Science

Key Stage 3

Intent

Science teaching at Patcham High School aims to give all children a strong understanding of the world around them whilst acquiring specific skills and knowledge to help them to think scientifically, to gain an understanding of scientific processes and an understanding of the uses and implications of science today and for the future.

The science department delivers a course that not only fulfils all the requirements of the National Curriculum, but also looks towards key stage 4, helping to lay secure foundations for future learning in science. There is an increasing focus on the application of ideas and the amplified requirements for maths, literacy and communication, we have integrated these skills into the whole of our Key Stage 3 course. This means that, from the start of Year 7, students will steadily grow in confidence when using mathematical skills, thinking scientifically and communicating their ideas clearly and logically.

Implementation

At KS3, Science is taught in distinct units. The order of teaching of units in science is determined by:

- Introduction and development of key ideas in science (cells, particle theory, energy, forces, interdependence).
- Opportunities for review and building on prior knowledge.
- The availability of equipment for practical work (including the study of ecosystems when the weather is warmer).

Students will need help with things such as measuring, graph plotting and so on at different stages in their studies, these are dealt with via the comprehensive range of skills delivered throughout the lessons.
Each unit is assessed to check that students are making the progress expected of them. Monitoring every student's progress is of key importance to ensure no learner gets left behind or 'stuck' in the Key Stage. At KS3, we use a range of materials to support formative and summative assessment, helping us to evaluate student progress and adapt teaching strategies accordingly.

- Science lessons start with a learning review, providing students with the opportunity to practise the recall of previous learning (from the previous lessons, previous weeks and previous months) and allows students to make links between different topics. This also allows teachers to quickly assess what has clearly been embedded and what areas still need some focus/time.
- Specialist vocabulary for topics is taught and built upon.
- Complex processes are broken down into smaller steps to aid students' progression.
- Questioning is used to check, strengthen and deepen understanding, and address any misconceptions, before moving on.
- Teachers regularly use modelling. This could be modelling of a written answer, a calculation, or how to use practical equipment.
- Students are given an opportunity for guided practise before moving on to completing work independently.
- Students receive regular verbal feedback as they complete tasks.
- To support progress with some more challenging work students are provided with a scaffold to help get them started and build confidence.
- Students complete 3 cumulative assessments during each of Y7 and Y8, as well as short end of unit m/c tests.

Impact

Students' assessment scores are entered on to a centralised department spreadsheet, students are given a percentile which allows us to see progress across the whole year group. We use tracking data to celebrate the success of good progress and to put in place support for any students not making the expected progress.

At the end of key stage 3, students progress on to either GCSE combined science or GCSE biology, GCSE chemistry and GCSE physics, for a very small number of students ELC in science is also offered.

Key Stage 4

Intent

Science teaching at PHS provides the foundations for understanding the world and promotes curiosity. Students are encouraged to understand how science can be used to explain what is occurring and why, predict how things will behave, and question evidence. Scientific understanding is changing our lives and is vital to the world's future prosperity. All students must learn the essential aspects of the knowledge, methods, processes and uses of science. They must gain an understanding of how complex and diverse phenomena of the natural world can be described in terms of key ideas that relate to the sciences.

GCSEs in Science will enable the students to:

- Develop scientific knowledge and understanding through the disciplines of Biology, Chemistry and Physics.
- Develop and learn to apply observational, practical, modelling, enquiry and problem-solving skills in the laboratory, in the field and in other learning environments.
- Develop their ability to evaluate claims based on science through critical analysis of the methodology, evidence and conclusions, both qualitatively and quantitatively.

Implementation

At KS4, Science is taught in distinct units on a rotation.

The order of teaching of units in science is determined by:

- Further development of key ideas in science (cells, particle theory, energy, forces, interdependence).
- Opportunities for review and building on prior knowledge.
- The availability of equipment for practical work (including the study of ecosystems when the weather is warmer).

Students will continue to develop skills such as measuring accurately, graph plotting and so on at different stages in their studies, these are developed and supported via the comprehensive range of lessons delivered throughout the units. Each unit is assessed to check that students are making the progress expected of them. Monitoring every student's progress is of key importance to ensure no learner gets left behind or 'stuck' in the Key Stage. At KS4, we use a range of materials to support formative and summative assessment, helping us to evaluate student progress and adapt teaching strategies accordingly.

- Science lessons start with a learning review, providing students with the opportunity to practise the recall of previous learning (from the previous lessons, previous weeks and previous months). This also allows teachers to quickly assess what has clearly been embedded and what areas still need some focus/time.
- Specialist vocabulary for topics is taught and built upon. Students are expected to use technical vocabulary in their answers.
- Complex processes are broken down into smaller steps to aid students' progression.
- Questioning is used to check understanding before moving on.
- Teachers regularly use modelling. This could be modelling of a written answer, a calculation, or how to use practical equipment.
- Students are given an opportunity for guided practise before moving on to completing work independently.
- Students receive regular verbal feedback as they complete tasks.
- To support progress with some more challenging work students are provided with a scaffold to help get them started and build confidence.
- Students complete end of unit assessments for each topic, with feedback provided and time used to address areas of weakness.
- Exam practise in Y11 is used to build confidence, refine skills and the adequate use of technical vocabulary.
- Key Stage 4 students complete a number of cumulative assessments to help prepare them for their final GCSE exams.

Impact

Students assessment scores are entered on to a centralised department spreadsheet, students are given a percentile which allows us to see progress across the whole year group. We use tracking data to celebrate the

success of good progress and to put in place support for any students not making the expected progress. We keep previous years data to compare progress with that made by previous year groups.
At the end of key stage 4 a number of students progress on to A level courses in Biology, Chemistry and Physics or vocational science qualifications.