Science Year 7– Spring Term 2022

	What? **When?** **Why?**			
	BIOLOGY **7C Muscles & bones**	**CHEMISTRY** **7F Acids & alkalis**	**PHYSICS** **7J Current electricity**	**CHEMISTRY** **7G Particle model**
Lesson 1 Learning intentions	**Muscles & breathing** Describe how muscles cause air to enter and leave your lungs. Describe what happens during the process of gas exchange in your lungs. Explain how muscle cells are adapted to their function	**Hazards** Recall everyday examples of acids Recall Hazard symbols Describe the meaning of different hazard symbols Describe the differences between corrosives and irritants	**Circuits** Recall materials that are conductors and insulators State the meaning of: conductor, insulator, complete circuit, ammeter, current. Identify common circuit components and their symbols Model circuits using simple circuit diagrams. Explain how switches work to turn a circuit on or off. Describe the effects of breaking or removing bulbs in a circuit. Use the idea of a complete circuit to test whether different materials conduct electricity.	**States of Matter** State what is meant by volume Classify materials as solids, liquids or gases Appreciate that some substances are difficult to classify Describe the properties of the three states of matter in terms of shape, volume and compressibility. Record observations and describe simple properties of the three states of matter.
Lesson 2 Learning intentions	**Muscles & blood** Describe the structure of red blood cells.	**Indicators** Recall the colour changes associated with litmus indicator	**Models for circuits** Identify common circuit components and their symbols.	**Particles** State that all materials are made from particles

	Describe the functions of: red blood cells, white blood cells and plasma. Explain how the structure of capillaries is related to their function. Explain why the left-hand side of the heart has a thicker muscle wall than the right-hand side.	Describe how indicators are used to distinguish between acidic, alkaline and neutral solutions. Explain why litmus is purple in neutral solutions. Design a plan to make an indicator scale using red cabbage.	Model circuits using simple circuit diagrams. State what is meant by: current. Recall that current is not used up Construct a circuit from instructions provided in the form of a circuit diagram. Use a model to describe how an electrical circuit works. Evaluate a physical model for electric circuits on how well it explains data or observations.	Describe, draw and recognise the arrangement of particles in solids, liquids and gases Describe how the movement and spacing of the particles is different in solids, liquids and gases. Use the particle theory to explain the properties of solids, liquids and gases. Use the particle model to explain other observations about matter
Lesson 3 Learning intentions	**<u>The Human Skeleton</u>** Recall the main functions of the skeleton (support, protection, movement). Recall the main bones in the human skeleton: skull, vertebra(e), ribs, sternum, hip, thigh, shin, collar bone, knee cap, ribcage. Describe the functions of individual bones (skull, vertebrae, ribs, sternum, hip). Relate the properties of bones to their functions. Compare vertebrate and invertebrate skeletons.	**<u>Making an indicator</u>** Recall examples of everyday substances that are acids and alkalis Use solutions of known acidity/alkalinity in order to deduce a colour chart for an indicator Evaluate the effectiveness of different indicators	**<u>Current</u>** Describe why a cell is needed in a circuit. Measure current and state its unit. Describe and explain how adding more bulbs affects the brightness of bulbs in a circuit. Construct a circuit from instructions provided in the form of a circuit diagram. Recall the link between current and bulb brightness. Describe how changing the number or type of components in a circuit affects the current.	**<u>Brownian Motion</u>** Describe Brownian motion State where Brownian motion can be observed Explain how Brownian motion occurs, using particle theory. Convert metres to nanometres and vice versa. Explain how evidence from Brownian motion is used to support the particle theory

			Describe what the current is like at different points in a series circuit. Recall how electrical cells work.	
Lesson 4 Learning intentions	**Joints** Recall the parts of joints and the types of joint Classify joints as different types. Use a knowledge of bones and joints to suggest causes of problems with them Compare natural hip joints with their artificial replacements.	**Acidity & Alkalinity** Describe how universal indicator is used to distinguish between acidic, alkaline and neutral solutions Describe the use of universal indicator and pH meters to determine the pH of a solution. Describe solutions as being more or less acidic/alkaline by comparing their pHs. Describe the main features of the pH scale (numbered scale that shows how acidic or alkaline a solution is, with solutions below pH 7 being acidic, those above pH 7 being alkaline and those at pH 7 being neutral) Use information about indicator colour changes to design different indicators for different purposes	**Series & parallel circuits** Recall how to measure current and state its unit. State what is meant by series circuit, parallel circuit. Construct a circuit from instructions provided in the form of a circuit diagram. Describe how changing the number or type of components in a circuit affects the current. Recall the differences between how current behaves in series and parallel circuits and describe and predict what the current is like at different points in a series circuit and parallel circuit.	**Diffusion** Describe diffusion as the movement of one substance through another without any external mixing Recall some everyday examples of diffusion Make a prediction about diffusion Explain how diffusion occurs in terms of movement of particles. Explain why the speed of diffusion in gases is faster than in liquids. Recognise examples of diffusion causing problems Carry out a calculation to work out the speed of diffusion
Lesson 5 Learning intentions	**Muscles & Movement** Recall that contracting muscles produce a force and recall the unit for measuring forces.	**Neutralisation reactions** Recall that acids react with alkalis and this is called neutralisation	**Uses of parallel circuits** Recall the differences between how current behaves in series and parallel circuits and describe and predict what the current is like at	**Gas pressure** Describe how moving gas particles cause pressure when they hit the walls of their container

	Describe how muscles and bones work together to allow movement. Describe some evidence for continual changes in bone and muscles. Consider the consequences of the effects of frictional and impact forces on joints.	Recall the names of 3 lab acids (hydrochloric acid, sulfuric acid, nitric acid). Recall the name of the type of salt produced by these acids Explain how chemical reactions are different to physical changes. Interpret a word equation to identify the products and reactants in a chemical reaction. Model simple reactions using word equations. Supply missing reactants or products to complete a word equation. Describe the reactions of acids with alkalis Apply ideas about the pH scale to explain the changes that take place on neutralisation and dilution Plot and interpret graphs of pH against volume of acid or alkali added in a neutralisation reaction	different points in a series circuit and parallel circuit. Explain how switches can be used to control different parts of a parallel circuit. Explain why the lights in a house are wired in parallel. Analyse a given parallel circuit and say which components will be on or off with different combinations of switches closed. Use knowledge of switches and parallel circuits to devise circuits for specified purposes.	Recognise some effects of pressure (e.g. blowing up a balloon) Explain that more particles in a container will cause a greater pressure Explain the ways in which gas pressure can be increased (more particles introduced into a container, container is made smaller, gas is heated). Describe what a vacuum is. Explain some of the effects of air pressure (e.g. using a straw, collapsing can). Explain how barometers work
Lesson 6 Learning intentions	**<u>Antagonistic Pairs</u>** Recall the function of and the parts in the locomotor system and correctly use the terms: locomotor system, biomechanics.	**<u>Applications of neutralisation</u>** Recall some applications of neutralisation (changing the pH of soils, antacids, toothpastes,	**<u>Using electricity</u>** Recall some dangers of electricity.	

	Describe what happens when muscles contract and relax. Describe the action of the biceps and triceps as an example of an antagonistic pair. Explain why antagonistic muscles are used to operate bones in many joints.	treating waste gases, rust removal) Correctly use the term: base Explain how everyday examples of neutralisation are useful (changing the pH of soils, antacids, toothpastes, treating waste gases, rust removal). Describe the reactions of acids with bases. Investigating antacid tablets. Describe how to produce a solution that is only a salt and water using the reaction between an acid and an alkali or insoluble base	Recall some safety precautions to be followed when using electricity. Identify electrical hazards in a scenario. Explain why electricity is more convenient than other sources of energy, and classify some of its uses. Explain some safety precautions to be followed when using electricity. Apply knowledge of voltage, current and electrical safety to novel situations	
Lesson 7 Learning intentions	**<u>Muscles & Drugs</u>** Recall that drugs are substances that affect how the body works. Recall that drugs can be addictive and correctly use the term: substance abuse. Recall that muscles are controlled by the nervous system.		**<u>Fuses & plugs</u>** Recall how the different wires are connected in a plug. Describe the job that fuses do Identify errors in the wiring of a plug. Explain how a fuse works. Explain how a domestic ring main is a form of parallel circuit	

	Classify drugs as legal, illegal, medical, recreational. Describe the effects of stimulants and depressants, including on reaction times. Describe how muscle action is controlled by nervous impulses.		Apply knowledge of voltage, current and electrical safety to novel situations.	
Lesson 8 Learning intentions	**<u>Investigating Reaction Times</u>** Carry out an investigation into reaction times. Identify independent and dependent variables Identify sources of error			
Lesson 9 Learning intentions	**<u>The effect of drugs</u>** Recall the short- and long-term effects of alcohol on the body. Recall the short- and long-term effects of commonly abused substances.			

	Explain the short- and long-term effects of alcohol. Explain the effects of stimulants and depressants on the body by reference to the nervous system. Explain the importance of testing drugs.			