Key Stage 3 Grade Descriptors

Asking questions/ making predictions/ planning and designing investigations			
Pathway	Year 7	Year 8	Year 9
Foundation	Describe observations Ask questions that could be tested in a laboratory.	Choose a variable to change and one to measure. Identify equipment from a given selection	Describe prior knowledge that may help with the questions. Describe steps in an investigation planning for repeats. Suggest what might happen in the test. Repeats will occur and data will be recorded to a reasonable level of accuracy.
Core	Describe prior knowledge that may help with the questions. Describe steps in an investigation planning for repeats. Select one independent and dependant variable to make a valid test. Identify control variables. Suggest what might happen in the test.	Repeats will occur and data will be recorded to a reasonable level of accuracy. Identify variables that can be controlled or measured. Suggest a hypothesis that relates to the independent and dependant variable. Select techniques and equipment from a broad range.	Identify three variables that can be controlled or measured. Suggest a hypothesis of how the independent variable affects the dependent variable. Select techniques and equipment and suggest a suitable range based on related experiences.
Proficient	Identify variables that can be controlled or measured. Suggest a hypothesis that relates to the independent and dependant variable. Select techniques and equipment from a broad range.	Suggest a hypothesis of how the independent variable affects the dependent variable. Select techniques and equipment and suggest a suitable range based on related experiences. Select variables that can be accurately and precisely measured. Describe steps in detail including aspects to improve accuracy, precision and repeatability.	Suggest a hypothesis of how the independent variable affects the dependent variable that is based on prior knowledge and observations. Justify the range of values collected. Based on a hypothesis make a prediction that relates to measurable values and ranges. Justify selection of techniques and equipment.

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Exceptional	Select variables that can be accurately and precisely measured. Suggest a hypothesis of how the independent variable affects the dependent variable that is based on prior knowledge and observations. Describe steps in detail including aspects to improve accuracy, precision and repeatability. Justify the range of values collected. Based on a hypothesis make a prediction that relates to measurable values and ranges. Justify selection of techniques and equipment.	Justify the range of values collected. Based on a hypothesis make a prediction that relates to measurable values and ranges. Justify selection of techniques and equipment. Outliers are checked and handled appropriately. Based on a hypothesis make a prediction that relates to measurable values and ranges, the outcomes will be quantified. Justify each decision.	Based on a hypothesis make a prediction that relates to measurable values and ranges, the outcomes will be quantified. Justify each decision. Justify the selection of variables to be measured. Justify each decision and relate choices in technique to accuracy, precision and repeatability.

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Making and recording observations			
Grade	Year 7	Year 8	Year 9
Foundation	Follow a given plan.	Follow a given plan and record data in a given table.	With clear guidance create a data table. Repeats will occur. Data will be recorded to a reasonable level of accuracy.
Core	Data will be recorded to a reasonable level of accuracy. Create a suitable table with correct use of headings and units.	Create a suitable table with correct use of headings and units. Collect data with attention to accuracy and precision.	Collect data with attention to accuracy and precision. Repeats will be carried out and recorded clearly.
Proficient	Collect data with attention to accuracy and precision.	Repeats will be carried out and recorded clearly.	Collect data systematically with attention to accuracy and precision Outliers are checked and handled appropriately
Exceptional	Collect data systematically with attention to accuracy and precision Outliers are checked and handled appropriately	Outliers are checked and handled appropriately Evaluate the reliability of methods through preliminary tests.	Evaluate the reliability of methods through preliminary tests and suggest improvements to techniques and equipment.

Key Stage 3 Grade Descriptors

Presenting and Interpreting Data/ Analysing data/ calculating scientifically			
Grade	Year 7	Year 8	Year 9
Foundation	A given table will include space for averages to be calculated and guidance given for these calculations. Use the correct units for familiar values. Graphs will be drawn on given axes with worked examples.	Use the correct units for familiar values. Simple descriptions of the trend. Calculate averages with given examples. Include appropriate labels on graphs.	Graphs will be drawn on given axes with worked examples. Simple descriptions of the trend. Calculate averages with given examples. Include appropriate units on graphs. Calculate averages.
Core	Calculate averages with given examples. Include appropriate units on graphs.	Calculate averages. Draw a graph with correct axes (some errors in plotting). Describe the pattern shown in the data. Use given equations to calculate simple values.	Describe the pattern shown in the data. Use given equations to calculate simple values. Draw a graph with accurate plotting. Explain the pattern shown in the data based on prior knowledge. Include specific data points in the trend description. Draw an appropriate graph with an appropriate line of best fit.
Proficient	Describe the pattern shown in the data. Use given equations to calculate simple values. Draw an appropriate graph with an appropriate line of best fit.	Explain the pattern shown in the data based on prior knowledge. Include specific data points in the trend description. Recall simple equations and be able to rearrange them when necessary.	Explain the trend in the line with the explanations given for your hypothesis. Recall simple equations and be able to rearrange them when necessary. Explain any data values that are not as expected. Be able to compare data values looking for multiples or % changes.
Exceptional	Explain the trend in the line with the explanations given for your hypothesis. Recall simple equations and be able to rearrange them when necessary. Explain any data values that are not as expected.	Explain any data values that are not as expected. Be able to compare data values looking for multiples or % changes. Range calculated and range bars included on graph.	Range calculated and range bars included on graph. Discuss how far the data supports the prediction and explain any changes. Recall and manipulate equations for data analysis.

Key Stage 3 Grade Descriptors

Evaluating data			
Grade	Year 7	Year 8	Year 9
Foundation	Comment on the data Comment on if there is enough data to draw a conclusion.	Comment on if there is enough data to draw a conclusion. Suggest any extra data that might be needed. Comment on how closely the data matches what was expected.	Suggest any extra data that might be needed. Discuss if the range chosen allowed the original question to be answered. Compare the data to the hypothesis; identify matching points and points that do not match.
Core	Discuss if the range chosen allowed the original question to be answered. Compare the data to the hypothesis; identify matching points and points that do not match.	Compare the data to the hypothesis; identify matching points and points that do not match. Suggest questions for further investigation.	Suggest questions for further investigation. Describe in detail data points that are not as expected and given reasons for the differences.
Proficient	Suggest questions for further investigation. Describe in detail data points that are not as expected and given reasons for the differences.	Describe in detail data points that are not as expected and given reasons for the differences. Make comments on accuracy, precision and repeatability.	Make comments on accuracy, precision and repeatability. Outline any further questions, extensions or variations on the original question.
Exceptional	Make comments on accuracy, precision and repeatability. Outline any further questions, extensions or variations on the original question.	Outline any further questions, extensions or variations on the original question. Detailed account of the relevant data needed to increase the confidence in the hypothesis.	Detailed account of the relevant data needed to increase the confidence in the hypothesis. Compare results to secondary data commenting on how it supports, extends or undermines the primary data.

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Building Scientific Awareness			
Grade	Year 7	Year 8	Year 9
Foundation	Work safely in the laboratory Identify risks in a planned activity Check data to see if it is good enough.	Identify risks in a planned activity Check data to see if it is good enough. Recognise that scientific ideas change throughout history. Identify any necessary safety measures for a planned activity.	Identify any necessary safety measures for a planned activity. Check data matches the question being investigated. Check there is only one independent variable and that control variables are being monitored.
Core	Identify any necessary safety measures for a planned activity. Check data matches the question being investigated.	Check data matches the question being investigated. Check there is only one independent variable and that control variables are being monitored.	Give examples of how key ideas have changed through history. Use hazard information to recognise risk in unfamiliar examples.
Proficient	Give examples of how key ideas have changed through history. Use hazard information to recognise risk in unfamiliar examples.	Use hazard information to recognise risk in unfamiliar examples. Review given data for accuracy and repeatability. Look at the equipment and techniques used and decide if they are the best.	Review given data for accuracy and repeatability. Look at the equipment and techniques used and decide if they are the best. Consider how publishing results and ideas allow scientific ideas to develop.
Exceptional	Review given data for accuracy and repeatability. Look at the equipment and techniques used and decide if they are the best. Consider how publishing results and ideas allow scientific ideas to develop.	Consider how publishing results and ideas allow scientific ideas to develop. Carry out full risk assessments.	Carry out full risk assessments. Evaluate the impact of peer review on the development of scientific ideas.

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