal (Peat is compacted - volatiles reduced) |
| 41 | | Between which two lines of latitude would you expect to find hot desert environments? | 30°N and 30°S |
| 42 | | Why is there such a wide temperature range (diurnal) in a hot desert? | Lack of cloud cover (extreme heat in the day - heat escapes at night) |
| 43 | | What sedimentary structure is formed from the build up of sand in a migrating dune system (Desert sandstone)? | Cross-bedding (large-scale) |
| 44 | | Name 3 types of salt that can be found in temporary playa lake deposits. | Halite, Calcite, Gypsum |
| 45 | | In a cold shallow marine environment where does the clastic sediment predominantly originate from? | Rivers (terrestrial) - also coastal erosion of cliffs |
| 46 | | Name 2 rock types that form as result of coastal sediment being compacted and cemented. | Orthoquartzite, Conglomerate |
| 47 | | What does a symmetrical ripple mark indicate in terms of current direction? | Bi-directional (two ways) e.g. tides on a beach |
| 48 | | What does the level of fragmentation in fossils tell us about the level of energy where they were deposited? | High levels of fragmentation = high energy (storms) |
| 49 | | Why are warm shallow marine environments clear? | Lack of terrestrial input (from rivers) |
| 50 | | Which mineral commonly forms the cement in fossiliferous and reef limestones? | Calcite |
| 51 | | Name 3 conditions needed for corals to form and grow. | 23°C - 29°C, Lack of sediment, Stable salinity levels, Sunlight (photic zone), High energy (oxygenated) |
| 52 | | What word is used to describe the layering of an Oolith (Oolitic limestone)? | Concentric |
| 53 | | What name is given to the single-celled algae that forms Chalk? | Coccoliths |
| 54 | | What name is given to a high velocity current that flows down the continental shelf/slope? | Turbidity current |
| 55 | | Which poorly sorted sandstone forms from the turbidity current deposit in a submarine fan? | Greywacke (poorly sorted - graded bedding) |

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| 56 | Sedimentary Processes and Products | Which fine-grained clastic rock is formed from settling out of clay minerals in a deep (low-energy) marine environment? | Shale (mudstone) |
| 57 | | What is the difference between a breccia and a conglomerate? | Breccia = angular, Conglomerate = rounded |
| 58 | | Give 2 examples of medium-grained clastic rocks that are poorly sorted. | Arkose, Greywacke |
| 59 | | What percentage of quartz minerals does an Orthoquartzite typically contain? | >90% |
| 60 | | What mineral is common in fine-grained clastic rocks which show laminations (layering)? | Mica (clay minerals) |

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| 1 | Igneous and Metamorphic Processes and Products | What 4 factors allow for igneous rock classification and identification? | Mineralogy, Silica %, Colour (dark-light), Crystal size (texture) |
| 2 | | What name is given to igneous rocks that crystallise below the Earth's surface? | Extrusive |
| 3 | | What name is given to igneous rocks that crystallise above the Earth's surface? | Intrusive |
| 4 | | Give an example of an igneous rock that is dark in colour and has a glassy texture. | Obsidian |
| 5 | | Give an example of an igneous rock that has coarse crystals and contains Quartz and Feldspar. | Granite |
| 6 | | Give an example of an igneous rock that is mafic and has fine crystals. | Basalt |
| 7 | | Why does Gabbro have coarser crystals than Dolerite? | Slower cooling rate |
| 8 | | Give 2 examples of minerals that could be found in an ultramafic igneous rock. | Olivine, Augite (Peridotite) |
| 9 | | What igneous rock group is Andesite in? | Intermediate |
| 10 | | What percentage of Silica would you find in a silicic igneous rock? | >66% |
| 11 | | At what depth would you find major igneous intrusions (plutons/batholiths)? | >10km |
| 12 | | Give 2 examples of minor igneous intrusions that are found between 1-5km below the Earth's surface. | Sills, Dykes |
| 13 | | Why do rocks that crystallise from lava flows form fine crystals? | Rapid cooling - crystals have limited time to grow |
| 14 | | On average, how big are the coarse crystals in a rock such as Granite? | >3mm |
| 15 | | When an igneous rock has an equicrystalline texture, what does this suggest about the cooling? | Constant rate of cooling (1 stage) |
| 16 | | When an igneous rock has a porphyritic texture, what does this suggest about the cooling? | 2 stages of cooling (initially slow, followed by rapid cooling) |
| 17 | | Why are vesicular textures often seen in extrusive igneous rocks such as basalt? | Gas (in solution within the magma) rises to the surface - trapped when rock crystallises |
| 18 | | What name is given to the coarser crystals seen in a porphyritic texture? | Phenocrysts |
| 19 | | What rock is pale grey in colour and is produced by frothy (gas-rich) lava flows? | Pumice |
| 20 | | Which form of feldspar is found in mafic rocks? | Plagioclase |

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| 21 | Igneous and Metamorphic Processes and Products | Which type of plate margin is commonly associated with mafic magmas? | Divergent (Constructive) - also Hotspots e.g. Hawaii |
| 22 | | Which type of plate margin is commonly associated with intermediate/silicic magmas? | Convergent (Destructive) - Andes (o-c), Japan island arc (o-o), Himalayas (c-c) |
| 23 | | What word is used to describe mafic eruptions from fissures or shield volcanoes? | Effusive |
| 24 | | What word is used to describe intermediate/silicic eruptions from stratovolcanoes? | Explosive |
| 25 | | In terms of their orientation, how are dykes different to sills? | Dykes = vertical, Sills = horizontal |
| 26 | | What word is used to describe a sills relationship to the surrounding country rock? | Concordant |
| 27 | | How many baked margins does a dyke have? | 2 |
| 28 | | How many chilled margins does a lava flow have? | 1 |
| 29 | | What name is given to a fragment of older rock is contained within younger rock? | Xenolith |
| 30 | | What is the recrystallised zone of country rock surrounding a major igneous intrusion called? | Metamorphic aureole |
| 31 | | How is the viscosity of lava produced from effusive eruptions different to explosive eruptions? | Less viscous (runny) - Pahoehoe/Aa |
| 32 | | Which type of volcano has the steeper sides? | Stratovolcanoes (~30°) |
| 33 | | Which type of volcano has the hotter lava? | Shield |
| 34 | | How is the explosivity of a volcanic eruption measured? | VEI (Volcanic Explosivity Index, 0-8) |
| 35 | | What is another term for a volcanic mudflow? | Lahar |
| 36 | | What is the relationship between the size of pyroclasts from an eruption and the distance from the volcano? | Heavier material = closer to the vent |
| 37 | | Which volcano erupted in 1980 and saw large parts of the surrounding area destroyed by pyroclastic flows? | Mt. St Helens (USA) |
| 38 | | What volcanic feature forms as a result of mafic lava flows cooling (contracting) at differing rates? | Columnar jointing (e.g. Giant's Causeway, N. Ireland) |
| 39 | | What name is given to circular depression formed due to the collapse of a volcanic cone? | Caldera |
| 40 | | What name is given to hot springs/jets of water that have been heated by a magmatic source? | Geysers |
| 41 | | What are the 4 agents of metamorphism? | Heat, Pressure, Time, Parent rock |
| 42 | | Which 2 agents are responsible the recrystallisation process? | Heat, Pressure |
| 43 | | True or false. Metamorphic rocks can be in a liquid state. | False - when temperatures exceed the melting curve rocks begin to melt |
| 44 | | How does heat affect the grains in metamorphism? | Coarser grained (colour can change) |
| 43 | | What is Earth's geothermal gradient in volcanically inactive areas? | 30°C/km |
| 44 | What type of plate boundary would expect see the most extreme pressures? | Convergent (Destructive) - Himalayas (c-c) | |
| 45 | What term is used to describe the re-alignment of plat (clay) minerals in a rock? | Foliation | |

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| 46 | Igneous and Metamorphic Processes and Products | Which dark-red mineral with a hardness of 7 often appears as an index mineral (new growth) within a Schist? | Garnet |
| 47 | | Name the 3 types of metamorphism. | Burial, Contact, Regional |
| 48 | | Which type of metamorphism happens as a result of medium/high pressures and low temperatures? | Burial |
| 49 | | Which type of metamorphism happens as a result of low pressures and high temperatures? | Contact |
| 50 | | Which type of metamorphism happens on a large-scale and has a range of grades? | Regional |
| 51 | | What is the term used for metamorphic rocks that are unfoliated? | Granoblastic |
| 52 | | Give 2 examples of contact (granoblastic) metamorphic rocks. | Marble (Limestone), Metaquartzite (Sandstone) |
| 53 | | Which low-grade regional metamorphic rock has very fine foliation and a slaty cleavage? | Slate |
| 54 | | Which medium-grade regional metamorphic rock has a shiny appearance and contains porphyroblasts? | Schist |
| 55 | | Which high-grade regional metamorphic rock has dark-light banding and coarse grains (>5mm)? | Gneiss |
| 56 | | Give 3 factors that affect the extent of the metamorphic aureole. | Magma composition, Dip of contact, Country rock composition |
| 57 | | Which silicate minerals form the light-coloured bands in gneissose banding? | Quartz, Plagioclase feldspar |
| 58 | | What is the parent rock of slate? | Shale (mudstone) |
| 59 | | Which process of the rock cycle precedes burial metamorphism? | Diagenesis |
| 60 | True or false. The melting point of all metamorphic rocks is the same. | False - dependent on pressure conditions (Lower pressure = high melting point) | |

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| 1 | Plate Tectonics | Which outer layer of the Earth is cold and rigid? | Lithosphere |
| 2 | | At what temperature does the weaker asthenosphere start? | 1300°C (geotherm) |
| 3 | | Which tectonic process occurs as a result of magma rising from mantle and through the crust at MORs? | Ridge push |
| 4 | | Which tectonic process occurs when plates sink under gravity at a subduction zone? | Slab pull |
| 5 | | What type of boundary is created as plates move toward each other? | Destructive (Convergent) |
| 6 | | What type of boundary is created as plates move away each other? | Constructive (Divergent) |
| 7 | | What type of boundary is created as plates move past each other? | Conservative |
| 8 | | What is the theory which highlights that the Earth's plates have moved position over millions of years? | Continental Drift |
| 9 | | Who published the 'Origins of the Continents and Oceans' in 1915, outlining the theory of Continental Drift? | Alfred Wegener |
| 10 | | Who proposed the theory of Sea Floor Spreading in 1962, which outlined an explanation for drifting continents? | Harry Hess |
| 11 | | Which two British geologists discovered palaeomagnetism, and therefore helped to support the theory of Sea Floor Spreading? | Frederick Vine and Drummond Matthews |
| 12 | | Which pioneering geologist proposed that convection currents in the mantle were a mechanism for plate movement? | Arthur Holmes |
| 13 | | Which geophysicist's research in the 1960s was fundamental for explaining the theories behind 'hotspots' and transform faults? | John Tuzo-Wilson |
| 14 | | What are the name of cells of hot rock that rise at MORs and sink at convergent margins? | Convection currents |
| 15 | | Give 5 pieces of evidence for continental drift. | Jigsaw fit, Glaciations, Fossils, Rock types, Mountain ranges |
| 16 | | Give 4 pieces of evidence for sea floor spreading. | Active volcanism, Gravity anomalies, Sediment thickness/age, Transform faults |
| 17 | | What type of igneous rock type forms as a result of eruptions at constructive plate margins? | Basalt - effusive |
| 18 | | What happens to the pressure as magma rises at MORs, ultimately causing melting at the ridge? | Decrease in pressure (decompression) |
| 19 | | What type of fault system develops along a MOR? | Transforms faults (side-by-side movement) |
| 20 | | How can the pattern created by the magnetic stripes (anomalies) either side of an MOR be described? | Symmetrical |
| 21 | | How would describe the heat flow at a MOR? | High |
| 22 | | Give an example of hotspot (mantle plume). | Hawaii |
| 23 | | Why is Hawaii not just a single island but a series of islands and seamounts? | Movement of the Pacific plate over hotspot (NW) |
| 24 | | What tectonic process causes subduction at convergent plate margins? | Slab pull |
| 25 | | What name is given to the chain of volcanoes that develop at a destructive (oceanic-oceanic) margin? | Island arc (e.g. Japan) |

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| 26 | Plate Tectonics | Why would expect to see a negative heat anomaly above the ocean trench? | Cold ocean water and oceanic crust being subducted |
| 27 | | Where would expect to see a positive heat anomaly at a destructive (oceanic-oceanic) margin? | Over the volcanoes |
| 28 | | What type of rock type is produced from the lava erupted at a destructive (oceanic-oceanic) margin? | Andesite |
| 29 | | Give an example of a destructive (oceanic-continent) margin. | Nazca - South America (Andes mountain range) |
| 30 | | Why does the oceanic crust subduct at a destructive (oceanic-continent) margin? | Denser than the continental crust |
| 31 | | What does the friction between the two plates generate at a destructive (oceanic-continent) margin? | Earthquakes (Benioff zone) |
| 32 | | What name is given to the type of volcanoes that erupt at a destructive (oceanic-continent) margin? | Stratovolcanoes (Andesitic) - explosive |
| 33 | | Why does the magma rise through the continental crust at a destructive (oceanic-continent) margin? | More buoyant than the surrounding country rock |
| 34 | | Give an example of a destructive (continent-continent) margin. | India - Eurasia (Himalayas) |
| 35 | | Why don't volcanoes occur at destructive (continent-continent) margins? | Extreme crustal thickness - magma cools before it reaches the surface |
| 36 | | How would you describe the earthquakes that occur at destructive (continent-continent) margins? | Deep (high magnitude) |
| 37 | | What are the structural features that form as a result of continent-continent collision? | Fold mountains |
| 38 | | True or False: There is no subduction or volcanic activity at a conservative margin. | True (plates move past/alongside each other) |
| 39 | | How would you describe the earthquakes that occur at conservative margins? | Shallow (very destructive) |
| 40 | Give an example of a conservative margin. | San Andreas Fault (California) | |

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| 1 | Earth Hazards | What name is given to the study of earthquakes? | Seismology |
| 2 | | Where do earthquakes generally occur? | Along plate margins (boundaries) |
| 3 | | What name is given to many intraplate areas (not along plate margins) where earthquakes don't occur? | Aseismic |
| 4 | | Where does an earthquake originate from? | Focus |
| 5 | | What name is given to the point above the focus where seismic waves first reach the surface? | Epicentre |
| 6 | | Why do earthquakes not occur below ~700km? | Rocks are ductile (plastic) - stress is not stored |
| 7 | | Which seismic wave is the fastest? | P-wave |
| 8 | | Which seismic wave can only travel through solids? | S-wave |
| 9 | | What happens to S-waves as they reach the outer core? | Refracted (shadow zone) |
| 10 | | Describe the movement of P-waves. | Push and pull |
| 11 | | Which seismic wave is the slowest? | Surface - Long (L) waves |
| 12 | | Which seismic wave causes the most damage? | Surface - 'rolls' the rocks in the crust |
| 13 | | Name 2 factors that determine the velocity of seismic waves. | Rock density, Composition (solid/liquid) |
| 14 | | What name is given to the instrument that records earthquakes? | Seismometer/Seismograph |
| 15 | | What do we call smaller vibrations recorded after the main earthquake event? | Aftershocks |
| 16 | | Which earthquake measurement scale measures the magnitude (strength) of the earthquake? | Richter (logarithmic) |
| 17 | | Which earthquake measurement scale measures the intensity (damage) of the earthquake? | Mercalli (I - XII) |
| 18 | | What are lines plotted onto an earthquake hazard map called? (Join places of equal earthquake intensity) | Isoseismal lines |
| 19 | | What is the greatest danger caused by earthquakes in urban areas? | Building collapse |
| 20 | | Why are death tolls usually higher in developing countries? | Less well prepared and educated |
| 21 | | How can the effects of earthquakes be categorised? | Short/Long-term (social, economic, environmental) |
| 22 | | Give 2 examples of engineering techniques that can reduce the impact of earthquakes. | Steel framework, Shock absorbers, Building shape (beehive/pyramid), Restricting building height |
| 23 | | Give 2 examples of how people can prepare for earthquakes. | Practice drills, Emergency packs, Secure heavy objects, Turn off gas |
| 24 | | Give 2 methods of earthquake prediction. | Seismic gap theory, Gas emissions, Ground level changes, Animal behaviour |
| 25 | | Name 4 different volcanic hazards. (Dependent on type of volcano) | Lava, Ash, Pyroclastic flows, Lahars, Gas, Lateral blast |
| 26 | | What word is used to describe the ability of a lava to flow? | Viscosity |
| 27 | | Name a type of lava that is highly viscous and has a low silica content. | Basaltic (Mafic) |
| 28 | | Name a type of lava that has a low viscosity and high gas content. | Andesitic (Silicic) |
| 29 | | What is the term used to describe a lava flow that has a ropey surface appearance? | Pahoehoe |
| 30 | | What is the term used to describe a lava flow that has a blocky surface appearance? | Aa |

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| 31 | Earth Hazards | What term is given to the lava flows that form continual and successive outpourings of basalt? | Flood basalts |
| 32 | | What term is used to describe the characteristic sometimes seen in slow cooling basaltic lava flows? | Columnar jointing (e.g. Giant's Causeway, N. Ireland) |
| 33 | | What is main factors affecting the distribution of ash distribution and thickness? | Wind speed/direction |
| 34 | | How do lahars (volcanic mudflows) form? | Mixing of ash and water (common around stratovolcanoes) |
| 35 | | Give 2 methods of predicting volcanic eruptions. | Gas emissions, Ground deformation, Seismic activity, Groundwater level |
| 36 | | Give 2 advantages of living in volcanically active areas. | Fertile soil, Geothermal energy, Metallic deposits, Building stone, Tourism |
| 37 | | Give 3 reasons why landslides might occur. | Springs (increased groundwater level), High rock porosity and permeability, Dip angle, Faults |
| 38 | | Name 3 engineering techniques that can be used to stabilise slopes prone to landslides. | Anchors (rock bolts), Drainage, Reprofiling of slopes, Gabions (wire cages) |
| 39 | | What rock types are highly likely to cause landslides if the conditions are right? | Sandstone, Mudstones (high porosity and permeability) |
| 40 | | What type of rock types provide high levels of slope stability | Crystalline (e.g. Granite) |
| 41 | | What type of plate boundary do tsunamis commonly form along? | Destructive (subduction) |
| 42 | | Describe the wave height and speed in the early stages of the tsunami forming. | Low wave height (<30cm), High speed (up to 800km/hr) |
| 43 | | Why does the wave height increase rapidly as it gets nearer to the shoreline? | Shallow water (friction with the sea bed) |
| 44 | | Apart from earthquakes, what else can tsunamis to form? | Volcanic eruptions along coastlines, Landslides (into the sea/under the sea) |
| 45 | | Name 3 prevention strategies for minimising the impact of tsunamis. | Warning systems (alarms/signs). Drills, Shelters, Education, Planting mangroves (absorb energy) |



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