Curriculum Map

Subject: Science KS3

Year: 7

	Autumn				Spring		
Content Knowledge	**Indroduction to Science Project:** • The role of a Scientist • Variables • Tables • Method writing • Mean and range • Graphs and charts • Resolution **Knowledge:** Explain the role of a scientist. Identify the control, independent and dependent variables. Identify risks within the lab. Calculate the mean and range of results. Plot line graphs from data. State the resolution of science equipment. Explain the importance of learning science.	**7A&C Cells, Muscles and Bones:** • Life processes • Microscopes • Cells, tissues, organs • Organ Systems • Muscles and Breathing • The Skeleton • Drugs **Knowledge:** Describe the 7 life processes, and to use life processes to justify whether something is living or non-living. Describe the functions of the parts of a microscope. Describe the functions of the plant and animal organelles. Describe the functions of major human and plant organs. Describe how the organs work together in the different organ systems. Describe how muscles and bones work together. Describe some long-term effects of drugs.	**7E Mixtures and Separation:** • Mixtures • Filtering • Solutions • Disolving • Evaporation • Chromatography • Distillation • Water purification **Knowledge:** Describe how to separate solids from liquids. Describe what a saturated solution is. Describe how solutes can be separated from a solution by evaporation. Describe how chromatography can be used to identify substances in a mixture. Describe how distillation can separate mixtures.	**7I Energy:** • Energy from food • Energy transfers and stores • Fuels • Renewable Energy Resources • Using Resources and the effects **Knowledge:** Explain why different people need different amounts of energy from food. Describe the different ways in which energy can be transferred. Explain why fossil fuels are described as non-renewable. Describe advantages and disadvantages of different renewable, energy resources. Explain how the levels of greenhouse gases in the atmosphere can be prevented from increasing further.	**7B Sexual Reproduction:** • Animal reproduction • Reproductive organs • Fertilisation • Gestation and birth • Puberty • The mentral cycle **Knowledge:** Describe how fish, birds, mammals reproduce sexually. Describe the structures and functions of the organs of the human reproductive system. Explain how sexual intercourse leads to fertilisation. Describe the effects of pregnancy on the mother. Describe what happens to parts of the body during puberty and adolescence. Describe the stages in the menstrual cycle.	**7F Acids and Alkalis:** • Hazards • Acids and alkali • pH Scale • Neutralisation • Chemical Reactions • Word equations • Application of neutralisation reactions **Knowledge:** Explain the meaning of different hazard symbols. Describe the properties of acids and alkalis. Identify different parts of the pH scale. Write neutralisation reactions using different acids and alkali. Explain how indigestion remedies work.	**7J Current Electricity:** • Current • Series and Parallel Circuits • Models for electricity • Components in a circuit • Resistance • Using electricity **Knowledge:** Describe what a current is and how it is measured. Describe what happens when the number of bulbs in a circuit is changed. Describe how switches can control different kinds of circuits. Use a physical model to help explain how an electrical circuit works. Describe how a voltmeter is used. Describe how the resistance of a wire varies with its length and thickness.

Skills	• Identify the control, independent and dependent variables • Write a scientific method. • Identify risks in the lab and write a risk assessment • Calculate the mean and range of results • Plot data on line graphs and draw a line of best fit • Dividing and drawing the axis of a line graph on graph paper	• Dividing and drawing the axis of a line graph on graph paper • Plot data on line graphs and draw a line of best fit • Calculate total magnification using a formula. • Draw a plant and animal cell with the main organelles. • Use a model to explain the process of breathing	• Writing risk assessments for practical work • Carry out a filtration • Experimentally determine how many grams of salt can dissolve in water • Obtain crystals through evaporation • Separate dye through chromatography • Obtain pure water through distillation	• Qualitatively test how much energy is in food • Evaluate the use of renewable and non-renewable energy resources • Debate the use of renewable and non-renewable energy resources in terms of the impact to social, economic and environmental factors.	• Writing a hypothesis and making predictions • Using flow charts to explain the scientific method • Interpreting graphs • Plot data on line graphs and draw a line of best fit • Identify anomalalous results in a graph	• Plan an investigation to determine the best antacid • Writing risk assessments for practical work • Use an indicator to determine if a substance is acid or alkaline • Determine the pH of a substance using the pH scale • Justify conclusions with scientific evidence	• Use a model to explain electricity in circuit • Construct a simple series and parallel circuits • Draw circuit diagrams using circuit symbols to represent components • Record results from practical work in a table • Investigate how the resistance of a wire varies with its length and thickness
Key Questions	What is the role of a scientist? What are control, independent and dependent variables? What risks are there in a lab? How can we minimise these risks? How do you calculate the mean and range of results? What can you conclude from a graph? Why is it important to learn science?	How can you justify that an organism is living? What is a cell made up of? What is a tissue? What is an organ? What makes up our organ systems and how do these work together to carry out their function? What is the difference between respirationand breathing? How do our muscles and skeleton allow us to move? How do you plot data on a line graph?	What is a mixture? How can you separate a solid and liquid through filtration? how can solutes be separated from a solution by evaporation? How can we use chromatography to identify components of a mixture? How can you obtain pure water through distillation? What methods could you use to purify water?	Where do our bodies get energy from? How is energy stored? In what ways can energy be tranferred? What are fossil fuels and how are they used? What are the advantages and disadvantages of different renewable, energy resources? How can we reduce the levels of greenhouse gases in the atmosphere?	How do fish, birds, mammals reproduce sexually? What makes up the reproductive system? How does the egg become fertilised? Why ultrasound scans are used during pregnancy? What changes occur t the body during puberty? What happens during the mentral cycle?	What are hazard symbols? What are the properties of acids and alkalis? What can universal indicator tell you about a substance? What is the general word equation for a neutralisation reaction? How do indigestion remedies work?	What a current is and how it is measured? How does current behave in a series and parallel circuit? What is the relationship between resistance and current? What does a voltmeter measure? How does the resistance of a wire vary with its length and thickness?

Assessment	End of chapter assessed project ReAct tasks	End of chapter test ReAct tasks	End of chapter test ReAct tasks	End of chapter test ReAct tasks	End of chapter test ReAct tasks	End of chapter test ReAct tasks	End of chapter test ReAct tasks
Literacy/ numeracy / SMSC/ Character/	**Key words:** observation, practical, investigate, cooperation, hypothesis, prediction, record, analyse, conclusion, method, independent variable, dependent variable, control variable, repeat, accurate, mean, range, graph, axis, scale, line of best fit, resolution, beaker, conical flask, Bunsen burner. **Numeracy:** taking measurements using scientific equipment. Calculating mean and range of results. Calculating scales on a graph. **SMSC:** Studying the scientific method and how scientists collaborate to share and test ideas.	**Key words:** Organism, life processes, movement, magnification, nucleus, cytoplasm, mitochondria, cell wall, cell membrane, vacuole, chloroplasts, tissue, muscle, fat, function, circulatory system, digestive system, gas exchange, arteries, veins, capillaries, vessles, contract, relax, stimulant **Numeracy:** Interpreting data and graphs, drawing graphs, lines of best fit and plotting data. **SMSC:** students consider what it means to be a living organism. Develop a fascination in learning about the cells, tissues and organs that make up the human body. Studying and discussing the impacts of a drug going wrong using the thalidomide incident.	**Key words:** suspension, colloid, solution, filter, solvent, soluble, solute, saturated, resolution, evaporation, boiling, chromatogrphy, desalination, condense, distillation, purification **Numeracy:** Interpreting data, taking measurements and logging results in a table. **SMSC:** students consider the safety of others during practical work. Identify hazards and describe how to reduce risks. Discuss how to survive without access to clean water and design a water purification device to help communities without access to clean water.	**Key words:** joule, kilojoule, diet, weight, chemical energy, cells, electricity, transferred, forces, kinetic energy, law of conservation of energy, thermal energy, elastic potential energy, gravitational potential energy, nuclear energy, oil, natural gas, fossil fuels, coal, renewable, solar power, wind turbines, hydroelectric power, geothermal power, climate change. **Numeracy:** Interpreting data, taking measurements and logging results in a table. **SMSC:** consider the impacts of different energy resources on the environment. Studying what constitutes a ‘healthy diet’.	**Key words:** gametes, fertilisation, parent, sexual reproduction, offspring, testes, puberty, sperm ducts, glands, semen, urethra, bladder, ovary, uterus, cervix, vagina, egg, sperm, embryo, pregnant, umbilical cord, hormones, puberty, adolescence, ovulation **Numeracy:** Interpreting data, analysing graphs. **SMSC:** Develop and understanding of the changes that happen to the body during puberty and pregnancy. Discuss possible problems with fertility.	**Key words:** hazard, acids, alkalis, corrosive, diluted, symbol, toxic, dangerous, environment, explosive, flammable, caution, universal indicator, pH scale, neutralisation, chemical reaction, word equation, reactants, products, antacid. **Numeracy:** Interpreting data, taking measurements and logging results in a table. **SMSC:** Identify hazards on household chemicals and describe how to reduce risks. Discover how neutralisation reactions can used in everyday products.	**Key words:** current, energy, components, filament, ammeter, amperes, series circuit, parallel circuit, charges, metals, conductors, voltage, voltmeter, volts, resistance, resistor, hazard, risk, fuse, live, neutral wires, earth wire. **Numeracy:** calculating resistance through measurements of current and potential difference. **SMSC:** Students will develop and use a range of social skills to learn and socialise with their peers through practical work. Students reflect on dangers of electricity and how to minimise these risks.
Enrichment opportunities and futures	KS3 Science Club Science Museum Zoo Trip Visits from outside presenters Science Competitions Science Week Students explore how Science influences the next stage of their education and/or employment in end-of-topic Career lessons which link the content to career options and applications.						

	Summer				
Content Knowledge	**7D Ecosystems:** ● Variation ● Adaptations ● Inherited vs Environmental variation ● Food webs ● Transfers in food chains ● Pesticides **Knowledge:** Describe what is meant by variation. Classify variations as continuous or discontinuous. Describe adaptations that some organisms have. Classify inherited and environmental variation. Interpret Food chains and webs. Draw pyramids of numbers. Explain how human use of chemical substances can damage food webs.	**7G&H Particles:** ● States of matter ● Particles ● Diffusion ● Air pressure ● Atoms, Elements, and Molecules ● Metals and non-metals ● Compounds ● Thermal Decomposition **Knowledge:** Describe the properties of the three states of matter. Recognise the arrangement of particles in solids, liquids and gases. Use particle theory to explain diffusion in liquids and gases. Identify elements, mixtures and compounds from descriptions. Describe some uses of elements. Classify substances as metal and non-metal elements.	**7K Forces:** ● Types of forces ● Springs ● Friction ● Pressure ● Balanced and unbalanced forces ● SI units **Knowledge:** Classify forces as contact or non-contact forces. Describe the effects of different forces on objects. State the difference between stretched and compressed. Describe some ways friction can be changed. Calculate pressure and recall its units.	**7L Sound:** ● Frequency and aplitude ● How sound travels ● Speed of sound ● Detecting sounds ● Comparing waves **Knowledge:** Recall that sound travels through different materials by vibrations, and needs a medium. Compare the sounds that different objects make by looking at the size and speed of the vibrations. Describe how fast sound is transmitted by solids, liquids, gases. Describe the functions of the parts of the ear. Explain how sonar and echolocation work. Compare longitudinal and transverse waves.	**8H Rocks:** ● Natural disasters ● Structures of rocks ● Porous rocks ● Metamorphic and igneous rock ● Chemical, physical and biological weathering ● Rock cycle **Knowledge:** How geologists can help predict natural disasters. Describe the structure of rocks. Explain why certain rocks are porous and/or permeable. Describe the textures and properties of igneous and metamorphic rocks. Explain how rocks are chemically physically and biologically weathered. Describe the continuous process of the rock cycle.

Skills	• Identify the dependent, independent and control variables • Identify and plot data on different types of charts or graphs • Describe a relationship in a scatter graph • Draw and interpret pyramid of numbers • Evaluate the use of pesticides	• Classify solids, liquids and gases based on their properties • Use diagrams to explain the movement of particles • Present data in a pie chart or bar chart • Relate the use of an element to its property • Carry out a fair test to investigate properties of metals and non-metals	• Label a diagram with arrows showing the forces acting on it • Record numbers using suitable units and prefixes for measuring • Convert between different units • Calculate the mean • Investigate friction using a Newtonmeter	• Use a model to explain how the particles move as a wave • Label scientific diagrams of the ear • Link back to 7G&H Particles topic to apply understanding of particles in solids, liquids and gases.	• Draw a scientific diagram of a rock using diagram rules • Calculate magnification of a diagram • Investigate the amount of water a rock can absorb • Investigate how rocks chemically wear away
Key Questions	What is meant by variation? What are examples of inherited and environmental variation? How are organisms adapted to their environment? What does a food chain tell us? How is enegery lost in a food chain? How does human use of chemical substances damage food webs?	What are the properties of the states of matter? How do the particles move in a solid, liquid and gas? What is Brownian motion? What s the difference between atoms and molecules? What are elements? How do you know if a substance is a metal?	What are contact and non-contact forces? How can you measure forces? What is the difference between stretched and compressed? How does the extension of a spring change depending on the force applied? How can you change friction? How can you calculate pressure?	How is sound created? How does sound travel through different materials? What are the different parts of the ear? how do sonar and echolocation work? What are longitudinal and transverse waves?	How can geologists help predict natural disasters? Why are certain rocks porous and/or permeable? What are the properties of igneous and metamorphic rocks? How are rocks chemically, physically and biologically weathered? What are the stages in the rock cycle?
Assessment	End of chapter test ReAct tasks	End of chapter test ReAct tasks	End of chapter test ReAct tasks	End of chapter test ReAct tasks	End of chapter test ReAct tasks
Literacy/numeracy/SMSC/Character	**Key words:** Organism, life processes, movement, magnification, nucleus, cytoplasm, mitochondria, cell wall, cell membrane, vacuole, chloroplasts, tissue, muscle, fat, function, circulatory system, digestive	**Key words:** solid, liquid, gas, flow, volume, compressed, pressure, particle, diffusion, vacuum, element, compound, atom, molecule, mixture of elements, periodic table, metals, non-metals, flexible, conductors,	**Key words:** contact forces, air resistance, water resistance, upthrust, friction, non-contact forces, gravity, static electricity, magnetism, newtons, stretched, compressed, extension, elastic, pressure, pascal, area,	**Key words:** Vibrations, volume, amplitude, pitch, frequency, medium, particle, vacuum, pressure, wave, energy transfer, solid, liquid, gas, ear drum, cochlea, ear canal, auditory nerve, absorb, decibels, Transmitted,	**Key words:** Eruption, sinkhole, earthquake, Rock slide, Grains, minerals, texture, interlocking, crystals, porous, permeable, igneous, basalt, lava, extrusive, intrusive, compress, metamorphic, Chemical weathering,

	system, gas exchange, arteries, veins, capillaries, vessles, contract, relax, stimulant **Numeracy:** Interpreting data and graphs, drawing graphs, lines of best fit and plotting data. **SMSC:** Students develop an appreciation and an understanding of the variation in individual's characteristics and what makes us all unique. Students explore characteristics and features of people from different backgrounds.	malleable, magnetic, brittle, thermal decomposition, carbonate **Numeracy:** Interpreting data and graphs. Balancing equations. **SMSC:** Students are encouraged to develop a sense of fascination in learning about how particles make up solids, liquids and gases and can behave differently in the world around them.	units. **Numeracy:** Interpreting data and graphs. Taking measurements using scientifc equipment. **SMSC:** Students acquire the ability to apply their knowledge to different scenarios. Students discuss how scientists around the world work together and use a universal set of standard units to communicate.	communication, absorbed, reflected, echo, echolocation, longitudinal, transverse **Numeracy:** Interpreting data. Comparing frequency and volumes. **SMSC:** Students develop an understanding of how we hear and explore how animals communicate through sounds. Students consider the use of sound in ultrasounds to help people recover with injuries.	freeze-thaw, physical weathering, expand and contract, sedimentary, fossils **Numeracy:** Interpreting data. Taking measurements using scientific equipment. **SMSC:** Students analyse the cause of natural disasters and discuss their consequences. Students develop an understanding of how we can analyse fossils to study the past.
Enrichment opportunities and futures	KS3 Science Club Science Museum Zoo Trip Visits from outside presenters Science Competitions Science Week Students explore how Science influences the next stage of their education and/or employment in end-of-topic Career lessons which link the content to career options and applications.				