Disciplinary Knowledge - Science

Salisbury Manor Primary School
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The tables below outlines where disciplinary knowledge – the working scientifically elements – is **first taught** and deliberately practised in KS1 or KS2. The curriculum has been sequenced so that the content is also reviewed in subsequent units (and may also be reviewed in other subject areas like geography and history), but to keep the table readable, we have only set out where it is first taught. The Mathematics Programmes of Study have been considered so that pupils never need to apply mathematical skills (e.g. calculating mean, rounding to an appropriate degree, constructing graphs) until they have first been taught in mathematics lessons

	Scientific Attitudes & Planning (A&P)	**Measuring & Observing** (M&O)	**Recording & Presenting** (R&P)	**Analysing & Evaluating** (A&E)
EYFS	• Make predictions about what might happen when I try something	• Measure/observe using senses • Observe using a magnifying glass safely	• Use hoops to classify objects based on simple criteria	• Notice patterns in the world around me
Y1	• Scientists look for patterns in the world around them • Scientists group objects or living things based on their properties • Scientists conduct secondary research to learn from what other scientists have already learned	• Gather information from text/ books/ images	• Record numerical or descriptive observations in a table • Draw a diagram, a simple scientific drawing that explains or informs • Use a table to classify items based on properties • Use a Carroll diagram to classify items based on properties • Use a Venn diagram to classify items into two or three sets based on properties	• Make simple statements about the results of an enquiry

Y2	• It is important that we keep as much as we can the same, apart from the one thing we measure and the one thing we change • Make a prediction based on substantive knowledge • There are four main stages of enquiry (A&P, M&O, R&P, A&E) • Scientists identify potential hazards in their experiments and plan ways to reduce them • Scientists conduct investigations to identify whether a pattern they think they've seen is really there	• Make systematic observations of an object	• Use a pair of axes to classify items based on the extent it displays two properties	• Ask further questions that could be explored to extend findings

	Scientific Attitudes & Planning (A&P)	**Measuring & Observing** (M&O)	**Recording & Presenting** (R&P)	**Analysing & Evaluating** (A&E)
Y3	• Select most appropriate equipment to measure (the variables) that will give you the best chance of an accurate result • A dependent variable is what you measure; an independent	• Gather information from the internet • Anomalous results should be discarded and rerecorded • Data is repeatable if the same person repeats the investigation and gets the	• Design a table to collect data with the appropriate number of rows and columns and correct headings	• Draw conclusions (e.g. 'the greater the… , the greater the…') • Use scientific understanding to explain their findings

	variable is what you change; controlled variables are things that stay the same • Scientists identify factors in an investigation that should be controlled, and try to find ways to control them • Write an appropriate method • Science is studied as three disciplines: biology (study of organisms), chemistry (study of materials) and physics (study of energy)	same results; data is reproducible if the investigation is repeated by a different person and the results are the same • Taking multiple readings allows you to see if your data is repeatable, and helps identify outliers		• Suggest ways to improve practical procedures to obtain more accurate measurements • Use findings of investigation to make further predictions
Y4	• Set a hypothesis to test • Draw diagram of the investigation • Scientists use models to help explain their ideas	• Gather information using a data logger (e.g. sound meter app; heart rate app)	• Use a classification key to identify an object • Draw a dichotomous classification key to help others identify an object • Present information orally using a prop or demonstration • Present information in a written format	• Identify scientific evidence that has been used to support or refute ideas
Y5	• Science is studied as three disciplines: biology (study of organisms), chemistry (study of properties of matter and	• Measure force using a Newtonmeter	• Scatter graphs can help you decide if there is a relationship between two variables	• Make judgements on the accuracy of the data

	how it interacts with energy) and physics (study of energy) • Scientists look for patterns in data to try to identify correlations • Scientists must work out if the factor is the cause of the outcome in a correlation		• (Geography: Interpret and construct climate graph) • Line graphs can be used when data is continuous; bar charts can be used when data is discrete	• Some people may agree or disagree with the use of some scientific discoveries • Science is never 'complete' and scientists are always working to make models more accurate or to discover new explanations
Y6		• Taking multiple readings allows you to see if your data is repeatable, helps identify outliers and allows a mean to be calculated	• Decide which graph is most appropriate for the enquiry	• Calculating the mean can be used as a method of analysing data
KS3	• Evaluate risks	• Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility • Use a wider range of apparatus and techniques • Apply sampling techniques • Evaluate data, showing awareness of potential sources of random and systematic error	• Use a range of graph types to display data, including pie charts, scatter graphs and line graphs	• The difference between correlation and causation, and suggesting ways to test for both • Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review