



# CURRICULUM PLAN

TRIPLE SCIENCE BIOLOGY  
(EDEXCEL 9-1)  
BRAMHALL HIGH SCHOOL

## **Curriculum Intent**

It is our intention as Science Department to provide all children, regardless of their prior learning, background, or special needs, with a broad and balanced science curriculum. We aim to promote positive attitudes to science as an interesting and enjoyable subject. To develop pupils' awareness of how science impacts on their everyday life.

Pupils are encouraged to develop their practical skills, to work collaboratively and to query and evaluate scientific evidence.

We aim to cultivate an environment conducive to learning. We encourage and value our pupils' opinions, ideas, and contributions. Similarly, we expect pupils to strive for excellence and respect the contributions of other adults and their peers. Our intention is for pupils to enjoy their learning, to be resilient, make progress and achieve at an appropriate level.

## YEAR 10

Term	Programme of Learning	Links to the National Curriculum / Specification / Additional	Assessments	What extra learning opportunities are planned?	Disciplinary Literacy
<b>Term 1a</b>	<b>SB2 Cells and control</b> <ul style="list-style-type: none"> <li>- Mitosis</li> <li>- Growth in animals</li> <li>- Growth in plants</li> <li>- Stem cells</li> <li>-The brain</li> <li>- Brain and spinal cord problems</li> <li>- The nervous system</li> <li>-The eye</li> </ul>	Coordination and control Experimental skills and strategies	CPR – Nervous system related question  B2 End of topic test	Research the effects of different drugs on neurotransmitters.	<b>Tier 1:</b> Growth, cancer. <b>Tier 2:</b> tumours, malignant, <b>Tier 3:</b> Cell cycle, *mitosis
<b>Term 1b</b>	<b>SB3 Genetics</b> <ul style="list-style-type: none"> <li>- Sexual reproduction</li> <li>- Asexual reproduction</li> <li>- Meiosis</li> <li>- DNA</li> <li>- Protein synthesis</li> <li>- Genetic variants and phenotypes</li> </ul>	Evolution, inheritance and variation Analysis and evaluation	CPR – Genetics related question  CPR – Protein synthesis related question	Investigate correlations between different variation features, e.g. arm length and height.  Research the methods involved in the human genome project.	<b>Tier 1:</b> DNA, gene. <b>Tier 2:</b> Embryo, mutation. <b>Tier 3:</b> *Meiosis, gametes.

<b>Term 2a</b>	<b>SB3 Genetics</b> <ul style="list-style-type: none"> <li>- Mendel</li> <li>- Alleles</li> <li>- Inheritance</li> <li>- Multiple &amp; missing alleles</li> <li>- Gene mutations</li> <li>- Variation</li> </ul>	Evolution, inheritance and variation Analysis and evaluation	CPR - Inheritance related question  CPR – Selective breeding/genetic engineering related question  B3 End of topic test	Research the ABO blood groups.	<b>Tier 1:</b> Sexual, gene. <b>Tier 2:</b> dominant, recessive. <b>Tier 3:</b> *Homozygous, heterozygous.
<b>Term 2b</b>	<b>SB4 Natural selection and genetic modification</b> <ul style="list-style-type: none"> <li>- Human evolution</li> <li>- Darwin's theory</li> <li>- Development of Darwin's theory</li> <li>- Classification</li> <li>- Breeds and varieties</li> </ul>	Evolution, inheritance and variation The development of scientific thinking	CPR – Fertilisers and biological control related question  B4 End of topic test	Contrast the theory of natural selection from Darwin and Wallace with the work of Lamarck.	<b>Tier 1:</b> Handy man, survival of the fittest. <b>Tier 2:</b> *Evolution, natural selection, species, common ancestor. <b>Tier 3:</b> Human genome project, antibiotic resistance.

<b>Term 3a</b>	<b>SB4 Natural selection and genetic modification</b> <ul style="list-style-type: none"> <li>- Tissue culture</li> <li>- Genes in agriculture and medicine</li> <li>- GM and agriculture</li> <li>- Fertilisers and biological control</li> </ul> <b>SB5 Health, disease and the development of medicines</b> <ul style="list-style-type: none"> <li>- Health and disease</li> <li>- Non-communicable diseases</li> <li>- Cardiovascular disease</li> </ul>	Evolution, inheritance and variation The development of scientific thinking	Year 10 Exams  CPR – Disease related question	Research the current status of growing genetically modified crops in the UK and other countries.	<b>Tier 1:</b> Disease. <b>Tier 2:</b> Artificial, extinction, *differentiation. <b>Tier 3:</b> Selective breeding, genetic engineering, restriction enzymes.
<b>Term 3b</b>	<b>SB5 Health, disease and the development of medicines</b> <ul style="list-style-type: none"> <li>- Pathogens</li> <li>- Spreading pathogens</li> <li>- Virus lifecycles</li> <li>- Immune system</li> <li>- Monoclonal antibodies</li> </ul>	Health, disease and the development of medicines Analysis and evaluation	CPR – Virus related question  CPR – Photosynthesis related question  5.18B Investigate the effects of antiseptics,  B5 End of topic test	Research recommended levels of exercise, dietary and alcohol intake.  Research values for high and low blood pressure.	<b>Tier 1:</b> Health, disease. <b>Tier 2:</b> Infection, virus, bacteria. <b>Tier 3:</b> Ebola, *communicable, malaria, vectors.

## YEAR 11

Term	Programme of Learning	Links to the National Curriculum / Specification / Additional	Assessments	What extra learning opportunities are planned?	Disciplinary Literacy
<b>Term 1a</b>	<b>SB6 Plant structure and their function</b> <ul style="list-style-type: none"> <li>- Photosynthesis</li> <li>- Photosynthesis factors</li> <li>- Absorbing water</li> <li>- Absorbing minerals</li> <li>- Transpiration</li> <li>- Translocation</li> <li>- Plant adaptations</li> <li>- Plant hormones</li> <li>- Uses of plant hormones</li> </ul>	Photosynthesis	CPR – Transport in plants related questions  CPR – Plant hormone related question  B6 End of topic test	Investigate the effect of different coloured light on the rate of photosynthesis.	<b>Tier 1:</b> Light, carbon dioxide, <b>Tier 2:</b> Optimum. <b>Tier 3:</b> *Photosynthesis, chloroplasts, chlorophyll, palisade cells.
<b>Term 1b</b>	<b>SB7 Animal coordination, control and homeostasis</b> <ul style="list-style-type: none"> <li>- Hormones</li> <li>- Hormonal control of metabolic rate</li> <li>- The menstrual cycle</li> <li>- Hormones and the menstrual cycle</li> <li>- Control of blood glucose</li> </ul>	Coordination and control	CPR – Hormone related question  CPR – Homeostasis related question	Research the effects on the body if the hormones are not produced at the correct level.  Calculate sugar intakes of different foods and how starchy foods increase blood glucose levels.	<b>Tier 1:</b> Puberty, period, contraception. <b>Tier 2:</b> Menstruation, ovulation, *fertilisation. <b>Tier 3:</b> Oestrogen, progesterone, negative feedback.

<b>Term 2a</b>	<b>SB7 Animal coordination, control and homeostasis</b> <ul style="list-style-type: none"> <li>- Type 2 diabetes</li> <li>- Thermoregulation</li> <li>- Osmoregulation</li> <li>- The kidneys</li> </ul>	Coordination and control	CPR – Kidney system related question	Research the long-term side effects of diabetes type 1 and type 2.	<b>Tier 1:</b> <b>Tier 2:</b> Hormone. <b>Tier 3:</b> *Endocrine glands, pancreas, insulin, glucagon, metabolic rate, glycogen.
<b>Term 2b</b>	<b>SB8 Exchange and transport in animals</b> <ul style="list-style-type: none"> <li>- Efficient transport and exchange</li> <li>- Factors affecting diffusion</li> <li>- The circulatory system</li> <li>- The heart</li> <li>- Cellular respiration</li> </ul>	Transport systems Analysis and evaluation	CPR – Circulatory system related question  CPR – Respiration related question  8.11 Investigate the rate of respiration  B8 End of topic test	Interpret heart traces under different conditions.  Explain why specific cell types have more mitochondria than others.	<b>Tier 1:</b> Glucose, oxygen, carbon dioxide. <b>Tier 2:</b> Heart rate, *respiration <b>Tier 3:</b> Exothermic, aerobic, anaerobic, mitochondria, lactic acid.

<b>Term 3a</b>	<b>SB9 Ecosystems and material cycles</b> <ul style="list-style-type: none"> <li>- Ecosystems</li> <li>- Energy transfer</li> <li>- Abiotic factors and communities</li> <li>- Biotic factors and communities</li> <li>- Assessing pollution</li> </ul>	Transport systems Analysis and evaluation	Year 11 Mocks  9.5 Investigate the relationship between organisms	Show examples, e.g. chicken / fish farming, to show ways to limit energy loss at trophic levels.	<b>Tier 1:</b> Disease, fossil fuels. <b>Tier 2:</b> Ecosystem, community, populations. <b>Tier 3:</b> *Biotic, abiotic, quadrat.
<b>Term 3b</b>	<b>SB9 Ecosystems and material cycles</b> <ul style="list-style-type: none"> <li>- Parasitism &amp; mutualism</li> <li>- Biodiversity &amp; humans</li> <li>- Preserving biodiversity</li> <li>- Food security</li> <li>- The water cycle</li> <li>- The carbon cycle</li> <li>- The nitrogen cycle</li> <li>- Rates of decomposition</li> </ul>	Ecosystems Vocabulary, units, symbols and nomenclature	B9 End of topic test	Study a specific endangered animal to explain the cause of its population decrease.	<b>Tier 1:</b> Conservation. <b>Tier 2:</b> Indigenous, reforestation, captivity. <b>Tier 3:</b> Food security, biofuels, biodiversity, *eutrophication, decomposition,