SPECIALIST EDUCATION SERVICES

Science Policy and Practice

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1 RATIONALE

This document should be read in conjunction with the Curriculum Intent Statement, which outlines specific issues underpinning the Curriculum approach at SES

The very nature and purpose of the holistic provision at our establishments means that the focus is always on the 'whole child'. This is amplified in the range of documentation, policy and practice that reflects our philosophy of '24hr' learning, coupled with our "no limits' positive psychology.

The intensity of work in this respect, with both the child and where possible, family, is beyond what any child in a mainstream setting, and in many other specialist settings, would experience because of the very purpose and nature of practice at SES.

This document sets out the policy and principles that underpin the whole process of learning across the twenty-four hour learning experience available.

1.1 THE NATURE OF SCIENCE

The discipline of Science is both a body of knowledge and a method of enquiry. It is our way of explaining and understanding the natural phenomena within our environment through activity-based exploration and investigation. It engages learners at many levels, linking direct practical experience with scientific ideas. Making and testing hypotheses by observation and experimentation are especially characteristic of Science and encourage critical and creative thought.

Science has an essential contribution to make to students' education in the following ways:

- Helping students understand scientific ideas
- Using scientific methods of investigation
- Learning how knowledge and understanding in science are rooted in evidence.
- Discovering how scientific ideas contribute to technological change – affecting industry, business and medicine and improving quality of life.
- Appreciating the contribution Science makes to society and the moral and ethical issues
- Contributing to personal development
- Appreciating the powerful but provisional nature of scientific knowledge
- Tracing the development of science worldwide and recognise its cultural significance.
- Learning to question and discuss issues that may affect their own lives, the directions of societies and the future of the world.

Science is 'exploring', 'discovering' and investigating' the world around us and these activities help students gather the experience they need to understand the world in which they live.

2 AIMS AND OBJECTIVES

The aims and objectives of the SES Science curriculum are commensurate with those found in the National Curriculum. Reference should also be made to the safety guidance file.

The aims of Science Teaching at SES can be described as follows:

- Achievement in Science is part of the process of building the child's 'academic self esteem'. We aim to attain the maximum possible achievement commensurate with each individual child's potential through a broad, well balanced, challenging, and appropriately delivered curriculum.

- In a broader sense Science teaching at seeks to foster the personal values of self-esteem, responsibility, and respect for other people and the environment. It seeks to value and respect student's existing knowledge, engage their interest, encourage collaborative work, encourage success and record and affirm progress and achievement.

Science can and should foster a range of desirable personal qualities that will have a bearing upon a child's relationships. It should encourage curiosity and a healthy scepticism, respect for the environment, the critical evaluation of evidence, an appreciation of a significant part of our cultural heritage and an insight into Man's place on the universe.

2.1 SCIENCE AND NATIONAL CURRICULUM AIMS

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all students should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, students should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

The national curriculum for science aims to ensure that all students:

- develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics
- develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.

2.2 SCIENCE AND READING, WRITING, COMMUNICATION, MATHS AND COMPUTING SKILLS (RWCM+C)

RWCM+C skills are core elements of English, Mathematics and Computing that provide individuals with the skills and abilities they need to operate confidently, effectively and independently in life, their communities and work. Individuals

possessing these skills are able to progress in education, training and employment and make a positive contribution to the communities in which they live and work.

Development of RWCM+C skills is embedded within personalised programmes of study in Science. RWCM+C skills within the curriculum is not limited t this subject. The curriculum offers opportunities for RWCM+C skills development in Science, which encourages working beyond the Learning Centre and making links to a wide range of learning opportunities. To be effective, RWCM+C skills teaching must be relevant and allow learners to engage with real situations in the real world.

Learners need opportunities to:

- apply their skills in plausible contexts or use their skills for real purposes
- engage with the world beyond the Learning Centre
- integrate learning by linking knowledge within and between the RWCM+C areas
- spend time planning and developing their work
- make choices and decisions, think creatively and act independently
- experience success in real situations as a result of using their skills effectively

SES aspire to develop learners' confidence in RWCM+C skills through Science by providing opportunities to:

- read and understand information and instructions, then use this understanding to act appropriately.
- Interpret given information in line with specific learning intentions.
- Record evidence of learning in written form of varying formats at appropriate timescales, taking into account individual needs of learners.
- use key terminology to explore and develop knowledge and understanding.
- use verbal communication to effectively develop knowledge and understanding
- to acknowledge listening as integral to developing knowledge and understanding
- to seek opportunities to develop mathematically skills in the areas of using and applying, number, shape, space and measure and handling data.
- to integrate opportunities for a contextualised use of computing applications.

2.3 SCIENCE AND PERSONAL, EMOTIONAL AND SOCIAL DEVELOPMENT (PESD)

Effective planning for PESD in Science must ensure that relevant elements, are embedded into; individual learning episodes, sequences of work, teaching approaches and learning outcomes. When this is done well, it will build individual confidence, enrich the experiences of leaners and support their progress in Science, while increasing coherence across the curriculum.

At SES mastery of PESD skills is integral to all aspects of Learning Opportunities through a holistic and cross-curricular approach. We seek to ensure pupils demonstrate that they can develop and then apply their PESD skills in an extensive range of subject based and real life contexts. In Science we promote the consolidation of core PESD skills by structuring learning opportunities to promote development in this area. Progress in PESD is reflected in personalised PESD files and Learning Centre Education Plans.

2.4 SCIENCE AND THE SEMH (SOCIAL EMOTIONAL AND MENTAL HEALTH) DIMENSION

Many of the students coming to SES may well have had difficult experiences with Science, either in the way it has been taught or in the way they have received the teaching. Their low self esteem and poor self image as learners, coupled with their learned avoidance behaviours often used for self protection against the risk of failure, mean that they may never have experienced the excitement and satisfaction of success in Science.

Our aim is to provide experiences that will improve the child's self esteem allowing him to develop confidence and at the same time enjoy success in areas of endeavour specific to the subject.

> *"The most beautiful experience we can have is the mysterious. It is the fundamental emotion which stands at the cradle of true art and true science."*
>
> Albert Einstein (1879-1955) U.S. physicist, born in Germany.

The specific curriculum objectives are to encourage students to:

a. enquire, speculate and hypothesise. *(These skills require confidence, knowledge and open mindedness all of which are in short supply when you consider yourself to be a failure, know little and find risk taking threatening to your identity)*

b. explore, observe, investigate and discover *(Very often SEMH students feel very exposed by these processes. They are not used to having adults trust that their views are valid and that they have something to contribute).*

c. solve problems, with due attention to co-operation, perseverance and ingenuity *(Very often students with SEMH see problem solving as holding too great a challenge, so they shy away from it; they often struggle with anything that requires a longer attention span and perseverance – they would rather give in than risk failure – and they find great difficulty in sharing resources whether that be people or things, and co-operating with others means sharing attention, which they dislike)*

d. work toward achieving at a continually higher standard. *(Very often SEMH students prefer to fail or shortfall on expectations that set too high a standard for them. This way it's "safe" and doesn't expose them to further failure. They have a view of them selves as failures, which has been continually reinforced by their life and learning experience).*

e. practise communication skills in presenting their work *(Very often SEMH students are socially clumsy and do not communicate well with others. They use behaviour to articulate their moods and feelings).*

f. take increasing responsibility for their own learning. *(Very often SEMH students are unable to accept responsibility for their own actions).*

g. experience a supportive learning environment that stimulates through praise and affirmation. *(Very often SEMH students have experience learning environments that have not responded positively to their needs. They can find praise and affirmation threatening, as their level of confidence is low and their fear of failure high. Praise and affirmation therefore can represent an expectation they cannot reach in their own minds and therefore it's better to reject before you're rejected).*

h. relate their work to everyday experiences. *(Very often SEMH students find difficulty in relating anything to the real world, as they are very self-centric and absorbed in their own world)*

i. evaluate their learning with their teacher. *(Evaluation is highly threatening to SEMH students as they equate it with criticism and letting them know they're not good enough)*

3 SCIENCE AND KEY OUTCOMES

These key outcomes are a useful vehicle to conceptualise a holistic approach to children's needs.

3.1 ENJOY AND ACHIEVE

Science is a subject that fires students' curiosity about phenomena in the world around them, providing enjoyment through a sense of awe and wonder.

The investigative and practical nature of science, and the opportunities it offers for working with others, engages and motivates students and increases their understanding of the world. In addition, students enjoy exploring the contemporary applications and implications of science and its effect on their lives on a personal, local, national and global scale.

3.2 BE HEALTHY

The study of science allows students to make informed decisions about healthy lifestyle choices, including issues related to substance abuse and sexual health. Students learn about growth, development, behaviour and health and how they can be affected by diet, drugs or disease. The science programme of study provides opportunities for students to consider the importance of a balanced diet complemented by regular exercise; the effect of alcohol, tobacco and other drugs on the human body; and the consequences of bacterial and viral infections. Students also learn about preventative measures people can take against sexually transmitted infections.

3.3 STAY SAFE

The investigative and practical nature of science provides opportunities for students to assess and manage risk. They become familiar with the risks associated with handling chemicals and biological materials. They also learn to manage the

dangers associated with experimental techniques, such as those involving electricity and intense heat and light sources. Knowledge and understanding of scientific procedures inform personal and collective decisions related to maintaining a safe environment.

3.4 ACHIEVE ECONOMIC WELL-BEING

The contribution of science to technological advances and innovation is at the heart of changes in the global economy. Studying science plays an essential role in contributing to young people's long-term economic wellbeing because it helps them develop practical and investigative skills, including the ability to obtain, analyse, evaluate and communicate data and information. These skills are essential in the workplace, whether in a scientific or non-scientific career.

The science programme of study encourages students to consider the varied career opportunities, both within science and in other areas that are provided by science qualifications, allowing students to see how they can contribute to the future success of the economy.

3.5 MAKE A POSITIVE CONTRIBUTION

The nature of scientific understanding, based on critical interpretation of observational and experimental evidence, allows students to develop their own opinions and become active contributors. They question and discuss issues that may affect their own lives, the development of societies and the future of the world. They learn to realise the consequences of their actions, consider ethical and moral issues and recognise how they can contribute in a positive way to global sustainability.

4 THE IMPLEMENTATION OF SCIENCE

SES recognises, but is not limited to, the common framework provided by the structuring of Science within the National Curriculum.

4.1 EQUAL OPPORTUNITIES

SES is committed to ensuring that all students are treated with equality of regard.

This will involve:

- Providing equality of opportunity in the Science curriculum in an attempt to maximise the potential of each individual pupil.
- Treating as of equal value the different needs, interests and abilities of individual students.
- Through their experiences within Science pupils should have respect for others and the idea that all should be treated as equals.

In pursuing this policy with regard to individual students, there are four categories of difference between groups of students, in which it is generally acknowledged that

'treatment as equals' may be problematic and for which it is therefore important to have specific policies. These are:

- Racial/Cultural differences
- Social class differences
- Ability differences
- Gender differences.

4.1.1 Racial/Cultural Differences

It is vital that staff avoid any racial bias or stereotyping with respect to the particular individuals who are from ethnic-minority backgrounds and that they are alert to and willing to challenge any such discrimination or stereotyping by students.

4.1.2 Gender Differences

Equal opportunities in terms of participation are carefully considered, however, issues of prejudiced attitudes and stereotyping towards the opposite sex can be in existence and can potentially be magnified in our environments, especially given the contextual background and past experiences of our young people.

Staff should therefore be aware of this and should be willing to challenge any such discrimination or stereotyping by students. Furthermore such risks can be mitigated through planned teaching strategies.

4.1.3 Social Class Differences

Staff should be aware of making assumptions about student's levels of knowledge and opportunities for acquisition of knowledge whatever their background.

4.1.4 Ability Differences

SES is resourced such that Students receive a highly individualised curriculum based on their Portfolio of Achievement and Needs. Implicit in this is a response to differing levels of ability.

It is also important that protected characteristics as defined in the SES Equality and Diversity Policy are considered when planning and implementing teaching practice to ensure equal opportunities. This policy should therefore be read in conjunction with the SES Equality and Diversity Policy and Practice document and the DfE guidance around our equality duty.

4.2 SCIENCE AS A CROSS CURRICULAR SUBJECT

It is important to stress the inter-relationship of scientific enquiry and investigative skills with many other areas of the curriculum and with aspects of communication and social functioning beyond the Learning Centre day. Every aspect of its

operation is viewed as a potential vehicle for building upon students' scientific understanding and skills. All staff need to be skilled at finding unobtrusive ways of taking advantage of the total living experience without this intruding on the naturalness of domestic living.

Indeed Science is not an isolated subject in the curriculum, but is a source of skills and ideas that feed other areas, and is a vehicle for the practice and development of skills gained in other areas. Science provides opportunities for communication, problem solving, study skills, information technology, numeracy and co-operation. In particular, science stimulates language development by providing a rich environment for oral and written responses. Science also provides a motivating context for practising reading skills and the use of mathematical skills and concepts.

'Today's Science is tomorrow's History'

The study of Science draws on other disciplines as a matter of course, notably Mathematics, Technology and Computing. Reciprocally, Science units taught cross the Key Stages involving the use of Mathematics, Technology and Computing feedback newly acquired skills into these areas. For example, studying 'nutrition and digestion' and 'health' are areas also found in Physical Education and it's teaching at SES. In this area of Science both curriculum areas support one another.

Several practical experiments across the Key Stages involve the scientific principles behind the cooking of food and the killing of bacteria in the process. This body of knowledge is reflected and supported within students' involvement in food preparation at SES.

Cross curriculum dimensions provide important unifying areas of learning that help young people make sense of the world and give education relevance and authenticity. They reflect the major ideas and challenges that face individuals and society.

Dimensions can add a richness and relevance to the curriculum experience of young people. They can provide a focus for work within and between subjects and across the curriculum as a whole, including the routines, events and ethos of the school.

Cross curriculum dimensions include:

- identity and cultural diversity
- healthy lifestyles
- community participation
- enterprise
- global dimension and sustainable development
- technology and the media
- creativity and critical thinking

4.3 SCIENCE AND COMPUTING

Computing is incorporated as an integral element into all aspects of the curriculum. (See Computing Policy and Practice document). Computing plays a fundamental role in enriching and enabling curriculum delivery.

At SES we regard Computing capability to be one of the most powerful tools in delivering a high quality individualised curriculum. Computing is taught both as a discreet subject and as a cross-curricular subject. In many cases it may be the primary vehicle for significant proportions of a students highly personalised learning. In this respect we anticipate a significant proportion of the Science Curriculum to be taught through the medium of Computing.

Purposeful and appropriate application of Computing in subjects offers students opportunities to:

- use their Computing capability to assist and progress their learning in science;
- engage in higher-order thinking skills, for example, by using Computing to undertake detailed analysis when modelling data;
- demonstrate, apply and reinforce their understanding of Computing capability within a range of subject contexts. The transferability of Computing capability is an important aspect of progression in students' knowledge, skills and understanding.

The following uses of Computing in Science can be integrated into the planning for each study unit:

- the computer is used as a tool to help students draft and improve written report work when communicating the methods and outcomes of both practical and research work
- computer databases can be used to search, extract and interpret Scientific information gleaned from research and experimental contexts
- the computer can form part of the apparatus operating within an experiment helping to give instant analysis and illustrations of results and more sophisticated data than would be possible with standard equipment (e.g. temperature readings to 0.1 of a degree)
- multimedia packages enable students to assemble text, photos, results, video clips and sound samples about Scientific fact and findings and present them on screen or as a printed package
- computer modelling can enable students to understand phenomena in a particular way and understand the relationship between ranges of variables. This is especially useful with regard to processes difficult to demonstrate in school by other means (an example would be a software package that illustrated the effects of effluent introduction to a pond or lake)
- data-logging assists students in the collection, display and analysis of experimental data. Experiments can be carried over longer periods of time. Data can be presented immediately in the form of a graph or calculation, allowing students more time to discuss, interpret and make predictions based on findings.
- Spreadsheets allow more time to consider relationships between variables as opposed to spending it on routine calculations
- Online learning programmes can be drawn upon to deliver specific scientific modules for individuals and groups

- DV cameras can be used to record experimental procedures for use in presentation, analysis and communicating results

4.4 TEACHING AND LEARNING STYLES

Much of the work undertaken by students must be based on practical, problem-solving activities that are relevant and challenging. Students must have opportunities to work co-operatively and alone and develop the ability to take responsibility for their work. Attitudes of persistence, curiosity, confidence, independence, consideration and enjoyment must be fostered. Teaching styles should account for this as well as the notion that we cater for students' individual learning strengths and style.

Key elements of teaching methods in Science are:

- knowledge delivered directly by the teacher
- relating use of Science to real experiences such as hands on experiments and field work
- question and answer
- individual and group enquiries
- use of a range of technology and media for presentation
- the use of specific online learning programmes

Approaches to learning will to a greater or lesser extent involve an enquiry method:

- asking questions and possibly forming hypothesis
- planning investigations
- finding, collecting and recording information
- analysing and interpreting information
- drawing conclusions
- evaluating and organising information
- researching various information sources including museums, books and the internet

Activities which enhance student skills and experience are:

- discussion and debate with the teacher
- reporting findings using a range of methods
- presentation of findings in a variety of ways to the class group or a wider audience
- tasks which develop knowledge, skills and understanding
- activities should be balanced between activities which are short in duration and those which have scope for development over an extended period
- activities should, where appropriate, use students' own interests or questions
- activities should, where appropriate, involve both independent and co-operative work
- activities should encourage students to become confident in the use of a range of media and equipment
- activities should encourage students to become confident in the use of a range of new technology

4.5 PLANNING FOR SCIENCE EXPERIENCES

The planning of Science is guided by, but not limited to, the National Curriculum Framework for Science.

Planning for Science will take a variety of forms for which personalised learning episodes and units of work will include:

- Individual work
- Group Work
- Classroom based learning
- Extended learning in the wider community

Elements to consider in the planning of Science lessons are:

- An individual programme of work on a specific skills, aspects of knowledge and understanding drawn from the programmes of study or as identified in the student's Portfolio of Achievement and Needs
- An individual topic/unit of work of usually no less than half a terms duration which focuses on the acquisition of relevant scientific concepts, processes and knowledge through a contribution of theoretical, practical and investigative Science
- An appreciation of the necessity to differentiate when presenting work to students of varying abilities
- Access to the varied elements of the Science curriculum in terms of opportunities to work in a range of contexts and with a range of equipment appropriate to the tasks involved
- An awareness of cross curricular links which may serve to reinforce core curriculum skills
- Developing progression in learning within units of work and across units of work
- The use of ICT integrated into planning to enhance and further promote student learning
- An awareness of and calculation of the risk element involved, particularly using chemicals. All such risk assessments must be clearly stated in the appropriate section of the lesson plan. Reference should be made to the 'CLEAPSS HAZCARDS' as part of this process.

4.5.1 Learning Outside the Classroom

SES supports and endorses the Learning Outside the Classroom initiative as its principles and philosophy match the SES Vision Statement. We believe that every young person should experience the world beyond the classroom as an essential part of learning and personal development, whatever their age, ability or circumstances.

The use of places other than the classroom for teaching and learning often provide the most memorable learning experiences and help us to make sense of the world around us by making links between feelings and learning. They stay with us into adulthood and affect our behaviour, lifestyle and work. They influence our values and the decisions we make. They allow us to transfer learning experienced outside to the classroom and vice versa.

Students can benefit from well-organised visits, community activities and getting involved in wider learning projects (such as helping to organise information, reviewing policies and providing peer support). As students progress, work placements and visits help shape their decisions about future opportunities.

All children have the opportunity to participate in both focused field trips and extended residential weeks, throughout a range of local and national locations. In addition to the social and personal benefits, these offer real life knowledge and experience that can be developed in context.

4.5.2 Units of Work/Episodes of Learning

- A unit of work will relate to the National Curriculum Programmes of Study, as well as, where applicable, to the requirements of any examination syllabus chosen in KS4
- A unit of work is intrinsically flexible; it is useful to use a variety of approaches and teaching strategies covering the same core unit to develop a variety of skills.
- A unit of work may be based on specific grammatical skills used as introduction, consolidation or revision.
- A unit of work may rely on a variety of media; audio, DVD, ICT/Computing, or literature. It should also consider fieldwork where appropriate.
- A unit of work may be designed to be revisited as many times as is judged necessary across all year groups and key stages.
- A unit of work may take a whole group approach to areas such as key topics and fieldwork as well as informing aspects of some Individual Programmes which may be based on interest or future aspiration
- Units of work are designed primarily to be enjoyable, to offer the chance of success, to enrich and enthuse the experience of each individual and to offer the opportunity of development across the experience of Science.
- Units of work may be based on a bespoke personalised interest or passion to re-engage the student in the learning process.

4.6 PRESENTATION OF WORK

At SES we believe presentation of work is vital aspect of creating a positive and stimulating environment and in enhancing student motivation and self-esteem. Presentation of work can take a wide variety of forms ranging from:

- Written format
- Recording (oral and photographic)
- Displays
- Through use of computing and digital media
- Through witness statements created pupils and adults

Adults at SES, are expected to make a professional judgement with regards to each individual pupil's aptitude and ability in terms of facilitating presentation of work. We seek to continually implement our 'No Limits' thinking in the way we facilitate

presentation of work ensuring feedback is given to support young people's continual progress in this area.

4.7 SCIENCE AS AN ACCREDITED SUBJECT

Students are supported in choosing an appropriate level of qualification. The Edexcel Science Entry Level (1-3) has been previously selected as assessment is formative throughout the course. At GCSE, the OCR Gateway Science syllabus has been followed. This GCSE format was chosen as it allows students to study a broad range of scientific concepts in relevant, real life and practical contexts. The supporting materials include textbooks, planed lessons and workbooks as well as PowerPoint presentations, videos and audio clips. Further resources are available online and add to the varied delivery of the course.

4.8 PROGRESSION IN SCIENCE

Progression includes:

- an increase in knowledge, skills and understand
- moving from familiar to unfamiliar contexts
- meeting needs which demand more complex or difficult solutions
- students' awareness of their growing Scientific capabilities be it knowledge of skills

To allow for progression within units of work and lessons planning should reflect:

- a steady acquisition of new skills, knowledge and understanding
- consolidation of skills in a range of contexts

- opportunities for student reflection with regard to applications of skills, knowledge and understanding
- opportunities for choice about the application of knowledge and equipment to various situations
- use of familiar and unfamiliar equipment

4.8.1 Continuity

In order to build on the experiences of every child at our establishments there is continuity in the framework of the Science NC programme of study, with students expected to know, apply and understand the matters, skills and processes specified for each key stage. The latest National Curriculum has significantly reduced the prescribed content, and due to the personalisation of learning at our establishments, progress and outcomes are not determined by academic year of age. Decisions about where they start on the framework relates to their starting points, maturity, capability and personal interests.

At SES, across both SES establishments, we are continually evolving a 'fit for purpose' assessment framework to support staff in planning for progress, and to ensure an effective, consistent and quantifiable measure of student progress.

4.9 DIFFERENTIATION

Students at our establishments will clearly differ in ability and teaching should take account of this by providing a range of learning situations and approaches. In addition the philosophy of SES is such that personalised learning is a cornerstone.

Differentiation is a process not a single event. This process involves recognising the variety of individual needs within a group, planning to meet those needs, providing appropriate delivery and evaluating the effectiveness of the activities in order to maximise the achievements of individual students.

Science provides wide opportunities for differentiation by:

- Input
- Resource
- Task
- Support
- Outcome
- Response

In planning for our students, the following factors should be considered:

- Activities should build on what our students already know and can do
- Our students need immediate and regular encouragement, praise and reward
- The activities should be broad enough to allow scope for development and not prevent more able students from extending their learning
- The work should be pitched at the age, maturity and ability of the group and or individual
- Tasks should be differentiated according to individual student needs
- Consider the balance between group activities and individual differentiated tasks for specific students
- Emphasis given to practical tasks

To achieve this, clear attention should be given to the following:

- A range of appropriate equipment
- Using a variety of teaching methods to elicit a particular response
- Organising the learning session in different ways appropriate to particular aims
- Setting open-ended tasks so that students can respond at their level
- Issuing different ‘challenges’ to different students
- Providing extension work for students with greater ability
- Allowing time for individual diagnosis, teaching and feedback.

The method of assessment and reporting should provide feedback that is appropriate to students of differing abilities. It should aid their future learning by providing knowledge but should also give them support and encouragement. More specifically, the teacher should consider:

- Resources reading levels and ease of use
- Availability of a range of media/software

- Availability of a range of support equipment
- Provision of a variety of tasks to cover the main content area
- Take account of time available to support individuals/group
- Other adult/student support
- Student/student support e.g. pairing
- Various ways of praising achievement

4.10 ASSESSMENT AND RECORDING

Assessment is part of an ongoing process that informs future planning and subsequent learning. All assessments should take account of:

- Skills, knowledge and understanding acquired
- The contexts of the activity
- The purpose of the activity

Effective formative and summative assessment:

- is embedded in planning, teaching and learning
- requires a shared understanding of learning objectives and success criteria between teacher and learner
- draws on evidence of learners' achievement and progress from a wide range of contexts within and beyond the classroom
- values information that teachers retain in their heads, as well as concrete evidence produced by learners
- is based on evidence generated in the course of continuous teaching and learning, engagement with learners through observation, discussion, questioning, and review and analysis of work
- helps to shape and refine future teaching and learning, and to personalise the experience of individual learners
- provides the basis for discussions with learners themselves, their parents/carers and with other professionals about their strengths, areas for development and future learning targets
- is the foundation upon which periodic assessment can be based
- recognises and celebrates learners' progress in the light of their previous performance and motivates them to improve further
- promotes independence and self-motivation
- develops the capacity for peer and self-assessment among learners.

Assessment is a continuous process and testing and accreditation are built in at various stages of a students development.

Any system of evaluation and assessment should:

- Identify what has been taught and learnt
- Monitor students progress in each
- Monitor students progress in cross-curricular elements
- Establish students’ needs as a basis for further planning and teaching.

Student involvement in the assessment and evaluation process is critical.

Evidence can be gleaned from:

- Observing
- Questioning and listening
- Discussion
- Written work, audio and video tape recording, drawings, charts, etc.
- Specific assessments tied to curriculum materials.

4.10.1 The marking of students work

Teachers' responses to students' work should be positive, encouraging, sympathetic, honest and appropriate. Marking should be completed in a pragmatic way, as appropriate to the needs of the student and whenever possible completed in their presence. Further areas of study can then be negotiated with the student.

- Students should be made aware of the assessment criteria being employed, particularly before tackling new situations and subsequently when marking work
- Students should, as a result of the interaction, be aware of the next steps in their learning
- It is sometimes useful for students to respond to each others work

4.10.2 Record Keeping

Records are kept in the form of long term planning (Curriculum Overview), Medium Term Planning (unit objectives) and short term planning (detailed planning of learning episodes). A record of progress is evident in the on-going feedback (verbal and written) between adult and pupil. Where appropriate an evidence base is collated for an episode of learning this can take various forms e.g.files, exercise books, scrap books, digital media files.

4.10.3 Individual Programmes

- The Portfolio of Achievement and Needs of each student will inform the global priority targets to be addressed for the child.
- More detailed educational objectives will be identified by Learning Centre staff and students, and negotiated targets reached.
- Targets set will be specific, measurable, attainable, realistic and time related.
- Targets will always be compatible with the requirements of the National Curriculum and/or Portfolio of Achievement and Needs

5 SMSC AND BRITISH VALUES IN SCIENCE

At SES we believe the development of SMSC and promotion of British Values, should be embedded within all areas of teaching and learning across both the school and residential setting. This policy should be read in conjunction with the Spiritual, Moral, Cultural and Social Policy and Practice document and the British Values Policy and Practice Document.

5.1 SMSC

At SES we develop SMSC in many aspects of the curriculum through ensuring opportunities for SMSC development are extensive and frequent. These opportunities are reflected in planning documents as well as in outcomes for pupils.

Examples of SMSC development within Science are:

Spiritual

- Posing questions to help understands and explore the world around us.
- Developing the knowledge that there is not an answer for everything.
- Questioning the work of others and openly challenging current schools of thought.
- Experiencing the wonder and awe of the natural environment and creation of the universe.

Moral

- Understanding that science has provided many moral dilemmas such Atomic and nuclear technology.
- Exploration of ethical concepts such as animal testing and stem cell research.
- Energy consumption and allocation of natural resources.

Social

- In Science we explore the impact of developments on global society.
- We explore population and the number of issues and debates that currently exist in this area.
- Current technologies are investigated in relation to their ability to shape society and move it in certain directions.

Cultural

- Appreciation of the historical context of scientific discovery. Our students are encouraged to develop an understanding of how different cultures have allowed and promoted science to move forward.
- Science at SES allows our young people to explore population explosion and the impact this can have on maintaining cultural differences.
- Science allows our young people to explore the differing views from many global/ historical cultures in relation to the universe and creation.

5.2 BRITISH VALUES

Promotion of British values is an integral part of life at SES. We believe that the promotion of such values should be inherent in teaching and learning as well as in the wider community. We fundamentally believe that the promotion of British Values is an essential strategy in preventing radicalisation. This document should therefore be read in conjunction with our Radicalisation Policy and Practice document.

Examples of the promotion of British values within Science are:

Rule of Law

- To develop an understanding of how scientific principles underpins law in Britain.
- Appreciating the decisions that are made to create new laws and that these often have a basis in scientific developments.
- Exploring issues such and drugs and alcohol as well as age related restrictions, using scientific approaches to place key questions in context.

Democracy

- Understanding that the democratic process is often driven by development in science and technology.
- Appreciation that due to scientific development, change is often necessary and that democracy is a management tool used to ensure this change is delivered in the best interest of equality.
- Explore that ethical dilemmas facing the world are important to engage with and that the democratic process is the manner by which everybody can have their voice heard.

Individual Liberty

- Students are encouraged to make personal decisions and life choices based on their understanding of scientific principles.
- Where possible, pupil are encouraged to explore ethical issues that they find challenging and explore a variety of differing viewpoints.
- Understanding topical issues such as research into mobile devices and their impact on health, at the same time accepting that their use is a matter of individual liberty.

Mutual respect for and tolerance of those with different faiths and beliefs and those without faith

- Science encourages an understanding of historical development and closely links knowledge with power. The study of science encourages young people to build a wider appreciation of the varying groups that make the world fascinatingly diverse.
- Where appropriate, young people may explore issues relating to the varying viewpoints in relation to stem cell research and euthanasia.
- Ultimately the study of science will allow our young people to develop the mechanisms to challenge differing views in the right manner.