Big Question: How do we keep ourselves safe in the lab?

AoLE: Science & Technology	Subject: Science - General	Year: 7

Big Question / Aim / Objective / Concept	Vision (Proposed outcome) / Purpose of curriculum	Prior knowledge / Learners previous knowledge
How do we keep ourselves safe in the lab?	During the scheme of work pupils will have the opportunity to start to investigate the world around them as scientists. They will learn how to experience science safely and be aware of the world around them. Critically thinking about the hazards posed to themselves and their peers. They will explore the scientific method which underpins how we carry out science and investigate phenomena. They will go on to use their numeracy and literacy skills to collate and evaluate data, write predictions, methods and conclusions on their findings.	Likely areas covered in Ks2: Pupils should have been given opportunities to carry out different types of enquiry, such as the following: pattern-seeking, exploring, classifying and identifying, making things, fair testing, using and applying models.

What does progression look like in this Big Question?

Progression Indicator	Description of learning (What matters statements)	Student evidence of progression (Blooms) / Knowledge
Excelling	I can describe the impacts of science and technology, past and present, in my everyday life. I can understand how my actions and the actions of others impact on the environment and living things. I can engage with scientific and technological evidence to inform my own opinions. I can evaluate methods to suggest improvements. I can use design thinking to test and refine my design decisions without fear of failure. I can apply my knowledge and skills when making design decisions in order to produce specific outcomes. I can use my findings to draw valid conclusions. I can review my own opinions based on new scientific evidence.	Evaluate using qualitative and quantitative methods to investigate a range of measurements to decide if two variables are proportional or inversely proportional. Use abstract science knowledge and multiple sources of information to explain predictions. Construct an appropriate graph for a given experiment with no support from the teacher. Suggest how they would control variables and state what range they will use. Be able to develop the use of repeat readings and averages into their own table. Collect their own data and arrange the results appropriately without support. Suggest a number of different control variables and justify why they are being controlled. Pupils are able to state the resolution of a given piece of apparatus. Pupils can justify the need for higher resolution instruments. Evaluate an investigation and suggest improvements to methods. Suggest how they would control variables and state what range they will use using their understanding of the scientific processes involved.

Advancing	I can suggest conclusions as a result of carrying out my inquiries. I can identify questions that can be investigated scientifically and suggest suitable methods of inquiry. I can use design communication methods to develop and present ideas, and respond to feedback. I can use a range of models to explain and make predictions. I can select relevant scientific knowledge from a range of evidence sources to evaluate claims presented as scientific facts.	Evaluate a specific incident and identify a suitable hazard symbol. State the role of oxygen in changing the type of flame of a Bunsen burner. Plot an appropriate graph for a given experiment with the correct axis labels. Suggest a number of different control variables. Be able to use some scientific understanding to help them explain a prediction. Plan to collect valid and reliable results. Plan a fair investigation without help. Evaluate why certain situations are hazardous.
Beginning	I can recognise that changes in materials affect their properties and uses under different conditions. I can use my knowledge and understanding to predict effects as part of my scientific exploration. I can recognise patterns from my observations and investigations and can communicate my findings. I can recognise that what I do, and the things I use, can have an impact on my environment and on living things.	Identify potential hazards in the laboratory and minimise potential risks in the lab. Identify basic hazard symbols used in the lab. State the names of key scientific apparatus used in the laboratory. Identify how to use a Bunsen burner safely and explain how to change the flame. State the difference between independent, dependent and control variables. Display data in tables. Use a range of tools with fine divisions accurately. Identify key variables in an investigation.

Authentic learning experiences (Local / National / International)	Skills (Literacy / Numeracy / DCF) / Cross Curricular links
Pupils link their lab safety training to the experimental method. Pupils design a key practical experiment linked to the steepest road in Wales and the forces acting on the object.	Numeracy • Measurement using fine division instruments. • Construction of accurate experimental drawings. • Use of averages. • Use of whole and decimal numbers. • Correct graphing technique - SALUTE. Literacy • Describe and explain using connectives to structure reasoning. • Focus on the command words for the description of processes. • Extended writing formalising sentences and structuring paragraphs. Pupils use connectives to explain their reasoning. • Summarise information. • Use oracy skills to present and discuss information. •

Assessment (How will we know that students have learnt what we taught them?)	
Formative assessment: • Teacher circulating • Q&A discussions on various phenomenon and scientific understanding • Identify key terms to definitions/examples • Peer/self-assessment tasks • Group experimental work • Explanations of specific processes such as conduction, convection and radiation • Lesson tasks such as measuring angles precisely allows the use of whiteboards or tasks that feedback to the teacher to ensure pupils have learnt the desired process	Summative assessment: • Pupils will undertake a practical assessment, pupils will have to plan, develop and carry out a practical experiment of their design • Pupils will undertake longer written questions using correct spelling, punctuation and grammar • Pupils will undertake an end of topic test to assess their understanding and knowledge

Evaluation (TBC July 2023)		
Strengths	Areas for Development	Pupil Voice