



Excellence in Science



South Craven School
SUPPORTED BY SOUTH CRAVEN ACADEMY TRUST

Adult Excellence

Explore

- Deep curiosity and understanding of the scientific world and its importance within society, the environment and the economy.
- Excellent subject knowledge in a given area.
- Research and develop theories to a high standard.
- Resilient and reflective learner.
- Good understanding of how to stay healthy and its importance.
- Make well-informed decisions that affect society.
- Excellent independent scientific skills.
- Keen to develop understanding.

Experiment

- Plan and carry out own investigations; follow complex, multi-step instructions; show dexterity in using a wide range of scientific equipment; make accurate, reliable measurements; be risk aware and able to access risks.

Explain

- Use logical thinking and problem-solving skills when faced with complex problems.
- Interpret, use, display and analyse data in a range of formats.
- Make specific improvements to ideas and make well-informed choices.
- Understand new developments as reported in the media, and able to question and challenge scientific claims that are made e.g. fake news.
- Communicate complex ideas clearly and eloquently to peers.
- Understand and use scientific terms appropriately.
- Deep understanding of the world.
- Effectively explain key concepts to others.
- Excellent subject knowledge that can be transferred to a wide range of new and different situations.

Key Stage 5 Excellence

Explore

- Independent, enjoy challenge, set high expectations for themselves yet shows resilience and is able to learn from their mistakes.
- Seek help where appropriate (not just from teaching staff).
- Make links between scientific ideas in their specialism.
- Consider economic, environmental and social issues and take these into account when making decisions.
- Participate actively in learning their subject.
- Able to demonstrate independent scientific skills.
- Excellent subject knowledge.
- Willing and able to research their interests.
- Curious nature and able to suggest theories and make detailed links between subject areas.
- Regularly research areas of interest of the subject.
- Understand the importance of science in society.
- Confidence in knowledge enough to use it to solve problems or pose questions.
- Develop interest in Biology/Chemistry/Physics/Applied Science-related careers and further study.
- Understand the scientific world and its importance within society.
- Do not accept things as facts but question validity and transferability of studies and understand the importance of data analysis in evaluating conclusions.
- Use problem-solving skills when faced with various problems.

Experiment

- Able to: plan and carry out own investigations; select appropriate equipment; correctly follow instructions; work methodically; make adjustments to methods where necessary, correctly use a range of scientific equipment with minimal assistance or prompting; identifies and controls significant quantitative variables; make accurate, reliable mean; identifies, assesses and minimises hazards/risks; makes accurate observations and collects sufficient data for analysis; processes and reports data.
- Experience of the key Common Practical (CPAC) activities and able to describe and explain these key techniques.

Explain

- Analyse, interpret and evaluate scientific information, ideas and evidence to make judgements and reach conclusions and refine practical design and procedures, considering errors and statistical analysis.
- Report experimental findings in an appropriate manner.
- Make reference to where data is obtained and know when to include the data of others to support ideas.
- Display data appropriately, use appropriate methods to analyse data, interpret trends and patterns in data and use it to draw conclusions.
- Evaluate the effectiveness of a method and make reasoned suggestions for improvements.
- Use research to support planning and conclusions, and reference this appropriately.
- Present balanced arguments and use data to back up their points.
- Read an exam question, know what it requires of them and answer with key points.
- Make informed decisions about how to present findings astutely.
- Explain key concepts to others clearly, with specific examples and using scientific terminology correctly.
- Make links between different concepts.
- Use subject knowledge in a range of new or different situations.
- Willingness to develop further understanding.
- Some understanding of new developments as reported in the media and able to question scientific claims that are made (e.g. fake news).

Key Stage 4 Excellence

Explore

- Innate curiosity and develop understanding of the scientific world.
- Apply understanding to novel situations and solve problems.
- Transfer some skills between science disciplines.
- Link curriculum to media issues and ability to explain use of key ideas outside of the classroom.
- Team worker; open-minded; resilient; confidence to learn from failure; independent; experimental; methodical; self-motivated learner; polite.
- Confidence to question perceived wisdom or presented fact.
- Willingness and ability to challenge own understanding to develop more complex schema to explain relationships.
- Ability to produce reasoned scientific arguments.
- Identify the real-world importance of key scientific topics.
- Understand human impact and scientific research on areas such as medicine and climate change.
- Process personal information and choices e.g. vaccine information and food labels.
- Understand ecological and economic issues related to science.
- Is a world citizen.

Experiment

- Plan practicals (coherent method; labelled diagram; equipment list; variables).
- Identify variables (IV, DV, CV) and suggested appropriate values and measuring equipment.
- Use a control in appropriate experiments and explain why it's needed.
- Carry out practicals (safely use equipment; risk assessment; picking correct equipment; repeats; teamwork – designate; patience; time management).
- Conducts research about practicals prior to piloting.
- Ability to improvise and plan.
- Methodically follow multistep instructions.
- Describe key practical techniques in detail so others could follow instructions.
- Propose improvements to practical procedures and give reasons for them.

Explain

- Draw scientific conclusions using appropriate scientific terminology to communicate ideas.

- Describe and explain key scientific processes with examples and correct use of key scientific vocabulary.
- Communicate ideas in a clear and concise manner.
- Begin to link ideas between different areas of science.
- Choose and manipulate multiple formulae at once and formulate answers using a logical process and using correct units.
- Rearrange equations.
- Work with scientific units and use standard form.
- Highlight anomalous results.
- Interpret line graphics deciding if things are proportional, directly proportional etc.
- Write a valid description of the interrelationship of more complex relationships involving up to four variables.
- Understand scientific information in the news (graphs, sample size etc.).
- Make attempts to assess reliability of information or ask questions (don't believe everything that is read).
- Offer opinions on scientific information based on factual information and personal opinion (and ability to recognise the difference).
- Understanding of the world around them, how the environment and body works and how to have a healthy lifestyle.
- Analyse theories.
- Evaluate own work and make improvements using independent resources, not the teacher.

Key Stage 3 Excellence

Explore

- Innate curiosity and develop understanding of the scientific world.
- Apply understanding to novel situations and solve problems.
- Transfer skills between science disciplines.
- Confidence to question and have the willingness to change their own and others minds.
- Start to identify the real-world importance of key scientific topics.
- Develop an understanding of human impacts and scientific research on areas such as medicine and climate change.
- Begin processing personal information and choices.
- Become a resilient and confident learner, appreciating successes as well as learning from failure.
- Begin evaluating own work, and make improvements using independent resources, not the teacher.

Experiment

- Plan practicals; choose equipment from a list; draw a labelled diagram; write a coherent method.
- Identify variables (IV, DV, CV) and suggested appropriate values and measuring equipment.
- Use a control in appropriate experiments and explain why it's needed.
- Write clear and concise methods, conclusions and evaluations.
- Use appropriate numeracy skills e.g. averages and unit conversion.
- Carry out practicals safely.
- Conduct a pilot test and adjust methods accordingly.
- Be methodical and resilient.
- Work independently and part of a group.
- Criticise methodology, propose improvements and give reasons for them.

Explain

- Draw scientific conclusions using appropriate scientific terminology to communicate ideas.
- Describe and explain key scientific processes with examples and correct use of key scientific vocabulary.
- Begin to link ideas between different areas of Science.

- Highlight errors and adjust data where required.
- Make attempts to assess the reliability of information.
- Use formulae and rearrange it/use the correct units for basic equations.
- Begin to interpret simple graphs and describe trends.
- Develop analytical skills to be able to understand scientific information in the news.
- Some understanding of relatable concepts including some exposure to more distant examples e.g. space, transport in plants, fields etc.
- Begin to scrutinise scientific communications with respect to bias and ethics and to offer an opinion based on factually information and personal opinion, and recognise the difference between the two.