SUBJECT: Curriculum Overview

Year 10

Half Term	Topic studied	What will I learn?	How will I be assessed?	National Curriculum Map
Year 10 Autumn	1- What are minerals 2 - Created by fire: Igneous Rocks 3 - Sedimentary 4 - Broken: Sedimentary Rocks	1. Identifying Minerals 2. Minerals and rocks 3. What are igneous rocks 4. What happens in the Earth's crust 5. Extrusive igneous rocks 6. Identifying igneous rocks 7. Weathering and erosion 8. Sieving 9. Sedimentary environments 10. Sedimentary structures	Exam questions from Paper 1 and 2 End of topic tests using the above sources for each topic area. Gravestone mapping assessment Sieving practical assessment	***Mineral**s • the physical properties of minerals • modes of formation of common rock-forming minerals • modern laboratory techniques in the study of minerals (scanning electron microscope, electron microprobe) • the uses of a minimum of three minerals (at least one in construction, one in industrial manufacturing and one in energy generation* ***Igneous rocks** • diagnostic textures and mineralogy of igneous rocks • characteristics of a minimum of four igneous rocks (one ultramafic, one mafic, one intermediate and one silicic) • the effect of magma cooling rates on crystal size • the effect of viscosity of magma on the type of volcanic activity and morphology of the volcano • the characteristics of passive and violent eruptions • structures within igneous bodies (columnar joints and pillow structures) • the forms of igneous bodies (lava flows, sills, dykes and plutons) • the characteristics of igneous bodies (textures, structures and field relationships) in hand specimen/rock exposures, simple geological maps, diagrams and photographs* ***Sedimentary rocks and their fossil content** • diagnostic textures and mineralogy of sedimentary rocks • characteristics of a minimum of four sedimentary rocks (at least one of clastic, one of chemical and one of organic origin) • the relationship between sedimentary textures*

				(size, shape and sorting of the grains) and processes within the rock cycle • the structures within sedimentary rocks (lamination/bedding, graded bedding, cross bedding, ripple marks and desiccation cracks) • the influence the degree of compaction and cementation of sedimentary grains on porosity and permeability of sedimentary rocks • sedimentary rock type and fossil content as evidence of the environment of deposition (marine and terrestrial) over geological time • the characteristics of sedimentary rocks (textures, structures and fossil content) in rock exposures, simple geological maps, diagrams and photographs • morphology of a minimum of three fossil groups (including corals and plants) 5 • the significance of major fossil discoveries (including Burgess Shale fauna) • the morphology of modern reptiles and birds (the link with macro fossil evolution - Archaeopteryx) • the incomplete nature of the fossil record • features of early hominids ('Lucy')
Year 10 Spring	5 – Under pressure: Metamorphic Rocks 6 – Rock Cycle 7- Earth Forces	11. Contact metamorphism 12. Regional metamorphism 13. Identifying metamorphic rocks 14. How do rocks form 15. 2-Geochronology and Earth time 16. James Hutton and Geological principles Folding 17. Faulting 18. Introduction to Geological maps	Exam questions from Paper 1 and 2 End of topic tests using the above sources for each topic area. Practical – mineral identification End of topic tests using the above sources for each topic area.	***Metamorphic rocks*** *• diagnostic textures and mineralogy of metamorphic rocks • characteristics of a minimum of two metamorphic rocks (one contact and one regional metamorphic) • the relationship between metamorphic textures (crystal size and orientation) and processes within the rock cycle • the formation of metamorphic rocks as a result of heat and/or pressure on preexisting rocks • foliated textures (slaty cleavage and schistosity) • the characteristic features of a metamorphic aureole on simple geological maps/diagrams • the characteristics of metamorphic rocks (textures and reaction with acid) in hand specimen/rock exposures, simple geological maps and diagrams, and photographs* ***Rock cycle*** *• the differing rates of rock cycle processes ('seconds' – catastrophism, compared to 'millions of years' – gradualism) • the rock cycle linked to igneous, sedimentary and metamorphic processes over geological time (energy transfer) • the relevance of weathering and erosion to sedimentary characteristics (size, shape and sorting) and geological history* **Geochronological principles and stratigraphy** • the principle of uniformitarianism • the concepts of original horizontality, lateral continuity and superposition • the relative dating of rocks based on included fragments, crosscutting relationships and fossil assemblages • stratigraphic principles in interpreting the geological history of rock exposures in the field, and in diagrams and

				photographs • radioactive decay rates and radiometric age determinations • the development of the concept of deep time (The Bible, Hutton, Kelvin, Joly and Holmes) Lab skills and techniques: • recording observations • use of photomicrographs to identify minerals and rock textures • constructing graphic logs • applying classification systems • producing annotated scientific drawings • constructing geological maps • constructing geological histories ***Structures*** *• the evidence of tectonic activity in the rock record • the concept of dip and strike of 3D planar surfaces • the characteristics of rock structures (folds, faults and unconformities) in field exposures, simple geological maps and diagrams, and photographs • folding caused by compressional stresses • characteristic features of folding (antiforms/synforms and axial plane traces) in field exposures, simple geological maps, and diagrams and photographs • processes and causes of faulting in compressional, tensional and strike-slip dominated regimes • characteristic features of faulting (normal/reverse, thrust and strike-slip displacement) in field exposures, simple geological maps, and diagrams and photographs • unconformities as breaks in the rock record • the characteristics of unconformities in the field, in photographs, and in diagrams and on geological maps • unconformities in interpreting geological history*
Year10 Summer	8 - Plate Tectonics. . 9 - Global Climate change. 10 – Planets 11- Cornwall field trip	19. Earth Structure 20. Plate tectonics 21. Plate theory and time 22. Intro to hazards 23. Ice house/Hot house Earth. 24. Causes of modern climate change. 25. Landforms associated with climate change. 26. Our solar system 27. The moon 28. Meteorites 29. Introduction to Cornwall	Exam questions from Paper 1 and 2 End of topic tests using the above sources for each topic area.	**Plate tectonics** • the structure of the Earth in terms of its chemical properties (crust, mantle and core) and mechanical behaviour • the concept of a “tectonic plate” (related to its mechanical behaviour – lithosphere and asthenosphere) • the evidence for plate tectonics theory (maps and seismic, magnetic, heat flow, fossil and Global Positioning System (GPS) data) and the related plate movement • the type of magmatism, seismic activity, deformation and topographic features associated with different plate boundaries • plate theory as being continually re-evaluated in the light of new evidence **Past global temperature and sea level changes** • the major sources of carbon dioxide in the atmosphere (volcanic emissions and burning of fossil fuels) 7 • the evidence for changes in climate through geological time (icehouse to greenhouse conditions) and sea level from sedimentary rocks (tillite, limestone and drowned forests) • the evidence for changes in atmospheric carbon dioxide levels over geological time (sedimentary rock and ice cores) • the effect on climate of the northward movement of the British area from the Lower Palaeozoic to the Cenozoic • the positive and negative controls on the long term carbon cycle (subduction,

		30. Methodology for data collection in Bude. 31. Cornwall write up and assessment.		volcanic emissions, chemical weathering and marine storage) • the effect of global temperature change on ice sheets and sea levels over geological time • carbon sequestration as a geological strategy for reducing atmospheric carbon dioxide **Planetary geology** • the similarities and differences (rocks, landscapes, atmosphere, temperature, pressure and gravity) between the Earth and its planetary neighbours 6 • meteorite evidence for the composition of the Earth • the impact that meteorites/comets may have had on the Earth's evolution • planetary features as analogues for unseen Earth processes (e.g. Moon impact craters) • the use of space imagery and exploration technology in obtaining planetary exploration data (e.g. Moon and Mars) **Field work:** • location of geological features in the field using traditional navigation and basic field survey skills, and with the use of GPS • identification of geological structures in the field • measurement of two and three-dimensional geological data across a range of scales such as dip and strike of planar surfaces or apparent dip of fold limbs exposed on a hillside or cliff section using a compass clinometer • sampling 9 • production of full rock description of macro and micro features from conserved hand specimens and unfamiliar field exposures • use of appropriate apparatus to record a range of quantitative measurements (mass, time, volume, temperature and length) • use of physical and chemical testing to identify minerals: