

Curriculum map - Science

Year 9

In Year 9 the building blocks for the subjects are **Cell structure**, **Atomic Structure** and **Energy**. These are all taught first in that subject with the other topics following in different orders. This is in accordance with the principle of spaced learning and ensuring that basic knowledge is revisited over a number of occasions during the year. This enables teachers to start with their specialism in order to focus on making relationships with the class at the beginning of the year and for equipment use to be spaced out in order to ensure that the students have smaller groups sizes when they are learning from the practical activities.

Assessments are completed after the topic has finished for lower stakes testing and within the end of year 9 test at the end of the year. Informal assessment that also takes place may include homeworks set on educake or exam questions on top of assessment for learning tasks that will take place in class. Practical skills are assessed within the GCSE through exam questions. During the required practicals there is a common proforma for writing up the method which ensures this is a standardised practice which will ready them for their GCSEs.

	Ideas Covered	Why is it Important?	Why Now?	Impact	Assessment
Cell structure	Further cell structure How to use a microscope and calculate magnification	Cells are the building block of life and this knowledge is a foundation for further modules within all of the other biology topics. This also reinforces the practical nature of studying cells using microscopes.	This topic allows students to build upon what they have learnt in year 7 but with further cognitive development they are now able to process IAM calculations	Students will be able to list and describe the function of many different organelles, and describe how to use a light microscope	Topic test and end of year assessment
Cell division	The concept and difference between mitosis and meiosis	Cells divide to replace dead/damaged cells or to ensure variation within a species. This also includes the concept of stem cells and cancer, linking directly to real life.	This continues the ideas taught in cell structure and develops further understanding of cells.	Students will be able to describe the difference and similarities between mitosis and meiosis. Students will also be able to describe stem cells and explain their importance and how cancer develops.	Topic test and end of year assessment
Cell transport	The concept and application of diffusion, osmosis and active transport	Cells and tissues require a variety of biological molecules for life. This module describes the three key ways that they acquire them.	Students were introduced to diffusion in year 7 and this knowledge is built upon for the more complex concepts	Students will be able to describe the processes and provide examples of where they are used within the body	Topic test and end of year assessment

	Ideas Covered	Why is it Important?	Why Now?	Impact	Assessment
Bioenergetics	Photosynthesis and respiration	Life is dependent on the energy stored in glucose and subsequent release of energy in respiration. Photosynthesis provides the glucose for respiration in animals	Students were introduced to respiration and photosynthesis in year 8 and this knowledge is built upon for the more complex concepts	Students will be able to compare these processes and describe factors affecting the rate of these reactions	Topic test and end of year assessment
Disease	Examples of disease and the concept of communicable and non communicable categories How the body defends itself from disease	Disease can have a significant impact on humans and understanding how diseases develop, spread and can be treated or cured. Moreover, it is important to see how humans have progressed and developed important treatments	This is a natural progression in biological concepts and relates to each and every one of them	Students will be able to describe different pathogens, along with their associated diseases and possible treatments	Topic test and end of year assessment
Atomic structure	Atomic structure Isotopes	Atoms make up all matter and so a study of these structures help to understand how matter is built	This is vital knowledge for building to understand the rest of the concepts taught at GCSE and into A Level	Students can describe the structure of the atom and how , as humans, we have reached this theory	Topic test and end of year assessment
Groups 1,7,0	Properties of Groups 1,7 and 0	These groups of the periodic table have practical application as well as describing how the periodic table is organised and beginning to predict properties of other groups	This follows on directly from the structure of atoms, which explain the properties and trends seen in these groups	Students can describe the properties and trends within groups 1, 7 and 0 of the periodic table	Topic test and end of year assessment
Bonding	Ionic, covalent and metallic bonds Giant covalent structures Linking bonds to properties	The bonds between atoms in different materials gives those materials their properties	This follows the structure of atoms to explain more about materials	Students can explain how covalent, ionic and metallic bonds are formed. They can relate giant covalent structures with their properties	Topic test and end of year assessment
Acids and Bases	Further detail in the nature of acids and alkalis	Acids and Alkalis are a large part of everyday life	This follows the more basic acids and alkalis topic taught in year 7	Students can describe the properties of acids and alkalis and the neutralisation reaction.	Topic test and end of year assessment

	Ideas Covered	Why is it Important?	Why Now?	Impact	Assessment
Energy	The concept of energy stores How thermal energy transfers Energy in the home	The way in which energy is stored, how it is transferred is applicable to everyday situations.	This is a topic to begin to look at simpler equations and has many aspects that are connected to familiar situations	Students can describe energy and simple changes in energy stores	Topic test and end of year assessment
Energy transfers	The national grid Renewable and non renewable energy resources. Concept and application of Specific heat capacity and specific latent heat Changes of state	The importance of renewable resources is highlighted. How and why matter changes state has many practical applications	This has some more complicated equations such as specific heat capacity and so builds on the maths work undertaken in the previous topic	Students can describe how the national grid works. They can also form a reasoned argument between the use of renewable and non renewable fuels. Students can describe how materials change state, calculate specific heat capacity and interpret graphs on specific latent heat	Topic test and end of year assessment
Forces	Interactions between basic forces in our everyday lives	The interaction between forces governs all aspects of our lives and existence	There are many parts of this topic that are applicable to real life situations which balance the equations taught earlier in the year	Students should be able to state how forces interact and the effects of those interactions	Topic test and end of year assessment