Curriculum Content Map — **Subject: Year 9 Science**

Month			Term 1				Term 2				Term 3		
			September	**October**	**November**	**December**	**January**	**February**	**March**	**April**	**May**	**June**	**July**
Cultural Transmission	**Units of Work**		*Unit 1- Forces* *Contact Forces* *3 Lessons* *Unit 1- Forces* *Pressure* *3 Lessons* *Unit 9- Ecosystems* *Respiration* *3 Lessons*	*Unit 9- Ecosystems* *Photosynthesis* *4 Lessons* *Unit 6- Reactions* *Types of reactions* *4 Lessons*	Unit 6- Reactions Chemical energy 3 Lessons Unit 7 Magnetism and electromagnets	Unit 10- Genes Evolution 4 Lessons	*Unit 10-Genes* *Inheritance* *4 Lessons* *Unit-7 Earth* *Climate* *3 Lessons* *Unit-7 Earth* *Earth resources* *3 Lessons*	*Unit 3- Energy* *Work* *Heating and cooling* *4 Lessons*	Unit 4- Waves Wave effect Wave properties 3 Lessons	Unit 14 Science of cooking - Working Scientifically project	*Unit 15* *KS3 revision*	*Unit 15* *KS3 revision*	Unit 16 Science of drugs and engineering – Working Scientifically project
	National Curriculum area – KS3		Page 65 Forces Pressure in fluids Page 61 Cellular respiration	*Page 65* *Forces* *Pressure in fluids* *Page 61* *Cellular respiration*	Page 63 Energetics Chemical reactions Page 67 Magnetism	Page 62 Inheritance, Chromosomes, DNA and genes	Page 62 Inheritance, Chromosomes, DNA and genes Page 63 Earth and atmosphere	*Page 67* *Physical changes* *Energy in matter*	Page 65 Observed waves Pages 66 Energy and waves	Page 58 Working scientifically	KS3 national curriculum	*KS3 national curriculum*	Page 58 Working scientifically
	Substantive Knowledge	***The What!***	Unit 1- Forces Friction and drag Squashing and stretching Turning forces Pressure in gases Pressure in liquids Stress on solids Unit 9- Ecosystems Aerobic respiration Anaerobic respiration Biotechnology	Unit 9- Ecosystems Photosynthesis Leaves Investigating photosynthesis Plant minerals Unit 6- Reactions Atoms in chemical reactions Combustion Thermal decomposition Conservation of mass	Unit 6- Reactions Exothermic and endothermic Energy level diagrams Bond energies Unit 7 Magnets and magnetic fields Electromagnets Using electromagnets	Unit 6- Reactions Exothermic and endothermic Energy level diagrams Bond energies Unit 7 Magnets and magnetic fields Electromagnets Using electromagnets	Unit 10-Genes Inheritance DNA Genetics Genetic modification Unit-7 Earth Global warming The carbon cycle Climate change Extracting metals recycling	Unit 3- Energy Work, energy and machines Energy and temperature Energy transfer: particles Energy transfer: radiation and insulation	Unit 4- Waves Sound waves, water waves and energy Radiation and energy Modelling waves	Unit 14 Working scientifically project	Revision content from all of KS3 biology, chemistry and physics	Revision content from all of KS3 biology, chemistry and physics	Working scientifically project
	Disciplinary knowledge	***The How!***	Unit 1- Forces Students use newton meters to pull a box with masses in it along different surfaces. Students collect data for the change in length of springs and elastic. They record results in a table, plot a line graph, and describe the patterns. Students carry out simple moments calculations. Teacher demonstrate the collapsing bottle experiment to the class with boiling water. Students to suggest what has happened to the bottle in terms of pressure. Unit 9- Ecosystems Students plan an investigation to measure the effect of exercise on breathing rates. Students carry out an experiment to investigate the effect of changing the concentration of glucose on the rate of fermentation . Students carry out an investigation involving fermenting bread dough, and answer the questions that follow.	Unit 9- Ecosystems Students carry out an experiment to produce oxygen via photosynthesis, using pondweed, and the set-up described in the practical sheet. Students explain how leaf adaptations aid photosynthesis. Students follow instructions on the practical sheet to design and carry out an experiment that will show chlorophyll is essential for photosynthesis. They should write a risk assessment for the experiment. Unit 6- Reactions Students use molecular model kits to model the nitrogen monoxide reaction, and draw a particle diagram to represent the reaction. , students carry out a simple calorimetric experiment to compare the effectiveness of a candle and a spirit burner as fuels for heating water. Students work in groups to carry out thermal decomposition reactions for three metal carbonates using their results to draw conclusions	Unit 6- Reactions Students carry out four short practicals, monitoring temperature changes and recording their results in a results table. Students sketch their own energy level diagrams for familiar processes. Student pairs create a storyboard for a short video to explain energy level diagrams, referring to particle models. Unit 7 Students carry out a short practical in which they use a compass to plot field lines around a bar magnet. Students carry out a practical to investigate the effects of changing different variables on the strength of electromagnets, by taking part in a circus activity. Students compare properties of permanent magnets and electromagnets, and introduce the different uses of electromagnets, leading to loudspeakers.	Unit 10-Genes Students construct their own family trees. Students match different types of finch with their habitats based on information cards. Students then interpret a flow chart that explains the modern process of peer review. Students read about possible theories to explain the extinction of dinosaurs and teach each other about the different theories suggested, deciding on the theory that seems most credible. students read a case study about how tigers have become endangered, and a government initiative that has begun in India to try and save them. Students then complete the 'Captive breeding debate' activity in the student book. Students should produce a coherent series of arguments for or against captive breeding. Students then debate the points raised.	Unit 10-Genes Students discuss how mutations can be an advantage or a disadvantage. Students use the information sheets provided to determine the relative contribution of the two research teams towards the discovery of the double-helix structure of DNA. Students then work through an activity on Jack Russel terriers, using Punnett squares to explore variation.	Unit 3- Energy Students introduced to the work equation and carry out work calculations. Students carry out short experiments as part of an activity circus, recording their observation. Students carry out a short investigation on different materials to determine whether they are thermal conductors or thermal insulators. Students to design an experiment to investigate the best way to prevent heat loss by convection, conduction, or radiation. Share the methods with the class so each student can see a method for each method of heat loss.	Unit 3- Energy Students introduced to the work equation and carry out work calculations. Students carry out short experiments as part of an activity circus, recording their observation. Students carry out a short investigation on different materials to determine whether they are thermal conductors or thermal insulators. Students to design an experiment to investigate the best way to prevent heat loss by convection, conduction, or radiation. Share the methods with the class so each student can see a method for each method of heat loss. Unit 4- Waves Students experiment with a coil attached to a voltmeter, and a magnet, and see that moving the coil or the magnet produces a changing potential difference. Students discuss how some radiation can be harmful. In groups, students produce a wall display for one of the waves. Each group should then write five questions based on their wave. Teacher demonstrates water waves using ripples. Students identify wavelength and	Unit 14 Science of cooking KC video discussing the chemistry of taste. Discussion of whether the tongue is the only organ involved in taste. Students design and carry out various blindfold class tests investigating the role of the nose in detecting flavour. KC video 'Using salt in cooking'. Supply various recipes showing the cooking of vegetables using salt. Class discussion – why do cooks add salt Discussion of what ice cream is (focus on the words ice and cream). KC video 'making ice cream'. Look at the main components of ice cream and traditional instructions (focus on the need for stirring and use of salt to lower freezing point of ice) Students design and carry out experiments to test the effect of concentration of gelatine on the amount of time it takes for jelly to set. Students design experiments to test effect of self-raising flour / baking powder / plain flour on how much a cake rises. Look at chemistry of ingredients (reactants) and products when making cake / bread using the ingredients above.	There will be a 3-week revision rotation between year 7, 8 and 9. Every week they will focus on a specific science so that they revise biology, chemistry and physics for each KS3 year.	There will be a 3-week revision rotation between year 7, 8 and 9. Every week they will focus on a specific science so that they revise biology, chemistry and physics for each KS3 year.	Science of drugs Matching spider webs to drug types Presentations on different drugs and their effects. Pupils will research a famous drugs cheat and prepare a short presentation. Pupils design experiment to test their reaction times before and after intake of caffeine Introduction to the drug trial process. Debate on whether all drugs should be legal. Unit 16 Engineering To build a living platform that can stand in water for 5 minutes and withstand masses being put on. To test the living platform. To design and sketch a marble run To build a marble run that can run for 60 seconds To test the marble run To sketch and design a water filtration system To build a water filtration system To test the water filtration system To sketch and design a water rocket To build a water rocket To test the water rocket Design a Spaghetti bridge Build the bridge Feedback on a bridge
	Sequencing (How)	***Retrieval & Extension***	Unit 1- Forces builds from KS2 and KS3 Topic of forces covered in year 5 Year 7 unit 2 and unit 3 builds from KS2 and KS3 Topic of animals including humans covered in year 6. Year 7 unit 4 Year 7 unit 5 Year 8 unit 9 Unit 1- Forces is further developed in Year 10 Forces in balance topic Motion Forces and motion Unit 9- Ecosystems is further developed in Year 10 Respiration	Unit 9- Ecosystems builds from KS2 and KS3 Topic of animals including humans covered in year 6. Year 7 unit 4 Year 7 unit 5 Year 8 unit 10 Unit 6- Reactions builds from KS2 and KS3 Students haven't covered this topic at KS2 Year 7 unit 6 Year 7 unit 7 Year 7 unit 12 Year 7 unit 13 Year 8 unit 12 Unit 9- Ecosystemsis further developed in Year 10 Photosynthesis Organising animals and plants Unit 6- Reactionsis further developed in Year 10 Atomic structure Structure and bonding Chemical calculations	Unit 6- Reactions builds from KS2 and KS3 Students haven't covered this topic at KS2 Year 7 unit 6 Year 7 unit 7 Year 7 unit 12 Year 7 unit 13 Year 8 unit 12 Year 9 unit 5 Unit 7 builds from KS2 and KS3 Topic of electricity in year 6 Year 7 unit 9 Unit 6- Reactions is further developed in Year 10 Chemical changes Energy changes Unit 7 is further developed in Year 10 Electric circuits Electricity in the home Year 11 Electromagnetism	Unit 10-Genesbuilds from KS2 and KS3 Topic of living things and their habitats and the topic evolution and inheritance covered in year 6. Year 7 unit 10 and 11 Year 8 unit 3 Year 8 unit 4 Unit 10-Genesis further developed in Year 11 Genetics and evolution Adaptations, interdependence and competition	Unit 10-Genes Retrieval tasks will link to KS2 content on topic of living things and their habitats and the topic evolution and inheritance covered in year 6. Unit-7 Earth Retrieval tasks will link to KS2 content on topic of rocks covered in year 3. Retrieval tasks will also focus on content covered in – Year 7 unit 5 Retrieval tasks will also focus on content covered in – Year 7 unit 11 Year 8 unit 3 Year 8 unit 4 Year 9 unit 8	Unit 3 and 4 Retrieval to find misconceptions they may already Retrieval tasks will also focus on content covered in – Year 7 unit 8 and 9 Year 8 unit 7 and 8	Unit 3 and 4 Retrieval to find misconceptions they may already Retrieval tasks will also focus on content covered in – Year 7 unit 8 and 9 Year 8 unit 7 and 8	Unit 14 Retrieval will focus on working scientifically skills developed at lower and upper KS2 Retrieval tasks will also focus on content covered in – Year 7 unit 1 Year 7 unit 14 Year 8 unit 13	Throughout KS4 learning.	Throughout KS4 learning.	Throughout KS4 as part of investigations and experimental work in lessons
	Summative Assessment				AP1				AP2				End of year examination AP3
Personal Empowerment	**Virtue**		Friendliness & Civility	Justice & Truthfulness	Courage	Generosity	Gratitude	Good Speech	Good Temper & Humour	Self-Mastery	Self-Mastery	Compassion	Good Sense
	Link to Virtue	***The opportunity to reflect, think deeply and critically about an issue.***	Unit 1- Forces Students will learn about how we need to be civil and friendly to each other and how something that is seen as bad (friction) also can have positive uses. We therefore need to consider everyone as having potential to be good and we should be friendly to all. Unit 9- Ecosystems Students to be friendly and civil when learning about how yeast is used to ferment alcohol	Unit 9- Ecosystems Students to discuss whether fertilisers should be used to treat plant deficiencies and how truthful and honest companies are regarding their use of fertilisers. Unit 6- Reactions Students will use justice when learning that in conservation of mass nothing is lost or gained and therefore it is very just and fair.	Unit 6- Reactions Students will build their courage when learning advanced chemistry topics such as exothermic and endothermic reactions and energy level diagrams Unit 7 Students will build courage when building their own electromagnets	Unit 10-Genes Students will use generosity when looking at how we can preserve biodiversity and why it is important we do.	Unit 10-Genes Students will be able to be grateful to scientists such as Gregor Mendel, Miescher, Oswald Avery, Chargaff, Wilkins and Franklin, Watson and Crick who have discovered DNA and genetics. Students will also be able to appreciate the use of genetic modification. U Unit-7 Earth Students to be grateful at the effort everyone does in recycling to ensure global warming does not worsen.	Unit 3- Energy Students to use good speech when explaining the key definitions of this topic.	Unit 4- Waves Students will use good speech when modelling different types of waves.	Unit 14 Students to show good temper and humour when working together in groups to carry out scientific investigations	Students to show self-mastery when revising independently for end of KS3 exams but also demonstrate compassion when supporting each other when struggling.	Students to show self-mastery when revising independently for end of KS3 exams but also demonstrate compassion when supporting each other when struggling.	Unit 16 Students will use good sense to deduct and predict outcomes of different investigations they will carry out in teams.
Preparation for Work	**Skill**	***Transferable skills***	Listening	Leadership	Problem-Solving	Creativity	Staying Positive	Speaking	Staying Positive	Aiming High	Aiming High	Speaking	Teamwork
	Link to Skill		Unit 1- Forces Students to use listening skills when working in groups to compare aerobic and anaerobic respiration Unit 9- Ecosystems Students will use listening skills when needing to complete practicals on aerobic respiration	Unit 9- Ecosystems Students will demonstrate leadership skills when following methods to investigate photosynthesis Unit 6- Reactions Students will demonstrate leadership when carrying out experiments to determine conservation of mass	Unit 6- Reactions Students will use problem solving when working to solve everyday problems using electromagnets Unit 7 Students will use their problem solving skill to work out how to solve everyday problems using electromagnets	Unit 10-Genes Students will be creative in trying to predict how different species may evolve in the future to cope with changes in climate.	Unit 10-Genes Students will learn about global warming but focus on staying positive by looking at recycling of metals. Unit-7 Earth Students to stay positive when learning about global warming as they look at what we can do to prevent it getting it worse.	Unit 3- Energy Students to be able to explain verbally definitions such as convection current and insulation in terms of energy transfer	Unit 4- Waves Students to explain verbally the different types of waves there are and examples of each.	Unit 14 Students will demonstrate how to stay positive even when investigations and practicals do not work to plan.	Unit 15 Students to aim high during their revision to achieve their best end of KS3 result. Students to focus on using speaking to explain content learned to one another	Unit 15 Students to aim high during their revision to achieve their best end of KS3 result. Students to focus on using speaking to explain content learned to one another	Unit 16 Students will work in groups when carrying out various experiments to build and cement their disciplinary knowledge.
Preparation for Citizenship	**SMSC & British Values**	*Developing opinions on curent issues*											
	Link to SMSC & British Values		Students to relate friction in physics to friction between different students and focus on building tolerance with one another.	Students to develop responsibility as they look at the long term impact fertilisers have on our soil and agriculture.	Students to focus on the freedom we have to develop new products using exothermic and endothermic reactions as well as creating electromagnets for a particular use	Students to develop responsibility when they look at how we need to ensure that we allow preservation of species and prevent extinction	Students to demonstrate respect and tolerance when learning about genetics and what makes each of us different. Students to develop responsibility when learning about the effect we are having on climate change.	Students develop responsibility when looking at how we can prevent heat loss in houses using insulation	Students develop responsibility when looking at how we can prevent heat loss in houses using insulation	Students develop democracy and respect when carrying out experiments in the kitchen. Everyone has a right to have a go and complete practical.	Students develop liberty as they focus on revision and the freedom and ability they have to revise.	Students develop liberty as they focus on revision and the freedom and ability they have to revise.	Students to learn about the law when discussing if all drugs should be legalised. Students to develop tolerance and respect when discussing sensitive topics