## Teign School Curriculum Overview





**SCIENCE KS4 Curriculum – AQA Combined Science (Trilogy)**

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| **Year**  | **Cycle 1 -12 Weeks****(10 weeks teaching, 1 week assessment, 1 impact week)** | **Cycle 2 -12 Weeks****(10 weeks teaching, 1 week assessment, 1 impact week** | **Cycle 3 -12 Weeks****(10 weeks teaching, 1 week assessment, 1 impact week** |
| **10** |  |  |  |
| **Biology** | **Topic 2 Organisation: KS3 Link 8.3 and 8.4**Having learnt about cells in Year 9 cycle 1 we will link this to learn about how they work together in tissues, organs and systems. Examples are the human digestive and the respiratory system. In each case they provide dissolved materials that need to be moved quickly around the body in the blood by the circulatory system. We will then learn what enzymes are and the role they play in enabling organisms to function effectively. | **Topic 2 Organisation: KS3 Link 8.3 and 8.4****Topic 4 Bioenergetics (photosynthesis): KS3 Link 9.4**In this section we will explore how plants harness the Sun’s energy in photosynthesis in order to make food in the form of glucose, while releasing oxygen as a by-product. | **Topic 4 Bioenergetics (respiration): KS3 Link 9.3**Animals and plants use this oxygen to oxidise glucose in a process called aerobic respiration which transfers the energy that the organism needs to perform its functions. Anaerobic respiration does not require oxygen to transfer energy. **Topic 5 Homeostasis and response: KS3 Link 10.2**We will explore the structure and function of the nervous system and how it can bring about fast responses. We will also explore the hormonal system which usually brings about much slower changes. Hormonal coordination is particularly important in reproduction as it controls the menstrual cycle. |
| **PSHE LINKS** |  |  |  |
| **Physics** | **Topic 3 Particle model of matter: KS3 Link 5.1 and 5.3 and 1.3**This fundamental idea links with the Matter topics in KS3 but also comes after the first Chemistry topic so will be an opportunity for consolidation. The particle model helps us to explain a wide range of observations and engineers use these principles when designing vessels to withstand high pressures and temperatures. | **Topic 4 Atomic structure: KS3 Link 5.1 and 5.3 and 1.3**This topic also offers chance for consolidation based on Year 9 Physics and Chemistry topics. It deals with atomic structure first and then leads onto the concept of radioactivity. Radioactive materials are widely used in medicine, industry, agriculture and electrical power generation. | **Topic 5 Forces: KS3 Link 1.1 and 1.3 and 1.4**Engineers analyse forces when designing a great variety of machines and instruments, from road bridges and fairground rides to atomic force microscopes. Anything mechanical can be analysed in thisway. We examine gravity, work done, energy transfer, resultant forces, elasticity and motion. |
| **PSHE LINKS** |  |  |  |
| **Chemistry** | **Topic 2.1 Chemical Bonds and 2.2 Bonding and Structure KS3 Link 5.3**Having established atomic structure in Year 9 it is now possible to consider the ways that atoms join to form compounds and the kinds of structures this creates. There will also be an opportunity to recap the main Groups in the Periodic table.**These topics follows the previous curriculum plan which is running for Year 10 and 11 in 2022/23** | .**Topics 4.3 Electrolysis, 5.5 Energy changes and 5.7 KS3 Links 7.3**Building on the concepts of reactivity and REDOX in a previous cycle the concept of electrolysis is now introduced. Energy changes in chemical reactions are introduced **These topics follows the previous curriculum plan which is running for Year 10 and 11 in 2022/23** | **Topic 3 Quantitative chemistry and 4.1 Chemical changes KS3 Links 6.2**Linking back to Topic 1.1 to review RAM first, the concepts of RFM, conservation of mass and moles then follows. An introduction to the reactivity of metals and REDOX is followed by a recap of the reaction of metals with acids and the knowledge associated with salts**Topic 8 – Chemical Analysis**Introduces the idea mixtures and separating but also of chemistry being used analytically in chromatography |
| **PSHE LINKS** |  |  |  |
| **11** |  |  |  |
| **Biology** | **Topic 5 Homeostasis and response: KS3 Link 10.2 (from hormonal system)**We will explore the hormonal system which usually brings about much slower changes compared to the neuronal system. Hormonal coordination is particularly important in reproduction as it controls the menstrual cycle.**Topic 6 Inheritance, variation and evolution (cell division, variation and inheritance): KS2 Link 10.1** We will look at cell division and how genes control key characteristics. We will consider mutations, variation and their effect on natural selection. Lastly, we will look at selective breeding and genetic engineering – their uses and their controversies. | **Topic 6 Inheritance, variation and evolution (natural selection and classification) : KS2 Link 10.1**In this broad ranging topic we consider selective breeding, classification, evolution, the evidence for it including antibiotic resistant bacteria and, finally, the concept of extinction.**Topic 7 Ecology (Interdependence and adaptation): KS3 Link 9.1**In this unit we learn how materials including carbon and water are continually recycled by the living world, being released through respiration and taken up by plants in photosynthesis. Species live in ecosystems composed of complex communities of animals and plants dependent on each other and that are adapted to particular conditions. In order to continue to benefit from these resources humans need to engage with the environment in a sustainable way. | **Topic 7 Ecology (cycling and human activity): KS3 Link 9.1**This part of Topic 7 examines the effects of rising human population on global resources and considers how we can manage this sustainably |
| **PSHE LINKS** |  |  |  |
| **Physics** | **Topic 6 Waves: KS3 Link 4.1, 4.2, 4.3 and 4.4**Wave behaviour is common in both natural and man-made systems. Waves carry energy from one place to another and can also carry information. In this topic we examine wave basics, longitudinal and transverse waves and the EM spectrum. | **Topic 7 Magnetism and electromagnetism: KS3 Links 2.1, 2.2 and 2.3**This unit starts with fundamental ideas about magnetism but then links our understanding of electricity and magnetism together. Electromagnetic effects are used in a wide variety of devices. A magnet moving in a coil can produce an electric current and also a current flowing around a magnet can produce movement. We examine magnetic fields and forces as well as the motor effect.**Mock Exams****Required Practicals Review****Revision** |  |
| **PSHE LINKS** |  |  |  |
| **Chemistry** | **Topic 6 The rate and extent of chemical change: KS3 Links** Now students understand about the conservation of mass it is possible to begin exploring the factors that change the rate of a reaction. Temp, surface area, concentration and the presence of catalysts are all covered. Data collection and graph skills are developed further | **Topic 10 Using resources: KS3 Links 7.3, 7.4**This topic looks at the challenges that face a growing human population in terms of sustainable use of water and materials |  |
| **PSHE LINKS** |  |  |  |