

SCIENCE - LONG TERM PLANS SHOWING WHAT EACH YEAR GROUP IS CURRENTLY DOING

(More detailed plans per year group showing the KS3 or KS4 journey are available if requested) These are 'live' documents

YEAR 7		HT1	HT2	HT3	HT4	HT5	HT6
SCIENCE	BIG IDEA	PHYSICS What are current, voltage and resistance? How do objects move? BIOLOGY How do humans reproduce?	PHYSICS What is gravity? What is energy and how do we use it?	PHYSICS & CHEMISTRY How do we see and hear? What does the periodic table tell us?	CHEMISTRY How are metals and non-metals different and how do metals react? What are acids and alkalis? How is the Earth structured? Where are we positioned in the universe? How are rocks cycled on Earth?	BIOLOGY What are living things made of?	BIOLOGY Why do we look like our parents?
	ASSESSMENT	Hinge point questioning every lesson Working Scientifically knowledge Test 1 Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson Winter Assessment Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson Educake homework every week Working Scientifically knowledge Test 2 Feedback point written tasks – extended response answers	Hinge point questioning every lesson Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson End of Year Assessment Educake homework every week Feedback point written tasks – extended response answers
	WIDER CURRICULUM LINKS	Over one third of the people in the world do not have access to electricity from a national grid – why?	Graphing data from helicopter practical Space exploration – How can space rovers land safely investigation.	Why should you never jump into a pool without first checking the depth? Why do we see rainbows?	British Science Week Why this is important to prevent rusting? e.g. ships, machinery on building sites etc.	What is organ donation and would you choose to do this? How can we model things that we can't see?	Should people have to pay for IVF or should the NHS pay? Is behaviour genetic or environmental?

		Working safely with equipment and each other. Taking roles in turn and being a good team member How does a dimmer switch work? Link to resistance What changes occur during puberty?	How have our energy demands changed over time? How has this affected our community – link to coal mining in Yorkshire	Hearing – what damages it? History of the rainbow flag linked with LGBTQ+ community Historical linking of development of the periodic table and the model of the atom – how scientific ideas change over time	Hazard warning symbols – what do they mean? Understanding bee and wasp stings and how to treat them Uses of neutralisation Why peer review is important – to prevent bias Ground source heat pumps – environmental impact v cost The moon landings – did it really happen? 'Flat Earthers' What is this all about? Trusting scientific evidence Geothermal energy – Why Iceland has no CO₂ emissions from generating electricity		What do we mean by the term 'biological parent'? Who should be given credit for discovering the structure of DNA? Is genetic modification right or wrong? The human genome project
		Science Club every week throughout the year					

YEAR 8		HT1	HT2	HT3	HT4	HT5	HT6
SCIENCE	BIG IDEA	Biology How do living things rely on each other in an ecosystem? Physics What are contact forces?	Physics What are magnets and how can we use them? What is work done?	Physics How is heat energy transferred? How do we use waves? Chemistry How are particles arranged in substances and how can this change?	Chemistry How can we separate mixtures? What happens in a chemical reaction?	Chemistry What is happening in a chemical reaction in terms of energy? Biology What is breathing and why do we do it? What is digestion and why does it happen?	Biology What is respiration and why do living things need to do it? How do plants reproduce? How do plants make glucose?
	ASSESSMENT	Hinge point questioning every lesson Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson Working Scientifically knowledge Test 2 Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson Winter assessment Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson Working Scientifically knowledge Test 2 Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson End of Year Assessment Educake homework every week Feedback point written tasks – extended response answers
	WIDER CURRICULUM LINKS	Should all pesticides be banned? What is intensive farming and is it ethically right? Why do snow shoes work? Why does the pressure change as you go up in an aeroplane or dive to the deep end of the swimming pool?	How does a compass work? What causes the Northern Lights? What is sonar and how is it used?	How can insulating our homes reduce global climate change? How do we know what insulation is best for our homes? How does human hearing change as we get older? How does a thermometer work? What happens when something dissolves?	British Science Week Salter's Science Festival Who uses chromatography? Why are carbon monoxide detectors so important? How does deforestation and forest fires contribute to global climate change?	How do heat packs and cool packs work? Why do industries use catalysts? What is asthma? Why is exercise important? How have people's attitudes to smoking changed over time? Should smoking be illegal in the UK? How can you live a healthy lifestyle?	What happens if we don't get enough oxygen when we exercise? How has the reaction fermentation been used throughout history? Why are bees so important? How do plants spread their seeds? How have plants evolved to survive extreme environments?

						Making choices – being informed about drugs and their effects Why have some countries legalised cannabis?	
		Science Club every week throughout the year					

YEAR 9		HT1	HT2	HT3	HT4	HT5	HT6
SCIENCE	BIG IDEA	How have living things changed since the world began? How are humans affecting the climate? What does the Earth provide us with and how can we conserve it?	What does the periodic table show us?	What is a cell and are all cells the same? How do we study cells? How do things move in and out of cells?	How is energy transferred? How can we calculate energy transfers? What do we rely on for electricity generation and how has this changed?	How are particles arranged in substances? Do different reactions have different energy changes?	How do plants make glucose and what do they do with it? Are there different types of respiration? How are plants organised? What is the role of an analytical chemist?
	ASSESSMENT	Hinge point questioning every lesson Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson Working scientifically assessment 1 Educake homework every week Feedback point written tasks – extended response answers Winter Assessment	Hinge point questioning every lesson Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson Educake homework every week Feedback point written tasks – extended response answers	Hinge point questioning every lesson Summer assessment Educake homework every week Feedback point written tasks – extended response answers
	WIDER CURRICULUM LINKS	What is biodiversity and how are humans affecting it? How and why have ideas on evolution changed over time? Why are some living things extinct? What can we do to try and reduce our effect on global climate change? Why should we recycle materials?	Has the periodic table always looked like this? How has the model atom changed over time and why?	Could stem cells save lives? Is stem cell research ethical? What are clones and can we clone a human? How have scientists developed the microscope so we can study cells?	What are the issues with nuclear power? Renewable energy resources, what is the future? Why are fossil fuels so bad?	How do self heating cans work? How do pocket warmers work?	How do industrial farmers exploit photosynthesis? Why do we get a stitch when we exercise? How do chemists help to develop useful products? (formulations such as fuels, cleaning products, paints, medicines, alloys, fertilisers and foods)

YEAR 10		HT1	HT2	HT3	HT4	HT5	HT6
SCIENCE	BIG IDEA	How do humans digest food? How does our heart work? How do our lungs work? What is blood? What is the atom made of? What is radiation and is it all dangerous or can it be useful?	How are atoms bonded together? How does bonding affect the properties of materials? How are particles arranged in matter? How do things change state? What affects the rate of a chemical reaction?	What happens during a chemical reaction? How can we use chemical reactions to extract metals? What is a pathogen? How do our bodies protect us from infection? How does a vaccine work? How are new medicines developed?	What is electrical current? How can we represent circuits? What is mains electricity and the National Grid? How can we represent a chemical reaction? How can we calculate what products are made in a reaction?	What is crude oil and what can it be used for? How can we make crude oil useful? What is a hydrocarbon and the difference between alkanes and alkenes? What is kinetic energy? What is elastic energy? What is specific heat capacity?	How can we represent forces? What is a resultant force? What is the effect of a force on a spring How do forces affect motion? Why do offspring resemble their parents? What is selective breeding and how is this different to genetic engineering? How have living things evolved over time? How are living things classified?
	ASSESSMENT	Educake homework every week Feedback point written tasks – extended response answers	Winter Assessment Educake homework every week Feedback point written tasks – extended response answers	Educake homework every week Feedback point written tasks – extended response answers	Educake homework every week Feedback point written tasks – extended response answers	Educake homework every week Feedback point written tasks – extended response answers	Mock exam series Educake homework every week Feedback point written tasks – extended response answers
	WIDER CURRICULUM LINKS	Blood transfusions Evaluate the risk of using blood products Why do some people have pace makers? Evaluate different heart valve replacement options and other methods of treating heart problems	Maths – Writing numbers in standard form and recognising they show very large or very small numbers Orders of Magnitude Visualise and represent 2D and 3D forms of models of atoms	Links to washing hand to avoid catching diseases. Vaccinations in preventing the spread of diseases such as measles. Use of a condom to prevent contracting/spreading HIV.	Maths; calculating percentage (e.g. percentage element in a compound or percentage yield (SS only)). Calculating uncertainty, including calculating the range and mean. Use of standard form. Use of measurement units, e.g., moles, g, mg, ml,	Uses of crude oil What is a non renewable resource? Impact on fuel use for the future The dangers of incomplete combustion What are the contributions to the environment from combustion of a fuel?	The human genome project – what is it and how can it be used to benefit humans? Maths: Continuous and discontinuous data (variation) Use of simple ratios in genetic crosses and ideas of probability

		Why do people smoke or drink when they are pregnant? Should it be illegal? Discussion/Debate task Would you work in Chernobyl? Would you visit there? Why there is potential to get lots of research information from the disaster	Recognising values for melting point and boiling points as high or low numbers (positive or negative values) Discussion/Debate – why are catalysis used in industry? Uses of endo and exothermic reactions Why do I need to keep my tyres pumped up on my bike or car?	The impact on society of some named diseases. How to prepare food so that the spread of salmonella is reduced. How to identify gonorrhoea and how to prevent the disease and its spread. Discussion/Debate: Debating the use of vaccinations Common acids and alkalis Uses of acids and alkalis Economics of extraction of aluminium Why should we recycle metals?	Use of equations and re-arranging them (HT only), e.g. mass, conc. and volume. Use of ratios. Fractions and percentages. Use of an appropriate number of significant figures. Electrical safety – What is inside a mains plug and why are earth wires needed?	What are the energy changes in a bungee jump?	Discussion/Debate task – could we ever get talking chimps? How? Selective breeding for food – what are the concerns? Is the ‘super cow’ acceptable? Why would people selectively breed? Link to dogs and how humans have bred health issues into dog breeds (pugs have breathing problems) Discussion/Debate task Genetic engineering – why do people do it? What are the risks? What is MRSA and how are we trying to reduce the instance of antibiotic resistance? How science changes over time – how classification of living things has developed over time (historical context) If you could, would you want to know if your genes held a clue to disease you may get in the future? Genetic screening – ethical implications Embryo Screening – Why would people screen their embryos? What decisions would they have to make? Do you think it is right people can do this?
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							Discussion/Debate task – screening for cystic fibrosis and polydactyly Darwin’s ideas on evolution and how they contract with the idea from the Bible. Discussion/Debate Would the Titanic have reached terminal velocity? Why is the speed limit important? Discussion/Debate: Does everyone need the DVLS stopping guidance? Does it apply to everyone
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YEAR 11		HT1	HT2	HT3	HT4	HT5	HT6
SCIENCE	BIG IDEA	How do humans respond to changes in surroundings? How can hormones be used in fertility treatments? What is diabetes and how is it controlled? How has the atmosphere on earth changed and why? How are humans affecting the atmosphere? What can we do to reduce our impact on the earth's resources? How do we obtain potable water?	What is crude oil and what can it be used for? How can we make crude oil useful? What is a hydrocarbon and the difference between alkanes and alkenes? How do living things interact in their surroundings? How is biological field work carried out? How are carbon and water cycled? How are humans affecting land, water and populations of living things? What is being done to maintain biodiversity in the world?	What are transverse and longitudinal waves? What is the electromagnetic spectrum and how is it used? How is a permanent magnet different from a magnetic material? How can you see a magnetic field? What is an electromagnet and why are they useful?	Revision		
	ASSESSMENT	Educake homework every week Feedback point written tasks – extended response answers	Mock Exam Educake homework every week Feedback point written tasks – extended response answers	Educake homework every week Feedback point written tasks – extended response answers	Mock Exam cycle Educake homework every week Feedback point written tasks – extended response answers		
	WIDER CURRICULUM LINKS	Discussion/Debate: Why may some versions of reaction time investigations be considered unethical? Understanding the menstrual cycle Contraception	Emergence of new pathogens and its effect Humans changing ecosystems by introduction of non-native species (red squirrel, cane toad) Bee Population Sampling techniques used in real life	How electromagnets can be used to help with recycling and moving heavy objects Maths- applying and rearranging the equation for force on a wire.			

		Discussion/Debate: which method of contraception is best to use? Discussion/Debate: Evaluate the use of IVF for couples who cannot get pregnant naturally climate change – the effects on the world What can we do to reduce the effects? What is carbon footprint and what can we do to reduce it? Common atmospheric pollutants – why can this vary depending on where you live? Sustainability – using and preserving the finite amount of things on the Earth Preservation of water – why is it important? What type of copper extraction plant would you install in Castleford? Why? Discussion/Debate Is the 10p carrier bag charge right? Why should we recycle? What happens to all the waste water? Life cycle assessments – what are they and why do they matter?	Maths skills – mean, median and mode Surface area: volume ratio Lake in Tanzania, why is it red? Why is peat important? What are the effects of global warming? Human impacts on biodiversity Ways humans use land The worldwide effect of deforestation and what we can do about it Discussion/Debate – should humans have the right to destroy habitats so we can have more food and fuel? Links Earthquakes and Tsunami in Indonesia to discuss the impact on the area and people's lives.	The Earth has an iron core which means the Earth has its own magnetic field. Should x-rays and gamma be used for medical imaging and treatment even though there is a potential risk? Explain why it is important to not dive in to pools without knowing the depth of the water.			
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