



THE ARNEWOOD SCHOOL

KEY STAGE 4 SCIENCE – COMBINED

Implementation

Triple Science

Year 9:

Half term	Subject	Curriculum focus	Landmark assessment
Autumn 1	Biology	During this half term, the pupils will study the structure of plant, animal and bacterial cells. They will also learn how to use a microscope and calculate magnification.	Assessment is a formal exam at the end of the ½ term including long answers, short answers, multiple choice and calculations.
	Chemistry	During this half term, the pupils will study Atomic structure and the periodic table. This knowledge builds on their knowledge from KS3 and includes studying the history of the periodic table.	
	Physics	Pupils will build on their KS3 knowledge of energy stores. Key concepts developed will be the ideas of conservation of energy and mechanisms for change.	
Autumn 2	Biology	During this half term, the pupils will study the structure of plant, animal and bacterial cells. They will also learn how to use a microscope and calculate magnification.	Assessment is a formal exam at the end of the ½ term including long answers, short answers, multiple choice and calculations
	Chemistry	During this half term, the pupils will study structure and bonding in atoms. This knowledge builds on the knowledge from atomic structure and includes modelling different types of bonding.	
	Physics	Pupils will now learn how to apply the concept of energy conservation to make qualitative predictions. They will	





		consider how unwanted mechanisms can give rise to dissipation.	
Spring 1	Biology	After completing the learning about transport in and out of cells, pupils will begin to study the health topic. Some time is also spent preparing for the year 9 exams.	Students during this time are assessed formatively and are building their revision skills for the year 9 exam after half term. Students during this time are assessed formatively and are building their revision skills for the year 9 exam after half term.
	Chemistry	During this half term, the pupils will study chemical calculations. This is a new topic to students and includes titration practical work.	
	Physics	Pupils will study Electricity, building on their circuit knowledge from KS3. They will define precisely the meaning of current, potential difference and resistance and use their understanding of these to predict values in series and parallel circuits.	
Spring 2	Biology	Now that pupils understand what is needed to stay healthy, they study communicable and non – communicable diseases.	Students are given a formal year 9 exam covering subjects that they have covered at GCSE so far.
	Chemistry	During this half term, the pupils will study chemical changes. This builds on students knowledge of reactions from KS3 and includes using the reactivity series.	
	Physics	Pupils will analyse the relationship between current and voltage for different components and develop knowledge on the uses of Electricity in the home.	
Summer 1	Biology	The focus now moves to plant Biology, pupils' study how plants produce their own food and carry out practical investigations into the factors that affect photosynthesis.	Assessment is a formal exam at the end of the ½ term including long answers, short answers, multiple choice
	Chemistry	During this half term, the pupils will study Acids and build on their knowledge of reactions from KS3. This	





		will also include restudying the titration practical work.	and calculations
	Physics	This term, pupils will develop the simple Particle Model of matter that they learned at KS3 to describe and explain changes of state using the concept of internal energy. They will model gas behaviour using the ideal gas law.	
Summer 2	Biology	In the final half term pupils study the effects of environmental stimuli on plant growth. There is also the opportunity to consolidate the learning from the year.	Assessment is a formal exam at the end of the ½ term including long answers, short answers, multiple choice and calculations
	Chemistry	During this half term, the pupils will study electrolysis and build on their knowledge of ions from the bonding module within autumn 2. This will include problem solving skills when working with micro chemistry practical work.	
	Physics	This term, pupils will build on the knowledge of the atom that they gained at KS3 and in their chemistry lessons to develop an understanding of nuclear physics. They will study radioactive emissions, nuclear fusion and fission and the role of fission in energy supply.	

Co-Curricular: Students during the year will get the opportunity to take part in the Biology and Physics national challenge. Students will also be given the opportunity to develop their biology knowledge at Marwell Zoo.

Year 10:

Half term	Subject	Curriculum focus	Landmark assessment
Autumn 1	Biology	Pupils start year 10 by studying how animals and plants defend themselves against disease. This includes the	Assessment is a formal exam at the end of the





		development of drugs and the use of vaccines.	½ term including long answers, short answers, multiple choice and calculations.
	Chemistry	Pupils start year 10 looking at energy changes with reactions. This includes looking at both exothermic and endothermic reactions.	
	Physics	Pupils learn how to classify forces as being contact or non-contact and how to determine resultant forces using vector diagrams. They learn to apply Newton's 3 Laws of motion and how to interpret graphs of motion.	
Autumn 2	Biology	This then leads into the study of human organ systems including the circulatory and Digestive systems. Following this, pupils study cellular respiration and metabolism.	Assessment is a formal exam at the end of the ½ term including long answers, short answers, multiple choice and calculations
	Chemistry	Pupils then look at rates of reaction this half term. This has a strong practical element looking at how to experimentally measure rates of reactions.	
	Physics	Pupils apply their knowledge of forces to more complex situations. They learn about stopping distance, momentum conservation and pressure, and apply these to gears, levers and road safety.	
Spring 1	Biology	This term will involve learning about nerves and hormones. This includes studying the use of hormones in reproductive medicine and reflex actions	Students during this time are assessed formatively and are building their revision skills for the year 10 exam after half term.
	Chemistry	Pupils then start to look at organic chemistry with a focus on fuels and their derivatives. Following this pupils will look at nomenclature hydrocarbons.	





	Physics	Pupils start the waves topic by looking at the measurable properties of a wave and comparing longitudinal and transverse waves. They study the EM spectrum and the theory of reflection and refraction.	Students during this time are assessed formatively and are building their revision skills for the year 9 exam after half term.
Spring 2	Biology	The nerves and hormones topic concludes with learning about eyes and the brain. Some time is also spent preparing for the year 10 exams.	Students are given a formal year 10 exam. The year 10 exam is a paper one exam from biology, chemistry and physics.
	Chemistry	Building on Spring1 pupils will then look in more detail at the reactions of hydrocarbons. Following this pupils will look at more complicated functional groups.	
	Physics	Pupils study how we see, including why colours are the colour that they are and how filters can affect this. They learn how lenses create images and how lenses are used in applications such as the eye, in cameras and in microscopes.	
Summer 1	Biology	The focus for the rest of the year is classification and ecology. Pupils will learn how to classify living organisms and how species interact with each other.	Assessment is a formal exam at the end of the ½ term including long answers, short answers, multiple choice and calculations
	Chemistry	Building on Spring 2 pupils will then look at polymers and their reactions. The topic concludes looking at DNA and how it is an example of a polymer.	
	Physics	Pupils learn about the concept of a black body and apply this to predict the effect of radiation on the Earth's temperature and to predict the temperature of stars. This leads on to the final topic of the year, Space Physics.	





Summer 2	Biology	The conclusion of the ecology topic involves pupils carrying out a fieldwork investigation into the effect of trampling in plant growth. There is also the opportunity to consolidate the learning from the year.	Assessment is a formal exam at the end of the ½ term including long answers, short answers, multiple choice and calculations
	Chemistry	The students conclude year 10 looking at chemical analysis. This includes looking at various techniques to build a repertoire that can problem solve unidentified chemicals.	
	Physics	Building on their understanding of forces and of the EM spectrum, pupils study satellite orbits and their applications. They study the lifecycle of a star and learn how spectral analysis leads to our understanding of the expansion of the Universe and to the theory of the Big Bang	

Co-Curricular: Students are able to take part in the Med Tech challenges and also the Biology and Physics challenges.

Year 11:

Half term	Subject	Curriculum focus	Landmark assessment
Autumn 1	Biology	At the start of year 11, pupils study genetics and variation. They develop an understanding of how characteristics including genetic diseases are inherited.	Assessment is a formal exam at the end of the ½ term including long answers, short answers, multiple choice and calculations.
	Chemistry	At the start of year 11, pupils study the atmosphere and its chemistry. Pupils develop knowledge of reactions within the atmosphere and how the atmosphere has changed over time.	
	Physics	Our first topic for Year 11 is Magnetism and Electromagnetism. Pupils start by considering the difference between induced and permanent magnets. They then go on to study how	





		electrical current can be used to create electromagnets.	
Autumn 2	Biology	Following on from variation, pupils study how this then leads to the evolution of a species. Some time is also spent preparing for and reviewing the year 11 exams.	Assessment during this time will be paper 1 mock exams as students prepare for their summer GCSE.
	Chemistry	Following on from looking at the atmosphere in autumn 1, students look at other resources and also looking at how water is made safe to drink.	
	Physics	Pupils apply their knowledge of electromagnetism and forces to build electric motors and transformers and to explain how they work. Some time is also spent preparing for and reviewing the year 11 exams.	
Spring 1	Biology	Pupils will develop an understanding of the evidence to support the theory of evolution and make their own decision regarding this theory. They then move on to study the impact that the human population is having on the environment.	Assessment is a formal exam at the end of the ½ term including long answers, short answers, multiple choice and calculations
	Chemistry	Pupils will be engaged in revision and practice in preparation for the GCSE examinations. The focus for this half term will be looking at paper 2 content.	
	Physics		
Spring 2	Biology	The course concludes by studying food production including farming and the use of fisheries. Some time is also spent preparing for and reviewing the second year 11 exams.	Assessment during this time will be paper 2 mock exams as students





	Chemistry	Pupils will be engaged in revision and practice in preparation for the GCSE examinations.	complete the course.
	Physics		
Summer 1	Biology	Pupils will be engaged in revision and practice in preparation for the GCSE examinations.	Students are taking formal exams
	Chemistry		
	Physics		
Summer 2	Biology	Course completed.	Students are taking formal exams
	Chemistry		
	Physics		

Co-Curricular: Students will be able to complete research projects within Chemistry and Physics

