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Year 11 Overview 2025-26 – *Biology*

Date	Wk	Week	Units Studied & Learning Outcomes	Key Concepts & Assessment
8 weeks (8/9 Lessons for combined) (38Days)				
Tues 2-Sep Tues Y7 only Wednesday-whole school	A	1	**INSET DAY Friday 19th SEPT** **Overview of Unit/No. lessons** Variation and modes of reproduction (3 lessons) Mechanisms of inheritance, predicting patterns of inheritance and inherited disorders (6 lessons) **Sequence of Unit-Inheritance** 1) Causes of variation (1 lesson) 2) Types of reproduction (1 lesson) 3) Advantages and disadvantages of different reproduction strategies (1 lesson) 4) DNA, Chromosomes and the human genome (1-2 lessons) 5) Alleles and predicting patterns of inheritance (Punnett squares/genetic diagrams) (1-2 lessons) 6) The understanding of inheritance - the work of Mendel (1-2 lesson) 7) Inherited disorders (1 lesson) 8) Sex determination (1 lesson) 9) Revision for ST1 **Unit Learning Outcomes:** GW: state characteristics of the DNA molecule and understand that it is a 'code'. Identify what an allele and recognise different types of reproduction. Can complete a genetic diagram and identify probabilities BI: Can recall the base pairing rule and describe the DNA molecule in greater detail. Can define what an allele is and recognise key terms to describe pairs of alleles. Can interpret family trees. Can state some pros/cons of embryo screening. Can recognise the importance of the human genome project. EW: Can describe the importance of the human genome. Can construct arguments for and against embryo screening, with reasons. Can interpret and explain family tree diagrams linked to genetic disorders. Can confidently use key terminology when describing alleles. **Prior (Y9/10):** Year 7- Cells and Reproduction topics **Current (Y11):** Linking chromosomes with chemical they are made out of and how it functions **Next (Post 16):** Year 12 – Monomers and polymers DNA & RNA DNA & Protein synthesis	**Foundational Concepts** Principles of Inheritance **Outcomes** • Understand and describe the structure of DNA • Identify inherited disorders, understand their cause and describe their effects. *Link to World cerebral palsy day – recalling that some conditions are not caused by genetics.* • Describe and evaluate genetic screening. • Identify different types of reproduction • Understand the process of meiosis • Understand sex determination **KW**: Variation, Allele, dominant, recessive, chromosome, Double Helix, genome, polydactyly, Cystic fibrosis, Homozygous, heterozygous. **EDI-** • Inherited characteristics linked to diversity and race. • Genetic disorders – physical differences between individuals as a result of inherited genes. • In 1935, Dorothy Andersen discovered lesions in the pancreas of an infant during an autopsy, which led her to classify a condition she named cystic fibrosis of the pancreas. In 1938, she became the first to thoroughly describe symptoms of the medical condition cystic fibrosis. • Genetic screening – links to ethics associated with elimination of genetic disorders from families • Gregor Mendel- Came from a poor family but to gain an education, became a monk to develop his understanding of inherited characteristics. • Rosalind Franklin – Female scientist who helped developed the understanding of the structure of DNA, though did not win the Nobel Prize (Watson, Crick and Wilkins jointly received it – all males). **Links to root words (etymology):** • Allele comes from the Ancient Greek *'allos'* - other. Chromosome comes from the Greek words *'khroma'* - colour and 'zoma' -body. They were given this term as they are easily stained by some dyes used in research. • Polydactyly comes from the Greek words '*polu*' meaning 'many' and '*daktulos*' meaning 'fingers' • Meiosis comes from the Greek 'Meion' meaning less **History and culture**: • In 1869, Friedrich Miescher isolated "nuclein," DNA with associated proteins, from cell nuclei. He was the first to identify DNA as a distinct molecule. • The process of meiosis was first described in the mid-1870s by Oscar Hertwig, who observed it while working with sea urchin eggs. • Development of theories of evolution, Darwin's journey on HMS Beagle, historical/religious context & implications of Darwin/Wallace's NS theory
8-Sep	B	2		
15-Sep (INSET Friday)	A	3		
22-Sep	B	4		
29-Sep	A	5		
6-Oct	B	ST1		
13-Oct	A	ST1		
20-Oct	B	8		

			<table><tr><td></td><td></td><td>Mutations during Meiosis Diversity & taxonomy</td></tr></table> **Common misconceptions** Individuals inherit traits from only one parent. Some traits come from the mother, and other traits come from the father. Girls get most of their genes from their mothers, while boys get most of their genes from their fathers.	• In 1859, Charles Darwin set out his theory of evolution by natural selection as an explanation for adaptation and speciation. He defined natural selection as the "principle by which each slight variation [of a trait], if useful, is preserved" **Careers:** geneticist, biotechnologist, epidemiologist, forensic scientist, genetic engineer, research scientist, healthcare scientists – genomics, genetic counsellor. • **Assessment** (Quiz/Tests/application tasks/ ST: Including foundational concepts, wider disciplinary knowledge, key content.) Please Highlight the week number where formal feedback will be given (once per half term)
Half-Term			**7** weeks (10/11 lessons for combined) (35 Days)	
3-Nov 10-Nov 17-Nov 24-Nov 1-Dec 8-Dec 15-Dec	A B A B A B A	9 10 11 12 13 14 15	**Overview of Unit/No. lessons** ST2 FEEDBACK 9) Meiosis (1 lesson) 10) Evolution (1 lesson) 11/12) Theories of evolution (1 lesson) 13) Growing bacteria aseptically and testing antiseptics (1 lesson)- REQUIRED PRAC 14) Speciation (1 lesson) 15) Extinction (1 lesson) 16) Fossil formation (1 lesson) 17) Selective breeding (1 lesson) 18) Genetic engineering (1 lesson) 19) Classification (1 lesson) 20/21) Cloning (1-2 lessons) 22/23) Ecosystems and biodiversity (2 lessons) 24) Biotic and Abiotic factors (1 lesson) 25) Animal adaptations (1 lesson) **Unit Learning Outcomes:** GW: Identify reasons why organisms can become extinct and state different ways in which fossils can be formed. Identify steps in selective breeding & genetic engineering. State reasons why scientists classify living things. BI: Understand why there are gaps in the fossil record. Explain the different ways that living things can become extinct. Describe the process of selective breeding & genetic engineering. Identify different ways of classifying organisms. EW: Explain how fossils support Darwin's theory of Natural selection. Link conservation and biodiversity to prevention of extinction of species. Explain the process of genetic engineering and selective breeding. Explain how species can be classified and why classification systems have changed.	**Foundational Concepts:** Genetics, variation & evolution **Outcomes:** • Describe the formation of gametes during meiosis and compare this to mitosis • Know who proposed theories to explain evolution and apply the theories to examples. • Understand the process of selective breeding • Understand the process of genetic engineering and be able to describe applications of it. • Understand classification describing classification systems • Understand the process of cloning and its applications – linking back to therapeutic cloning • Be able to use principles of natural selection to explain how new species form • Know what ecosystems are and how different factors affect populations of species. **KW**: Evolution, fossil, bacteria, microorganism, antibiotic, inhibition, speciation, extinction, mineralisation, cloning, genetic engineering, classification, kingdom, phylum, genus, species, community, ecosystem, population, biotic, abiotic. **Tier 2/3 Vocabulary** • Glossaries, quick quizzes, within exam questions, PowerPoints. **EDI-** • Genetic engineering – Use of bacteria to produce human insulin for the treatment of diabetes. • Food security – different parts of the world • GE rice, vitamin A – developing food with greater nutritional content – potentially could be used in more deprived areas of the world. • Mary Anning - English fossil collector, dealer, and palaeontologist. Known internationally for her discoveries in Jurassic marine fossil beds in the cliffs along the English Channel at Lyme Regis in Dorset. **Links to root words (etymology):** • Phylum – From the Greek 'phylon' – meaning tribe • Genus – From the Latin meaning race, stock

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<table>
<tr>
<td></td><td></td><td></td>
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<table>
<tr><th>Prior (Y9/10)</th><th>Current (Y11)</th><th>Next (Post 16)</th></tr>
<tr><td>Year 7 – Plant & animal reproduction

Year 7 – classification

Year 7 Gametes & fertilisation

Year 7 DNA & inheritance</td><td>Genetic engineering

Cloning

Evolution

Extinction and Speciation</td><td>Year 12 – genetics & inheritance

DNA & RNA

Diversity & Taxonomy

Adaptations</td></tr>
</table>

Recall of knowledge, application of knowledge, interpret information, analyse results, carry out practical procedures, write practical methods, write word & chemical equations

Common misconceptions
Cloning – is a straightforward process and is successful every time. That the clone is an exact copy in every way – rather than considering environmental variation and lived experiences.
Genetic engineering – That genetically engineered organisms inherit many of the characteristics from the donor organism rather than a change in one or two genes.
Fossils – Fossils are made out of bones rather than undergoing mineralisation.
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<td>
• Species – From the Latin 'specere' – to look, appearance, beauty

History and culture:
• Classification – new species are regularly discovered and Linnaean classification is still used – often binominal names include reference to well-known people e.g Platysaurus attenboroughi
• Selective breeding – the earliest evidence of artificial selection of plants dates back to 7800 BCE in archaeological sites found in southwest Asia, where scientists have found domestic varieties of wheat
• Genetic engineering - 1973: Biochemists Herbert Boyer and Stanley Cohen develop genetic engineering by inserting DNA from one bacteria into another.
• Cloning – Dolly the sheep was the first mammal to be cloned from an adult body cell at the Roslin Institute in Scotland 1996.

Careers: geneticist, biotechnologist, epidemiologist, forensic scientist, genetic engineer, research scientist

Assessment (Quiz/Tests/application tasks/ ST: Including foundational concepts, wider disciplinary knowledge, key content.) Please Highlight the week number where formal feedback will be given (once per half term)
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<tr><td colspan="2">Christmas Holiday</td><td colspan="3">6 weeks (8/9 lessons for combined) (30 Days)</td></tr>
<tr>
<td>5-Jan</td><td>B</td><td>16</td>
<td rowspan="5"><u>Overview of Unit/No. lessons</u>
26) Plant adaptations (1 lesson)
27) Extremophiles (1 lesson)
28) Competition for resources (1 lesson)
29) Organisation of an ecosystem (Food chains and webs) (1 lesson)
30-31) Pyramids of biomass and trophic levels (2 lessons)
(32-33) Field investigation REQUIRED PRACTICAL (2 lessons)
34)Predator prey cycles (1 lesson)
35)The Carbon cycle (1 lesson)
36) Decay and decomposition (1 lesson)
37-38) Decay in milk REQUIRED PRACTICAL (2 lessons)

<u>Unit Learning Outcomes</u>:
GW: Be able to classify types of adaptations and identify examples. State what an extremophile is. Identify examples of predators and prey. Identify process that transfer carbon compounds between organisms

BI: Explain why organisms have particular adaptations. Describe how numbers of predators and prey affect each other.</td>
<td rowspan="5">Foundational Concepts
Ecology

Outcomes:
• Understanding Ecosystems and factors that affect them.
• Describe Biotic and Abiotic factors and their effects.
• Understand how to interpret food chains and food webs and the role of interference.
• Understand predator prey cycles
• Understand the role and processes of the carbon cycle
• Understand the process of the water cycle
• Understand the role of Trophic levels in an ecosystem
• Understand pyramids of biomass and how energy is lost or transferred within an ecosystem.
• Understand factors affecting decay and decomposition
• Carry out a required practical to measure decay

EDI:
Wangari Maathai - a social environmental and political activist who was the first African woman and first environmentalist to win the Nobel Peace Prize
In 1977 she founded the Green Belt Movement in Kenya, focusing on tree planting, conservation, and women's rights. The movement taught women not only how to plant trees in</td>
</tr>
<tr><td>12-Jan</td><td>A</td><td>17</td></tr>
<tr><td>19-Jan</td><td>B</td><td>ST2</td></tr>
<tr><td>26-Jan</td><td>A</td><td>ST2</td></tr>
<tr><td>2-Feb</td><td>B</td><td>20</td></tr>
<tr><td>9-Feb</td><td>A</td><td>21</td><td></td><td></td></tr>
</table>

			EW: Be able to describe how organisms depend on each other and how populations affect the stability of an ecosystem. **Common misconceptions** • Carbon cycle – students may think it the 'carbon dioxide cycle' and focus on transfer of CO_2 between organisms. Some don't recognise that Carbon is incorporated into other compounds as it passes round. • Water cycle – Some students think that transpiration returns water to the ground as droplets from the stomata rather than evaporation back into the atmosphere • Food chains and webs – in particular, the **direction** of arrows.	deforested areas but how to use this knowledge to draw income from the land. **History** • Aristotle and his student Theophrastus, both had interest in many species of animals and plants. Theophrastus described **interrelationships** between animals and their environment as early as the 4th century BC. • **Food chains** were first introduced by the Arab scientist and philosopher Al-Jahiz in the 10th century and later popularized in a book published in 1927 by Charles Elton, which also introduced the **food web** concept. **Root words (etymology):** • Abiotic – from the Greek 'a' – without and 'biotikos' - pertaining to life • Extremophile – from the latin 'extremus' – extreme and the Greek 'philia' – love • Epiphyte – from Greek 'epi' – upon and 'phyton' meaning plant – refers to the non-parasitic growth of epiphyte plants on the branches and trunks of other species • Biodiversity – from the Greek 'bios' – life and Latin 'Diversitas' - variety *LGBT+ History month* *Holocaust memorial day* *World Hijab Day* *Children's mental health week.* *Safer internet day* *Chinese New Year* **Assessment** (Quiz/Tests/application tasks/ ST: Including foundational concepts, wider disciplinary knowledge, key content.) Please Highlight the week number where formal feedback will be given (once per half term)

Prior	Current	Next
Yr 8- Photosynthesis, Food chains and webs and Biodiversity	Understand Ecosystems and factors that affect them	Year 12 – Adaptation, diversity and taxonomy. Biomass and productivity

Half-Term			6 weeks (8/9 lessons) (28 Days)	
23-Feb	B	22	**Overview of Unit/No. lessons** 40) Air pollution and global warming (1 lesson) 41) The water cycle (1 lesson) 42-43) Land and water pollution (2 lessons) 44) Quorn production and sustainable food production (1 lesson) 45) Food security and over-fishing (1 lesson) 46) GCSE Exam preparation – Cells and organisation 47) GCSE Exam preparation – Digestive system and enzymes 48) GCSE Exam preparation – Breathing system, gas exchange and respiration 49) GCSE Exam preparation - Photosynthesis 50) GCSE Exam preparation – Hormones and the Nervous system	**Foundational Concepts** Ecology and human impacts on the environment. **Outcomes:** • Describe the cause and impact of acid rain • Understand the greenhouse effect and global warming • Explain the impact of deforestation on the environment • Describe how a body of water undergoes eutrophication • Evaluate the link between population increase and pollution • Understand the issues surrounding food security and over-fishing • Understand the role of biotechnology in food production. **Tier 2/3 Vocabulary** • Glossaries, quick quizzes, within exam questions, PowerPoints.
2-Mar	A	23		
9-Mar	B	24		
16-Mar	A	25		
23-Mar	B	26		
30-Mar (finish Wednesday 1st April)	A			

Prior (Y9/10)	Current (Y11)	Next (Post 16)
Yr 8- Photosynthesis, Food chains and	Understand the impacts of humans on their surroundings	Year 12 – Adaptation, diversity and taxonomy.

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			webs and Biodiversity | | Biomass and productivity **Common misconceptions** • Water cycle – Some students think that transpiration returns water to the ground as droplets from the stomata rather than evaporation back into the atmosphere • Global warming – difference between regional and global temperature changes. Some students confuse the greenhouse effect and global warming. • Misconceptions about the effects that different gas emissions are responsible for e.g. Global warming/acid rain/effects on the Ozone layer • Incorrect representation of food chains and webs – in particular, the **direction** of arrows.	**KW**: Ecosystem, Biodiversity, Population, Community, Habitat, Interdependence, stability, extremophile, eutrophication, precipitation, percolation, adapted, succulent, Epiphyte, Apex predator, Carbon sink Detritivore, decomposer **EDI**: • Links to population increase, birth, death rate and medical facilities in developing countries. Links to sustainable food production in developed and developing countries • Greta Thunberg – Autistic climate change activist, known for challenging world leaders at a young age about the effects of climate change. • George Washington Carver – a prominent Black scientist of early 20th century who worked on Ecology. • Emmanuel Dongala – worked on a environmental toxicology and was refuge from the Republic of Congo, moving to the USA as a result of war. • Rachel Carson – wrote *Silent spring* to bring attention to the harm that pesticide contamination has on ecosystems **Careers**: Conservation volunteer, park ranger, Environmental Impact assessment officer, Zoo worker, Ecologist, wildlife specialist **History and culture:** **Food chains** were first introduced by the Arab scientist and philosopher Al-Jahiz in the 10th century and later popularized in a book published in 1927 by Charles Elton, which also introduced the **food web** concept. **Root words (etymology)** • Eutrophication - From the Greek *Eutrophos* meaning 'well nourished' • Percolation – From the Latin *percolatus* meaning 'to strain through' • Precipitation – From the Latin *praecipitare* meaning to 'throw down' *Women's history month* *Ramadhan begins 1/3* *21/3 World Down Syndrome day* *31/3 Transgender day of visibility*
Easter Holiday			5 weeks (?? lessons) (24 Days)	
20-Apr	B			
27-Apr	A	29		
4-May (Bank holiday Mon)	B	GCSE		
11-May	A	GCSE		
18-May	B	GCSE		
Half-Term			7 weeks (?? lessons) (35 Days)	
1-Jun	A	GCSE		
9-Jun	B	GCSE		
16-Jun	A	GCSE		

23-Jun	B	GCSE		
(Total: 190 Days)				

Prompt Questions

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Please revisit the prompts from last year:

- What are the Key concepts for this unit?
- How will it link to wider disciplinary knowledge/cultural capital: history, culture, authentic artefacts, music, art, literature?
- How does it build on prior knowledge and link to other units, concepts, years, GCSE?
- What is it intended students will have learned?
  - For each Unit? By the end of the Year?
    - GW: ; BI: ; EW
- Is it worth summarising in a knowledge organiser?
- **Assessment: how do you know they have learned the foundational concepts, curriculum and wider disciplinary knowledge? Does assessment look like GCSE light? Should it?**
- Skills used/learned
- Tier 2/3 vocabulary ((Etymology e.g. of Greek/Latin)
- How will you assess students understanding?
- How will written feedback be given?
- How can lessons be adapted?