



Bideford College Science Faculty: Key Stage 2 – 4 Progress Matrix

	In order to get a grade 1 at GCSE you must be able to	In order to get a grade 2 at GCSE you must be able to	In order to get a grade 3 at GCSE you must be able to	In order to get a grade 4 at GCSE you must be able to	In order to get a grade 5 at GCSE you must be able to	In order to get a grade 6 at GCSE you must be able to	In order to get a grade 7 at GCSE you must be able to	In order to get a grade 8 at GCSE you must be able to	In order to get a grade 9 at GCSE you must be able to
Literacy	S1.1: Use some simple scientific terminology.	S2.1: Consistently use a range of simple scientific terminology both verbally and in written work.	S3.1: Use a range of scientific terminology accurately in paragraphs.	S4.1: Consistently write scientific terminology and definitions in well-structured paragraphs.	S5.1: Show use of command words such as describe and explain and write scientifically with fluency.	S6.1: Respond to questions independently with accuracy and depth.	S7.1: Ambitiously use a wide range of scientific terminology within coherent paragraphs.	S8.1: Respond to questions with clarity and displaying a well-developed argument.	S9.1: Respond to questions with fluency showing clear evaluation and understanding.
Numeracy	S1.2: Identify simple units. Use fractions as parts of a whole and percentage as parts per 100.	S2.2: Record results in frequency tables and draw bar charts. Calculate simple percentages and ratios.	S3.2: Find the mean, median and mode from data.	S4.2: Know and use correct units. Use the naming system for organic chemicals.	S5.2: Use significant figures, prefixes and powers of ten in calculations, eg. kilo ($\times 10^3$)	S6.2: Substitute numbers into equations, understand and use mathematical symbols and relationships.	S7.2: Rearrange simple equations and derive units. Determine the slope and intercept of linear graphs.	S8.2: Rearrange complex equations and derive units. Draw and use a tangent to a curve.	S9.2: Use calculators to find and use power, exponential and logarithmic functions.
Planning Investigations	S1.3: Identify what some pieces of equipment are used for. Select control variables from a list.	S2.3: Select appropriate equipment. Identify one or more control variables independently.	S3.3: Justify choices of equipment. Identify independent, dependent and control variables.	S4.3: Produce a coherent method that could be repeated identifying suitable intervals and ranges.	S5.3: Identify variables which cannot be controlled. Justify choices of equipment.	S6.3: Consider, accuracy, precision, repeatability and reproducibility in a scientific plan.	S7.3: Use a source and preliminary investigations to inform planning.	S8.3: Use theories, models, explanations and research from a range of sources to develop hypotheses.	S9.3: Craft a report detailing exactly how a hypothesis can be investigated to laboratory standards.
Experimental Skills and Strategies	S1.4: Carry out experiments safely with support from a teacher. Suggest some risks involved.	S2.4: Recognise and manage some risks in an experiment. Record a range of measurements safely.	S3.4: Identify most significant risks and hazards. Record a range of data safely and accurately	S4.4: Identify all significant risks and hazards in an experiment and how to manage them.	S5.4: Fully evaluate how to control and reduce risks in an experiment.	S6.4: Independently use hazcards to produce a risk assessment.	S7.4: Manipulate specialist apparatus to collect accurate data whilst considering health and safety.	S8.4: Carry out procedures methodically, identifying problems and making adjustments when necessary.	S9.4: Use practical work to make sense of the development of scientific thinking.

Collecting and Presenting Data	S1.5: Create a results table with support. Draw a bar chart to display some data.	S2.5: Draw a results table with the correct headings and label graph axis appropriately.	S3.5: Draw a results table to record data considering precision & repeats. Plot graphs accurately.	S4.5: Select suitable scales for graphs. Draw a line of best fit. Identify anomalies.	S5.5: Calculate means to suitable sig. fig. Justify the graph chosen. Draw accurate lines of best fit.	S6.5: Draw range bars. Explain anomalies and whether data is continuous or categoric.	S7.5: Measure gradients on graphs and carry out complex calculations with them.	S8.5: Record results methodically. Calculate % error, draw error bars and tangents to curves.	S9.5: Communicate the scientific rationale for findings through detailed reports and presentation.
Analysing Data	S1.6: Use results to suggest answers to questions.	S2.6: Identify one trend from given data using both the independent and dependent variables.	S3.6: Describe main trends from given data using evidence to support.	S4.6: Use scientific knowledge and understanding to explain results with some errors.	S5.6: Describe trends and interpret them correctly with reference to data and scientific knowledge.	S6.6: Comment on the extent to which data is consistent with a given hypothesis.	S7.6: Decide if given data supports a particular theory through critical analysis of conflicting evidence.	S8.6: Explain why new data from experiments or observations led to changes in models or theories.	S9.6: Process data to identify complex relationships between variables.
Evaluating Methods	S1.7: Identify one thing that either went well in your experiment or could have been better.	S2.7: Identify at one thing that went well in your experiment and one that could have been better.	S3.7: Identify a limitation in the method and suggest an improvement.	S4.7: Give reasons for an improvement in the method and comment on the validity of the data.	S5.7: Show awareness of potential sources of random and systematic error.	S6.7: Independently identify what caused anomalous results.	S7.7: Suggest and justify improvements to a procedure using scientific knowledge.	S8.7: Identify errors, evaluate accuracy, repeatability and reproducibility of data.	S9.7: Evaluate our perception of risk in relation to data and consequences.
Biology Knowledge and Conceptual Understanding	S1.8: Identify and name a number of different living organisms.	S2.8: Recall parts of cells and their functions. Name substances that organisms require for survival.	S3.8: Suggest how biological systems work and substances living organisms need are transported.	S4.8: Describe how substances move inside organisms. Recall biochemical equations for life processes.	S5.8: Explain the link between substances in life processes and what affects the rate of these.	S6.8: Link the role of cells to inheritance/ disease. Outline an ethical argument on new technology.	S7.8: Explain living transport systems. Apply and develop abstract ideas and models.	S8.8: Explain every day and technological applications of biology.	S9.8: Evaluate associated personal, social, economic and environmental implications using evidence.
Chemistry Knowledge and Conceptual Understanding	S1.9: Identify and name some materials around you. Recognise when a chemical reaction took place.	S2.9: Understand that everything is made up of atoms. Describe particle theory in using reactions.	S3.9: Recall the symbols of some elements. Recognise a reactant/ product and an element/ compound.	S4.9: Construct word equations when given reactants and products. State the number of atoms in formulae.	S5.9: Construct word equations without all the reactants and products being provided.	S6.9: Write balanced symbol equations given formulae. State the no. of atoms in complex formulae.	S7.9: Construct balanced symbol equations using formulae with brackets without being given formulae.	S8.9: Use models in explanations of data from experiments or observations.	S9.9: Understand that electrons are found in orbitals. Demonstrate understanding of ionic equations.
Physics Knowledge and Conceptual Understanding	S1.10: Recall some key words and ideas in physics such as	S2.10: Recall and communicate some knowledge of key words and	S3.10: See links between physics and everyday life. Describe models	S4.10: Show knowledge of key ideas and equations such as calculating	S5.10: Apply knowledge of topics like calculating power in circuits and	S6.10: Use the idea of cause and effect, models and equations to	S7.10: Examine a situation using models, theories and equations to	S8.10: Recognise that differences in physical conditions	S9.10: Show a full understanding of the nature of physics, its laws,

	selecting correct forces from a list.	what key ideas are involved.	such as for sound and magnetism.	pressure and balancing moments.	describing electrical fields.	explain observations.	analyse situations eg. fields.	can cause change and explain this.	principles and applications.
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