SCARBOROUGH UTC
Technical Excellence, Employable Graduates

We develop a greater understanding of the wider world, empowering individuals to travel and explore. We engage, inspire and challenge learners to become informed global citizens. A desire for lifelong learning will help to produce leaders in more sustainable working environments.

LONG TERM PLAN

YEAR 12

Half Term	Unit Title	Key knowledge/ content to learn and retain	Essential skills to acquire (subject and generic)	Link to subject intent and ethos	Anticipated misconceptions	Link to previous KS	Opportunity to stretch higher attainers	SMSC & British Values	Cultural Capital	Career Link
1.	The conditions for life on Earth Conservation of Biodiversity	What are the features of earth that created suitable conditions for life? Why is conserving biodiversity important? What are the main threats to biodiversity? How do we set conservation priorities? How can we conserve biodiversity? How are habitats different across the globe?	Using IUCN criteria to categorise endangered species. Comparing international, national and local conservation priorities. Using flow diagrams to demonstrate habitat development. Using data to compare biomes. KEY WORDS: **Anomalous** **Sequestration** **Biomimetics** **Adhesion** **Physiological** **Gene pool** **Exploitation** **Turbidity** **IUCN red list** **CITES** **Embryo transfer** **Seed bank**	Developing a greater understanding of the wider world—selected habitats across the globe. Protecting habitats by developing sustainable approaches to conservation management.	Oxygen existed from the creation of earth. Illegal trade of animals is minimal. Habitats are no longer being destroyed in the UK. Tropical rainforest soils are thick and nutrient-rich.	Resource Reliance The UK in the 21st Century	Linking Milankovich cycles to future habitat destruction. Linking the conservation of habitats to future sustainable practices across the globe. Using advanced data analysis techniques to reach conclusions.	Considering the Wildlife and Countryside Act and how it is helping to protect Biodiversity across the UK. Forming opinions.	The importance of international organisations such as IUCN and CITES in the protection of rarer species. Fragile environments across the globe.	Conservation officer Border agent Data analysis Research and Development Field officer Environmental technician Ranger

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2	Life Processes in the Biosphere	How do organisms ‘adapt’? What are abiotic and biotic factors? What is ecological succession? How can we conserve plagioclimax communities? How can we use fieldwork to study a plagioclimax community? How does species diversity and ecological stability relate to population dynamics? What is a Biome?	Understanding the ‘bell curve’ on a range of tolerance. Using flow diagrams to represent ecological succession. Comparing line graphs and data in order to understand population dynamics. KEY WORDS **Abiotic** **Biotic** **Seres** **Plagioclimax** **R-selected** **K-selected** **Carrying capacity** **Niche** **Biome**	Studying biomes across the globe develops and understanding of the wider world.	Climax communities only stem from one type of Sere. It is easy to regulate natural populations Species numbers can exceed the carrying capacity due to human intervention.	Distinctive Landscapes Sustaining ecosystems	Linking adaptions to changing environments due to global warming. Species and communities may shift their position in the globe due to a temperature rise. Critically thinking about the future of the North York Moors.	Developing and expressing personal views and opinions—particularly with regard to grouse shooting and its effect in the local area on the plagioclimax community created on the moors.	Discussion of conservation priorities across the globe. Should humans intervene where ecosystems are failing?	Conservation officer Ranger Warden Education specialist Maintenance Rights of way Planning Cartography

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3	Atmosphere Hydrosphere	What is the composition of the atmosphere? How does the atmosphere support life? How is the enhanced greenhouse effect different to the natural greenhouse effect? How is climate change affecting the cryosphere? Why is it difficult to monitor climate change? What is ozone depletion and how has it been prevented? Why is there such a huge demand for water? How have humans impacted the hydrological cycle? How can we sustainably manage water?	How can we sue data to monitor amounts of CO2 in the atmosphere? Using a graph to show temperatures in the atmosphere. Using flow diagrams to show energy budgets. Using flow diagrams to show biogeochemical cycles. KEY WORDS **Monatomic** **Diatomic** **Triatomic** **Dynamic equilibrium** **Energy budget** **Cryosphere** **Feedback** **Ozone** **Abstraction** **Aquifer** **Afforestation**	A detailed look at global warming and issues surrounding water stress allows students to become informed global citizens. Sustainability is a key part of these topics.	The greenhouse effect is bad. The greenhouse effect is slowing. Water stress is reducing.	Global Hazards Sustaining Ecosystems	Linking systems in the atmosphere to systems in the hydrosphere and developing a deeper understanding of negative and positive feedback loops. Showing an understanding that water conservation is a priority in many areas of the globe. Evaluation of future changes in the atmosphere and hydrosphere due to climate change.	Developing and expressing personal views—particularly with regard to human damage to both the atmosphere and hydrosphere.	The impact of global warming in both the atmosphere and hydrosphere—how is this affecting global systems. An opportunity to explore the Montreal Protocol and the benefits it had for the whole world.	Atmospheric scientist Pollution monitoring Water board Hydrologist Field scientist

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4	Lithosphere	Which minerals are extracted from the lithosphere? What geological processes led to exploitable mineral deposits? What is Lasky's principle? Which factors affect mineral exploitation? How does mineral exploitation affect the natural environment? How can we exploit minerals in the future using sustainable methods? What is cradle to cradle design?	Using diagrams to explain geological processes. Using linear and log-linear scales to understand Lasky's principle Using flow diagrams to explain cradle to cradle design. KEY WORDS **Hydrothermal** **Metamorphic** **Sedimentary** **Evaporite** **Reserve** **Resource** **Stock** **Batholith** **Buffer zone** **Turbid** **Aesthetics** **Benthic** **Leachate** **Polymetallic** **Phytomining**	Critical thinking regarding the exploitation of mineral resources across the globe challenges learners to become informed global citizens. Studying 'cradle to cradle' design, phytomining and bioleaching encourages students to think about sustainable methods of mineral exploitation.	We will never run out of minerals. Taking minerals from the earth does not cause pollution. Recycling will solve the lack of minerals.	Resource reliance.	Using Lasky's principle to further develop ideas regarding the sustainable exploitation of future mineral resources. Linking the topic to energy production and pollution to form a more complete picture.	Developing and expressing personal views and opinions. Linking the extraction of coal and other minerals to the UKs leading of the industrial revolution.	The disparity between resource availability and consumption. Understanding the opportunities and challenges that will be presented in the local area by Anglo American's development of the Woodsmith site near Whitby.	Anglo American—range of employment. Environmental impact officer Mining Geologist Seismologist

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5.	Biogeochemical cycles Soil	What is the carbon cycle? Which biotic and abiotic factors affect the carbon cycle? What is the nitrogen cycle? How are we managing the nitrogen cycle more sustainably? What is the phosphorus cycle? What are the features of fertile soil? How do humans affect soil fertility? What is a soil triangle? How can we study soils in the laboratory? What is soil erosion? How can we use the universal soil loss equation to better manage soils?	Using flow diagrams to understand natural cycles. Using the soil triangle to identify different types of soil. Using laboratory techniques to assess soil fertility. Using the universal soil loss equation to monitor soil erosion. KEY WORDS **Fossilization** **Aerobic** **Anaerobic** **Exsolve** **Dissociate** **Desorption** **Cryogenic** **Ionization** **Biota** **Contour** **Tied ridge** **Terrace**	The study of cycles allows students to consider the bigger, global picture. Working in the field challenges learners to further develop an understanding of the real world.	Cycles are independent of each other. It is easy to rectify dynamic equilibrium if it has been disrupted. Soil problems only affect LIDCs.	Resource Reliance Sustaining Ecosystems	Building integrated diagrams of biogeochemical cycles. Recognising that positive feedback loops may lead to tipping points. Planning integrated approaches to prevent soil erosion.	Developing and expressing personal views and opinions. Thinking about how British technology can be used to improve soil erosion problems in LIDCs.	Comparison of soil erosion problems across the globe. The impact of global warming on biogeochemical cycles.	Soil Scientist Agronomist Climatologist Hydrologist

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6.	Energy Resources	How important have energy resources been in the development of society? What are the features of energy resources? Is current energy use sustainable? What is the future of energy supplies? Is nuclear energy the answer? How is renewable energy taking over from fossil fuels? How can we store energy more efficiently? What is energy conservation? How should energy infrastructure be managed in order to protect the natural environment?	Using data to compare energy sources – especially with regard to energy density. Use line graphs for cost comparison. Using graphs to map trends and extrapolate future patterns. Using choropleth maps to compare renewable energy use across the globe. KEY WORDS: **Affluence** **Depletable** **Renewable** **Energy density** **Fracking** **Fission** **Fusion** **Photovoltaic** **Molten salt** **Peak shaving**	A real emphasis placed on designing energy resources that drive the development of sustainable working environments across the globe.	We have enough finite resources to provide energy in the future. Nuclear energy is extremely dangerous. We already have sustainable solutions to the world energy crisis.	Resource reliance Sustaining ecosystems Urban futures	Showing a detailed understanding of the link between energy resources and development. Creating detailed plans for future green energy across the globe. Recognising that green energy production can still damage natural environments.	Developing and expressing personal views and opinions. Recognising that the UK was a lead in energy production during the industrial revolution.	The opportunities and challenges of living in energy rich areas of the globe. Comparison of new ways of making energy that may protect the natural environment.	Electricity technician Infrastructure building and maintenance Energy research Nuclear research Green energy