

### OVERVIEW

In Year 11, we build on the knowledge that has been taught in Year 10 and KS3. Year 11 students will cover a variety of different topics from the three different disciplines of Science; Biology, Chemistry and Physics. The Biology topics are homeostasis and response, inheritance, variation and evolution and ecology. The Chemistry topics are rates of reaction, organic chemistry, chemical analysis, chemistry of the atmosphere and using the Earth's resources. The Physics units are forces, waves and magnetism and electromagnetism.

### AUTUMN

#### Paper One Mocks

##### Biology:

**B5 – Homeostasis:** In this section 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 since it controls the menstrual cycle. An understanding of the role of hormones in reproduction has allowed scientists to develop not only contraceptive drugs but also drugs which can increase fertility.

##### Chemistry:

**C6 – Rates of Reaction:** In this topic, students learn that chemical reactions can occur at vastly different rates. Whilst the reactivity of chemicals is a significant factor in how fast chemical reactions proceed, there are many variables that can be manipulated in order to speed them up or slow them down. Chemical reactions may also be reversible and therefore the effect of different variables needs to be established in order to identify how to maximise the yield of desired product.

**C7 – Organic Chemistry:** Students learn that crude oil is separated using fractional distillation and are taught about the different uses for the fractions. Chemists are able to take organic molecules and modify them in many ways to make new and useful materials such as polymers, pharmaceuticals, perfumes and flavourings, dyes and detergents.

**C8 – Chemical Analysis:** Analysts have developed a range of qualitative tests to detect specific chemicals. The tests are based on reactions that produce a gas with distinctive properties, or a colour change or an insoluble solid that appears as a precipitate.

##### Physics:

**P5 – Forces:** Students learn how 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 this way. Recent developments in artificial limbs use the analysis of forces to make movement possible.

#### Assessment

Each topic has an end of unit test.

Fluency is completed once a week which is based on skills.

#### Personal Development

Students learn about IVF treatments and the ethical issues behind that.

Students also learn about different methods of contraception.

### SPRING

#### Paper Two Mocks

##### Biology:

**B6 – Inheritance:** In this section we will discover how the number of chromosomes are halved during meiosis and then combined with new genes from the sexual partner to produce unique offspring. Gene mutations occur continuously and on rare occasions can affect the functioning of the animal or plant. These mutations may be damaging and lead to a number of genetic disorders or death. Very rarely a new mutation can be beneficial and consequently, lead to increased fitness in the individual. Variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve.

##### Chemistry:

**C9 – Earth and The Atmosphere:** Students learn that the Earth's atmosphere is dynamic and forever changing. The causes of these changes are sometimes man-made and sometimes part of many natural cycles. The problems caused by increased levels of air pollutants require scientists and engineers to develop solutions that help to reduce the impact of human activity.

**C10 – Using Resources:** Industries use the Earth's natural resources to manufacture useful products. In order to operate sustainably, chemists seek to minimise the use of limited resources, use of energy, waste and environmental impact in the manufacture of these products. Pollution, disposal of waste products and changing land use has a significant effect on the environment.

##### Physics:

**P6 – Waves:** Students learn that wave behaviour is common in both natural and man-made systems. Waves carry energy from one place to another and can also carry information. Modern technologies such as imaging and communication systems show how we can make the most of electromagnetic waves.

**P7 – Magnetism:** Electromagnetic effects are used in a wide variety of devices. Engineers make use of the fact that a magnet moving in a coil can produce electric current and also that when current flows around a magnet it can produce movement. It means that systems that involve control or communications can take full advantage of this.

#### Assessment

Each topic has an end of unit test.

Fluency is completed once a week which is based on skills.

#### Personal Development

Students learn about selective breeding and genetic engineering and the issues behind them.

Students also learn about the effects of greenhouse gases on The Earth.

### SUMMER

#### Revision for GCSE Exams

#### Assessment

Each topic has an end of unit test.

Fluency is completed once a week which is based on skills.

#### Personal Development

### Useful resources for supporting your child at home

**Seneca** – There are quizzes on [www.senecalearning.com](http://www.senecalearning.com) that align with all the units we study in Year 11. This will allow your child to quiz themselves to improve their ability to remember knowledge and test their exam skills.

**Knowledge Organiser** – The science knowledge organiser contains all the key definitions students need to know for each unit. You could test your child on their ability to remember these facts, or get your child to self-quiz using the 'Look, Cover, Write, Check' technique.

### Homework