HPRS

CURRICULUM MAP

SUBJECT AREA:	Biology/Science	YEAR / GROUP:	10

BRIEF SUMMARY OF CURRICULUM INTENT

The Year 10 pupils will access a range of biology content in their weekly lesson. This will cover Biology content from GCSE Combined Science courses for those pupils who may return to mainstream education for their GCSEs, and work on the AQA Biology GCSE curriculum for those pupils who may be at H3 in Year 11.

Biology teaching, at H3 in year 10, involves covering topics in depth in order to answer GCSE questions and in more detail in a cross-curricular way in order to generate longer answers in the form of written pieces such as leaflets, reports and articles – cross curricular English.

The Year 10 Biology/Science curriculum at year 10 will also include shorter 'mini-topics' to review the KS3 Science curriculum.

Due to pupils at H3 being on a part-time timetable, coverage of this curriculum map will be proportional to the amount of time spent covering the subject and differentiated to meet their SEN needs and best ways of working.

How SMSC and British Values are delivered in this subject

The H3 Science lessons contribute to pupils' SMSC development by:

Spiritual development is enhanced through the consideration of issues such as the structure of the solar system and the formulation of the Universe.

- awe of the scale of living things from the smallest microorganism to the largest tree.
- the complexity of living things.
- the wonder of the extent of geological time.
- the beauty of natural objects or phenomenon – crystals, rainbows, the Earth from Space.

Moral development is enhanced through the consideration of issues such as the effects of human activity on the planet e.g. extinction of species, global warming, pollution.

- genetic modification.
- IVF
- human cloning.
- recognition that discoveries in Science can have both harmful and beneficial effects (eg. splitting of the atom).

Social development is enhanced by students being encouraged to show respect for other people's ideas.

- developing social skills through group and practical work.
- considering the safety of others during practical work.
- the effects of Science on their lives e.g. enhancement of plant growth, use of artificial satellites, development of polymers, medicines.
- how the rights of others may be affected by pollution, building wind farms, etc.
- health issues linked to smoking, poor diet, lacking exercise.

Cultural development is enhanced by consideration of the work done by various Scientists e.g. Pasteur, Darwin, Wegener etc.

- drawing attention to how cultural differences can influence the extent to which scientific ideas are accepted, used and valued.
- considering the historical context that influenced the way new theories are considered e.g. motion of the Earth, evolution, plate tectonics, Big Bang theory

KEY DATES / NOTES

Timing	**Key Skills** **for each half term**	**Teaching & Learning** • **Themes** • **Learning Styles**	**Literacy elements to be covered (whole school Literacy focus)**	**Assessment Focus** ***including dates and suggested assessments Methods of assessment***	**Additional features of map** • **Visits** • **Special events**
AUTUMN Half term 1	Skills Key words and facts/ understanding	Teaching and learning	Biology elements	Assessment	Additional features
	• Ecosystems • Competition • Interdependence • Abiotic • Biotic • Adaptation • Extremophile • Population • Quadrat • Transect line • Decomposers • Carbon cycle • Water cycle • Food chain	Ecosystems Describe different levels of organisation in an ecosystem. Explain why different organisms in an ecosystem show interdependence. Describe the factors that determine where organisms can live. Describe some of the techniques used by scientists to study ecosystems.	Relationships between organisms Adaptations Studying Ecosystems. Decomposition. Recycling Materials. Feeding Relationships.	Topic assessments AQA revision tests AQA questions AQA papers CC English/Biology written answers Topic assessments AQA revision tests AQA questions AQA papers	Face-to-face Online Research Teacher lead CC maths and English Practical work Face-to-face Online Research Teacher lead CC maths and English Practical work

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	• Producer • Trophic level • Predator • Prey • Apex predator KS3 Science review topics: Cells and Respiration (microscopes, cells, organisation and diffusion, respiration) Humans as organisms (nutrition, digestion, skeleton, muscles, gas exchange, breathing, exercise, reproduction, drugs)	Cycles and feeding relationships. Describe the factors needed for decomposition. Explain how carbon and water are recycled in nature. Explain how feeding relationships can be shown in food chains and predator-prey graphs.		CC English/Biology written answers Quizzes and review games	
AUTUMN Half term 2	Skills Key words and facts/ understanding	Teaching and learning	Biology elements	Assessment	Additional features
	• Biodiversity • Pollution • Acid rain • Deforestation • Global warming	Disrupting Ecosystems. Explain why biodiversity is so important and why it is at risk. Describe the main causes of pollution. Explain how pollution and over- exploitation are contributing to global warming. Describe some of the steps that are being taken to maintain biodiversity.	Biodiversity Pollution Overexploitation Conserving biodiversity	Topic assessments AQA revision tests AQA questions AQA papers CC English/Biology written answers Topic assessments AQA revision tests	Face-to-face Online Research Teacher lead CC maths and English Practical work Face-to-face Online Research Teacher lead CC maths and English

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	KS3 Science Review Topics: Plants and Ecosystems (plant nutrition, plant reproduction, food chains, food webs) Inheritance and Variation and Survival (DNA and inheritance, variation, natural selection, extinction and preserving species).			AQA questions AQA papers CC English/Biology written answers Quizzes and review games	Practical work
SPRING Half term 3	skills Key words and facts/ understanding	Teaching and learning	Biology elements	Assessment	Additional features

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	Key points and key words: ▪ Farming techniques ▪ Sustainable ▪ Pyramid of biomass ▪ Biotechnology ▪ Fermenter ▪ Mycoprotein ▪ Asexual reproduction ▪ Gamete ▪ Runners ▪ meiosis KS3 Science Review Topics: Classifying materials (solids, liquids, gases, particle	Ecology Feeding the World: Explain why providing enough food for everyone is becoming more difficult Explain how food production can be increased by manipulating energy flow Describe how biotechnology is used to increase food production Biology cc maths- interpreting data/reading data and information. Inheritance, Variation and Evolution. Describing some examples of asexual reproduction in different organisms. Explain why sexual reproduction involves meiosis Explain why organisms may reproduce sexually or asexually at different times.	• The need for more food • Manipulating Energy Flow • Biotechnology • Asexual Reproduction • Sexual Reproduction and Meiosis • Asexual Versus Sexual Reproduction.	Topic assessments AQA revision tests AQA questions AQA papers CC English/Biology written answers Topic assessments AQA revision tests AQA questions AQA papers CC English/Biology written answers Quizzes and review games	Face-to-face Online Research Teacher lead CC maths and English Practical work Face-to-face Online Research Teacher lead CC maths and English Practical work

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	theory, changes of state, atoms and elements, compounds, mixtures, separating mixtures, metals, non-metals) Chemical Changes (equations, reactions, acids and alkalis, reactivity series)				
SPRING Half term 4	Skills Key words and facts/ understanding	Teaching and learning	Biology elements	Assessment	Additional features
	▪ DNA ▪ Chromosomes ▪ Gene ▪ Genome ▪ Polymer ▪ Nucleotide ▪ Collagen ▪ Mutation KS3 Science Review Topics: The Earth and the Atmosphere (Earth's structure, minerals and rocks, recycling, carbon cycle, atmosphere and climate) Energy and Matter (energy stores, energy transfer, conservation of energy, electricity, power ratings, physical changes, movement of particles)	DNA and protein Synthesis Describe how the genetic material is arranged in a cell Describe the structure of DNA Explain how DNA can code for proteins and how this can go wrong.	• The Genome • The Structure of DNA • Making proteins • Mutations	Topic assessments AQA revision tests AQA questions AQA papers CC English/Biology written answers Quizzes and review games	Face-to-face Online Research Teacher lead CC maths and English Practical work

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SUMMER Half Term 5	Skills Key words and facts/ understanding • Allele • Genotype • Phenotype • Dominant • Recessive • Homozygous • Heterozygous • Monohybrid inheritance • Punnett square • Polydactyl • Cystic fibrosis • Sex chromosomes • Variation • Evolution • Natural selection • fossils	Teaching and learning Patterns of Inheritance Describe the contribution made by Gregor Mendel to the study of genetics. Explain how ideas about genetics have changed since his work. Predict the outcome of genetic crosses using genetic diagrams. Describe examples of human genetic disorders. Explain how sex is determined in humans. Variation and Evolution Describe the main sources of variation between individuals. Explain Darwin's theory of natural selection Life of Darwin in detail and associated scientists/naturalists. Lamark Describe some of the evidence for evolution. Biology cc Maths- interpreting and handling data.	Biology elements Gregor Mendel Modern Ideas about Genetics Genetic Crosses Genetic Disorders Sex Determination Variation Natural Selection Evidence for Evolution	Topic assessments AQA revision tests AQA questions AQA papers CC English/Biology written answers Topic assessments AQA revision tests AQA questions AQA papers CC English/Biology written answers Quizzes and review games	Face-to-face Online Research Teacher lead CC maths and English Practical work Face-to-face Online Research Teacher lead CC maths and English Practical work

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	KS3 Review Science Topics: (Forces and Motion (speed, distance and time, forces, air and water resistance, forces, moments, elasticity, pressure) Waves (water and light waves, reflection, refraction, sight, cameras and sight, light ad colour, sound, hearing, energy and waves)				
SUMMER Half term 6	Skills Key words and facts/ understanding	Teaching and learning	Biology elements	Assessment	Additional features
	• Selective breeding • Genetic engineering • Genetically modified GM • Clone • Cuttings • Tissue culture • surrogate	Manipulating Genes Describe the process of selective breeding Explain how genetic engineering can be used to change organisms' characteristics. Compare different cloning techniques. Classification	Selective Breeding Genetic Engineering Cloning Principles of Classification Extinction Speciation	Topic assessments AQA revision tests AQA questions AQA papers CC English/Biology written answers	Face-to-face Online Research Teacher lead CC maths and English Practical work Face-to-face Online Research

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	Ks3 Science Review topics: Electricity and Magnetism (circuits, current, potential difference, series and parallel circuits, static electricity, magnets) The Earth and Beyond (Gravity, sun and stars, day and night)	Explain why classification systems have changed over time Describe why organisms may become extinct Explain how new species are formed. Describe how evolutionary trees are constructed. Biology CC Maths- interpreting data.		Topic assessments AQA revision tests AQA questions AQA papers CC English/Biology written answers Quizzes and review games	Teacher lead CC maths and English Practical work