Scheme of Work 2024/25

Geology A Level Yr 13

Week	Specification reference	Content	Comments	Practical sessions and *Maths Skills*	Resources and Homework
9th Sept	Topic G3: **PAST LIFE AND PAST CLIMATES** Key Idea 1: **Fossils provide evidence for the increasing diversity of life through geological time**	a. The fossil record provides evidence of changes in floras and faunas through geological time and the development of higher life forms: • Precambrian life: life possibly evolved early in Earth history (3.8 billion years ago). The Ediacaran fauna represents the oldest diverse set of multicellular, soft bodied organisms (565 Ma) • The Cambrian Explosion: the development of mineralised skeletons led to a wide variety of advanced marine invertebrates by the early Cambrian Life in the ocean diversified in stages identified by separate fauna: a basic understanding of the difference between Cambrian, Palaeozoic and modern faunas	Candidates should be familiar with the use of cladograms in showing the relationships amongst organisms and in the development of evolutionary trees. Candidates should be able to evaluate a range of hypotheses (environmental, developmental and ecological) that have been proposed for the sudden faunal diversification at the Precambrian-Cambrian boundary. http://www.nature.com/news/ what-sparked-the-cambrian- explosion-1.19379 Candidates will be expected to interpret modes of life from an analysis of vertebrate	Interpretation of evolutionary diagrams. Analysis of the possible causes of faunal diversification at the Precambrian-Cambrian boundary. Interpretation of simple diversity curves (Sepkoski's curves).	2015 xs Past Paper: GL1 2006

			morphologies including: size, shape, dentition (carnivore v herbivore), pelvis, vertebrae, limbs, ornamentation (horns, plates, feathers).		
16th Sept		The Phanerozoic was marked by the migration of organisms onto the land during the Palaeozoic. Vertebrate development of amphibians from fish, reptiles from amphibians and mammals and birds from reptiles. Colonisation of the land by plants. d. There are alternative interpretations of evolutionary patterns based on the fossil record. Gradual change (gradualism) vs stability interrupted by sudden change (punctuated equilibrium).	Candidates should be aware of fossil evidence in vertebrate development (as exemplified by *Ichthyostega*, *Archaeopteryx*).	Analysis of the morphology of fossil vertebrates (including dinosaurs) to interpret function/mode of life. Evaluation of alternative interpretations of evolutionary patterns.	2012 map Past Paper: AS C2 Specimen paper

23rd Sept	Key Idea 2:**A combination of global factors contributes to climate change through geological time**	Long-term changes to the global climate, composition of the atmosphere, sea level and distribution of the continents are recorded in the Phanerozoic rock record. The J. Tuzo Wilson Cycle provides a framework for understanding these long term changes. b. Changes in the atmospheric composition of greenhouse gases (especially CO_2 and methane) result from natural processes (volcanic activity, rock weathering, warming of methane hydrates) throughout geological time. c. There have been climate changes throughout geological time. The current rate of change appears to differ from those in the past. d. The Anthropocene is a proposed epoch that began when human activities changed the Earth's surface environment on a scale comparable with the major events of the geological past. There is currently a lack of consensus for the proposed epoch.	Candidates will be expected to identify stages of the J. Tuzo Wilson Cycle in the current distributions of oceans and continents for comparison with previous arrangements. Candidates will be expected to analyse climatic data including ice cores, deep sea ocean cores and fossils (plants and animals) to establish past climates. Evaluation of the contribution of naturally produced CO_2 and methane to climate change with time. Analyses of graphs showing different rates of climate change. Teachers may find the following resource useful: http://www.geolsoc.org.uk/AnthropoceneSchoolsResources Candidates should be aware of a range of climatic indicators in rocks including red	Analysis of *present day* oceanic and atmospheric circulation in relation to climatic effects. Analysis of data used to determine *past* climatic regimes. Evaluation of the arguments in the debate for the inclusion of the Anthropocene as a new epoch. Investigation of the evidence for climatic extremes in the rock record.	HW: The Anthropocene 2016 xs Past Paper: AS C2 2018

	Key Idea 3: **Evidence for global climate change is interpreted from the geological record and the geochemistry of rocks**	a. Evidence for global climate changes can be interpreted from both the geological record and the isotope geochemistry of ocean- floor sediments. b. The fossil record provides evidence of different climatic zones, as exemplified by: • land plants • corals.	sandstones, evaporates, coal, coral limestone, tillites and oxygen isotope ratios ($^{18}O/^{16}O$) in fossil shells. Candidates should be aware that fossil plant remains (e.g. leaves and pollen) provide evidence of prevailing climatic regimes. Teachers may find the following resource useful: http://www.palaeontologyonline.com/articles/2012/fossil-focus-plant-fossils/		

30th Sept		c. Sedimentary sequences provide evidence of palaeoenvironments related to particular climatic zones. • Ancient icehouse deposits (e.g Carboniferous). Tropical greenhouse deposits (e.g. Cretaceous). d. Oxygen isotope ratios ($^{18}O/^{16}O$) in fossil shells are indicative of the temperature of ancient ocean waters.		Simple analysis of oxygen isotope curves.	2013 map Past paper: AS C2 2019
7th Oct	*Trips to RSPB Pulborough and Portsmouth University*	e. The "Snowball Earth" hypothesis proposes that the Earth's surface became entirely or nearly entirely frozen at least once, sometime earlier than 650 Ma.	Candidates are expected to understand the significance of the evidence for "Snowball Earth" including low latitude glacial deposits (tillites), dropstones and cap carbonates.	Assessment of the validity of the evidence for the "Snowball Earth" hypothesis in Neoproterozoic rocks. RSPB Pulborough field trip: **SP4:** Production of scaled annotated scientific drawings of rock samples from hand samples using a light microscope, or hand lens observation. **SP12:** Location of geological features onto a base map. **SP13:** Identification of the location of geological features in the field using six figure grid references on maps. **SP14:** Production of scaled, annotated field sketches at unfamiliar field exposures to record data relevant to an investigation.	2017 xs Past Paper: AS C2 2020

				SP15: Measurement of dip and strike elements: dip angle, dip and strike directions of planar surfaces, including valid sampling, relevant to an investigation.	
14th Oct	Topic F4: **EARTH STRUCTURE AND GLOBAL TECTONICS** Key Idea 1: **The Earth has a concentrically zoned structure and composition**	a. The Earth has a layered structure: crust, mantle, outer and inner core. Each layer has a distinctive composition and/or rheological properties. Direct and indirect evidence is derived from meteorite (stony, iron) compositions, mantle xenoliths, mean density calculations and geophysical measurements (seismology, geomagnetism, gravity, conductivity). b. The crust is a thin layer of distinctive composition overlying the mantle; continental and oceanic crust can be recognised and distinguished by their differing thicknesses, composition and structure.	Candidates should be able to use evidence to interpret the state, depth and probable composition of the Earth's layers. *For exemplification of mathematical skills see* ***Mathematical Guidance for A level Geology***. *The mathematical skills identified are not exclusive to this section of the specification.* Candidates should be given the opportunity to evaluate and validate the new knowledge obtained from current ongoing scientific research. • the significance of serpentinite at the Moho discontinuity	Analysis of seismological evidence for the internal structure of Earth: P and S body waves, surface waves, time-distance curves, shadow zones, velocity-depth models of Earth structure, density distribution with depth. *Translation of information between graphical, numerical and algebraic forms.* **SP18:** Measurement of the densities of representative samples of Earth layers (e.g. granite, basalt). Simple analysis of geomagnetic evidence for core composition and processes. Interpretation of geophysical data on crustal structure (seismic, gravity, magnetic) from continental and oceanic areas. Analysis of ocean drilling data to re-interpret the Mohorovičić discontinuity (Moho) at the base of the crust (e.g. Joides Resolution 360).	HW: Plate tectonics paradigm 2014 map Past paper: AS C2 2021

			https://www.cardiff.ac.uk/earth-ocean-sciences/aboutus/supporting-education http://www.bbc.co.uk/news/science-environment-34967750 http://www.nature.com/news/quest-to-drill-into-earthsmantle-restarts-1.18921		
21st Oct	Topic F4: **EARTH STRUCTURE AND GLOBAL TECTONICS** Key Idea 2: **The Earth's internal heat is the underlying cause of lithospheric plate motions that control global geological processes**	a. The uppermost part of the mantle and the overlying crust form a rigid outer shell of the Earth known as the lithosphere, forming tectonic plates, underlain by a weaker upper mantle zone known as the asthenosphere. The asthenosphere is evidenced by the seismological low velocity zone (LVZ). b. The lithosphere consists of several plates in relative motion. Three types of plate boundary are recognised; divergent, convergent (involving subduction) and conservative. There is a relationship between seismicity, volcanicity and plate boundaries.	Candidates should be aware of the importance of the plate tectonic model in providing an underlying framework to understand how the Earth works. Teachers may find the following resource useful in the delivery of F4: https://www.geolsoc.org.uk/Plate-Tectonics	Investigation of how the plate tectonics paradigm developed over time, from continental drift, through active mantle convection carrying passive tectonic plates, to modern theories of the causes of plate movement (slab pull and ridge push). Interpretation of the evidence for plate tectonic theory from: direct measurement – ocean floor drilling, relative movement using GPS global maps of the distribution of continents, volcanoes, earthquake epicentres/foci, ocean trenches and ridges, orogenic belts and palaeoecological /palaeoenvironmental zones. seismic tomography an investigation of the geomagnetic/geoelectrial properties of rocks and minerals.	2018 AS xs Past paper: AS C2 2022

				□□geothermal data (hot spots, heat flow). *Use of a scatter diagram to identify a correlation between two variables (MPS16).*	
Half term					
4th Nov		c. Forces driving plates are a matter of current debate involving thermal convection of the mantle together with gravitational forces and ocean lithosphere density differences at subduction zones. d. Some rocks contain a record of the direction of the Earth's magnetic field at the time of their formation, known as remanent magnetism. This is linked to ferromagnetism in some iron minerals and their Curie temperatures.	Candidates should be aware that currently the possible mechanisms for plate movement are much disputed.	Evaluation of the possible mechanisms for plate movement (role of mantle convection, slab pull, ridge push).	2015 map Past Paper: AS C2 2023
		e. Palaeomagnetism can be used to determine changes of latitude as different continents moved through geological time, indicating continental drift. Ocean floor magnetic anomalies indicate sea floor spreading. f. The various elements of the rock cycle may be linked directly to plate tectonic processes: □□igneous - basaltic magmatism at oceanic spreading centres; basaltic and andesitic magmatism at	Candidates should be aware of remanent magnetic inclination in determining changes in continental latitude through geological time. Knowledge of Polar Wandering Curves is not required.	**SP19:** Investigation of the relationships between earthquake data (focal depth, magnitude and distance from plate boundaries) using data on Google EarthTM.	

		convergent margins; granitic magmas in orogenic belts sedimentary - erosional processes and depositional environments influenced by tectonic movements regional metamorphism in subduction zones and orogenic belts at plate boundaries.			
11th Nov	Topic G4 : **EARTH MATERIALS AND NATURAL RESOURCES** Key Idea1: **Geological processes lead to the concentration and accumulation of natural resources in deposits that can be exploited; economic deposits can be concentrated by igneous and sedimentary processes**	a. Processes of formation of metalliferous ores. • Igneous associations of ores – magmatic segregation, hydrothermal activity. • Sedimentary associations of ores – placer deposits; residual deposits; precipitated deposits. b. Processes of formation of non-metallic minerals of economic importance: china clay. c. Formation of sedimentary deposits of economic importance as "bulk minerals"	Candidates are expected to have studied the formation of cumulate deposits (e.g. iron chromite ores), massive sulphide ores (black smokers), hydrothermal ores associated with igneous intrusions (hydrothermal mineral veins, pegmatite deposits). Candidates are expected to have studied the formation of placer deposits, residual deposits (bauxite) and precipitated deposits (BIFs and evaporates). Candidates are expected to have studied the formation of china clay only. Candidates are expected to be aware of the accumulation of sand and gravel deposits in a	Geological map interpretation (ore body geometry, field relations); section-drawing through ore bodies. *Calculation of the circumferences, surface areas and volumes of regular shapes (MPS6).* *Recognition and making use of appropriate units in calculations.* *Use of ratios, fractions and percentages (MPS5).* Geological map interpretation; section drawing through industrial mineral deposits.	Past Paper: C1 Specimen paper including xs

		for aggregate: sand and gravel.	range of environments: river, river terrace, glacial/fluvioglacial, beach.		
18th Nov		d. Origin of hydrocarbons and coals: hydrocarbons and coals result from the thermal alteration of organic material due to burial. • Hydrocarbons: source rocks; sediment burial and the temperature and pressure conditions of oil and natural gas formation. Coal-forming environments; peat, lignite, bituminous coal, anthracite; coal rank.	Simple analysis of maturity: depth (temperature) graphs showing oil and natural gas windows. Identification of coal types. Simple assessment of reserves (e.g. tonnage of coal in a given area). *Calculation of the circumferences, surface areas and volumes of regular shapes (MPS6).*	Candidates should be aware of a range of source rocks for hydrocarbons (to include fine grained sedimentary rocks and coal), the migration of hydrocarbons to, and accumulation in, a host rock. Candidates are expected to have studied the factors necessary for coal formation and the factors that determine the rank of coal produced.	Past Paper: C1 2019 including xs
25th Nov		c. Oil and gas migration are controlled by geological factors: migration paths – relative buoyancy of oil and natural gas; structural and stratigraphic traps for hydrocarbons; reservoir rocks and cap rocks.		Analysis of geological cross-sections through oil and natural gas bearing structures.	Past Paper: C1 2020 including xs
2nd Dec	Key Idea 3: **A wide range of prospecting techniques can be employed to explore for mineral resources**	a. Techniques used to prospect for mineral resources. • geophysical surveying – gravity (Bouguer), seismic, magnetic, electrical.	Candidates are expected to have studied the following geophysical prospecting techniques: • gravity (Bouguer) • seismic	Geological map interpretation; simple analysis of geophysical and geochemical data related to mineral exploration. Selection of appropriate	Past Paper: C1 2021 including xs

		• geochemical prospecting – river water, river sediment and soil sampling. Each method has particular applications and limitations	(reflection only – 2 way time) • magnetic (including aeromagnetic) • electrical (resistivity only) • electromagnetic (EM survey) Teachers may find the following resource useful in delivering part of this section: http://www.sub-surfrocks.co.uk/	geophysical methods for different mineral searches, depending upon the geometry and physical properties of the target body.	
	Key Idea 2: **Permeable rocks offer pathways for oil and gas migration; highly porous rocks can act as natural reservoirs for underground supplies of oil and gas** Key Idea 3: **A wide range of prospecting techniques can be employed to explore for mineral resources**	a. Porosity and permeability of rock and sediments affects the presence, distribution and migration of fluids (water, oil and natural gas): primary/secondary porosity in rock; factors that affect porosity and permeability. b. Fluid flows in rocks and sediment can be modelled using Darcy's Law. Techniques used to prospect for mineral resources. • geophysical surveying – gravity (Bouguer), seismic, magnetic, electrical. Each method has	Analysis of rock textures in terms of porosity and permeability (grain size, shape, packing, sorting; cementation); primary and secondary porosity. Application of Darcy's Law to model fluid flow: $Q = -kA\left(\frac{h_2 - h_1}{L}\right)$ Candidates are expected to have studied the following geophysical prospecting techniques: • gravity (Bouguer) • seismic	Candidates will be required to apply, but not recall, Darcy's Law to measure fluid flow in rocks. *For exemplification of Darcy's Law see* ***Mathematical Guidance for A level Geology***. *(MPS7)* Interpretation of seismic reflection sections to identify potential oil and natural gas-bearing structures.	

		particular applications and limitations	(reflection only – 2 way time) • magnetic (including aeromagn etic) • electrical (resistivity only) • electromagnetic (EM survey)		
9th Dec		b. Microfossils are used for correlation in prospecting for oil and natural gas.	Candidates should be aware of the use of the following: foraminifera, calcareous nannofossils and palynomorphs (pollen, spores and dinoflagellates) http://www.ucmp.berkeley.edu/fosrec/ ONeill.html	Construction of geological cross- sections from borehole data, including dating and correlation using microfossils.	HW on microfossils Past paper: C1 2022 including xs
		d. The characteristics of subsurface geology which control the flow of groundwater (hydrogeology) include aquifers, aquicludes, aquitards, the water table, piezometric surfaces, cones of depression and recharge	Candidates are expected to have studied the differing geologies associated with the formation of springs	Analysis of the controls on groundwater quality which result from geochemistry (carbonates and sulfates), aquifer filtration, residence	
16th Dec	Topic T1: **GEOHAZARDS - Earthquakes**	a. Seismic hazards. • There is a relationship between earthquakes and active fault zones. • The magnitude of an earthquake event is	Though candidates are expected to be familiar with appropriate case studies they will not be required to recall specific case study detail in assessments. Teachers should be aware of the link with volcanic	Analysis of geological data from appropriate case studies of each the following: • a major earthquake • a mass movement event	C1 mock

		measured on the Moment Magnitude scale **(**MW**).** The intensity of earthquake damage around an event is measured on the modified Mercalli scale and is related to earthquake size, depth, distance, local ground conditions and building standards. • Seismic hazards include ground shaking, liquefaction. Tsunamis can cause devastation in coastal areas following an undersea earthquake (landslide or volcanic eruption). a. Geohazard and risk are intimately linked. • Geohazard: the probability of a change in the geological environment of a given magnitude within a specific time period in a given	hazards outlined in F2. Candidates should be aware that shaking is linked to the natural frequency of vibration of a building (resonance) and depends upon the earthquake frequency (Hz) and the height/shape of the building. Candidates should be aware of the physical, social and economic factors that affect the impact of geohazards (including population density, building type and density, hazard awareness/preparation and level of economic development). Candidates should be aware of the difference between the terms "hazard" and "risk".	to compare and contrast the nature of the geological hazards. Investigation of the factors that affect the impact of earthquakes and mass movements. *Understanding of simple probability (MPS13).*	

		area. Risk: the consequent threat of loss of life or damage to property and infrastructure. b. The risk assessment of geohazards involves an analysis of: • the nature of the hazard • the probability of occurrence and the return period of the hazard communication of the risk to the vulnerable population. c. Attempts to predict earthquakes include monitoring changes in: seismic activity, groundwater levels and pressure, ground deformation (creep meters, strain meters, tilt meters), radon gas emissions and electrical resistivity. d. The destructive effects of earthquakes and mass movements can, to some extent, be managed and controlled by engineering geology applications.	Teachers may find the following resources useful in the delivery of T1: http://www.bgs.ac.uk/research/earthHazards/geohazardNotes.html http://www.bgs.ac.uk/research/engineeringGeology/shallowGeohazardsAndRisks/home.html Though candidates are expected to be familiar with appropriate case studies they will not be required to recall specific case study detail in assessments. Teachers should be aware of the link with volcanic hazards outlined in F2. Candidates should be aware of engineering solutions in earthquake management e.g. • base isolators • aseismic 'smart' buildings building materials.	Analysis of the causes and effects of geohazards in the British Isles from appropriate data sets. An investigation of the monitoring of: • a major earthquake • a mass movement event evaluating the level of success in hazard prediction.	

		Earthquakes: reducing of the impact of ground accelerations; aseismic building design; tsunamis defences.			
Christmas					
6th Jan		b. Mass movement hazards. The mechanism and triggering of rock avalanches, landslides and debris flows are linked to angle of slope, lithology, weathering, load, groundwater regime, rainfall, ground vibration, vegetation cover. d. Sites of potential slope failure can be monitored by: • ground levelling and surveying; monitoring of micro- seismic events and borehole distortion; ground deformation (creep, strain, tilt) and groundwater pressures • Use of electronic distance measurement (EDM), satellite and GPS techniques. Mass movement: slope stabilisation methods, drainage control, retaining structures.			**HW: Oso mass movement** Past Paper: C2 specimen paper 2018 xs

		c. The British Isles is prone to local natural geohazards at different scales associated with: earthquakes, landslides, shrinking and swelling clays and subsidence (including sink holes).			
13th Jan		d. There is evidence that significant tsunamis have affected the British coast in the recent geological past.	Candidates are expected to be aware of the Storegga slide. http://www.bbc.co.uk/earth/story/20160323-the-terrifying-tsunami-that-devastated-britain		Past Paper: C2 2019 2016 map
20th Jan	Key Idea 3: **Engineering activities can have a major impact on the natural environment**	a. Extraction of geological raw materials and economic storage of waste products involves interference with the surface and/or subsurface environment. • Quarrying and mining. Problems associated with the extraction of rock and minerals – stability of working faces, rock falls, ground subsidence, flooding, surface/groundwater pollution and waste tipping.	Candidates will be expected to have studied extraction from open cast pits and underground mines.	Analysis of the methods of extraction of geological raw materials to identify potential environmental problems and the ways by which these may be minimised. Analysis of landfill engineering data for the disposal of domestic waste or underground sites for the disposal of highly toxic chemical and radioactive waste.	Past Paper: C2 2020 2019 AS xs

		Waste disposal. Problems of ground contamination, including groundwater pollution and methane gas production, can be ameliorated by good geological site selection and engineering practice. There are special problems with the disposal of highly toxic chemical and radioactive waste. Contaminated land. Problems with the management and remediation of industrial brownfield sites associated with toxic chemical materials, ground instability, subsidence and groundwater pollution.	Candidates will be expected to have studied: • toxic heavy metal contamination (e.g. cadmium, mercury , lead and arsenic) of soil and groundwater • problems of ground pollution and instability of former landfill sites • remediation solutions (e.g. phytoremediation, solidification and stabilisation methods) Teachers may find the following resources helpful: http://www.unep.or.jp/Ietc/Publications/Freshwater/FMS2/1.asp https://clu-in.org/download/Citizens/a_citizens_guide_to_solidification_and_stabilization.pdf	Analysis of the issues associated with the remediation of one industrial brownfield site.	
27th Jan		b. Civil engineering work should take account of geological factors to avoid: • problems of ground instability associated with weathering, dip of strata, folding,		Simple analysis of rock slope stability involving friction angle and orientation of rock discontinuities.	2017 map Past Paper: C2 2021

		faulting, rock cleavage, joint patterns and fracture density interference with the hydrological system: pore water pressure, surface and underground drainage (porosity, permeability, water table, aquifers) radon gas – sources and pathways to surface, surface geology of high-risk areas. c. In building major structures geological factors and geological rock properties must be taken into account (e.g. dams and reservoirs, cuttings and tunnels, buildings).	Candidates should be aware of the impact of valley shape, rock structure (bedding, jointing, faulting, cleavage), rock strength (unconfined compressive strength – UCS), porosity and permeability in major engineering projects.	Analysis of the suitability of sites using a variety of geological and geotechnical data.	
3rd Feb	Topic T4: **GEOLOGICAL EVOLUTION OF BRITAIN** Key Idea 1: **The Neoproterozoic and Phanerozoic stratigraphy of the British area has been determined largely by the assembly of lithotectonic terranes during three orogenic events**	a. Rocks from all the major subdivisions of geological time occur in Britain and surrounding shelf areas: Precambrian, Early and Late Palaeozoic, Mesozoic, Cenozoic. b. Information used to investigate the geological history of the British Isles also includes remote sensing techniques that provide an indirect way to investigate the	Study of geological maps at various scales including maps linking onshore and offshore areas. Use of maps and related data to investigate major geological processes operating in different parts of the British area from the Precambrian to the Quaternary. Application of remote sensing and subsurface data collection to help interpret the Palaeozoic and Neoproterozoic geology of the British area.	Candidates are expected to use their fieldwork to collect and analyse data of a selected area(s) to interpret the local stratigraphy and place into a wider context. Teachers may find the following resource useful in delivering part of this section:	Past Paper: C2 2022 Minerals revision sheet and check list 2020 AS xs

		subsurface geology. The principles associated with: • potential field measurements gravity (Bouguer anomaly) and magnetic surveys • borehole analysis; as exemplified by the Mochras Borehole. seismic reflection surveys; onshore and offshore.		http://www.sub-surfrocks.co.uk/	
		c. A number of orogenic events have affected the British area: location and large-scale geology. Ages, main structures and dominant trends of the Caledonian and Variscan orogenic belts; Alpine orogenic influences in Britain.	Interpretation of geological maps to identify outcrop patterns associated with large-scale geological features of orogenic belts; fold shapes and descriptors, plunging folds; fault descriptors; regional structural trends as displayed by major folds and faults.		
		d. Study of the geology (plutonic/volcanic and metamorphic rocks) of these orogenic belts aids the reconstruction of the plate tectonic regimes in which they developed.	Collation and evaluation of geological evidence to interpret the Caledonian and Variscan orogenic belts and Palaeogene Igneous Province in plate tectonic terms.		
		e. The Palaeogene Igneous Province of NW Britain provides evidence of the early history of the opening of the North Atlantic Ocean, with	Interpretation of the geological characteristics of the Palaeogene Igneous Province in plate tectonic terms.	Candidates should be aware of the tectonic link between the opening of the North Atlantic ocean and the rifting of the North Sea.	

		associated basaltic volcanicity.			
10th Feb	Contingency Mock				C2
Half term					
24th Feb	Key Idea 2:**The evidence for the northward drift of the British area through the Neoproterozoic and Phanerozoic**	a. The palaeomagnetic field direction in some British rocks provides evidence of latitude at the time of magnetisation. b. Rocks in Britain show evidence of major climatic change through Phanerozoic time as a result of the northward drift of the British area, exemplified by: • Devonian and Permo-Triassic – semi-arid and desert terrestrial and hypersaline marine deposits. Carboniferous, Jurassic and Cretaceous – tropical, shallow marine and terrestrial (coal) deposits.	The use of palaeomagnetic data to calculate palaeolatitudes for the British area, and interpretation of apparent polar wandering curves to determine palaeolatitude changes through time.	Candidates should be aware of the role of magnetic inclination, declination and polar wandering curves in determining palaeolatitude. Candidates should be able to understand the significance of changes in rock type (to include limestone, sandstone and coal) and fossils (to include corals, plants and microfossils) in determining climate change through the Palaeozoic.	Past Paper: C3 specimen paper including map
3rd Mar	Key Idea 3: **The northward drift of the British area as controlled by plate tectonic motions has resulted in the deposition of a wide range of sedimentary**	a. Sedimentary rocks deposited in Britain are related to the interplay of global plate tectonics and associated climatic changes: 1. *Neoproterozoic.* The break-up of the super-continent, Rodinia. Link to the	Interpretation of maps, fossils, sedimentary rocks and structures to evaluate the evidence for changing depositional with particular reference to: 1. an evaluation of the “Snowball Earth” hypothesis with evidence from	Candidates will be expected to analyse data in a variety of forms (including photographs, palaeogeographic maps, and geological section logs) to interpret the location, climate and physiographic conditions of the British area at selected geological times.	Past Paper: C3 2019 including map

	facies during the Neoproterozoic and Phanerozoic (from 1000Ma to 2.6Ma)	cooling of the global climate around 700 Ma. 2. *Early Palaeozoic*. Northern and southern parts of Britain in different continents separated by the Iapetus Ocean. Deep and shallow marine environments. 3. *Mid Palaeozoic*. Caledonian Orogeny and fusion of Euramerica.	Britain: diamictites of the Port Askaig formation; rapid evolution of primitive life in the Ediacaran fauna – Charnia. 2. shallow seas: Cambrian and Silurian sandstones, shales and limestones with shallow water fossil assemblages including corals, brachiopods, trilobites; deep seas: Ordovician black graptolitic shales and turbidites. 3. continental red beds: Devonian sandstones; breccias; conglomerates; mudstones.	Candidates should be able to relate rocks and structures to different palaeogeographies and plate settings and identify major geological changes related to the plate tectonic evolution of the British area.	
10th Mar		*4. Late Palaeozoic*. Britain drifted north across the equator with possible destruction of a tract of oceanic lithosphere during the Variscan Orogeny. 5. *Early Mesozoic*. Separation of Laurasia and Gondwana by the Tethys ocean in southern Europe. Rifting and subsidence in the North Sea area	4. equatorial rain forest conditions: Carboniferous coal measures with sandstones, shale, freshwater bivalves and plant remains. Coal seams and seat-earths with rootlets. 5. continental red beds and evaporites. Permo- Triassic – semi-arid and desert terrestrial; hypersaline marine deposits; Jurassic		Past Paper: C3 2020 including map Sedimentary rocks revision sheet and check list

		related to the opening of the Atlantic Ocean. 6. *Late Mesozoic*. During the Cretaceous, continued opening of the Atlantic and continued subsidence of the North Sea area. 7. Ce*nozoic*. Formation of the Alps with related tectonic uplift in the British area. Ongoing subsidence in North Sea area.	shallow marine shelf deposits. 6. open marine Cretaceous chalk deposits recording a period of high global temperatures and sea levels. shallow and non-marine Paleogene deposits recording transgressive-regressive cycles.		
17th Mar	Topic T2: **GEOLOGICAL MAP APPLICATIONS** Key Idea 1: **Outcrop patterns on geological maps can be used to identify and interpret structural elements**	Outcrop patterns of dipping strata and faults in relation to topography: direction of closure of V-shaped outcrops in valleys as an indication of dip direction; close parallelism of geological boundaries and topographic contours as a sign of near horizontal dip; linear geological boundaries crossing topographic relief as an indication of steep dip.	Interpretation of relationships between structural features, outcrops and topography on geological maps. Identification of fold types using outcrop patterns on geological maps. Identification of fault types and measurement of displacements using offsets of geological boundaries across faults. Identification of unconformities based on field relationships displayed on geological maps. Analysis of the 3D nature of geological maps and cross-	Eduqas Virtual field trip – SP 6, SP12, SP13, SP14, SP15 **SP6:** Construction of graphic logs using appropriate scale and symbol sets for unfamiliar geological sequences and exposures to record data relevant to an investigation. Candidates should be familiar with using colour BGS maps (at any scale) as a data resource in assessments and as part of specific investigations in the field. Teachers may find the following resources useful in the analysis of 3D geology mapwork:	Past Paper: C3 2021 including map Igneous rocks revision sheet and check list

			sections using block diagrams and/or GIS systems (including Google Earth^{TM}).	http://app.visiblegeology.co m/ http://geology.isu.edu/topo/blocks/	
		a. Geological maps provide an essential database of detailed information about the distribution of rocks at the surface that can be used to interpret or predict subsurface geological conditions.	Use of geological maps at various scales to identify from outcrop patterns and other data on geological maps: • conformable and unconformable sedimentary formations • metamorphic sequences and igneous bodies (and any associated metamorphic effects) structural features.	Additional map resources http://www.bgs.ac.uk/data/maps/home.html (for free online viewing of all BGS maps) Copies of past WJEC Geology A level question papers (GL4) featuring colour BGS maps can be accessed using the “GL4 BGS colour maps and past questions” resource in the Resources for Teachers section of the Eduqas A level Geology webpage. This resource, with additional mark schemes is repeated on the secure website.	
24th Mar		b. Geological maps provide an essential database for geological applications: • design of construction projects • identification of geological hazards • location of resources – groundwater, fossil fuels; alternative energy sources		Use of geological maps at various scales to: • assess the potential of surface sites for a range of engineering projects on the basis of the prevailing geology • identify geological hazards (landslides, subsidence) at defined	Past Paper: C3 2022 including map Metamorphic rocks revision sheet and check list

		identification of environmental issues from extraction of these resources assessment of suitability for sustainable waste disposal or brownfield remediation.		surface sites on the basis of the prevailing geology • interpret subsurface geology in connection with groundwater (water table, springs, aquifers, artesian wells), coal, oil, natural gas and geothermal energy identify the environmental issues specific to extraction of resources from the map area assess the suitability for sustainable waste disposal/contaminated land remediation in a given area.	
31st Mar	C3 mock (2023)				
Easter					
22nd April	**C3 mock (2024)**				
28th April	C1 and C2 revision				2022 AS xs

5th May	C2 Mock (2024)				
12th May	C1 Mock (2024)			Practical Endorsement completion	