

## Science at Stuart Bathurst.

The Science department encourages a positive attitude to learning, and lessons have a strong, practical approach. Throughout their time at Stuart Bathurst, pupils will cover a variety of units across all three Science disciplines, and will develop skills such as measuring accurately, designing scientific investigations and exploring how to work safely within the lab. As well as discovering the mysteries that Science has to offer.

The Science department is made up of six full time scientists, two part time scientists and are supported by one full time science technician. All of our staff are from various scientific disciplines and vocational backgrounds, and classes are based in 5 good sized well-equipped laboratories all with interactive whiteboards. The team is dedicated to developing our young scientists and engineers for the future, as well as giving all pupils the opportunities to enjoy and develop the essential skills whilst studying a practical based subject.

### **KS3 (years 7, 8 and 9).**

Pupils in Year 7, 8 and 9 cover a range of topics that enable them to experience “real” science. Topics are applied to real life as much as possible, and we have put a focus on the range of different careers that can be accessed with a Science degree. Our aim is to allow pupils to see the importance of science in the world around them. Pupils will complete exam style questions throughout their lessons, and will complete end of topic tests for each module they complete. Three times throughout the year pupils will complete an assessment week in which they are assessed on all of the topics they have completed so far throughout the year. An end of year exam for all pupils also takes place in June to track progress, and inform setting for the following school year.

#### **Year 7 topics:**

- Working scientifically,
- Rocks,
- Space,
- Cells,
- Particles and their behaviour,
- Unicellular organisms,
- Electricity,
- Reproduction,
- Acids and alkalis.

#### **Year 8 topics:**

- Food and nutrition,
- The Periodic table,
- Breathing and respiration,
- Metals and their uses,
- Energy,

- Ecosystems,
- Forces,
- Light,
- Combustion,
- Muscles and bones,
- Sound.

#### **Year 9 topics:**

- Separation techniques,
- Adaptation,
- Motion and pressure,
- Biology fundamentals → cells, organisation, gas exchange.
- Chemistry fundamentals → Atomic structure and the Periodic table, structure and bonding, rates and equilibrium.
- Physics fundamentals → energy, electricity, waves.

Revision guides are available to purchase from the Science department to support the teaching of this course, priced at £3.00 for the revision guide.

#### **KS4 (year 10 and 11).**

All learners study the AQA suite of Science GCSE's.

Students from Set 1 who opted for Triple Science commence their 3 GCSE's in parallel, with exams taken at the end of Year 11. Triple Science is delivered in 5 lessons of the Curriculum time with 3 teachers, each delivering their subject specialism.

Sets 2, 3, 4, 5 and 6 follow the GCSE Combined Science Double Award starting in Year 10 with all content to be examined at the end of Year 11. There are three units Biology, Chemistry and Physics. Students will also have the opportunity to carry out 21 required practical's as part of their overall GCSE award.

There are six papers: two biology, two chemistry and two physics papers.

#### **Biology paper 1**

What's assessed?

Cell Biology; Organisation; Infection and response; and Bioenergetics.

#### **Biology paper 2**

What's assessed?

Homeostasis and response; Inheritance, variation and evolution; and Ecology.

### **Chemistry paper 1**

What's assessed?

Atomic structure and the periodic table; Bonding, structure, and the properties of matter; Quantitative chemistry; Chemical changes; and Energy changes.

### **Chemistry paper 2**

What's assessed?

The rate and extent of chemical change; Organic chemistry; Chemical analysis; Chemistry of the atmosphere; and Using resources.

### **Physics paper 1**

What's assessed?

Energy; Electricity; Particle model of matter; and Atomic structure.

### **Physics paper 2**

What's assessed?

Forces; Waves; and Magnetism and electromagnetism

### **How science is assessed:**

- Written exams: 6 X 1 hour 15 minutes
- Foundation and Higher Tiers
- 70 marks per paper
- 16.7 % of GCSE per paper
- Style of questions
- Multiple choice, structured, closed short answer, and open response.

Revision guides are available to purchase from the school for all courses. AQA Combined Science Trilogy revision guides are £3.00 each, and Triple Science Revision guides are £3.00 per discipline. Triple Science pupils will require the revision guide for each discipline, bringing the total cost to £9.00 for the full set.

## Useful websites and Apps: KS4

### GCSE:

AQA website for Specifications and past exam papers - <https://www.aqa.org.uk/>

Teachit Science - <https://www.teachitscience.co.uk/>

KS4 Bitesize - <https://www.bbc.com/bitesize/subjects/zp266yc>

Apps - Seneca learning

You tube - Free science lessons. All of the required practical's in detail

You tube - Primrose kitten. All of the specification in video form

GCSE Pod

### KS5 (A-level).

The Stuart Bathurst Science department currently runs all 3 sciences at A-level with specialist subject teachers. The practical element of each subject is woven throughout the course in the form of Required Practical's that will be assessed on the terminal paper. All exams are taken at the end of the course and qualification is 100% exam based.

### Biology

Topics 1-4 Year 12 - Biological Molecules, Cells, Organisms exchange substances with the environment, Genetic information, variation, and relationships between organisms.

Topics 5-8 Year 13 - Energy transfers in and between organisms, Organisms respond to changes in their internal and external environment, Genetics, populations, evolution, and ecosystems, The control of gene expression.

## Linear exams at the end of Year 12 for AS Biology or Year 13 for A2 Biology

### 2.3 A-level

#### Assessments

Paper 1	Paper 2	Paper 3
<b>What's assessed</b> <ul style="list-style-type: none"><li>Any content from topics 1-4, including relevant practical skills</li></ul>	<b>What's assessed</b> <ul style="list-style-type: none"><li>Any content from topics 5-8, including relevant practical skills</li></ul>	<b>What's assessed</b> <ul style="list-style-type: none"><li>Any content from topics 1-8, including relevant practical skills</li></ul>
<b>Assessed</b> <ul style="list-style-type: none"><li>written exam: 2 hours</li><li>91 marks</li><li>35% of A-level</li></ul>	<b>Assessed</b> <ul style="list-style-type: none"><li>written exam: 2 hours</li><li>91 marks</li><li>35% of A-level</li></ul>	<b>Assessed</b> <ul style="list-style-type: none"><li>written exam: 2 hours</li><li>78 marks</li><li>30% of A-level</li></ul>
<b>Questions</b> <ul style="list-style-type: none"><li>76 marks: a mixture of short and long answer questions</li><li>15 marks: extended response questions</li></ul>	<b>Questions</b> <ul style="list-style-type: none"><li>76 marks: a mixture of short and long answer questions</li><li>15 marks: comprehension question</li></ul>	<b>Questions</b> <ul style="list-style-type: none"><li>38 marks: structured questions, including practical techniques</li><li>15 marks: critical analysis of given experimental data</li><li>25 marks: one essay from a choice of two titles</li></ul>

## 2.2 AS

### Assessments

Paper 1	Paper 2
<b>What's assessed</b> <ul style="list-style-type: none"><li>Any content from topics 1–4, including relevant practical skills</li></ul>	<b>What's assessed</b> <ul style="list-style-type: none"><li>Any content from topics 1–4, including relevant practical skills</li></ul>
<b>Assessed</b> <ul style="list-style-type: none"><li>written exam: 1 hour 30 minutes</li><li>75 marks</li><li>50% of AS</li></ul>	<b>Assessed</b> <ul style="list-style-type: none"><li>written exam: 1 hour 30 minutes</li><li>75 marks</li><li>50% of AS</li></ul>
<b>Questions</b> <ul style="list-style-type: none"><li>65 marks: short answer questions</li><li>10 marks: comprehension question</li></ul>	<b>Questions</b> <ul style="list-style-type: none"><li>65 marks: short answer questions</li><li>10 marks: extended response questions</li></ul>

### Chemistry

Topics Year 12: Physical Chemistry 1, Inorganic Chemistry 1, Organic Chemistry 1

Topics Year 13: Physical Chemistry 2, Inorganic Chemistry 2 and Organic Chemistry 2

### Linear exams at the end of Year 13

All exams are 1 and a half hours, with 20 marks available for multiple choice questions.

- Paper 1: Physical Chemistry and Inorganic Chemistry and relevant practical skills
- Paper 2: Physical Chemistry and Organic Chemistry and relevant practical skills
- Paper 3: Synoptic Paper (all topics and all practical skills).

### Physics

Topics Year 12: 1 Measurements and their errors, 2 Particles and radiation, 3 Waves, 4 Mechanics and materials, 5 Electricity

Topics Year 13: 6 Further mechanics and thermal physics, 7 Fields and their consequences, 8 Nuclear physics and Astrophysics

### Linear exams at the end of Year 13.

- Paper 1: testing sections 1 to 5 and 6.1 & 6.2
- Paper 2: testing sections 6.3, 6.4, 7 and 8
- Paper 3: testing students practical skills and one of the 5 option units: Astrophysics, Medical Physics, Turning Points in Physics, Engineering Physics or Electronics.

**Useful websites KS5:**

A level:

AQA website for Specifications and past exam papers - <https://www.aqa.org.uk/>

<https://www.cyberphysics.co.uk/>

<https://www.alevelphysicsonline.com/aqa>

<https://isaacphysics.org/>

[https://www.youtube.com/watch?v=QnQe0xW\\_JY4&list=PL3EED4C1D684D3ADF&safe=active](https://www.youtube.com/watch?v=QnQe0xW_JY4&list=PL3EED4C1D684D3ADF&safe=active)

<https://mathsmadeeasy.co.uk/a-level-biology-revision/aqa-past-papers-a-level-biology/>

<https://www.physicsandmathstutor.com/past-papers/a-level-biology/>

<https://www.aqa.org.uk/subjects/science/as-and-a-level/biology-7401-7402/assessment-resources>

<https://www.youtube.com/channel/UCEFS1oWBiWN-6psYhFsQWuA>