

Science

Intent:

At the Marches School we aim to embrace the natural curiosity of our pupils, through an innovative and inspiring science curriculum. We encourage students to ask questions and think critically to develop a deep understanding of scientific concepts.

Context:

There are 10 'big ideas' in Science that make up and explain everything in the world around us:

- Forces
- Electromagnets
- Energy
- Waves
- Matter
- Reactions
- Earth
- Organisms
- Ecosystems
- Genes



Trilogy Biology Key Stage 4 Overview

What is my Learning Journey for Year 10 and 11?

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.



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

Exams:

-6 x 75 minute papers – 2 for biology, 2 for chemistry, 2 for physics
There is no coursework element.

Assessments:

-End of unit tests
--6 mark question practice for each unit

#realworldready

- Appreciate how scientific understanding can lead to the development of cures and treatments for diseases to save lives
- Understand how to minimise our impact on the organisms in the world around us
- Consider whether just because science allows us to manipulate organisms, should we be allowed to?
- Understand the importance of science to a wide variety of careers.

Useful websites and support

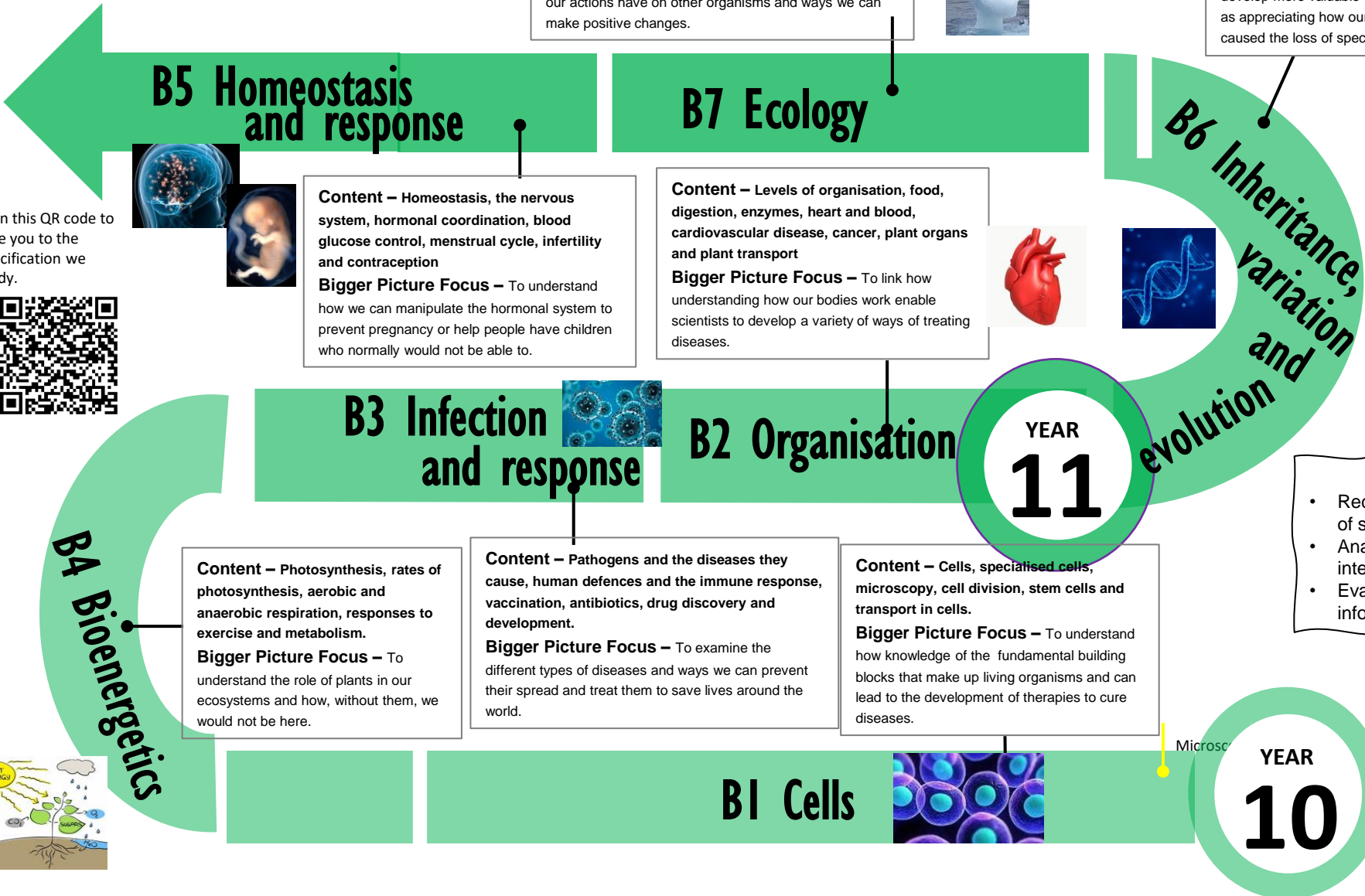
- GCSE bitesize
- GCSEpod
- Oak Academy
- Seneca
- Educake
- Savemyexams
- Physics and maths tutor

Home Learning

- Weekly interleaving quizzes and homework
- Other tasks may include:
 - 6 mark question practice for each unit
 - Past paper practice
 - Flipped learning tasks

Key Skills:

- Recall and retention of scientific facts
- Analysing and interpreting data
- Evaluating information



B5 Homeostasis and response



Content – Homeostasis, the nervous system, hormonal coordination, blood glucose control, menstrual cycle, infertility and contraception

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.

B7 Ecology

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.



B6 Inheritance, variation and evolution

B3 Infection and response



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.

B2 Organisation

Content – Pathogens and the diseases they cause, human defences and the immune response, vaccination, antibiotics, drug discovery and development.

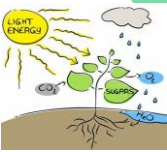
Bigger Picture Focus – To examine the different types of diseases and ways we can prevent their spread and treat them to save lives around the world.

Content – Cells, specialised cells, microscopy, cell division, stem cells and transport in cells.

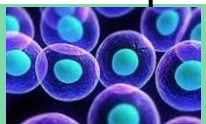
Bigger Picture Focus – To understand how knowledge of the fundamental building blocks that make up living organisms and can lead to the development of therapies to cure diseases.

YEAR 11

B4 Bioenergetics



B1 Cells



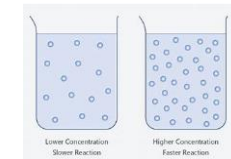
YEAR 10

Microsc



Trilogy Chemistry Key Stage 4 Overview

What is my Learning Journey for Year 10 and 11?



Exams:
-6 x 75 minute papers – 2 for biology, 2 for chemistry, 2 for physics
There is no coursework element.

Assessments:
-End of unit tests
--6 mark question practice for each unit

#realworldready

- Understanding about the elements that make up the world around us, how we can study and separate each of these elements and compounds.
- Looking at the history behind different scientific theories and understanding how these change over time.
- Topics look at how we can best look after the world around us and live more sustainably.
- Understand the importance of science to a wide variety of careers.

Useful websites and support

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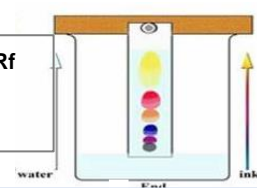
Home Learning

- Weekly interleaving quizzes and homework
- Other tasks may include:
-6 mark question practice for each unit
-Past paper practice
-Flipped learning tasks

Content – Affect of catalyst, concentration, temperature on rate of reaction. Reversible reactions



Content – Crude oil, Hydrocarbons and alkanes



Content – Chromatography, Rf values, Pure substances and mixtures

C8 Chem Analysis

C7 Organic Chem

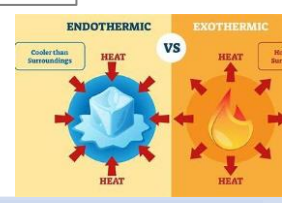
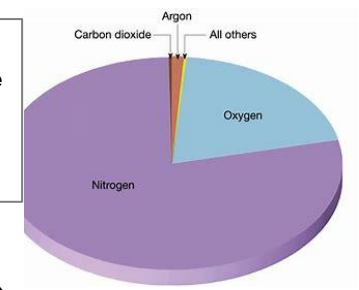
C6 Rates

YEAR
11

Content – Recycling, Water, Reducing use of resources, Finite and renewable resources



Content – Developing the atmosphere, Polluting the atmosphere



Content – Endothermic and exothermic reactions, Reaction profiles

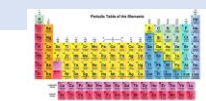
C5 Energy Changes

C9 Atmosphere

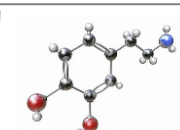
C10 Using Resources

YEAR
10

Content – Periodic table, element, compound, atomic structure, groups of the periodic table



Content – Three states of matter, Ionic bonding, Covalent bonding, Metals and alloys



Content – Calculating formula mass, Conservation of mass, Calculating concentration, Balancing equations

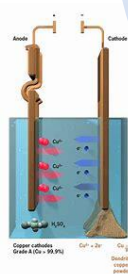
C3 Quantitative

C2 Bonding

C1 Atomic Structure

Content – Reactions of metals, Acids, alkalis, salts, Electrolysis

C4 Chem Changes



Scan this QR code to take you to the specification we study.

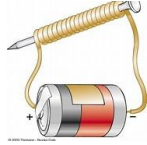




Trilogy Physics Key Stage 4 Overview

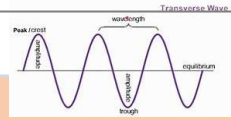
What is my Learning Journey for Year 10 and 11?

Content – Permanent and induced magnets, magnetic field, Electromagnets



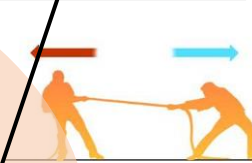
P7 Magnets

Content – Labeling a wave, calculating wave speed, refraction, electromagnetic waves uses and dangers



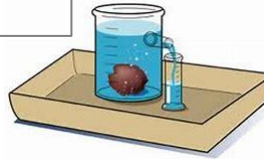
P6 Waves

Content – Speed, Acceleration, Distance-Time graphs, Velocity-Time graphs, Contact and non-contact forces, Gravity, Hooke's Law, Newton's laws, Scalar and Vector



P5 Forces

Content – Density, States of matter, Changes of state, Gas particles



P3 Particle Model

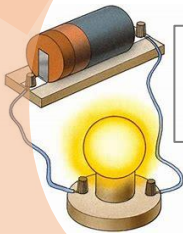
Content – Atomic model, Discovery of the atomic model, Isotopes, Ions, Radioactive decay, Uses and dangers of radiation



P4 Atomic Structure

YEAR
11

Content – Current, Voltage, Resistance, Power, National grid



P2 Electricity

Content – Energy stores, Energy calculations, Work, Power, Renewable and Non-Renewable



P1 Energy

YEAR
10

Key Skills:

- Recall and retention of scientific facts
- Analysing and interpreting data
- Evaluating information

Exams:

-6 x 75 minute papers – 2 for biology, 2 for chemistry, 2 for physics
There is no coursework element.

Assessments:

-End of unit tests
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- Understanding how and why objects act in the way that they do
- Understanding the theories that Scientists have developed over time and how/why these change
- Looking at the use of electricity in everyday lives and how we can develop our usage to be more sustainable.
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Useful websites and support

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Home Learning

- Weekly interleaving quizzes and homework
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Scan this QR code to take you to the specification we study.



Year 10 Trilogy Science

The Big Picture—Intent:

Students continue to follow the GCSE specification in Science, building on the modules that underpin much of the specification taught in Y9 and KS3. Practical skills continue to be developed through class practical and required practical tasks

| Content / Units | Skills | Knowledge | Prior—Y9 | Next—Y11 |
|--|--|---|---|--|
| 11 topics from the AQA trilogy specification. Split into specialisms 3 Biology units, 5 Chemistry units and 3 Physics units. | Literacy and Numeracy skills are built in science, literacy through the use of 6 mark level of response questions and numeracy through the multiple equations and mathematical processes that students will need to employ in all three sciences (10% of the Biology, 20% of the Chemistry and 30% of the Physics GCSE content is L2 or equivalent mathematics). | B2 – Organisation B3 – Infection and Response B5 – Homeostasis and Response C2 – Bonding C3 – Quantitative Chemistry C4 – Chemical Changes C9 – Atmosphere C10 – Using Resources P2 – Electricity P3 – Particle Model P4 – Atomic Structure | In year 9 will have started the GCSE content, covering the basic principles in Biology, Chemistry and Physics – C1 Atomic Structure, B1 Cell Biology, P1 and P2 – Energy and Electricity. | In year 11 will continue with the GCSE trilogy content – building on the content covered in year 10. B6, B7 C6, C7, C8 P5, P6, P7 |

| Implementation | Marches Futures Links | Summative Assessment |
|---|--|--|
| <p>The units taught in Y10 are designed to cover all of the content that is covered in Paper one of each of the three science specialisms and more (content that appears and is assessed in Paper 2) in order to front load content. In all of these modules LORIC opportunities present themselves naturally in practical lessons and also in lessons where past exam questions are being tackled (communication, organisation and resilience in 6mark LOR questions). Home learning will be focused on flipped learning researching topics and completing past examination questions. Some home learning will be specified interleaving homeworks to ensure the long term recall and long term embedding of knowledge of the units covered in Y9 and Y10.</p> <p>Some topics include Required Practicals to be covered, where certain skills are required, these include:</p> <ul style="list-style-type: none"> • safe use of appropriate heating devices and techniques • use of appropriate apparatus to make and record a range of measurements • safe and ethical use of living organisms <p>Trilogy Science is taught across 5 hours per week with specialist Science teachers – specialism content taught by 2 or 3 teachers per group.</p> | <p>Science week is the second week in March and lessons during this week have a focus on STEM careers and further education links.</p> <p>SMSC is covered in each topic (see schemes) links made to relationships and sex during B3 when looking at infectious diseases and STIs.</p> <p>Links to careers are made at the start of each topic and required practicals link to further education and careers.</p> | <p>All units include:</p> <ul style="list-style-type: none"> • 6 Mark LOR questions • Low stake testing • End of Unit Tests <p>Some units include:</p> <ul style="list-style-type: none"> • Required practical tasks set by the exam board |

Impact:

By the end of the Year students will be confident with the fundamental and more complex principles, knowledge and application of this knowledge in all three subject areas. They will be able to understand what they need to do in response to all exam style questions and LOR questions; they will be able to revise effectively as they head towards Year 11.

Their practical skills will have developed both in discussing variables and describing methods but also analyzing data, interpreting results and suggesting improvements.

It is also hoped that links can be made between other sciences as they develop as complete scientists.

Year 11 Trilogy Science

The Big Picture—Intent:

Students continue to complete the GCSE specification in Science, building on the modules that underpin much of the specification taught in Y9, Y10 and KS3. Practical skills continue to be developed through class practical and required practical tasks

| Content / Units | Skills | Knowledge | Prior—Y10 | Next—KS5 |
|---|--|--|--|--|
| 8 topics from the AQA trilogy specification. Split into specialisms 2 Biology units, 3 Chemistry units and 3 Physics units. | Literacy and Numeracy skills are built in science, literacy through the use of 6-mark level of response questions and numeracy through the multiple equations and mathematical processes that students will need to employ in all three sciences (10% of the Biology, 20% of the Chemistry and 30% of the Physics GCSE content is L2 or equivalent mathematics). | B6 – Inheritance, variation and evolution B7 – Ecology C6 – Rates C7 – Organic Chemistry C8 – Chemical analysis P5 – Forces P6 – Waves P7 - Magnetism | In year 10 will have started the trilogy AQA specification. This knowledge from year 10 will be recapped throughout year 11 through interleaving tasks. | Year 12 Biology, Chemistry and Physics build upon the knowledge taught at KS4. At KS5 the OCR specification is taught for the Sciences. |

| Implementation | Marches Futures Links | Summative Assessment |
|--|---|--|
| <p>The units taught in Y11 are designed to completely cover all of the remaining content that is covered in Paper two of each of the three science specialisms. In all of these modules LORIC opportunities present themselves naturally in practical lessons and also in lessons where past exam questions are being tackled (communication, organisation and resilience in 6mark LOR questions). Home learning will be focused on flipped learning researching topics and completing past examination questions, with added emphasis on exam style questions and refining examination technique in preparation for the examinations. Some home learning will be specified interleaving homework's to ensure the long-term recall and long-term embedding of knowledge of the units covered in Y9 and Y10.</p> <p>Some topics include Required Practical's to be covered, where certain skills are required, these include:</p> <ul style="list-style-type: none"> • safe use of appropriate heating devices and techniques • use of appropriate apparatus to make and record a range of measurements • safe and ethical use of living organisms <p>Trilogy Science is taught across 5 hours per week with specialist Science teachers – specialism content taught by 2 or 3 teachers per group.</p> | <p>Science week is the second week in March and lessons during this week have a focus on STEM careers and further education links.</p> <p>SMSC is covered in each topic (see schemes) links made to relationships and sex during B3 when looking at infectious diseases and STIs.</p> <p>Links to careers are made at the start of each topic and required practical's link to further education and careers.</p> | <p>All units include:</p> <ul style="list-style-type: none"> • 6 Mark LOR questions • Low stake testing • End of Unit Tests <p>Some units include:</p> <ul style="list-style-type: none"> • Required practical tasks set by the exam board |

Impact:

By the end of the Year students will be confident with all of the fundamental and more complex principles, knowledge and application of this knowledge in all three subject areas. They will be able to understand what they need to do in response to all exam style questions and LOR questions; they will be able to revise effectively as they head towards the final examinations in the summer of Year 11. Their practical skills will have developed both in discussing variables and describing methods but also analysing data, interpreting results and suggesting improvements. It is also hoped that links can be made between other sciences as they develop as complete scientists.



Separate Physics Key Stage 4 Overview

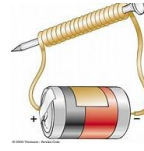
What is my Learning Journey for Year 10 and 11?

Content – Big bang theory, Red shift, Lifecycle of a star

P8 Space

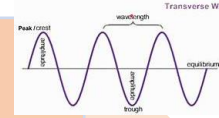
Content – Permanent and induced magnets, magnetic field, Electromagnets

P7 Magnets



Content – Labeling a wave, calculating wave speed, refraction, electromagnetic waves uses and dangers

P6 Waves



Exams:

-6 x 75 minute papers – 2 for biology, 2 for chemistry, 2 for physics
There is no coursework element.

Assessments:

-End of unit tests
--6 mark question practice for each unit

#realworldready

- Appreciate how our Earth is part of a wider system and the study into this.
- Understanding how and why objects act in the way that they do
- Understanding the theories that Scientists have developed over time and how/why these change
- Looking at the use of electricity in everyday lives and how we can develop our usage to be more sustainable.
- Understand the importance of science to a wide variety of careers.

Useful websites and support

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Key Skills:

- Recall and retention of scientific facts
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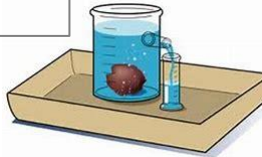
Home Learning

- Weekly interleaving quizzes and homework
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Content – Density, States of matter, Changes of state, Gas particles



P3 Particle Model

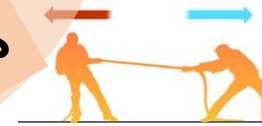
Content – Atomic model, Discovery of the atomic model, Isotopes, Ions, Radioactive decay, Uses and dangers of radiation



P4 Atomic Structure

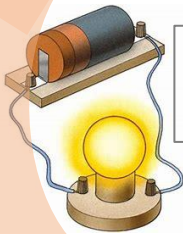
Content – Speed, Acceleration, Distance-Time graphs, Velocity-Time graphs, Contact and non-contact forces, Gravity, Hooke's Law, Newton's laws, Scalar and Vector

P5 Forces



YEAR
11

Content – Current, Voltage, Resistance, Power, National grid



P2 Electricity

Content – Energy stores, Energy calculations, Work, Power, Renewable and Non-Renewable



P1 Energy

YEAR
10

The Big Picture—Intent:

Students continue to follow the GCSE specification in Science, building on the modules that underpin much of the specification taught in Y9 and KS3. Practical skills continue to be developed through class practical and required practical tasks

Year 10 Physics

| Content / Units | Skills | Knowledge | Prior—Y9 | Next—Y11 |
|--|--|--|--|---|
| 4 topics from the AQA Chemistry specification, a mixture of paper 1 and paper 2 content. | Literacy and Numeracy skills are built in science, literacy with 6 mark level of response questions and numeracy through the multiple equations and mathematical processes that students will need to employ in Physics (30% of the Physics GCSE content is L2 or equivalent mathematics). | P2 – Electricity P3 – Particle Model P4 – Atomic Structure P8 - Space | In year 9 will have started the GCSE content, covering the basic principles in Physics = P1 and P2 – Energy and Electricity. | In year 11 will continue with the GCSE trilogy content – building on the content covered in year 10. P5 - Forces P6 – Waves P7 - Magnets |

| Implementation | Marches Futures Links | Summative Assessment |
|--|--|--|
| <p>The units taught in Y10 are designed to cover all of the content that is covered in Paper one of each of the three science specialisms and more (content that appears and is assessed in Paper 2) in order to front load content. In all of these modules LORIC opportunities present themselves naturally in practical lessons and also in lessons where past exam questions are being tackled (communication, organisation and resilience in 6mark LOR questions). Home learning will be focused on flipped learning researching topics and completing past examination questions. Some home learning will be specified interleaving homework to ensure the long-term recall and long-term embedding of knowledge of the units covered in Y9 and Y10.</p> <p>Some topics include Required Practicals to be covered, where certain skills are required, these include:</p> <ul style="list-style-type: none"> • safe use of appropriate heating devices and techniques • use of appropriate apparatus to make and record a range of measurements • safe and ethical use of equipment <p>Separate Science is taught across 7 hours per week with specialist Science teachers – specialism content taught by 2 or 3 teachers per group.</p> | <p>Science week is the second week in March and lessons during this week have a focus on STEM careers and further education links.</p> <p>SMSC is covered in each topic (see schemes) links made to the wider world in P8, P2 use of electricity.</p> <p>Links to careers are made at the start of each topic and required practicals link to further education and careers.</p> | <p>All units include:</p> <ul style="list-style-type: none"> • 6 Mark LOR questions • Low stake testing • End of Unit Tests <p>Some units include:</p> <ul style="list-style-type: none"> • Required practical tasks set by the exam board |

Impact:

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It is also hoped that links can be made between other sciences as they develop as complete scientists.

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Year 11 Physics

| Content / Units | Skills | Knowledge | Prior—Y10 | Next—KS5 |
|--|---|---|--|--|
| 3 topics from the AQA Physics specification. | Literacy and Numeracy skills are built in science, literacy with 6-mark level of response questions and numeracy through the multiple equations and mathematical processes that students will need to employ in all three sciences (30% of the Physics GCSE content is L2 or equivalent mathematics). | P5 – Forces P6 – Waves P7 - Magnetism | In year 10 will have started the trilogy AQA specification. This knowledge from year 10 will be recapped throughout year 11 through interleaving tasks. | Year 12 Physics builds upon the knowledge taught at KS4. At KS5 the OCR specification is taught for the Sciences. |

| Implementation | Marches Futures Links | Summative Assessment |
|--|--|--|
| <p>The units taught in Y11 are designed to completely cover all of the remaining content that is covered in Paper two of the Physics specification. In all of these modules LORIC opportunities present themselves naturally in practical lessons and also in lessons where past exam questions are being tackled (communication, organisation and resilience in 6mark LOR questions). Home learning will be focused on flipped learning researching topics and completing past examination questions, with added emphasis on exam style questions and refining examination technique in preparation for the examinations. Some home learning will be specified interleaving homework to ensure the long-term recall and long-term embedding of knowledge of the units covered in Y9 and Y10.</p> <p>Some topics include Required Practicals to be covered, where certain skills are required, these include:</p> <ul style="list-style-type: none"> • safe use of appropriate heating devices and techniques • use of appropriate apparatus to make and record a range of measurements • safe and ethical use of living organisms <p>Separate Science is taught across 7 hours per week with specialist Science teachers – specialism content taught by 2 or 3 teachers per group.</p> | <p>Science week is the second week in March and lessons during this week have a focus on STEM careers and further education links.</p> <p>SMSC is covered in each topic (see schemes)</p> <p>Links to careers are made at the start of each topic and required practicals link to further education and careers.</p> | <p>All units include:</p> <ul style="list-style-type: none"> • 6 Mark LOR questions • Low stake testing • End of Unit Tests <p>Some units include:</p> <ul style="list-style-type: none"> • Required practical tasks set by the exam board |

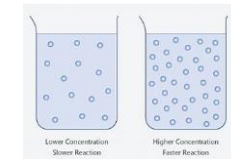
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Separate Chemistry Key Stage 4 Overview

What is my Learning Journey for Year 10 and 11?



Exams:
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 There is no coursework element.

Assessments:
 -End of unit tests
 --6 mark question practice for each unit

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- Understanding about the elements that make up the world around us, how we can study and separate each of these elements and compounds.
- Looking at the history behind different scientific theories and understanding how these change over time.
- Topics look at how we can best look after the world around us and live more sustainably.
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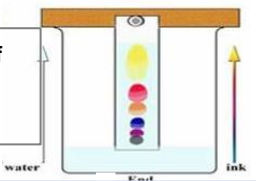
Content – Affect of catalyst, concentration, temperature on rate of reaction. Reversible reactions

C6 Rates



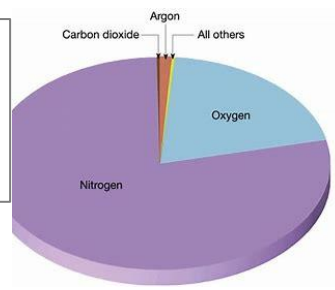
Content – Crude oil, Hydrocarbons and alkanes

C7 Organic Chem



Content – Chromatography, Rf values, Pure substances and mixtures

C8 Chem Analysis



Content – Developing the atmosphere, Polluting the atmosphere

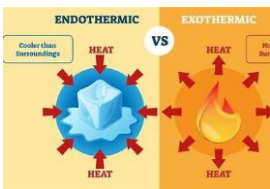
C9 Atmosphere

Content – Recycling, Water, Reducing use of resources, Finite and renewable resources



C10 Using Resources

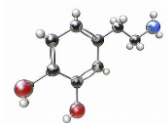
YEAR
11



Content – Endothermic and exothermic reactions, Reaction profiles

C5 Energy Changes

Content – Three states of matter, Ionic bonding, Covalent bonding, Metals and alloys



C2 Bonding

Content – Periodic table, element, compound, atomic structure, groups of the periodic table

C1 Atomic Structure

YEAR
10

Key Skills:

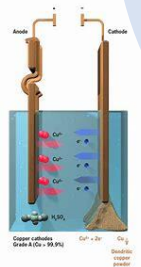
- Recall and retention of scientific facts
- Analysing and interpreting data
- Evaluating information

Content – Calculating formula mass, Conservation of mass, Calculating concentration, Balancing equations

C3 Quantitative

Content – Reactions of metals, Acids, alkalis, salts, Electrolysis

C4 Chem Changes



Scan this QR code to take you to the specification we study.



The Big Picture—Intent:

Students continue to follow the GCSE specification in Science, building on the modules that underpin much of the specification taught in Y9 and KS3. Practical skills continue to be developed through class practical and required practical tasks

Year 10 Chemistry

| Content / Units | Skills | Knowledge | Prior—Y9 | Next—Y11 |
|--|---|--|---|--|
| 5 topics from the AQA Chemistry specification, a mixture of paper 1 and paper 2 content. | Literacy and Numeracy skills are built in science, literacy with 6 mark level of response questions and numeracy through the multiple equations and mathematical processes that students will need to employ (20% of the Chemistry GCSE content is L2 or equivalent mathematics). | C2 – Bonding C3 – Quantitative Chemistry C4 – Chemical Changes C9 – Atmosphere C10 – Using Resources | In year 9 will have started the GCSE content, covering the basic principles in Chemistry – C1 Atomic Structure, | In year 11 will continue with the GCSE Chemistry content – building on the content covered in year 10. C6, C7, C8 |

| Implementation | Marches Futures Links | Summative Assessment |
|---|---|--|
| <p>The units taught in Y10 are designed to cover all of the content that is covered in Paper one of each of the three science specialisms and more (content that appears and is assessed in Paper 2) in order to front load content. In all of these modules LORIC opportunities present themselves naturally in practical lessons and also in lessons where past exam questions are being tackled (communication, organisation and resilience in 6mark LOR questions). Home learning will be focused on flipped learning researching topics and completing past examination questions. Some home learning will be specified interleaving homework to ensure the long-term recall and long-term embedding of knowledge of the units covered in Y9 and Y10.</p> <p>Some topics include Required Practicals to be covered, where certain skills are required, these include:</p> <ul style="list-style-type: none"> • safe use of appropriate heating devices and techniques • use of appropriate apparatus to make and record a range of measurements • safe and ethical use of living organisms <p>Separate Science is taught across 7 hours per week with specialist Science teachers – specialism content taught by 2 or 3 teachers per group.</p> | <p>Science week is the second week in March and lessons during this week have a focus on STEM careers and further education links.</p> <p>SMSC is covered in each topic (see schemes) links made to the wider world in C9 and C10 – pollution etc.</p> <p>Links to careers are made at the start of each topic and required practicals link to further education and careers.</p> | <p>All units include:</p> <ul style="list-style-type: none"> • 6 Mark LOR questions • Low stake testing • End of Unit Tests <p>Some units include:</p> <ul style="list-style-type: none"> • Required practical tasks set by the exam board |

Impact:

By the end of the Year students will be confident with the fundamental and more complex principles, knowledge and application of this knowledge in all three subject areas. They will be able to understand what they need to do in response to all exam style questions and LOR questions; they will be able to revise effectively as they head towards Year 11.

Their practical skills will have developed both in discussing variables and describing methods but also analyzing data, interpreting results and suggesting improvements.

It is also hoped that links can be made between other sciences as they develop as complete scientists.

The Big Picture—Intent:

Students continue to complete the GCSE specification in Science, building on the modules that underpin much of the specification taught in Y9, Y10 and KS3. Practical skills continue to be developed through class practical and required practical tasks

Year 11 Chemistry

| Content / Units | Skills | Knowledge | Prior—Y10 | Next—KS5 |
|--|---|--|--|--|
| 3 topics from the AQA Chemistry specification. | Literacy and Numeracy skills are built in science, literacy by 6-mark level of response questions and numeracy through the multiple equations and mathematical processes that students will need to employ in all three sciences (20% of the Chemistry GCSE content is L2 or equivalent mathematics). | C6 – Rates C7 – Organic Chemistry C8 – Chemical analysis | In year 10 will have started the trilogy AQA specification. This knowledge from year 10 will be recapped throughout year 11 through interleaving tasks. | Year 12 Chemistry builds upon the knowledge taught at KS4. At KS5 the OCR specification is taught for the Sciences. |

| Implementation | Marches Futures Links | Summative Assessment |
|--|--|--|
| <p>The units taught in Y11 are designed to completely cover all of the remaining content that is covered in Paper two of the Chemistry specification. In all these modules LORIC opportunities present themselves naturally in practical lessons and also in lessons where past exam questions are being tackled (communication, organisation and resilience in 6mark LOR questions). Home learning will be focused on flipped learning researching topics and completing past examination questions, with added emphasis on exam style questions and refining examination technique in preparation for the examinations. Some home learning will be specified interleaving homework to ensure the long-term recall and long-term embedding of knowledge of the units covered in Y9 and Y10.</p> <p>Some topics include Required Practical's to be covered, where certain skills are required, these include:</p> <ul style="list-style-type: none"> • safe use of appropriate heating devices and techniques • use of appropriate apparatus to make and record a range of measurements • safe and ethical use of living organisms <p>Separate Science is taught across 7 hours per week with specialist Science teachers – specialism content taught by 2 or 3 teachers per group.</p> | <p>Science week is the second week in March and lessons during this week have a focus on STEM careers and further education links.</p> <p>SMSC is covered in each topic (see schemes)</p> <p>Links to careers are made at the start of each topic and required practicals link to further education and careers.</p> | <p>All units include:</p> <ul style="list-style-type: none"> • 6 Mark LOR questions • Low stake testing • End of Unit Tests <p>Some units include:</p> <ul style="list-style-type: none"> • Required practical tasks set by the exam board |

Impact:

By the end of the Year students will be confident with all of the fundamental and more complex principles, knowledge and application of this knowledge in all three subject areas. They will be able to understand what they need to do in response to all exam style questions and LOR questions; they will be able to revise effectively as they head towards the final examinations in the summer of Year 11. Their practical skills will have developed both in discussing variables and describing methods but also analysing data, interpreting results and suggesting improvements. It is also hoped that links can be made between other sciences as they develop as complete scientists.



Separate Biology Key Stage 4 Overview

What is my Learning Journey for Year 10 and 11?

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.



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

Exams:

-6 x 75 minute papers – 2 for biology, 2 for chemistry, 2 for physics
There is no coursework element.

Assessments:

-End of unit tests
--6 mark question practice for each unit

#realworldready

- Appreciate how scientific understanding can lead to the development of cures and treatments for diseases to save lives
- Understand how to minimise our impact on the organisms in the world around us
- Consider whether just because science allows us to manipulate organisms, should we be allowed to?
- Understand the importance of science to a wide variety of careers.

Useful websites and support

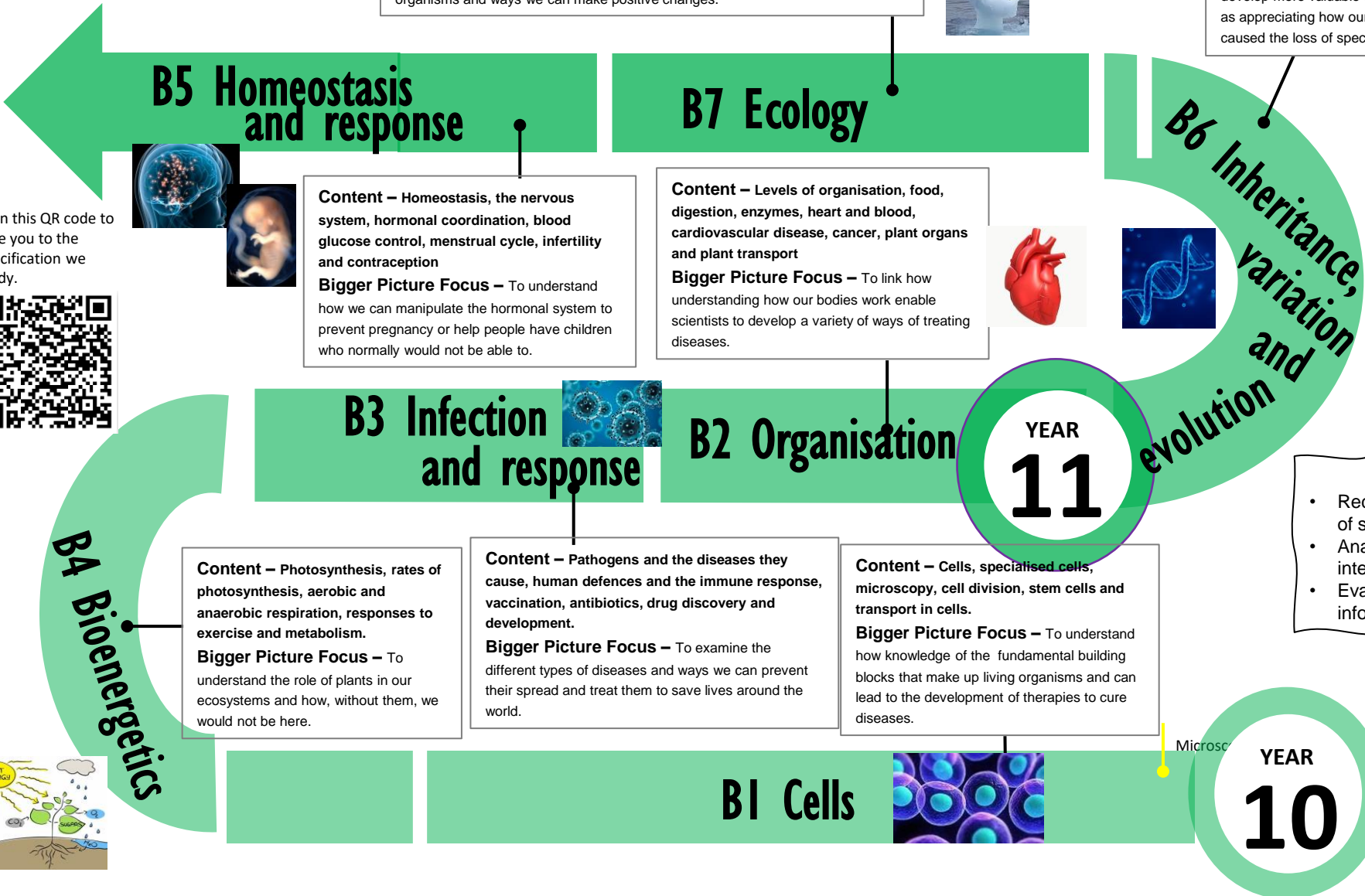
- GCSE bitesize
- GCSEpod
- Oak Academy
- Seneca
- Educake
- Savemyexams
- Physics and maths tutor

Home Learning

- Weekly interleaving quizzes and homework
- Other tasks may include:
 - 6 mark question practice for each unit
 - Past paper practice
 - Flipped learning tasks

Key Skills:

- Recall and retention of scientific facts
- Analysing and interpreting data
- Evaluating information



B7 Ecology

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.



B5 Homeostasis and response

Content – Homeostasis, the nervous system, hormonal coordination, blood glucose control, menstrual cycle, infertility and contraception

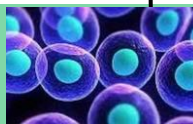
Bigger Picture Focus – To understand how we can manipulate the hormonal system to prevent pregnancy or help people have children who normally would not be able to.



B2 Organisation

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.



B3 Infection and response

Content – Pathogens and the diseases they cause, human defences and the immune response, vaccination, antibiotics, drug discovery and development.

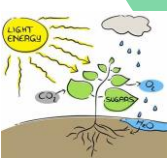
Bigger Picture Focus – To examine the different types of diseases and ways we can prevent their spread and treat them to save lives around the world.



B4 Bioenergetics

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.



Scan this QR code to take you to the specification we study.



The Big Picture—Intent:

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Year 10 Biology

| Content / Units | Skills | Knowledge | Prior—Y9 | Next—Y11 |
|--|--|---|---|---|
| 4 topics from the AQA Chemistry specification, a mixture of paper 1 and paper 2 content. | Literacy and Numeracy skills are built in science, literacy through the use of 6 mark level of response questions and numeracy through the multiple equations and mathematical processes that students will need to employ in Biology (10% of the Biology GCSE content is L2 or equivalent mathematics). | B2 – Organisation B3 – Infection and Response B4 - Bioenergetics B5 – Homeostasis and Response | In year 9 will have started the GCSE content, covering the basic principles in B1 Cell Biology, | In year 11 will continue with the GCSE Biology content – building on the content covered in year 10. B6 – Inheritance, Variation and Evolution B7 – Ecology |

| Implementation | Marches Futures Links | Summative Assessment |
|--|--|--|
| <p>The units taught in Y10 are designed to cover all of the content that is covered in the Biology Paper one and more (content that appears and is assessed in Paper 2) in order to front load content. In all of these modules LORIC opportunities present themselves naturally in practical lessons and also in lessons where past exam questions are being tackled (communication, organisation and resilience in 6mark LOR questions). Home learning will be focused on flipped learning researching topics and completing past examination questions. Some home learning will be specified interleaving homework to ensure the long-term recall and long-term embedding of knowledge of the units covered in Y9 and Y10.</p> <p>Some topics include Required Practicals to be covered, where certain skills are required, these include:</p> <ul style="list-style-type: none"> • safe use of appropriate heating devices and techniques • use of appropriate apparatus to make and record a range of measurements • safe and ethical use of living organisms <p>Separate Science is taught across 7 hours per week with specialist Science teachers – specialism content taught by 2 or 3 teachers per group.</p> | <p>Science week is the second week in March and lessons during this week have a focus on STEM careers and further education links.</p> <p>SMSC is covered in each topic (see schemes) links made to relationships and sex during B3 when looking at infectious diseases and STIs.</p> <p>Links to careers are made at the start of each topic and required practicals link to further education and careers.</p> | <p>All units include:</p> <ul style="list-style-type: none"> • 6 Mark LOR questions • Low stake testing • End of Unit Tests <p>Some units include:</p> <ul style="list-style-type: none"> • Required practical tasks set by the exam board |

Impact:

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The Big Picture—Intent:

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| Content / Units | Skills | Knowledge | Prior—Y10 | Next—KS5 |
|--|---|---|--|--|
| 2 topics from the AQA Biology specification. | Literacy and Numeracy skills are built in science, literacy with 6-mark level of response questions and numeracy through the multiple equations and mathematical processes that students will need to employ in all three sciences (10% of the Biology GCSE content is L2 or equivalent mathematics). | B6 – Inheritance, variation and evolution B7 – Ecology | In year 10 will have started the trilogy AQA specification. This knowledge from year 10 will be recapped throughout year 11 through interleaving tasks. | Year 12 Biology builds upon the knowledge taught at KS4. At KS5 the OCR specification is taught for the Sciences. |

| Implementation | Marches Futures Links | Summative Assessment |
|--|--|--|
| <p>The units taught in Y11 are designed to completely cover all of the remaining content that is covered in Paper two of the Biology specification. In all of these modules LORIC opportunities present themselves naturally in practical lessons and also in lessons where past exam questions are being tackled (communication, organisation and resilience in 6mark LOR questions). Home learning will be focused on flipped learning researching topics and completing past examination questions, with added emphasis on exam style questions and refining examination technique in preparation for the examinations. Some home learning will be specified interleaving homework to ensure the long term recall and long term embedding of knowledge of the units covered in Y9 and Y10.</p> <p>Some topics include Required Practicals to be covered, where certain skills are required, these include:</p> <ul style="list-style-type: none"> • safe use of appropriate heating devices and techniques • use of appropriate apparatus to make and record a range of measurements • safe and ethical use of living organisms <p>Separate Science is taught across 7 hours per week with specialist Science teachers – specialism content taught by 2 or 3 teachers per group.</p> | <p>Science week is the second week in March and lessons during this week have a focus on STEM careers and further education links.</p> <p>SMSC is covered in each topic (see schemes) links made to relationships and sex during B3 when looking at infectious diseases and STIs.</p> <p>Links to careers are made at the start of each topic and required practicals link to further education and careers.</p> | <p>All units include:</p> <ul style="list-style-type: none"> • 6 Mark LOR questions • Low stake testing • End of Unit Tests <p>Some units include:</p> <ul style="list-style-type: none"> • Required practical tasks set by the exam board |

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