Science
Year 11

Irlam and Cadishead Academy
The best in everyone™
Part of United Learning

OVERVIEW

In Year 11, we build upon the knowledge that has been taught in KS3 and Year 10. For example, in Chemistry C6, students will study the factors effecting the rate of a reaction which they covered during 9CE Energetics & Rates, and this also links to B4 Bioenergetics which was covered in Year 10. Year 11 is a time to consolidate knowledge covered throughout our curriculum and topics are covered which deepen our students understanding of practical applications of science in the wider world.

Autumn

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

Personal development:

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

Students also learn about different methods of contraception.

Assessment:

Paper One Mocks

- End of Topic Tests for each unit.
- Fluency once a week to support development of key skills.

Spring

Biology:
B6 – Inheritance: In this section, we will discover how the number of chromosomes is 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. 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.
P8 – TRIPLE ONLY Space: Questions about where we are, and where we came from, have been asked for thousands of years. In the past century, astronomers and astrophysicists have made remarkable progress in understanding the scale and structure of the universe, its evolution and ours. New questions have emerged recently. 'Dark matter', which bends light and holds galaxies together but does not emit electromagnetic radiation, is everywhere – what is it? And what is causing the universe to expand ever faster?

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.

Assessment:

Paper Two Mocks

- End of Topic Tests for each unit.
- Fluency once a week to support development of key skills.

Summer

Revision for GCSE Exams

Homework

Sparx Homework is expected to be completed weekly, alongside paper exam questions where relevant

Useful resources for supporting your child at home

Sparx Science Flashcards. Science Padlet available on KS4 area of ICA website

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.