

YEAR 7 TERM 1

BIOLOGY CELLS	<i>Students will know and remember...</i>	<i>So that they can...</i>
Describe the hierarchy of organisation in a multi-cellular organism	A definition of a multi-cellular organism is with examples Examples and descriptions of tissues, organs and organ systems in a multi-cellular organism. The functions of the main organs of an animal (human) The functions of organ systems in a multi-cellular organism Explain why multi-cellular organisms require organ systems	Label the main organs of an animal (human)
Identify cell structures in animal cells	The cell components that are found in animal cells The functions of each cell component in animal cell	Draw and label a diagram of an animal cell
Identify cell structures in plant cells	The cell components that are found in plant cells The functions of each cell component in plant cells Similarities and differences between plant and animal cells	Draw and label a diagram of a plant cell
Describe some examples of specialised plant and animal cells	Examples of specialised animal and plant cells The function of some specialised plant and animal cells The adaptations of some specialised plant and animal cells	Draw and label examples of specialised plant and animal cells
Explain how to use a microscope to observe a cell	The parts and functions of a microscope The uses of light microscopes How to calculate total magnification of a specimen	How to set up a microscope Draw an example of an animal and plant cell from observations through a microscope
Describe what a uni-cellular organism is	How a uni-cellular organism is adapted to carry out different functions Similarities between an amoeba and an animal cell Similarities between a euglena and a plant cell	
Describe the function of the skeletal system	The function of the skeletal system Examples of bones that are found in the human skeleton Problems with the skeletal system	Label the main bones of the human skeleton
Describe the function of joints in the human body	Where joints are found in the body The structure & function of joints (pivot, ball & socket, hinge)	How joints allow movement Model the movement of each type of joint (pivot, ball & socket, hinge)
Describe the function of muscles in the human body	The function of major muscle groups in the human body How movement is caused by muscles How antagonistic muscles work to cause movement	Suggest why some organs contain muscle tissue Model the movement in antagonistic muscles

CHEMISTRY PARTICLES	<i>Students will know and remember...</i>	<i>So that they can...</i>
Describe the particle model for solids, liquids and gases	All substances are made of particles Particle interact with each other by bonding There are three states of matter Particles are arranged differently in solids, liquids and gases	Identify the state of matter of a material
Explain the properties of materials using the particle model	The interactions between particles are called bonds Properties of a material are the quality of substance that describes its appearance or how it behaves	Predict the properties of a material using the state of matter and bonding
Explain the process of melting using the particle model	Melting is the transition between a solid and a liquid Bonds between particles are broken during melting Materials can form solids, liquids and gases All substances can form solids and liquids at an appropriate temperature	Measure the temperature of a substance Take a reading from a thermometer Create a graph of temperature change over tie Use data to identify the melting point of a substance using data
Explain the process of freezing using the particle model	Freezing is the transition a liquid becoming a solid Bonds between particles are made during freezing. All substances can form solids and liquids at an appropriate temperature	Measure the temperature of a substance using a thermometer Use data to identify the freezing point of a substance
Explain the process of condensation using the particle model	Condensation is the transition of a gas becoming a liquid Bonds between particles are made during condensation All substances can form gases and liquids at the appropriate temperatures	Use data to identify the point at which a gas becomes a liquid
Explain the process of evaporation using the particle model	Evaporation is the transition of a gas becoming a liquid Bonds between particles are broken during evaporation All substances can form gases and liquids at the appropriate temperatures	Predict the state of a substance using the melting point and the boiling point
Describe how gas pressure is produced	Gases are made of particles Gases can be compressed Increasing or decreasing the temperature affects the gas pressure	Explain observations of different gas pressure using particle diagrams.
Describe the process of diffusion	Concentration is the number of particles in a fixed volume. Diffusion is the moment of particles from a high concentration to a low concentration The factors that affect diffusion are: <ul style="list-style-type: none"> • Temperature • Particle size • State of substances 	The development of Brownian Motion using models by Robert Brown and Albert Einstein Calculate the speed of diffusion in a liquid Conclude the speed of diffusion using the conditions of the substances

PHYSICS ENERGY	<i>Students will know and remember</i>	<i>So that they can</i>
Describe how energy is stored	Name different energy stores State the 'law of conservation of energy'	
Describe how energy is transferred	Describe ways that energy is transferred between stores Explain how energy is dissipated in a range of situations	Describe energy transfers using specific examples in an energy circus Calculate the efficiency of a system given values of input and useful output energy
Compare energy values of different foods and fuels	State the unit of energy Name some common fuels Compare energy values of food and fuels Explain why some people require more energy than others	Test different foods to find how much energy they contain Calculate averages from repeated practical results
State the difference between energy and temperature	State the unit of temperature State what affects the thermal energy of a substance Explain why objects change temperature (heating and cooling)	
Describe how energy is transferred by particles	State the pathways that energy can be transferred through (conduction, convection & radiation) Describe the difference between conductors and insulators Explain why gases are poor conductors using ideas about particles	Draw diagrams to show conduction and convection
Describe how energy transfer is reduced	Explain how a thermal insulator works using ideas about particles	Use experimental ideas to find the best insulator Calculate the mean from a range of experimental data Identify improvements to experimental methods
Describe the energy resources used to generate electricity	Describe what is meant by a 'fossil fuel' Explain advantages and disadvantages of fossil fuels to generate electricity Explain advantages and disadvantages of renewable resources to generate electricity	

Compare power for different electrical appliances	<p>State the unit of power</p> <p>Compare energy usage and cost of using different electrical devices</p>	<p>Calculate the power of different electrical appliances</p> <p>Calculate the cost of running an electrical appliance for a given length of time</p>
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YEAR 7 TERM 2

BIOLOGY ECOSYSTEMS & PLANTS	<i>Students will know and remember...</i>	<i>So that they can...</i>
Identify and classify organisms	How different organisms co-exist within an ecosystem The difference between a producer and a consumer The difference between a prey and predator organism	Construction of a simple food chain with named examples Labelling of a food chain with key terms (producer, consumer, predator, prey)
Describe the difference between food chains and food webs	How to interpret a food web The effect of removing organisms from a food web	Combine simple food chains into a food web with named examples
Explain how toxic materials can accumulate in a food web	A definition of bioaccumulation Examples of toxins that can accumulate in a food web and the effect on organisms	Construct a pyramid of organisms to demonstrate how bioaccumulation affects top predators
Describe the importance of insects in pollination	The role of insects and bees help in the pollination of flowers The link between decreasing been populations and food supply.	
Describe the interaction between predator and prey populations	Resources that plants and animals compete for The characteristics of successful competitors	Draw and label a graph/diagram of a typical predator-prey cycle (e.g. lynx and hare)
Describe the structure of the reproductive system of a flower	The functions of the reproductive organs of a flower The features of insect- and wind-pollinated plants Differences between wind- and insect-pollinated plants	Label the reproductive organs of a flower
Describe the process of fertilisation and germination	What happens during fertilisation of a plant The conditions required for germination	Design and carry out an investigation into different conditions required for germination Label a diagram of a germinating seed
State the ways in which seeds can be dispersed	How a seed is adapted to its method of dispersal Why seed dispersal is important Differences between wind- ,water- and animal-dispersed seeds from observations of seeds	

CHEMISTRY Atoms, Elements & Compounds	<i>Students will know and remember...</i>	<i>So that they can...</i>
Compare atoms and elements	Define the term atom and element Identify different elements using the Periodic Table Identify the different parts of the atom Describe the different parts of the atom	Use the Periodic Table to identify elements and the composition of their atoms
Describe how a compound is formed	Define the term compound Identify compounds, atoms and elements Explain the difference between a compound and an element Identify the difference between a chemical and physical reaction Name the products of reactions	Record observations to identify elements and compounds Record observations of chemical reactions Use simple models to represent atoms, elements and compounds
Use word equations to describe chemical reactions	Identify the reactants and products in reactions Identify the position of reactants and product and word equations Describe how the names of elements change when they become compounds	Write word equations to describe reactions
Use Symbol equations to describe reactions	Identify the symbols for different elements Name compounds using chemical formulae Identify the number and type of each element in a chemical formulae Create the formulae for different compounds Describe the law of the conservation of mass	Write symbol equations for different reactions Demonstrate the law of the conservation of mass Evaluate a practical method using the masses of reactants and products.

PHYSICS Sound & Light	Students will know and remember	So that they can
Describe how sound waves are generated and how they travel	<p>State how a sound wave starts</p> <p>State that sound travels as a longitudinal wave</p> <p>Describe the mediums that sound can/cannot travel through</p> <p>Calculate the speed of sound</p>	<p>Draw particle models of solid, liquid and gas – relate to how sound travels</p> <p>Calculate the speed of sound/distance using given formula</p> <p>Use a slinky to demonstrate how sound waves travel</p>
Describe the features of a sound wave	<p>State definitions for 'amplitude', 'frequency' and 'wavelength'</p> <p>Describe how sound waves change as frequency/amplitude changes</p> <p>State the auditory range of humans and some other animals</p>	<p>Use an oscilloscope to demonstrate changes in sound waves</p> <p>Draw wave diagrams showing changes in sound waves</p>
Describe the structure of the ear	<p>Name structures within the ear</p> <p>State the functions of structures within the ear</p> <p>Explain how hearing can be damaged</p>	Label a diagram of the ear and contained structures
Describe how light travels	<p>State that light travels as a transverse wave</p> <p>Describe how transparent, translucent and opaque objects affect light waves</p> <p>State the speed of light</p>	Use a slinky to demonstrate how light waves travel
Describe the processes of reflection and refraction	<p>Describe how light is reflected from a flat (plane) mirror</p> <p>Explain how light is reflected from shiny and rough surfaces</p> <p>State the law of reflection</p> <p>Explain how light is refracted through different mediums</p>	<p>Draw diagrams from practical work showing the reflection of light at a plane and curved surfaces</p> <p>Draw diagrams from practical work showing the refraction of light through a glass block</p> <p>Draw diagrams from practical work showing the refraction of light through concave and convex lenses</p>

Describe the structure of the eye	<p>Name the structures within the eye</p> <p>Explain how lenses can be used to correct vision in near- and long-sighted people</p>	<p>Label a diagram of the eye and contained structures</p> <p>Draw ray diagrams to show how light passes through the eye</p>
Describe how we see in colour	<p>State the primary colours of light</p> <p>Describe how secondary colours are formed</p> <p>Explain the difference between different colours in terms of frequency</p> <p>Explain how filters cause objects to appear a certain colour</p>	<p>Use filters to show how objects appear different colours</p>

YEAR 7 TERM 3

BIOLOGY Variation & Reproduction	<i>Students will know and remember...</i>	<i>So that they can...</i>
State the two types of variation	State what is meant by discontinuous and continuous variation Describe how to plot discontinuous and continuous variation in a chart or graph	Graphical representation of variation within the class (height, eye colour etc.)
Describe the causes of variation in a species	Describe the differences between, and give examples of inherited and environmental variation	
Explain variation in species	State what is meant by adaptation Give examples of adaptations within a named species (e.g, snowshoe hare, camel) that allow its survival within its environment	Design an animal and describe the adaptations it has to allow it to survive within its environment
Describe the male reproductive system	State the organs that are found in the male reproductive system Describe the functions of each organ in the male reproductive system Name the male gametes	Label a diagram of the male reproductive system
Describe the female reproductive system	State the organs that are found in the female reproductive system Describe the functions of each organ in the female reproductive system Name the female gametes	Label a diagram of the female reproductive system
Describe the changes that occur during puberty	Describe the difference between adolescence and puberty List the main changes that occur to males and female during puberty Explain what causes puberty in males/females	
Describe the menstrual cycle	State the length of the female menstrual cycle Describe the main stages in the menstrual cycle Describe different types of contraception	Label a diagram showing main stages in the menstrual cycle
Describe the processes of fertilisation and implantation	Describe what happens during sexual intercourse Describe the process of fertilisation and implantation	
Describe the development of a foetus	Describe what happens during gestation and birth Explain how substances are passed between mother and foetus	Label a diagram of main stages of gestation
Describe the effect of maternal lifestyle on a developing foetus	Describe how drinking alcohol can affect the development of a foetus Describe how smoking can affect the development of a foetus	Arguments against the uses of alcohol and smoking during pregnancy

CHEMISTRY Acids & Alkalis	Students will know and remember...	So that they can...
Describe the difference between an acid and an alkali	Define the term acid and alkali Identify common substances as acids and alkalis	Identify common hazard symbols Create a risk assessment when using an acid
Describe how indicators can be used to identify acids and alkalis	Define the term indicator Name the colours that common indicators will turn in an acid or an alkali	Determine if a solution is acidic or alkaline using an indicator
Explain how to use the pH scale to determine acidity and alkalinity	Describe what pH is Identify the pH of a substance using Universal Indicator Explain the acidity or alkalinity of a substance using the pH scale Evaluate the hazardousness of a substance using the pH	Evaluate the precision of an approach and identify improvements
Explain how a neutralisation reaction occurs	Define the term neutralisation Name the pH of a neutral substance Identify the products of a neutralisation reaction Write word equations for neutralisation reactions Write symbol equations for neutralisation reactions	Measure the pH of a substance Draw a neutralisation curve Identify the end point of a neutralisation reaction
Describe the reactions between acids and metals	Name common acids and metals Identify the products of the reactions of metals and acids Describe how to test for hydrogen gas Compare the reactivity of acids and metals	Make observations of chemical reactions Create word equations to represent the reactions of metals and acids Create balanced symbol equations to describe the reactions of metals and acids

PHYSICS Space	Students will know and remember	So that they can
Describe the model of the solar system	Name the planets in the solar system Explain how ideas of the solar system have changed over time	Changing models of the solar system (geocentric & heliocentric)
Describe how gravitational force varies with mass and distance	Describe gravitational force Describe the difference between mass and weight	Calculate weight on different planets using a given formula
Describe the structure of the Universe	Describe objects that can be seen in the night sky	
Explain days and seasons on Earth	Describe how Earth experiences days and nights Explain how Earth experiences seasons (spring, summer, autumn, winter)	Model the phenomena of days and seasons using props