

Newfield Science Policy 2021-2022

Next review September 2022.

Aims of the department:

- Understanding of the key concepts to help solve problems in unfamiliar situations.
- Using scientific methods of investigation to solve problems in a safe and secure environment.
- Appreciating the contribution science makes to society and realising that applying science can lead to moral and ethical issues having to be addressed.
- Understanding that learning in science contributes to personal development as the interest and curiosity shown needs to be balanced by an awareness of health and safety matters and respect for living things and the environment.
- Appreciating the powerful, but provisional nature of scientific knowledge and explanation and an awareness that science is always developing.
- Giving students access to careers in science and technology at a variety of levels.

Science department curriculum 2021-2022:

Year 7-8

These groups follow 'Activate Science' schemes of work supported by Kerboodle. Each class has at least 2 lessons a week, all are taught by a subject specialist.

As part of the year 7 curriculum pupils are taught a topic on reproduction in both humans and plants, as it is part of the national curriculum pupils cannot be withdrawn from these lessons. It is not sex and relationship education, as it forms part of their biology module, sex and relationship education is taught through PSHE, the pastoral system, the school nurse, planned visitors, and some moral aspects through RE lessons. Reproduction topics covered in science include:

- Adolescence
- Reproductive Systems
- Fertilisation and Implantation
- Development of a fetus
- The menstrual cycle

Year 9, 10 & 11

Groups: follow the Edexcel BTEC First Award in the Principles of Applied Science. They will gain the equivalent of one GCSE in Applied Science. These pupils have at least 2 lessons a week and complete four mandatory units within a vocational context over the 3 year course, including an external examination at the beginning of Year 11 based on the unit 1 content.

Homework:

At Key Stage 3, homework can be set and is planned to match the current unit the pupil is studying. Homework can be in the form of worksheets, research and questionnaires. This is then used in the lessons. Feedback is written on the pupil's homework sheet.

At Key Stage 4, homework can be set. It may consist of exam style questions to match the pupils BTEC course and supports their progression in giving clear targets and experience in answering exam style questions. Grades and feedback are given.

Science and Literacy:

It has been shown that pupil's scientific attainment is linked to their literacy capability. If pupil's access and understanding are hindered by their literacy skills, they are unable to demonstrate their scientific level during written activities.

At Newfield, the Science Department are committed in being pro-active in developing pupil's literacy skills addressing a range of common problems with language and science.

For example:

- Difficulties with specialist words such as photosynthesis, condensation etc.
- Everyday equivalents e.g. force and pressure.
- Processes e.g. filter or evaporation.
- The context of the language – everyday or specialist e.g. 'since' and 'or'.
- Sequencing where concepts are not understood.
- Dyslexia
- Spelling – seeing words or pictures.
- Conventions and genre.

We have also been working to address issue with phrasing and questions posed to pupils for example,

Q: Name a light source?

A: Weight-watchers salad cream!

or

Q: Name a good conductor?

A: Beethoven!

The department fully supports the Whole School Literacy policy and has implemented strategies such as word walls and word cards. Activities using mind-maps and building glossaries during lessons support pupils in developing their knowledge and understanding of new terminology.

Word Walls:

- Use lower case letters to give shape to the word.
- Consider the type of font used (Century Gothic, Comic Sans MS and Tunga are preferred).
- Use size 150 and space the words using [Format ☐ Font ☐ Character Spacing ☐ Expanded].
- Use some graphics or pictures.
- Use sequencing/ flowcharts for processes.
- Use bold and bright colours, not too many on the same wall.
- Use lists of associated words to aid memory.

Mind-Maps:

These provide students with the opportunity to build on their previous knowledge and present opportunities to extend their knowledge through discussion, team-work and visual aids.

- Allow brain storming of the topic in words, sentences or pictures for all types of learner and student ability.
- Students could be given a selection of words to add to their work in the correct places.
- Join ideas and words into clusters or groups, which support certain concepts or theories.
- Add reasons to the links e.g. processes involved, to create a concept map.

Reading for purpose (PQRS):

Provide students with the opportunity to read a selection of varied texts to support their work and extend their understanding of the topics.

Preview: students look at titles/ subtitles/ diagrams and photos in order to get general ideas of the text.

Question: students discuss and decide upon simple and more difficult questions to ask each other about the text.

Read: students read the text and try to answer the questions whilst moving through the words.

Summarise: students note answers/ ideas and report back to groups/ whole class.

The department use a selection of literacy strategies within science:

Writing:

- Marking system used across the school.
- Pupil guidance on the presentation of work.
- Providing structures such as writing frames for pupils to use to develop their work.
- Encouraging re-drafting in order to produce accurate and well-structured work.
- The use of ICT to encourage extended writing.
- Development of supplementary writing experiences, such as project work.

Speaking and Listening:

- Class thought showers.
- Interactive games.
- Interactive voting.
- Use of varied questioning techniques.
- Using frameworks to record observations of presentations.
- Involving pupils in discussion and debate.
- Group and paired activities as a regular part of lessons.

The Science Department is also aware that homework can be structured to develop literacy skills through scientific themes.

- Writing definitions for key terminology.
- Providing key terms to match definitions.
- Sequencing events/ processes.
- Graph construction from data.
- Data analysis
- Making similarity difference tables.
- Past SAT/ GCSE questions.
- Correcting incorrect answers from a text.
- Comprehension based on a science text.
- Comprehension based on a newspaper article.
- Summarise key points of a topic.
- Research notes on a science topic.
- Preparing talk/ presentation to the rest of the class.

Science and ICT:

The Science Department at Newfield believes in the full integration of ICT across the curriculum. It promotes the use of a range of apparatus, to further and develop the teaching and learning within the department.

There is considerable evidence that learners are more highly motivated when their learning is supported by ICT. Newton and Rogers (2001)

To engage students and add interest, ICT is used in Science to support students and further the development of a longer attention span.

ICT can provide pupils with access to a huge range of resources that are of high quality and relevant to scientific learning. In some cases the resources fill gaps where there are no good conventional alternatives, in other cases they complement existing resources.

We use a range of multi-media resources to enable visualisation and manipulation of complex models within the new Key Stage 3 curriculum. Some three-dimensional images are used to enhance understanding of scientific ideas and phenomena.

ICT allows a range of teaching and learning materials to include text, still and moving images and sound. It increases the variety of ways that the material can be used for providing whole class and individual learning experiences, allowing learners to progress using their preferred learning style.

To further develop quality of data available to pupils. Information can be gained from the Internet. Data obtained can also be compared to students work in the laboratory.

Newfield Science Department is expanding its ICT capability, to allow pupils to extend their learning beyond the constraints of the classroom through the development of a learning platform, where teachers and pupils can access resources and information.

Digital cameras are used to allow a record of practical observation tasks for each pupil. These are kept in pupil folders or added to BTEC portfolios as evidence.

Interactive screens are used in support of the curriculum and can be annotated during a lesson and the new screen saved to be looked at again or for printing paper copies. The temporary nature of additions to the board encourages pupils to speculate and take risks in their responses. Pupils are encouraged to actively use the board during discussions and presentations.

To allow all pupils to access the resources appropriately, an ICT skills audit will take place at the beginning of the year and areas of weakness will be identified. To allow all pupils to be included, activities have been planned within the Science teaching and learning sessions to further develop these skills.

A range of commercial packages for the science curriculum are used to run alongside the text books and practical investigations carried out by the pupils.

Science and CCL's:

The Science Department is committed to the further development of the curriculum through integrated topics and themed approaches with the support of the other curriculum areas in line with the new OFSTED framework.

Themed activities at Key Stage 3 are developed to provide the bases for the vocational learning planned for Key Stage 4 and to allow pupils to enhance their learning by applying skills from other areas within the science environment.

Specific days/ weeks are developed alongside other subjects to allow pupils to have a focus for their knowledge, understanding, skills, attitudes and values. Embedding their use across the curriculum and allowing pupils to recognise the importance within a range of subjects.

CCL's are put onto all subject medium term planning and discussed regularly at meetings throughout the year to develop and change where appropriate.

Sharing of resources is encouraged and allows pupils to further develop their skills and understanding of how and why these are relevant in a different subject area.

Marking and Feedback:

KS3- All work is marked in line with School Marking Policy and practice will be scrutinised at regular intervals.

Across the BTEC courses, the Science Department follows the set objectives in the BTEC Specification provided by Edexcel. Each class teacher provides pupils with clear deadlines to complete vocational tasks and dates for unit marking ready for moderation. These are carried out throughout the school year, at the end of each unit section in preparation for the next.

A variety of levelled activities are carried out within the units, to allow teachers to recognise the areas in which the pupils are achieving and those, in which more attention is required for pupils to attain their potential.

Each pupil, is given an individual unit target, based on their previous units work or end of year exam grade and teacher assessment if starting the course in September of Year 10. (In Year 10, targets are will be based on their teacher assessment from the previous year).

Monitoring of individual pupils is an on-going process with clear individual targets set and discussed with each pupil at regular intervals throughout the academic year, a specific date is set for one to one time with their class teacher to discuss progress in the spring term. Pupils who are not making the expected progress will be referred to the whole school co-ordinator for further mentoring.

Expected levels for the end of their school year, are included on each pupil's academic record at the beginning of the Autumn term.

Internal Verification:

Within the Science Department, our Internal Verifier (IV) ensures that the pupils produce work of quality, which demonstrates consistent assessment and feedback from the class teacher.

Through regular moderation and meeting with class teacher the IV assures the unit-grading criteria in BTEC specifications are being correctly interpreted and applied.

Every class teacher participates in the IV process by making work available to the internal verifier at regular and planned intervals throughout the academic year. Through written comments on cover sheets and oral feedback at team meetings each teacher acts on identified actions promptly, and areas of weakness are improved for the following moderation.

Our IV System:

- Takes place across all BTEC units, ensuring consistency of assessment in all classes on the programme. The IV checks each assignment is fit for purpose, assessing the unit structure, format and content.
- Has planned regular meetings each term and includes reliable records of all activities.
- To ensure the quality of assessment, the IV samples a minimum of 4 different pupils work from each class for each unit completed.
- To ensure standardization, regular meetings between IV and class teachers are planned for each term. These also include sharing of best practice and planning.
- Meets the requirements of NSS and CRA, as all IV records are made available for NSS.

Internal verification checklist:

| Our IV ensures that: | Yes/ No |
|---|----------------|
| All assessors are fully briefed on BTEC assessment processes. | |
| There is an annual, agreed verification schedule covering all assessors on a programme. | |
| Internal verification activity is carried out to the agreed schedule. | |
| Assessors must not internally verify their own work. | |
| Assignments are presented for internal verification before use and that any recommendations are actioned. | |
| Assessment decisions are internally verified. The extent of the IV sample must be sufficient to ensure the security of the standard. For NSS purposes half of the learner sample must be internally verified. | |
| Cross-team/site internal verification and standardisation is organised where more than one team is involved. | |
| All evidence re-submitted after further work by learners is assessed using the relevant grading criteria. | |
| Suitable records are stored in a secure place. | |
| Appropriate feedback is given direct to the assessor. | |
| All IV record are signed and dated particularly when signing off completed actions. | |

