



Biology Scheme of Learning

Year 11 – Term 5/Unit B18

Intent – Rationale

.Students learn about the exponential growth of the human population and the impact this has had on land, resources and managing waste. They consider land, water and air pollution, the effects of deforestation and peat bog destruction and global warming. Triple students continue by learning about the impact of the changes on the distribution of organisms and how biodiversity can be maintained. They consider how this is monitored by looking at trophic levels and biomass, how biomass is transferred, factors that affect food security and making food production more efficient and sustainable.

| Sequencing – what prior learning does this topic build upon? | Sequencing – what subsequent learning does this topic feed into? |
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| GCSE Biology Topic B8 Photosynthesis, B15 Genetics and evolution, B16 Adaptations, interdependence and competition and B17 Organising an ecosystem | <ul style="list-style-type: none"> A Level Unit 3 Organisms exchange substances with their environment, Unit 4 Genetic information, variation and relationships between organisms, Unit 5 Energy transfer in and between organisms, Unit 6 Organisms respond to changes, Unit 7 Genetics, populations, evolution and ecosystems, Unit 8 The control of gene expression. |
| What are the links with other subjects in the curriculum? | What are the links to SMSC, British Values and Careers? |
| <ul style="list-style-type: none"> Base the content here on what you already know but there will be time in future to liaise further as part of our collaborative work | <ul style="list-style-type: none"> B18 L1 GB4abdg B18 SMSC M,SO |
| What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading? | What are the opportunities for developing mathematical skills? |
| FROM THE LIBRARY <i>Our Changing population-305</i> <i>Planet under Pressure-363</i> <i>Poulation-910</i> <i>Global Waste-363.72</i> <i>Waste Issues-363</i> | <ul style="list-style-type: none"> Tangents and gradients Percentages |



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Intent – Concepts

| What knowledge will students gain and what skills will they develop as a consequence of this topic? | | What opportunities are available for assessing the progress of students? | |
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| <p style="text-align: center;">Know</p> <ul style="list-style-type: none"> Describe some effects of Human population growth. Describe how sewage, fertilisers, pesticides and herbicides pollute the land and water. Describe how acid rain is formed. Define what is meant by deforestation. Use the terms greenhouse effect, global warming and climate change. Explain how an environmental change will affect the distribution of an organism. Construct pyramids of biomass. Explain how events could affect food security. Describe what is meant by sustainable food production. <p style="text-align: center;">Apply</p> <ul style="list-style-type: none"> List some ways People can help maintain biodiversity. Identify errors and improve terminology. Use word and symbol equations to show how burning some fuels produces acid rain. Why loss of biodiversity matters. Identify the link between carbon dioxide emissions and the mean global temperature and calculate gradients. State how organisms adapt to environmental change. Calculate the percentage of biomass passed between trophic levels and the efficiency of transfer. Evaluate the advantages and disadvantages of modern farming techniques. Describe the techniques used to conserve fish. <p style="text-align: center;">Extend</p> <ul style="list-style-type: none"> Explain why a high level of biodiversity is important to the stability of ecosystems. Describe the process of eutrophication. Explain what causes global dimming and smog. Explain the effects of deforestation and peat removal. Explain the causes and effects of rising carbon dioxide and methane levels in the atmosphere. Categorise environmental changes as due to seasonal changes, geographical changes, human interaction or a combination. Explain how biomass is lost by organisms at each stage of a food chain. Explain how factory farming techniques increase the rate of growth. | | | |
| What subject specific language will be used and developed in this topic? | | | |
| Word | Definition | <ul style="list-style-type: none"> B18 L1 use data to analyse and interpret information concerning human population growth. B18 L2 Long answer question – eutrophication B18 L4 Long answer question - deforestation B18 L7 calculations B8 summative test | |
| acid rain | rain that has an acidic pH caused by acid gases that have been released into the atmosphere, such as sulfur dioxide and nitrogen oxide. These gases dissolve in rainwater and react with oxygen in the air to form acid | | |
| biodiversity | a measure of the variety of all the different species of organisms on Earth | | |
| deforestation | the removal of trees from a large area of land so that the area can be used for other purposes, such as farming or building | | |
| incident energy | light from the Sun arriving at the surface of the Earth | | |
| trophic level | feeding levels in an ecosystem | | |



Intent – Concepts

| Lesson title | Learning challenge | Higher level challenge | Suggested activities and resources |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Can be given as a flipped unit in Y10 summer term. L1 The Human Population Explosion | Can I describe some effects of Human population growth? | Can I explain why a high level of biodiversity is important to the stability of ecosystems? | |
| L2 Land and water pollution | Can I describe how sewage, fertilisers, pesticides and herbicides pollute the land and water? | Can I describe the process of eutrophication ? | |
| L3 Air pollution | Can I describe how acid rain is formed? | Can I explain what causes global dimming and smog? | |
| L4 Deforestation and peat bog destruction | Can I define what is meant by deforestation ? | Can I explain the effects of deforestation and peat removal? | |
| L5 Global warming | Can I use the terms greenhouse effect, global warming and climate change? | Can I explain the causes and effects of rising carbon dioxide and methane levels in the atmosphere? | |
| L6 The Impact of Change (TRIPLE ONLY) | Can I explain how an environmental change will affect the distribution of an organism? | Can I categorise environmental changes as due to seasonal changes, geographical changes, human interaction or a combination? | |

