

SCIENCE at PHS

Curriculum

The National Curriculum is followed in years 7-11.

- Year 7 & 8 Follow the Activate SOW as part of a 5 year curriculum and also complete 3 investigative tasks per year to foster scientific skills.
- Year 9 complete the Entry Level Certificate in Science (ELC) achieving a level 1, 2 or 3 by completion.
- Year 10 study GCSE Biology (Edexcel) and sit their GCSE exams at the end of year 10 (completed in 1 year).
- Year 11 study GCSE Physics (Edexcel) and sit their GCSE exams at the end of year 11 (completed in 1 year).

Assessment

Science is assessed using verbal, written and graded feedback when appropriate. All tests are given a grade, WWW comment and an EBI comment with areas/ questions to do to improve.

- At the start of each year **all students** complete a baseline assessment appropriate for the year/ qualification.
- Yr 7 & 8 complete a comprehensive baseline assessment at the start of the year and end of the year test in the summer. They also complete topic tests at the end of each topic. All tests are provided by Kerboodle and assessed using the GCSE grading system using grade boundaries provided by Kerboodle. Their current grade is an average of all test grades.
- Yr 9 ELC is made up of 6 X ELC tests (2 X Bio, 2 X Chem, 2 X Phys). Tests / 25. Level awarded is the sum of marks from the 6 tests. Students can re - do tests to improve marks after 2 weeks.
- Biology (Yr 10) and Physics (Yr 11) GCSE. GCSE Topic tests / 40 completed after each topic (provided by Pearson Activelearn and assessed against the GCSE gradings) as well as a mock exam at Christmas and another mock exam after Easter. The current grade is an average of topic test and mock exam grades.

Moderation

- CL and AC internally moderate Mock exam papers at Christmas and Easter - Biology and Physics GCSE. ELC tests also internally moderated.
- HOD meets 2 X per year with HOD's from other schools - St. Antony's (SEMh) and Charles Dickens (Mainstream)

SEN/Interventions

- Knowledge organisers are given at the start of each topic in year 7 & 8, and are given at the start of the year (book) for GCSE subjects.
- Key vocabulary is highlighted in the POS and given to students on the LO/ title slide at the start of each lesson.
- Lessons are chunked and tasks scaffolded where necessary.
- Sentence starters and prompts used for independent literacy based tasks.
- The POS is shared with the TA at the start of each topic area and key words are highlighted for pre - teaching key vocab.
- Active recall quizzes used as the starter activity in each lesson.
- Adaptive teaching used to alter the lesson when misconceptions arise.
- Test review after each topic test with feedback personalised to each students specific strengths and weaknesses.
- Topic areas are re - taught if there is a class wide knowledge gap and additional topic areas are gone through with students on a 1:1 basis.
- Teaching content and style of tasks are adapted based on the need type of the class (eg, potential sensory overload taken into account in classes with high ASD, tasks are chunked into smaller sections for higher proportion of ADHD)
- TA's are directed to be with specific students in lessons based on individual needs of the class - could be knowledge based or engagement based with relationship to the specific student/s taken into account.

Subject enrichment/ cultural capital

Year 8 students visit a zoo setting as part of the Ecosystems unit.
Year 9 students will visit the science museum to look specifically at the Biology and physics areas in preparation for starting their GCSE's.

Rationale

AIMS of the curriculum - To secure for students high levels of educational attainment and prepare them for life beyond Portal House. If students complete year 9-11 at PHS they will achieve an Entry Level Certificate, Biology GCSE and Physics GCSE. Physics is most useful for the trades that our pupils may end up in such as construction or electrical.

- Year 7 & 8 Follow the Activate SOW - this gives a broad basis of all topics areas of the science NC that should be covered as part of KS3 and provides a base level for students moving on to Entry level and GCSE. The investigative tasks foster scientific problem solving skills and intrigue as well as teamwork.
- Year 9 ELC - Bridges the gap between KS3 and GCSE whilst providing a science qualification.
- Year 10 study GCSE Biology - In previous years this has been completed in year 9 but it was found that some students lack the maturity for sitting GCSE exams in year 9, and so this was moved to year 10. The content links well with PE theory.
- GCSE chemistry had previously been completed in year 10 but the volume and difficulty of the content turned students off science and grades were not as high as Biology or Physics so this has been removed.
- Year 11 study GCSE Physics - completed in year 11 as it has heavy numeracy content (30 - 35%) and students have more confidence when they have greater mathematical knowledge.
- GCSE's in Biology and Physics are sat in separate years instead of combined science as students would need to sit 6 X 1 hr 45 min exams and our students can struggle with exam resilience.
- 11PHS are learning the content for Biology GCSE. This is due to majority of the students online having already studied for and achieved an Entry Level Certificate.

Staffing

Miss Clarke teaches 7P, 7H, 8P, 8H, 9H, 10H and 11PHS (online learners).
Mrs Lavers is HOD and teachers 9P, 10P, 10S, 11P and 11H.
Students in year 10 and 11 are streamed.

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Feedback

- Verbal feedback is given within the lesson where appropriate.
- Detailed written feedback given after end of topic tests/ mock exams. Tests are marked and handed back within a week. Feedback is given in the form of WWW and EBI with questions suggested to be re - visited. Students self-assess/ correct work in green pen.
- Notes and long writes are marked for literacy (Capital letters, spelling and punctuation) according to the whole school literacy policy. They are also marked for their scientific content and written feedback given.
- Students RAG rate themselves against the LO at the start and end of the lesson and this is recorded on the SOW.

Revision

- Different revision techniques are modelled to students before end of topic tests from year 7 through to year 11 (spider diagrams, flash cards, online revision and quizzes).
- Students are all set up with a Seneca account at the start of their GCSEs.
- Knowledge organisers are given at the start of each topic in KS3, and beginning of the year for Biology and Physics GCSE.
- Students are also encouraged to use GCSE Bitesize, Seneca, Youtube revision videos and Tik Tok revision videos

Literacy

Aim: *To ensure that all students leave Portal House with high levels of literacy. To develop a highly skilled workforce. To prepare students for life beyond Portal House School.*

- Key vocab is identified in the POS and key vocab for the lesson is shared with pupils on the LO slide.
- Teacher to model the correct pronunciation and spelling of key vocab. Meaning of the word talked through where necessary to develop students understanding in a structured way.
- Command terms identified in questions, emphasised and meaning explained when questions are modelled. Walking, talking mocks/ end of topic tests completed where necessary for the class (This is being introduced gradually)
- Correct scientific language is promoted in all lessons eg. increase, decrease, trend, pattern along with language for scientific skills (independent, dependent, control variables etc).
- Students are prompted to be specific and to explain what 'it' is in their answers (exam technique).
- Students to be given activities that include reading and summarising small pieces of key text to improve inference and comprehension skills.
- Long writes completed as a minimum once per term. Long writes can be independent research, method writing, whole experiment planning, conclusions and evaluations. These are signposted in books and feedback given.
- Long writes are scaffolded where necessary with key terms, sentence starters, layout ideas and clear criteria of what to include.
- Work is also marked for capital letters, spelling and punctuation as per the whole school literacy policy.
- KS3 have spelling tests of key terms once per topic (this is being gradually introduced).

The following websites are excellent sites of background reading for Science:

BBC Science and Nature: <http://www.bbc.co.uk/sn/>

BBC Newsround: <http://www.bbc.co.uk/newsround/15743115>

Science For Kids: <http://www.sciencekids.co.nz/>

Science Experiments: <http://www.sciencebob.com/experiments/>

Children's Science News: <http://www.sciencenewsforkids.org/>

Science , Social Skills and Reading for Kids: <http://www.kidsdiscover.com/>

Numeracy

Aim: *To ensure that all students leave Portal House with high levels of numeracy. To develop a highly skilled workforce. To prepare students for life beyond Portal House School.*

- Good levels of numeracy are essential for higher achievement in science. The Biology GCSE has a 10% minimum mathematical component and Physics GCSE has a 30 - 35% mathematical component (equivalent to a high grade 2/ low grade 3 maths element alone). In order to help students achieve, the maths in science is promoted from year 7 through to year 11
- Calculations are modelled on the whiteboard to include how to show working out and layout.
 - Where applicable calculations are put into a formula triangle. Students in year 7 upwards are taught how to apply and rearrange equations using formula triangles.
 - Units given and use of correct units modelled.
 - Conversion of units modelled and practiced.
 - KS3 introductory lessons explore measuring and use of correct equipment for measuring.
 - Significant figures and decimal places used and modelled in calculations throughout KS3 & 4.
 - Active recall starter activities feature recall of equations -especially in Yr 11 when studying physics.
 - Scaffolding sheets/ examples used with step by step instructions given to less able students.
 - Whole school numeracy focus included within lessons.