

Curriculum Map Year 9 - Science

Topic Name	Term	Content / skills developed with link to NC / exam board subject content (if applicable)	Reflection on previous learning	Progress to future learning	Global Citizenship links	Qatar National Identity links
Atomic structure & ions	1	<ul style="list-style-type: none"> To understand the structure of the atom, name the subatomic particles, know the rules for the arrangement of electrons in the first 20 elements of the periodic table – using Bohr model 	Year 4 IPC – states of matter Year 5 IPC – properties of materials	Development of quantum theory of atomic structure at KS5 (AS)	PRIDE Prepare for future challenges Developing skills for the future	Conscious thinking about my Environment
Reactivity	1	<ul style="list-style-type: none"> Differences between chemical and physical changes Particle model in pressures increase/decrease pressure due to temperature of particle numbers Symbol and state symbols for balanced chemical reactions Recall reactions metals with water, oxygen, and acids Place metals in order of reactivity due to observations of chemical reactions 	Year 4 IPC - energy Year 5 IPC – reversible and irreversible changes	KS5 (A2) electrochemical series	PRIDE Prepare for future challenges Developing skills for the future	Conscious thinking about my Environment Conscious thinking about my Actions

		<ul style="list-style-type: none">• Describe atoms in reactivity due to subatomic particles• Predictions of period table reactivity due to arrangement• Describe and identify combustion type due to products, thermal decomposition, and oxidation• Test for oxygen• Starting activation energy requirements• Variables affecting rate of reactions• Classify endothermic and exothermic from temperature changes/energy profiles• Bonds breaking and bond making• State what happens during a displacement• Identify different displacement reactions (metals, metal oxides, halogens, halogen compounds and metal salt solutions.)• How displacement links to periodic table reactivity				
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		<ul style="list-style-type: none"> • Balanced displacement reactions • Metals from their ores • Links to redox reactions and identified oxidised and reduced elements link to oxidising agent and reducing agents • Extraction with carbon reduction and electrolysis • Which method is used due to reactivity placement in relation to hydrogen and carbon • Oxidation and reduction in terms ions 				
Speed & motion	1	<ul style="list-style-type: none"> • Understand different units of speed • Understand how to interpret distance-time and velocity time graph. • Use of acceleration Equation • Explain how to tell the story of the motion of an object using the average speed equation and distance-time graphs 	Year 5 IPC - forces	Solving problems, applying the equation, Graph Skills, interpretation.	PRIDE Prepare for future challenges Developing skills for the future	Conscious thinking about my Actions Conscious thinking about my Hobbies

Plant growth	1	<ul style="list-style-type: none"> • Model respiration and photosynthesis word and balanced symbol equations. • Recall the factors affecting the rate of photosynthesis. • Describe the adaptations to leaves and plant cells relating to photosynthesis. • Describe how water and minerals are absorbed and transported by the plant. • Recall the main nutrients required in plants and their functions. • Describe the role of transpiration. • Describe why and how cross breeding and selective breeding are done. • Explain impact of pests on food security and supply. • Explain how plant variety and pest control can increase food production • Use food webs to predict biological factors on plants. 	<p>Year 5 IPC – Life cycles Year 6 IPC – living things and their habitats</p>	<p>Year 10 Biology – Unit 2 nutrition</p>	<p>PRIDE Prepare for future challenges Developing skills for the future</p>	<p>Conscious thinking about my Environment Conscious thinking about my Country</p>
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		<ul style="list-style-type: none"> • Describe and explain the steps involved in the carbon and nitrogen cycles. 				
Force fields & electromagnets	2	<ul style="list-style-type: none"> • Recall shapes and direction of a magnets field and interaction of other materials • Earths field and magnets effect on compass' and strength of gravities to calculate weights. • Mass and distance affecting gravitational strengths • Describe how gravitational effects used to estimate mass of the earth • Use of domain model to explain magnetic phenomena • Charges of static electricity and its effects • Recall charges and effects on each other attraction and repulsion • Conductors and insulators in terms of static • Fields around charged objects due to transfer of electrons 	Year 5 IPC - forces Year 6 IPC – electricity	Year 10-11 Physics – Forces and electromagnets	PRIDE Prepare for future challenges Developing skills for the future	Conscious thinking about my Environment

		<ul style="list-style-type: none">• Switches use to control current in parallel circuits• Changing amount or components in circuit affects current• Current and voltage behaviour/comparison in series and parallel circuits• Links between voltage and energy• Current as flow of electrons• Power current and voltage formula• Relationship between current and resistance• Resistance varies due to length and thickness of wires• Voltage, current and resistance formula• Voltage-current graph interpretation for different valued resistors• Resistance in a filament lamp with increasing voltage• Shapes of magnetic fields around wires carrying current• Describe electromagnets and shapes of fields and				
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		<p>how to increase strengths</p> <ul style="list-style-type: none"> • Simple use and application of magnets • How changing size or currents effect magnetic fields and how electromagnets are used in relays 				
Ecology	2	<ul style="list-style-type: none"> • Understand the terms population, community, habitat, ecosystem, and biodiversity. • Recall how abiotic and biotic factors affect the population size and distribution of organisms • Recall the names given to different trophic levels, including producers, primary, secondary, and tertiary consumers, and decomposers • Understand the concepts of food chains, food webs, pyramids of number, pyramids of biomass and pyramids of energy transfer. 	<p>Year 4 IPC – habitats Year 4 IPC – food chains Year 6 IPC – living things and their habitats Year 6 IPC - adaptations</p>	<p>Year 11 Biology – Unit 4 ecology and the environment</p>	<p>PRIDE Prepare for future challenges Developing skills for the future</p>	<p>Conscious thinking about my Environment Conscious thinking about my Health Conscious thinking about my Future</p>

		<ul style="list-style-type: none"> • Understand the transfer of substances and energy along a food chain and explain why only about 10% of energy is transferred from one trophic level to the next. • Describe the stages in the carbon cycle, including respiration, photosynthesis, decomposition, and combustion 				
Rates of reaction	2	<ul style="list-style-type: none"> • Understand the factors that affect the speed of a chemical reaction and explain how changes to the factors affect a reaction. Know what a catalyst and describe experiments to show how the rate of a chemical reaction can be measured 	Year 5 IPC – reversible and irreversible changes	KS5 quantitative reaction kinetics	PRIDE Prepare for future challenges Developing skills for the future	Conscious thinking about my Environment
MRS GREN & the 5 kingdoms and cells	2	<ul style="list-style-type: none"> • Describe the common features shown by eukaryotic organisms: plants, animals, fungi and protists. • describe the common features shown by 	Year 4 IPC – group and classify living things Year 5 IPC - life cycles Year 6 IPC – living things and their habitats	Year 10-11 Biology	PRIDE Prepare for future challenges Developing skills for the future	Conscious thinking about my Environment

		<p>prokaryotic organisms such as bacteria</p> <ul style="list-style-type: none"> • understand the term pathogen and know that pathogens may include fungi, bacteria, protoctists or viruses • describe the levels of organisation in organisms: organelles, cells, tissues, organs and systems • describe cell structures, including the nucleus, cytoplasm, cell membrane, cell wall, mitochondria, chloroplasts, ribosomes and vacuole • know the similarities and differences in the structure of plant and animal cells • explain the importance of cell differentiation in the development of specialised cells • understand the advantages and disadvantages of using stem cells in medicine 				<p>Conscious thinking about my Health</p>
Genetics & evolution	3	<ul style="list-style-type: none"> • Explain environmental variation and examples. • Identify continuous and discontinuous variation 	Year 5 IPC - life cycles	Year 10 Biology - inheritance	PRIDE	<p>Conscious thinking about my Health</p>

		<ul style="list-style-type: none"> • Use term species • Ideas of classification • Explain inherited variation caused and examples • Understand genetics in the nucleus • Understand distribution curves • Mendel work in genetics • State pairs of chromosomes in cells and made of • Genes relationships to characteristics • Watson Crick DNA work relating to DNA Structure • Changes in biotic and abiotic factors effects to ecosystems • Adaptations and survival • Gene pools and distributions due to adaptations • Variation in populations due to environmental demographics • Natural selection in terms of survival and extinction 	<p>Year 6 IPC – living things and their habitats</p> <p>Year 6 IPC – adaptations</p> <p>Year 6 IPC - variation</p>		<p>Prepare for future challenges</p> <p>Developing skills for the future</p>	<p>Conscious thinking about my Environment</p>
Chemical equations & moles	3	<ul style="list-style-type: none"> • To understand what chemical formulae, mean and how to derive 	Year 5 IPC – reversible and	KS5 amounts of substances (unit 1)	PRIDE	Conscious thinking about

		<p>formulae for ionic compounds. To know how to balance chemical equations and the important of this in quantitative chemistry. To understand the concept of a mole and how to calculate this.</p>	irreversible changes		<p>Prepare for future challenges Developing skills for the future</p>	my Environment
Fluids & density	3	<ul style="list-style-type: none"> • Be able to describe the cause of pressure in fluids and how atmospheric pressure varies with altitude; • Understand how liquids can transmit pressure in a useful way; • understand that pressure increase with depth and that this causes upthrust; • explain what is meant by stress and how footwear or vehicles are adapted to minimise stress on surfaces • Density and Pressure definition and formula. • Similarities and differences, including density differences, 	<p>Year 4 IPC – states of matter Year 5 – IPC properties of materials</p>	<p>Analysis, critical thinking, interpretation, problem solving</p>	<p>PRIDE Prepare for future challenges Developing skills for the future</p>	<p>Conscious thinking about my Environment</p>

		<p>between solids, liquids, and gases</p> <ul style="list-style-type: none"> • Use of equations: $D = m/v$ and $P = F/A$, • Practical to find density of different materials. 				
<p>Maths skills in science</p>	<p>3</p>	<ul style="list-style-type: none"> • Maths for physics • Rearrangement of equation • Line graph • Scatter graph 	<p>Key stage 2 maths</p>	<p>Analysis, critical thinking, interpretation, problem solving</p>	<p>PRIDE Prepare for future challenges Developing skills for the future</p>	<p>Conscious thinking about my Future</p>