Shrewsbury Academy

What is your learning journey for Year 9 Science?

Marches Academy Trust

Applications

The enquiry skills unit prepares you with the skills that you need to fully understand the investigative aspects of GCSE Science.
Following on from this, the topics covered in Biology, Chemistry and Physics give you some of the fundamental knowledge that is used throughout the Science course.

Assessment & tests

- ➔ End of unit tests
- ➔ Exam practice for each unit
- ➔ Required practical activities in lesson

Content – Photosynthesis, rates of photosynthesis, aerobic and anaerobic respiration, responses to exercise and metabolism.
Bigger Picture Focus – To understand the role of plants in our ecosystems and how, without them, we would not be here.

Content – Cells, specialised cells, microscopy, cell division, stem cells and transport in cells.
Bigger Picture Focus – To understand how knowledge of the fundamental building blocks that make up living organisms and can lead to the development of therapies to cure diseases.

Year 9

B1 Cells

B4 Bioenergetics

Content – Evolution of the atmosphere, atmospheric pollution, the modern atmosphere, human effects.
Bigger Picture Focus – To understand how the atmosphere is continually changing, and the impacts of human activities on it.

Enquiry skills

C9 Atmosphere

C1 Atomic structure

Content – Periodic table, element, compounds, atomic structure, groups of the periodic table.
Bigger Picture Focus – To understand how theories and ideas can change with new evidence, and how evidence may be collected

Content – Electrical charges & fields, current, voltage, resistance, power, circuits, National grid.
Bigger Picture Focus – To understand how demands on electricity production are increasing and leading to the need to build more power stations - is there a sustainable answer?

P2 Electricity

P3 Particle model

Content – States of matter, changes of state, gas particles, temperature changes & specific heat capacity, density, gas pressure
Bigger Picture Focus – To explain a wide range of observations the principles used when designing vessels to withstand high pressures and temperatures, such as submarines and spacecraft.

Year 10 Science

This unit covers some of the key skills that you will use in Science:

- The maths skills that are used in science
- How to draw and analyse graphs
- Identifying variables
- How to carry out an investigation
- How to evaluate your work

Independent learning
Tasks may include:

- ➔ Consolidation work
- ➔ Educake quizzes
- ➔ 6 mark exam questions
- ➔ Past paper practice
- ➔ Interleaved tasks

Home Learning

Useful websites

- ➔ BBC Bitesize
- ➔ mrrscience.com
- ➔ GCSEPod
- ➔ Oak Academy
- ➔ Educake

Keep reviewing the work from these topics as you go through the year - it will help you to understand the work in Year 10 & Year 11.

Shrewsbury Academy

What is your learning journey for Year 10 Triple Biology?

Marches Academy Trust

Independent learning
Tasks may include:
- ➔ Consolidation work
- ➔ Educake quizzes
- ➔ 6 mark exam questions
- ➔ Past paper practice
- ➔ Interleaved tasks

Home Learning

Content – Pathogens and the diseases they cause, human defences and the immune response, vaccination, antibiotics, drug discovery and development.
Bigger Picture Focus – To examine the different types of diseases and ways we can prevent their spread and treat them to save lives around the world

Content – Interdependence, adaptation, ecosystems, recycling materials, biodiversity and human impacts
Bigger Picture Focus – To consider the impacts our actions have on other organisms and ways we can make positive changes.

Year 11

B7 Ecology

B3 Disease

B2 Organisation

Content – Levels of organisation, food, digestion, enzymes, heart and blood, cardiovascular disease, cancer, plant organs and plant transport
Bigger Picture Focus – To link how understanding how our bodies work enable scientists to develop a variety of ways of treating diseases.

Year 10

Assessment & tests
- ➔ End of unit tests
- ➔ Exam practice for each unit
- ➔ Required practical activities in lesson

Useful websites
- ➔ BBC Bitesize
- ➔ mrrscience.com
- ➔ GCSEPod
- ➔ Oak Academy
- ➔ Educake

Applications
In year 10, you will learn about how different body systems work to keep you healthy and how the food you eat fuels your body.
You will learn about the transmission of disease, how your immune system protects you, how vaccinations work and why they are important.
In the ecology unit, you will see how organisms adapt to the environment that they live in and the way that humans are affecting the planet.

Keep reviewing the work as you go through the year - it will help you to understand the content covered in later topics.

Shrewsbury Academy

Marches Academy Trust

What is your learning journey for Year 11 Triple Biology?

Assessment & tests
- ➔ End of unit tests
- ➔ Exam practice for each unit
- ➔ Required practical activities in lesson
- ➔ 2 x 1hr 45 min exams

Note: there is no coursework element

Useful websites
- ➔ BBC Bitesize
- ➔ mrrscience.com
- ➔ GCSEPod
- ➔ Oak Academy
- ➔ Educake

GCSE Exams

Content – Reproduction, DNA, inheritance, inherited disorders, variation, evolution, selective breeding, genetic engineering, fossils, extinction and classification

Bigger Picture Focus – To understand how we can use our knowledge of genetics to enhance crops, develop more valuable livestock as well as appreciating how our actions have caused the loss of species

Revision tasks may include (but is not limited to):
- ★ Past paper practice
- ★ Exam question analysis
- ★ Knowledge organisers & knowledge retrievers
- ★ Mock papers

BIOLOGY REVISION

B6 Inheritance

B5 Homeostasis

Content – Homeostasis, the nervous system, hormonal coordination, blood glucose control, menstrual cycle, infertility and contraception, the brain, the eye & eye problems.

Bigger Picture Focus – To understand how we can manipulate the hormonal system to prevent pregnancy or help people have children who normally would not be able to

Year 11

Independent learning
Tasks may include:
- ➔ Consolidation work
- ➔ Educake quizzes
- ➔ 6 mark exam questions
- ➔ Past paper practice
- ➔ Interleaved tasks

Home Learning

Applications

In year 11, you will discover about the systems that keep your body balanced and the ways in which these can go wrong. You will also see how these systems can be helped using medicine.

The inheritance unit explains how the work of past scientists has led to an understanding of the way that characteristics are passed between generations, the way that cloning is used and how genetic engineering may solve food security problems in the future. The work of evolutionary biologists such as Charles Darwin is discussed, and you will look how evidence is used to develop accepted theories of evolution.

Don't forget that for most Paper 2 topics, you will be revisiting some of the work from Paper 1 in lessons. Make sure that you keep revising Paper 1 because it will help!

Shrewsbury Academy

What is your learning journey for Year 10 Triple Chemistry?

Marches Academy Trust

Independent learning
Tasks may include:
- ➔ Consolidation work
- ➔ Educake quizzes
- ➔ 6 mark exam questions
- ➔ Past paper practice
- ➔ Interleaved tasks

Home Learning

Content – Three states of matter, types of bonding, metals and alloys, structures of carbon, nanoscience.
Bigger Picture Focus – To link understanding of different types of binding with the way that molecules behave, the uses of different compounds and how this is related to the molecular structure

Content – Reactions of metals, acids, alkalis, salts, electrolysis
Bigger Picture Focus – To examine the different types of chemical reaction and the ways that humans have used these to extract different metals

Year 10

C2 Structure & bonding

C4 Chemical changes

C3 Quantitative chemistry

C5 Energy changes

Year 11

Content – Calculating formula mass & concentration, conservation of mass, balancing equations, titrations
Bigger Picture Focus – To understand how calculations are used in reactions and how this applies to industry.

Content – Endothermic and exothermic reactions, reaction profiles, fuel cells and batteries.
Bigger Picture Focus – To understand the uses of different types of chemical reaction in everyday life and how chemistry can drive innovation.

Assessment & tests
- ➔ End of unit tests
- ➔ Exam practice for each unit
- ➔ Required practical activities in lesson

Useful websites
- ➔ BBC Bitesize
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- ➔ Educake

Applications
You will investigate the properties of different materials and link this to the type of chemical bond that is found within the molecules, and look at cutting-edge nanoscience and its possible applications.
By carrying out a number of experiments and investigations, you will see how different chemical reactions take place and the way in which both chemical changes and energy changes take place. You will apply this knowledge to the extraction of metals and possible alternative power sources such as hydrogen fuel cells.

Keep reviewing the work as you go through the year - it will help you to understand the content covered in later topics.

Pathway to be followed from September '22

Shrewsbury Academy

What is your learning journey for Year 11 Triple Chemistry?

Marches Academy Trust

Assessment & tests
- ➔ End of unit tests
- ➔ Exam practice for each unit
- ➔ Required practical activities in lesson
- ➔ 2 x 1hr 45 min exams

Note: there is no coursework element

Content – Chromatography, gas tests, pure substances and mixtures, ion tests, instrumental methods
Bigger Picture Focus – To show how chemistry is used in the real world to identify substances by their characteristics

GCSE Exams

Revision tasks may include (but is not limited to):
- ★ Past paper practice
- ★ Exam question analysis
- ★ Knowledge organisers & knowledge retrievers
- ★ Mock papers

CHEMISTRY REVISION

Content – Effect of different factors on rate of reaction, reversible reactions
Bigger Picture Focus – To understand how we can manipulate chemical reactions to our advantage

Content – Crude oil, hydrocarbons, homologous series, polymers
Bigger Picture Focus – To link the structure of different hydrocarbon molecules and their homologous series to their uses and how these apply to the real world.

C6 Rates of reaction

C7 Organic chemistry

C8 Chemical analysis

C10 Using resources

Content – Recycling, water, reducing use of resources, finite and renewable resources, materials, the Haber process, fertilisers
Bigger Picture Focus – To understand how we can use our knowledge of chemistry to determine our overall effect on the planet, and how chemistry can be used to overcome problems such as supplying food to an increasing population

Year 11

Applications

Industrial chemical reactions rely on a fast rate of reaction to maximise profits. Looking at the factors that affect the rate of simple reactions, as well as reversible reaction will give an insight into this.
Crude oil is a finite resource with many applications as both a fuel and a source of other chemicals used in a number of reactions.
By analysing chemicals present at crime scenes, the police may be able to track a suspect's movements. Fireworks are different colours because of the metals used - do you know which one?
It's also important that you can use your knowledge of chemistry to determine our overall effect on the planet.

Independent learning
Tasks may include:
- ➔ Consolidation work
- ➔ Educake quizzes
- ➔ 6 mark exam questions
- ➔ Past paper practice
- ➔ Interleaved tasks

Home Learning

Useful websites
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- ➔ mrrscience.com
- ➔ GCSEPod
- ➔ Oak Academy
- ➔ Educake

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Pathway to be followed from September '22

Shrewsbury Academy

What is your learning journey for Year 10 Triple Physics?

Marches Academy Trust

Independent learning
Tasks may include:
- ➔ Consolidation work
- ➔ Educake quizzes
- ➔ 6 mark exam questions
- ➔ Past paper practice
- ➔ Interleaved tasks

Home Learning

Applications
Human energy consumption is increasing, so it is important that you understand the different ways that these demands can be met, whether by the use of renewable energy resources or through nuclear power stations. There are developments in nuclear fusion reactors, with the aim of giving a 'clean' energy source.
Analysis of forces is used to give vehicles that move efficiently, as well as the determination of momentum being used in crash investigations.

Year 10

P1 Energy

Content – Energy stores, energy calculations, work, power, renewable and non-renewable energy sources.
Bigger Picture Focus – Limits to the use of fossil fuels and global warming are critical problems for this century. Physicists and engineers are working hard to identify ways to reduce our energy usage.

P4 Radioactivity

Content – – Atomic model, discovery of the atomic model, isotopes, ions, radioactive decay, nuclear fission & fusion, uses and dangers of radiation.
Bigger Picture Focus – Today radioactive materials are widely used in medicine, industry, agriculture and electrical power generation. Is this the answer to increasing energy demands?

Year 11

P5 Forces

Content – Speed, acceleration, distance-time graphs, velocity-time graphs, contact and non-contact forces, gravity, Hooke's Law, Newton's laws, scalar and vector
Bigger Picture Focus – 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 & tests
- ➔ End of unit tests
- ➔ Exam practice for each unit
- ➔ Required practical activities in lesson

Useful websites
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Keep reviewing the work as you go through the year - it will help you to understand the content covered in later topics.

Pathway to be followed from September '22

Shrewsbury Academy

What is your learning journey for Year 11 Triple Physics?

Marches Academy Trust

Content – Big bang theory, red shift, life cycle of a star
Bigger Picture Focus – In the past century, there has been remarkable progress in understanding the scale & structure of the universe & its evolution. New questions have emerged recently. 'Dark matter', which bends light and holds galaxies together but does not emit electromagnetic radiation – what is it? And what is causing the universe to expand ever faster?

Content – Permanent and induced magnets, magnetic field, electromagnets, motor effect, generator effect, speakers, transformers
Bigger Picture Focus – . 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 & tests
- ➔ End of unit tests
- ➔ Exam practice for each unit
- ➔ Required practical activities in lesson
- ➔ 2 x 1hr 45 min exams
  Note: there is no coursework element

GCSE Exams

Revision tasks may include (but is not limited to):
- ★ Past paper practice
- ★ Exam question analysis
- ★ Knowledge organisers & knowledge retrievers
- ★ Mock papers

PHYSICS REVISION

P6 Waves

P8 Space (T)

P7 Electromagnetism

Year 11

Content – Labeling a wave, calculating wave speed, refraction, electromagnetic waves uses and dangers, lenses & visible light
Bigger Picture Focus – . Designing comfortable and safe structures such as bridges, houses and music performance halls requires an understanding of mechanical waves. Modern technologies such as imaging and communication systems show how we can make the most of electromagnetic waves.

Applications
Magnets and electromagnets have a number of surprising uses in everyday life, from loudspeakers to electric motors, bells to transformers. How do these items work? What other applications do magnets have?
Different parts of the electromagnetic spectrum have fundamental role in communication and medicine. The visible spectrum is key to our ability to see, but how do corrective lenses work for someone with an eye problem?
The universe itself is constantly expanding, but why? How can the phenomena of red-shift explain this? How old is the sun and what will happen when it dies? These questions are answered in the space unit.

Useful websites
- ➔ BBC Bitesize
- ➔ mrrscience.com
- ➔ GCSEPod
- ➔ Oak Academy
- ➔ Educake

Independent learning
Tasks may include:
- ➔ Consolidation work
- ➔ Educake quizzes
- ➔ 6 mark exam questions
- ➔ Past paper practice
- ➔ Interleaved tasks

Home Learning

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Pathway to be followed from September '22