

Key skills in Science

One of the reasons that we teach and learn Science at Brownhill is to develop skills. It is hoped that during their time in Science lessons our students will develop a number of different skills. The practical skills to be developed are covered in the practical skills policy. However we hope in Science lessons to develop skills that are not just used in Science lessons but in other lessons and in the wider world beyond school.

These key skills will enable students to be successful in secondary education, further education, the world of work and in society in general. A question that students often ask in our science lessons is 'Why are we doing this?' Hopefully this policy will help answer this. In twenty years' time, long after they have left school it may not be vitally important that somebody remembers where oxygen is in the periodic table but it will be important that they can read and be able to be numerate.

Science education should be more than learning a string of facts, even though factual content is important, Science education is the opportunity to learn abilities that can serve you well, long after you leave the classroom.

Here are the key skills that can be developed in science lessons:-

READING

It is important that all members of society can read. The inability to read prevents many people from integrating into the wider world and from accessing the world of work. Leaving secondary education being unable to read is a great disadvantage, it prevents further development in many areas.

In science education there are many opportunities to develop reading. There are many texts which need to be read and understood. In science reading can take many forms. It can be the teacher reading aloud with the class following, it can be pupils reading aloud in turn or it could be the pupils reading to themselves or many other forms. All examples and practise of reading encourages development. It is important to take into account the individual pupil. Some pupils if asked to read aloud will lack confidence and so react negatively while others lack the patience to read by themselves for longer periods of time.

However, each student regardless of age or ability should have the opportunity to read in science lessons on a least a weekly basis and if this is maintained it should improve the reading ability of the pupil.

NUMERACY

Numbers, the ability to manipulate them and recognise patterns is a vital skill to possess. Some people say that the universe can be broken down to a series of mathematical formulae and even if you don't contemplate the fundamentals of the cosmos having a good sound understanding of mathematics and the ability to apply mathematics to real life situations is very important in modern society.

Mathematics in science can take many forms it can be mental arithmetic, it can be using written method, it can be using a calculator or it could be drawing a graph. Whatever form mathematics or numeracy takes in Science it is vital to recognise that the skills need to be regularly practiced and developed in order for our students to make progress.

In science we aim to work alongside mathematics in using common methods and ways of working to consolidate maths education. It is important that pupils use common mathematical methods in all of their subjects. This strengthens the idea of transferable skills and helps students realise that skills learned in one area may be used in another.

Just like reading it is vital that science students use their mathematical skills regularly and that teachers practise and develop the maths skills of their pupils. Students in science should be taught mathematical methods and given the opportunity to practice their mathematical skills regularly, this should be regardless of age or ability.

COMMUNICATION

In the modern world it is vital that everyone can communicate effectively. This communication can take many forms it can be verbal, it can be in writing or it can even be in the form of a drawing or diagram. Whatever form communication takes it is vital that that the communicator is able to get their meaning, intent and feelings across. This communication needs to be understood by its intended target. It is also important that pupils realise that communication is a two way process, it involves listening to and understanding information that you are being given as well as giving your opinion.

Communication in the classroom takes many forms it can be from teacher to pupils, it can be between pupils or it could even be pupil feedback. It is vital that all members of the class teachers, other adults and pupils are confident and able to communicate. All opinions should be listened to and considered and teachers should encourage with questions their pupils to put forward ideas and opinions.

Science classrooms should be places where communication is encouraged and everyone's work, ideas and opinions should be listened to and treated with respect.

OBSERVE

Another scientific ability that can be carried into the outside world is the ability to observe. It is important that pupils can mentally note events or actions that have happened and then record this for future reference. Observing is not the same as passively spectating, it is seeing actions unfold and trying to actively understand what it is going on, in short it is watching for a purpose. In observations it is vital that pupils notice any differences or changes that are occurring and be able to determine any patterns that may be apparent. It is also important that things that are observed can be described clearly, accurately and concisely.

There are many things that can be observed in the class videos, power points, experiments and photographs are just a few examples. Like all other skills observation is developed by practice and pupils should be given the opportunity to practice observation regularly.

Each unit of work should have at least one opportunity to practice the observe skill.

ANSWER

The world is full of questions, Why? What? Where? How? Science is the way we answer the most fundamental questions in life. The study of science is the way humanity answers the questions of its own existence. When pupils study science they are continually answering questions starting with the simple moving on to the more profound and when they come to sit exams answering questions become very important.

The process of answering a question may seem simple but in fact it is far from that. In exams sometimes even the most able students struggle to answer questions which appear to be quite straightforward.

Like all of the skills mentioned here, the skill of answering questions is developed by practice. The more questions that a student answers the better both verbally and in writing. Science lessons should be full of questions and pupils should become proficient in answering them. Of course not all pupils will be able to answer the most difficult questions straight away and differentiation and scaffolding should be used for all pupils to make progress.

SELF REVIEW

How well have I done? How can I get better? They are questions that pupils that most pupils ask at some point of their education. Sometimes the person best equipped to answer these questions is the student themselves. It is vital that students are given the ability to self-review their own work. Pupils need to assess their own levels and realise where they stand and realise what they need to do in order to get to the grades they need.

In science all pupils should get the opportunity to self-assess and be able to mark and grade their own work.

It is hoped that if pupils work on these six key skills they will be able to make progress, not just in their science education or wider studies but in by becoming more rounded and able citizens of the modern world. A world in which science will play an increasing part and we must equip our students to face.