



‘An ambitious curriculum that meets the needs of all’  
**Medium Term Planning - Topic: Inheritance**

<b>Curriculum Intent</b>	
<b>Skills/National Curriculum Links</b>	<p>In addition to working further on objectives from KS2 and the Cells, Evolution and Variation topics, pupils will be taught, following National Curriculum guidelines, the following in this topic:</p> <p>Inheritance, chromosomes, DNA and genes</p> <ul style="list-style-type: none"> <li>♣ heredity as the process by which genetic information is transmitted from one generation to the next</li> <li>♣ a simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model</li> </ul>
<b>Spiritual, moral, social, and cultural development</b>	<p><b>SMSC:</b> Enable students to develop their self-knowledge of their own body.</p> <p><b>PSHE/British Values:</b> With the advent of CRISPR, three parents embryo and genetically modified food / organism becoming normalised this topic allows for the understanding of advances in genetics. Gene mutations occur continuously and on rare occasions can affect the functioning of the animal or plant and therefore evolution of a species.</p> <p><b>Skills Builder:</b> Listening (Receiving, retaining and processing info), Speaking (The oral transmission of info and ideas), Problem solving (Find a solution to a situation or challenge), Creativity (imagination and generation of new ideas), Staying positive (The ability to use tactics and strategies to overcome setbacks), aiming high (Set clear and tangible goals), Leadership and teamwork</p>
<b>Numeracy</b>	Chromosome numbers in gametes, Cell division, bases in DNA
<b>Literacy</b>	<p><b>Vocabulary Tier 2:</b> material, chemical, divided, sections, arranged, fuse, detect, offspring, unique, prevention, discovered, technique, combination, toxin, beneficial.</p> <p><b>Vocabulary Tier 3:</b> Inherited characteristics, DNA, chromosome, gene, mutation, allele, Punnett square, recessive, dominant, genetic modification, yield.</p> <p><b>Reading:</b> Following a written method and read risk assessments. Students may be directed to the textbook; this could be in lesson or at home on Kerboodle.</p> <p><b>Writing:</b> Describing and explaining scientific phenomenon, free response writing for describing precautions taken, use of word mat to promote sentence formation.</p> <p><b>Oracy:</b> inclusion of BEST resources which are research evidence on common misunderstandings in science, effective diagnostic questioning and formative assessment, constructivist approaches to building understanding, and effective sequencing of key concepts that promote metacognitive talk and dialogue.</p>
<b>Becoming future ready</b>	<p><b>Careers/Employability:</b></p> <ul style="list-style-type: none"> <li>- Microbiologist</li> <li>- Biomedical scientist</li> <li>- Science Teacher</li> </ul>
<b>Adaptation</b>	Throughout this topic, quality first teaching will provide differentiation:
<b>QFT/SEND Provision</b>	<p><b>By product:</b> Linear assessments and differentiated practical work.</p> <p><b>By resource:</b> Lessons are differentiated per class and students, worksheets are coloured blue if support and assessments are linear.</p> <p><b>By Intervention:</b> by providing different levels of supervision and support</p> <p><b>By Progressive Questioning:</b> exploring pupils’ understanding through interactive dialogue.</p> <p><b>By Grouping:</b> according to prior attainment, gender, social preference, preferred learning style.</p> <p><b>By Task:</b> Pupils should be involved in the identification of targets which are meaningful to them and in the selection of an appropriate task from the given range.</p> <p><b>By Offering Optional Activities:</b> In class or as homework, to extend learning.</p> <p>This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.</p>

<b>Implementation Curriculum Delivery</b>	To be able to:	
<b>Learning Outcomes (Core Knowledge)</b>	<p><i>Know</i></p> <ul style="list-style-type: none"> <li>- State what is meant by DNA.</li> <li>- State what is meant by a chromosome.</li> <li>- State what is meant by a gene.</li> </ul> <p><i>Apply</i></p> <ul style="list-style-type: none"> <li>- Describe the relationship between DNA, genes, and chromosomes.</li> <li>- Describe how chromosomes from both parents combine to form offspring.</li> <li>- State what is meant by a mutation.</li> </ul> <p><i>Extend</i></p> <ul style="list-style-type: none"> <li>- Explain how a change in DNA may affect an organism.</li> <li>- Explain how a change in DNA may affect the future offspring of an organism.</li> <li>- Explain why gametes have 23 chromosomes, but normal body cells contain 46 chromosomes.</li> </ul>	
	<p><i>Know</i></p> <ul style="list-style-type: none"> <li>- Build a model of the DNA molecule.</li> </ul> <p><i>Apply</i></p> <ul style="list-style-type: none"> <li>- Describe the structure of DNA.</li> </ul> <p><i>Extend</i></p> <ul style="list-style-type: none"> <li>- Explain the relationship between gene, chromosome and DNA and how this affects the genotype</li> </ul>	
	<p><i>Know</i></p> <ul style="list-style-type: none"> <li>- State what is meant by an allele.</li> <li>- State that genetics allows us to track alleles from one generation to the next.</li> <li>- Complete a Punnett square to state how many offspring will have a particular characteristic.</li> </ul> <p><i>Apply</i></p> <ul style="list-style-type: none"> <li>- Describe the difference between dominant and recessive alleles.</li> <li>- Use a Punnett square to show what happens during a genetic cross.</li> <li>- Trace characteristics through a family tree using Punnett squares, giving answers as percentages and ratios.</li> </ul> <p><i>Extend</i></p> <ul style="list-style-type: none"> <li>- Explain how dominant or recessive alleles can be expressed as external features.</li> <li>- Explain how to use a Punnett square to predict the outcome of a genetic cross.</li> <li>- Trace characteristics through a family tree using Punnett squares, calculating the probability of different outcomes.</li> </ul>	
	<p><i>Know</i></p> <ul style="list-style-type: none"> <li>- State what is meant by genetic modification.</li> <li>- Name a product produced by genetically modified organisms.</li> </ul> <p><i>Apply</i></p> <ul style="list-style-type: none"> <li>- State how an organism can be genetically modified.</li> <li>- Describe some advantages of producing products through genetic modification.</li> </ul> <p><i>Extend</i></p> <ul style="list-style-type: none"> <li>- Describe how an organism can be genetically modified to display a desired characteristic.</li> <li>- Analyse advantages and disadvantages of producing products through genetic modification.</li> </ul>	
	<p><i>Know</i></p> <ul style="list-style-type: none"> <li>- Know why the scientists Watson, Crick and Franklin were so important</li> </ul> <p><i>Apply</i></p> <ul style="list-style-type: none"> <li>- Describe the structure of DNA.</li> <li>- Describe how scientists worked together to discover the structure of DNA.</li> </ul> <p><i>Extend</i></p> <ul style="list-style-type: none"> <li>- Explain why it is important for scientists to work together.</li> </ul>	
<b>Current learning to be developed in the future within:</b>	<p><b>Before:</b></p> <p>In KS2 you have already studied that animals and plants are adapted to suit their environment, living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p>	<p><b>Future:</b> At GCSE you will learn how variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve and how an understanding of these processes has allowed scientists to intervene through selective breeding to produce livestock with favoured characteristics.</p>

Assessment	Refer to assessment maps for formative and summative assessment opportunities.
Impact	Attainment and Progress – Refer to assessment results / data review documentation.

