Fairfield High School Curriculum Overview – Year 7

Subject	**Science**	**Why do we study these units in Year 7?**
Lessons per fortnight	7	The Year 7 Science programme begins with an introduction to the skills, laboratory techniques and Health & Safety requirements necessary for scientific study. We then build upon their prior KS2 learning with a **mastery approach** to the KS3 National Science Curriculum. The content is delivered **under 10 big ideas** which each contain four smaller topics. The smaller topics act as the building blocks for the big ideas, are taught over two years. This equips students for success at GCSE from Year 9 onwards. The Science curriculum is augmented throughout with extra-curricular lesson activities, clubs, externally delivered workshops and trips. All with the aim of increasing the Science Capital of our students
Setting	Mixed ability teaching in tutor groups	

Students are encouraged to be Responsible Global Citizens through numerous links to the sustainable development goals embedded within the Year 7 programme of study. All science topics are linked to at least one goal and these are explored through their links to the science being explored.
We ensure all students experience high challenge in the sciences by differentiating lessons so that ideas can be extended by all students even those making greater than expected progress.
Literacy work this year includes the introduction of a wide range of scientific vocabulary. This is explored through various scientific texts and scientific talk.

Innovation and Creativity opportunities are included in lessons and via workshops delivered by local universities and employers throughout the year. All Year 7 pupils experience the creativity involved in the annual Indoor Fireworks Show and the RAF Roadshow which showcases the innovation required to develop new technology.
Employability opportunities and skills are highlighted in lessons throughout the course and supplemented with workshops and trips offered across the year. All Year 7 pupils visit the Big bang Fair at the NEC in Birmingham which showcases the world of science in all its forms.

Term	Unit title	Knowledge and Understanding/content	Skills	Assessment
1	**Introduction to Laboratory Science**	1. Observation – The first skill of a scientist 2. Safety in the Lab 3. Using Scientific equipment 4. Taking measurements 5. Scientific investigations 6. How to use a Bunsen burner 7. Research Skills – using the Library 8. Research task	• Identify features of an investigation which are hazardous and ways to reduce the risks. • Collect data and draw conclusions • Interrogate sources and communicate ideas.	**Homework**: Safety in the Lab poster. **Research Project**: on a science topic of own interest to be presented to the class.
1	**Forces**:- Speed Gravity	1. Understanding speed 2. Describing journeys with distance–time graphs 3. Exploring journeys on distance–time graphs 4. Investigating the motion of a car on a ramp 5. Understanding relative motion 6. Understanding forces 7. Understanding gravitational fields	• Use the formula: speed = distance (m)/time (s) or distance-time graphs, to calculate speed.	**Homework**: Topic guide with keywords to learn **Homework**: Getting 'GCSE' ready practice questions to research

		8. Understanding mass and weight 9. Understanding gravity	• Use the formula: weight (N) = mass (kg) x gravitational field strength (N/kg).	**End of unit test**: Know, apply & extended knowledge test.
2	**Matter**:- Particle model Separating mixtures	1. Using particles to explain matter 2. Understanding solids 3. Understanding liquids and gases 4. Exploring diffusion 5. Explaining changes of state 6. Separating mixtures 7. Exploring solutions 8. Understanding distillation 9. Exploring chromatography	• Argue for how to classify substances which behave unusually as solids, liquids or gases. • Use techniques to separate mixtures.	**Homework**: Topic guide with keywords to learn **Homework**: Getting 'GCSE' ready practice questions to research **End of unit test**: Know, apply & extended knowledge test.
2	**Organisms**:- Movement Cells	1. Exploring the human skeleton 2. Understanding the role of joints and muscles 3. Examining interacting muscles 4. Exploring problems with the skeletal system 5. Understanding organisation in multicellular organisms 6. Describing plant and animal cells 7. Understanding adaptations of cells 8. Exploring cells 9. Understanding unicellular organisms	• Consider the benefits and risks of a technology for improving human movement. • Use a light microscope to observe and draw cells.	**Homework**: Topic guide with keywords to learn **Homework**: Getting 'GCSE' ready practice questions to research **End of unit test**: Know, apply & extended knowledge test.
3	**Electromagnets**:- Voltage and resistance Current	1. Describing electric circuits 2. Understanding energy in circuits 3. Explaining resistance 4. Describing series and parallel circuits 5. Comparing series and parallel circuits 6. Investigating static charge	• Calculate resistance using the formula: resistance (Ω) = potential difference (V) / current (A). • Evaluate a model of current as electrons moving from the negative	**Homework**: Topic guide with keywords to learn **Homework**: Getting 'GCSE' ready practice questions to research

		7. Explaining static charge 8. Understanding electrostatic fields	to the positive terminal of a battery, through the circuit.	**End of unit test**: Know, apply & extended knowledge test.
3	**Reactions**:- Metals and non-metals Acids and alkalis	1. Using metals and non-metals 2. Exploring the reactions of acids with metals 3. Understanding displacement reactions 4. Understanding oxidation reactions 5. Exploring acids 6. Exploring alkalis 7. Using indicators 8. Exploring neutralisation 9. Investigating neutralisation	• Deduce a rule from data about which reactions will occur or not, based on the reactivity series. • Given the names of an acid and an alkali, work out the name of the salt produced when they react.	**Homework**: Topic guide with keywords to learn **Homework**: Getting 'GCSE' ready practice questions to research **End of unit test**: Know, apply & extended knowledge test.
4	**Ecosystems**:- Interdependence Plant reproduction	1. Understanding food webs 2. Understanding the effects of toxins in the environment 3. Exploring the importance of insects 4. Exploring ecological balance 5. Exploring flowering plants 6. Exploring fertilisation 7. Understanding how seeds are dispersed 8. Understanding how fruits disperse seeds	• Make a deduction based on data about what caused a change in the population of a species. • Develop an argument why a particular plant structure increases the likelihood of successful production of offspring.	**Homework**: Topic guide with keywords to learn **Homework**: Getting 'GCSE' ready practice questions to research **End of unit test**: Know, apply & extended knowledge test.
4	**Energy**:- Energy costs	1. Understanding energy transfers by fuels and food 2. Comparing rates of energy transfer 3. Looking at the cost of energy use in the home 4. Getting the electricity we need 5. Using electricity responsibly	• Evaluate the social, economic and environmental consequences of using a resource to generate electricity, from data.	**Homework**: Topic guide with keywords to learn **Homework**: Getting 'GCSE' ready practice questions to research

	Energy transfer	6. Energy Stores and transfers 7. Exploring energy transfers 8. Understanding potential energy and kinetic energy 9. Understanding elastic potential energy	• Explain why processes such as swinging pendulums or bouncing balls cannot go on forever, in terms of energy.	**End of unit test**: Know, apply & extended knowledge test.
5	**Earth**:- Earth structure Universe	1. Understanding the structure of the Earth 2. Exploring igneous rocks 3. Exploring sedimentary rocks 4. Exploring metamorphic rocks 5. Understanding the rock cycle 6. Describing stars and galaxies 7. Explaining the effects of the Earth's motion 8. Exploring our neighbours in the Universe 9. Using models in science	• Identify circumstances that indicate fast processes of change on Earth and those that indicate slower processes. • Predict patterns in day length, the Sun's intensity or an object's shadow at different latitudes.	**Homework**: Topic guide with keywords to learn **Homework**: Getting 'GCSE' ready practice questions to research **End of unit test**: Know, apply & extended knowledge test.
5	**Genes**:- Variation Human reproduction	1. Looking at variation 2. Exploring the causes of variation 3. Considering the importance of variation 4. Understanding the female reproductive system and fertility 5. Understanding the male reproductive system and fertilisation 6. Learning how a foetus develops 7. Understanding factors affecting a developing foetus 8. Communicating ideas about smoking in pregnancy	• Use the ideas of variation to explain why one species may adapt better than another to environmental change. • Explain why pregnancy is more or less likely at certain stages of the menstrual cycle.	**Homework**: Topic guide with keywords to learn **Homework**: Getting 'GCSE' ready practice questions to research **End of unit test**: Know, apply & extended knowledge test.
6	**Waves**:- Sound	1. Exploring sound 2. Describing sound 3. Hearing sounds Understanding how sound travels through materials	• Use diagrams to compare the waveforms a musical instrument makes when playing different pitches or volumes.	**Homework**: Topic guide with keywords to learn

	Light	4. Learning about the reflection and absorption of sound 5. Exploring properties of light 6. Exploring reflection 7. Exploring refraction 8. Seeing clearly 9. Exploring coloured light	• Construct ray diagrams to show how light reflects off mirrors, forms images and refracts.	**Homework**: Getting 'GCSE' ready practice questions to research **End of unit test**: Know, apply & extended knowledge test.