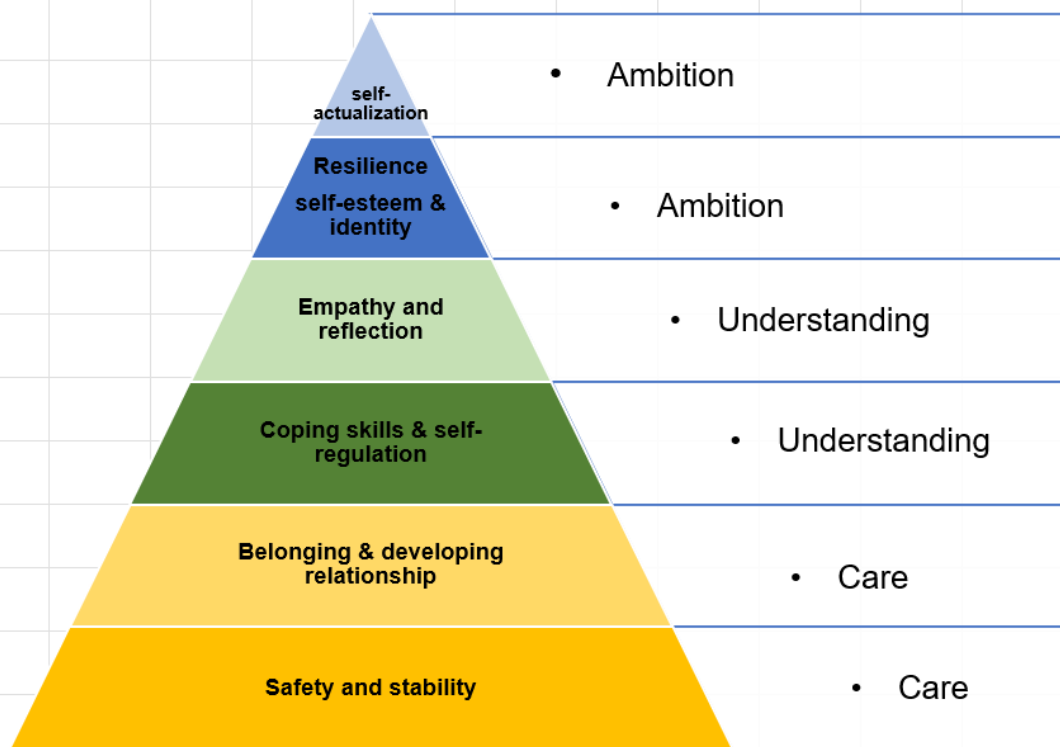




Science at Stone Lodge

Pupils are assessed against our PON in this subject. Alongside rigorous academic assessments, this supports learning and professional dialogue on how to further support accessing this subject for the pupil. Where pupils are identified as at the bottom of the PON triangle, it may mean that intervention is not necessarily needed for closing the gap but may be needed to support self-esteem and to build confidence to engage with the subject again.









Science at Stone Lodge Therapeutic School

At KS3 learners follow the AQA syllabus, and build a solid foundation of knowledge, ready to pursue the Cambridge IGCSE in combined Science during KS4. We do have the option to offer the Entry Level Certificate in Science at KS4 if it is more suitable for some of our learners.

Our learners arrive with varying Scientific knowledge and experiences and it is important to recognise that for some of our learners these may be negative and there may be significant gaps in knowledge. Our schemes of work and teaching methods are designed to be accessible for all our learners. Whilst gaining qualifications, our goals for our learners include; enjoying their Science lessons, becoming more competent in their knowledge and skills and therefore more confident in their ability and to gain enquiry skills that they will take forward for life.

<p>At the end of KS3</p> <p>Learners will have completed the AQA syllabus over three years and should have a good understanding of the Science fundamentals required for KS4. They will have had lots of practical experience and feel confident completing experiments. Learners will have built on their scientific vocabulary and enquiry skills.</p>	<p>At the end of KS4</p> <p>Learners will have completed their IGCSE. They will have developed practical skills advanced enough to enable them to successfully complete mandatory practical work.</p>	<p>Post 16</p> <p>Learners will have developed interests and skills to enable them to complete further scientific study or work post-16 if they wish to. They will have the enquiry and analytical skills to challenge society's news stories, data and politics. They will hopefully have a lifelong interest in Science.</p>
<p>Literacy opportunities</p> <p>Tier 2 Science literacy words – such as analyse, evaluate and argue will be defined and highlighted on exam past papers. They tend to be experimental skills based in Science but will also be used in other curricular areas.</p> <p>Tier 3 Science vocabulary – such as photosynthesis, electromagnetism and photovoltaic will be defined, used in supported and independent work and displayed in the classroom to support and embed learning.</p>	<p>Maths opportunities</p> <p>Using formulas</p> <p>Drawing and interpreting graphs and tables</p> <p>Ratios, fractions, decimals and percentages</p> <p>Using significant figures</p> <p>Calculating averages</p> <p>Measuring</p> <p>Converting units</p> <p>Using a calculator</p>	<p>Life skills and out of school experiences</p> <p>Health and fitness</p> <p>Environmental awareness – hopefully gain Eco School status and RHS Schools Gardening Certificate</p> <p>Visits</p> <p>Competitions – Science Week</p>
<p>Pedagogy</p> <p>Domain knowledge is built upon by direct instruction embedded into long-term memory by retrieval practices. Retrieval occurs at the start of lessons and then is scheduled for periodic revisits over the course of each year. For domain knowledge to be grown, existing knowledge must be ascertained; do learners possess the pre-requisite knowledge needed to access new learning? At the beginning of each learning sequence there will be an audit of existing knowledge. If the pre-requisite knowledge is not present then the learning sequence is stalled while this learning is covered.</p> <p>Direct instruction is implemented clearly and in a structured manner. Learning is sequenced and new information is supported by worked examples and models. After direct instruction and before independent practice can occur a 'check and consolidate' is performed. This will involve learners having to vocalise or write their understanding.</p> <p>To avoid overloading the working memory new vocabulary is introduced first before definitions are given. Support is in place whilst this learning is new. Questioning is used throughout as a method of checking that understanding has occurred and this is then built on with tasks to lock in this understanding. With this in mind the Rosenshine Model has been adopted to support the cognitive overload theory and we structure this in lessons using the following format:</p>		

Connect 	Explain 	Example 	Attempt 	Apply 	Challenge 
Activate prior learning	Instruct vocabulary Explain core concepts	High-quality modelling Explicit direct instruction (My turn)	Guided practice Gradually reduce scaffold (Our turn)	Independent practice Application of new concept (Your turn)	Deepen understanding Sophisticate thinking

Science practical work is completed alongside theory work. Practicals are chosen for their relevance to the curriculum and to ensure that student skills will develop.

There are opportunities within Science to explore moral and ethical dilemmas. This will be done sensitively and respectfully.

How does your subject allow you to develop the pupils understanding of PSHE and British values? Please give examples

PSHE - Health (including dental health) and fitness, personal hygiene, healthy lifestyles, reproduction and sexual health, health and safety.

British Values – scientific discoveries often come from other cultures, religious beliefs often compete with scientific understanding (tolerance and mutual respect), consider the views and opinions of others, take turns and instructions from others (democracy), understand the importance of following safety rules when working scientifically and the consequences of not doing so (the rule of law) and making choices when planning an investigation and considering that other people have a different point of view (individual liberty).

How does your subject and its delivery help pupils develop their essential skills? Please give examples



Listening - To other pupils answers, opinions and reasoning. Listening to instructions and following safety guidance and methods accurately. Listening and developing new Science vocabulary. Following instructions and being able to answer questions.

Speaking - Expressing opinions and ideas. Sharing findings and experimental analysis. Working as a pair/group. Answering questions.

Problem Solving – Developing a hypothesis and planning and implementing a practical to test the hypothesis. Being able to analyse the data to form a conclusion and evaluate the findings.

Creativity – Research projects, thinking outside of the box for problem solving, presenting information in a creative way. Linking with other curricular areas to work – Food Studies, Art, English, Geography, Maths.

Staying positive – having resilience if things do not originally go to plan, sticking with a difficult area of learning, being motivational and supportive of peers

Aiming High – Trying tasks set to extend learning and complete independent practice. Making links to build new knowledge onto existing knowledge

Leadership – Doing some peer teaching, leading on some group work, doing independent work and sharing this with the group

Teamwork – Working together to complete practical work, research tasks, sharing equipment, building on other learners ideas and answers

How else does your curriculum and delivery help the pupils prepare for life after Stone Lodge Therapeutic School; including their careers? Please give examples

All learners should leave Stone Lodge with a Science qualification that should enable them to go on to further study in a Scientific area if they wished to or to seek employment or an apprenticeship. Our pupils should have gathered experience that enables them to be effective communicators, collaborators and team workers. They will have perseverance, as well as analytical, reasoning and problem-solving skills

Assessment

- Questioning at the start of learning sequences to assess whether any required pre-requisite knowledge is present and to ascertain existing domain knowledge
- Retrieval questions at the start of each lesson to embed and revisit prior learning
- Constant assessment through verbal questions and tasks during a lesson
- End of unit assessments to check that progress has been made and for a further opportunity for retrieval practice
- Past paper exam questions will regularly be used with our students to prepare them for the content, structure and language of the exam papers

Cultural Capital

To enthuse our learners further in Science it is important that we spark interest wherever possible.

We want to foster a respect and passion for all things environmental so want to set up an Eco Club and to aim to become an Eco School.

We want to grow some of our own produce.

Trips to include The Science Museum, The National Space Centre and the Birmingham Aquarium.

To develop a range of activities during Science Week.

Professional Development

Subject knowledge enhancing – some self-led

Following respected science teachers and leaders on Twitter and reading blogs, journals

Member of CogSciSci – a community of Science teachers who share resources and champion the use of cognitive science in Science teaching – CogSciSci also offer free CPD courses

CLEAPPS membership

AQA courses (prep for Ofsted, Science leader courses, differentiation and teaching literacy)

STEM secondary Science leadership course

<https://www.stem.org.uk/pathways/leadership-secondary>

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