

NC POINTS	PRIOR KNOWLEDGE	SUBSTANTIVE (KNOW THAT ...)	DISCIPLINARY (KNOW HOW TO ...)	REQUIRED PRACTICAL(S)	LESSON BREAKDOWN	KEY VOCABULARY	
ORGANISMS Health and disease	<p>the effects of recreational drugs (including substance misuse) on behaviour, health and life processes.</p> <p>the effect of maternal lifestyle on the foetus through the placenta</p> <p>the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases</p> <p>the impact of exercise, asthma and smoking on the human gas exchange system</p> <p>plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots.</p>	<p><b>None of KS1 and 2</b></p> <p><b>KS3</b></p> <p>What happens when we breathe</p> <p>How the air we breathe out is different to the air we breathe in</p> <p>How our muscles work to allow us to breathe</p> <p>How a fetus develops in the uterus</p> <p>Describe the components of a healthy diet and the function of different nutrients in the body</p> <p>Describe the problems caused by an unbalanced diet</p> <p>What fermentation is</p> <p>What photosynthesis is</p>	<p>Explain what is meant by health</p> <p>The difference between communicable and non-communicable diseases</p> <p>Plant deficiency diseases</p> <p>Human deficiency diseases</p> <p>Problems caused by obesity and starvation</p> <p>Role of bacteria in digestion</p> <p>What the four types of pathogen are</p> <p>How to work with bacteria safely</p> <p>Effect of smoking on the body</p> <p>Effect of alcohol on the body</p> <p>Effect of recreational drugs on the body</p> <p>Effect of smoking, alcohol and drugs on a fetus</p>	<p><b>Domain 1</b></p> <p>Carry out experiments with regard for health and safety</p> <p>Identify variables</p> <p><b>Domain 2</b></p> <p>Inoculate an agar plate with bacteria</p> <p>Make and record measurements</p> <p><b>Domain 3</b></p> <p>Calculate the area of the zone of inhibition</p> <p><b>Domain 4</b></p> <p>Use experimental observations to draw conclusions</p>	<p>Investigating the efficacy of different cleaning products (aseptic technique)</p> <p>1. Health</p> <p>2. Communicable and non-communicable disease</p> <p>3. Plant deficiency diseases</p> <p>4. Human deficiency diseases</p> <p>5. Obesity and starvation</p> <p>6. Bacteria in digestion</p> <p>7. Aseptic technique RP set up</p> <p>8. Aseptic technique RP results and evaluation</p> <p>9. Smoking</p> <p>10. Alcohol</p> <p>11. Recreational drugs</p> <p>12. Effect of smoking alcohol and drugs on developing fetus</p>	<p>agar</p> <p>pathogen</p> <p>alcohol</p> <p>petri dish</p> <p>aseptic</p> <p>protest</p> <p>bacteria</p> <p>recreational drugs</p> <p>carcinogen</p> <p>stimulant</p> <p>communicable</p> <p>virus</p> <p>deficiency</p> <p>zone of inhibition</p> <p>depressant</p> <p>fungi</p> <p>health</p> <p>medicinal drugs</p> <p>non-communicable</p>	
	<p>waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition</p> <p>pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound; waves transferring information for conversion to electrical signals by microphone</p>	<p><b>KS1</b></p> <p>Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p><b>KS2</b></p> <p>Identify how sounds are made, associating some of them with something vibrating</p> <p>Recognise that vibrations from sounds travel through a medium to the ear</p> <p>Find patterns between the pitch of a sound and features of the object that produced it</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p> <p>Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</p> <p><b>KS3</b></p> <p>Eye colour and ear lobe attachment as examples of variation</p> <p>Waves transfer energy as well as matter</p> <p>During puberty the pitch of the voice changes in males</p> <p>How sound travels</p> <p>How we see colour</p> <p>How light travels</p> <p>Laws of reflection and refraction</p>	<p>Describe how sound transfers energy</p> <p>Describe how waves can be used to produce electricity</p> <p>Explain the uses of different wavelengths of the electro-magnetic spectrum</p> <p>Describe some risks of wavelengths of the electro-magnetic spectrum</p> <p>Explain how we can model waves</p> <p>Explain superposition of waves.</p>	<p><b>Domain 1</b></p> <p>Carry out experiments with regard for health and safety</p> <p>Identify variables</p> <p><b>Domain 2</b></p> <p>Use a digital thermometer</p> <p>Make and record measurements</p> <p><b>Domain 3</b></p> <p>Plot a graph of temperature against time</p> <p>Plot two sets of data on the same axes</p> <p><b>Domain 4</b></p> <p>Use experimental observations to draw conclusions</p> <p>Suggest improvements to experimental methods</p>	<p>Investigating radiation</p>	<p>1. Sound waves, water waves and energy</p> <p>2. Radiation and energy</p> <p>3. Investigating radiation RP investigation</p> <p>4. Investigating radiation RP graph plotting and evaluation</p> <p>5. Modelling waves</p> <p>6. Revision</p> <p>7. Assessment</p> <p>8. DIRT</p> <p><b>START WITH Y7 WAVES Sound</b></p>	<p>amplitude</p> <p>compression</p> <p>electromagnetic spectrum</p> <p>longitudinal</p> <p>model</p> <p>radiation</p> <p>rarefaction</p> <p>superposition</p> <p>transverse</p> <p>wavelength</p>
REACTIONS Types of reactions and energy changes	<p>what catalysts do</p> <p>energy changes on changes of state (qualitative)</p> <p>exothermic and endothermic chemical reactions (qualitative)</p>	<p><b>KS1</b></p> <p>Identifying everyday materials (e.g. wood, plastic, glass)</p> <p>Compare the physical properties and uses of everyday materials</p> <p>Identify and compare the suitability of materials for particular uses</p> <p><b>KS2</b></p> <p>Some changes result in the formation of new materials, e.g. acid and bicarbonate of soda</p> <p><b>KS3</b></p> <p>Behaviour and arrangement of particles in solids, liquids and gases</p> <p>Difference between an element and a compound</p> <p>Properties of elements in different groups of the periodic table</p> <p>Chemical reactions involve energy transfers</p> <p>Changing state requires a change in energy.</p>	<p>Explain what exothermic and endothermic reactions are</p> <p>Use energy level diagrams to identify exothermic and endothermic reactions</p> <p>Calculate bond energy changes</p> <p>State what a catalyst is</p>	<p><b>Domain 1</b></p> <p>Carry out experiments with regard for health and safety</p> <p><b>Domain 2</b></p> <p>Set up and use a Bunsen burner</p> <p>Use analogue thermometer to measure temperature</p> <p>Use measuring cylinder to measure volume</p> <p>Use 3 units for temperature, volume and time</p> <p>Record data in a table</p> <p><b>Domain 4</b></p> <p>Use experimental observations to draw conclusions</p>	<p>1. Energy level diagrams</p> <p>2. Bond energy</p> <p>3. Catalysts</p>	<p>bond energy</p> <p>catalyst</p> <p>endothermic</p> <p>exothermic</p> <p>oxidation</p>	
THE EARTH Carbon cycle	<p>the carbon cycle</p> <p>the production of carbon dioxide by human activity and the impact on climate</p>	<p><b>KS2</b></p> <p>recognise that environments can change and that this can sometimes pose dangers to living things</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p> <p>explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda</p> <p><b>KS3</b></p> <p>Chemical reactions involve energy transfers</p> <p>Set up and use a Bunsen burner</p> <p>Use analogue thermometer to measure temperature</p> <p>Explain the greenhouse effect</p> <p>Explain the process of global warming</p> <p>What is aerobic respiration</p> <p>What anaerobic respiration is</p> <p>What photosynthesis is</p>	<p>Compare complete and incomplete combustion</p> <p>Describe the problems caused by pollution from burning fossil fuels</p> <p>Explain how carbon is cycled</p>	<p><b>Domain 1</b></p> <p>Carry out experiments with regard for health and safety</p> <p><b>Domain 2</b></p> <p>Set up and use a Bunsen burner</p> <p>Use analogue thermometer to measure temperature</p> <p>Use measuring cylinder to measure volume</p> <p>Use 3 units for temperature, volume and time</p> <p>Record data in a table</p> <p><b>Domain 4</b></p> <p>Use experimental observations to draw conclusions</p>	<p>Investigating complete and incomplete combustion</p>	<p>1. Incomplete combustion</p> <p>2. Investigating combustion RP</p> <p>3. Pollution from fossil fuels</p> <p>4. Carbon cycle</p>	<p>acid rain</p> <p>carbon cycle</p> <p>carbon particulates</p> <p>complete combustion</p> <p>fossil fuel</p> <p>global dimming</p> <p>incomplete combustion</p> <p>nitrogen oxides</p> <p>pollution</p> <p>smog</p> <p>sulfur dioxide</p>
GENES Inheritance	<p>heredity as the process by which genetic information is transmitted from one generation to the next</p> <p>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</p>	<p><b>KS2</b></p> <p>describe the life process of reproduction in some plants and animals</p> <p>recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p><b>KS3</b></p> <p>The difference between inherited and environmental variation</p> <p>How fertilisation takes place</p> <p>Describe the processes of fertilisation and germination in plants</p>	<p>Explain how genetic material is inherited</p> <p>Explain what may happen in DNA becomes damaged</p> <p>Describe the structure of DNA</p> <p>Describe the key events in the discover of DNA</p> <p>Use genetic cross diagrams to calculate the probability of inheriting certain characteristics</p> <p>Explain the difference between dominant and recessive alleles</p> <p>Describe the process of genetic modification</p> <p>Compare the advantages and disadvantages of genetic modification</p>	<p><b>Domain 1</b></p> <p>Carry out experiments with regard for health and safety</p>	<p>Extracting DNA from fruit</p>	<p>1. Inheritance</p> <p>2. Discovering DNA</p> <p>3. Extracting DNA RP</p> <p>4. Genetics</p> <p>5. Genetic disorders</p> <p>6. Genetic modification</p> <p>7. Revision</p> <p>8. Assessment</p> <p>9. DIRT</p>	<p>allele</p> <p>DNA</p> <p>dominant</p> <p>double helix</p> <p>gene</p> <p>genetic modification</p> <p>inheritance</p> <p>Punnett square</p> <p>recessive</p>