Roundwood Park School

Science

Skills Descriptors

Demonstrating knowledge

Applying and communicating in science

Investigative skills

Maths Skills

Science – Demonstrating knowledge

YEAR 7	YEAR 8
	MASTERING + Working above a mastering level
MASTERING + Working above a mastering level	**MASTERING** Make explicit connections between abstract ideas and/or models in explaining processes or phenomena, systematically deciding the importance of each. Explain how different pieces of evidence support accepted scientific ideas or contribute to questions that science cannot fully answer. Explain the processes by which ideas and evidence are accepted or rejected by the scientific community.
MASTERING Use abstract ideas, models or multiple factors when explaining processes or phenomena. Identify the strengths and weaknesses of particular models. Describe some scientific evidence that supports or refutes particular ideas or arguments, including those in development. Explain how new scientific evidence is discussed and interpreted by the scientific community and how this may lead to changes in scientific ideas.	**SECURING** Use abstract ideas, models or multiple factors when explaining processes or phenomena. Identify the strengths and weaknesses of particular models. Describe some scientific evidence that supports or refutes particular ideas or arguments, including those in development. Explain how new scientific evidence is discussed and interpreted by the scientific community and how this may lead to changes in scientific ideas.
SECURING Use abstract ideas or models or more than one step when describing processes. Explain processes, suggest solutions to problems or answer questions by drawing on abstract ideas or models. Recognise scientific questions that do not yet have definitive answers. Identify the use of evidence and creative thinking by scientists in the development of scientific ideas	**DEVELOPING** Use abstract ideas or models or more than one step when describing processes. Explain processes, suggest solutions to problems or answer questions by drawing on abstract ideas or models. Recognise scientific questions that do not yet have definitive answers. Identify the use of evidence and creative thinking by scientists in the development of scientific ideas
DEVELOPING Use scientific ideas when describing simple processes. Use simple models to describe scientific ideas. Identify scientific evidence that is being used to support or refute ideas or arguments.	**ACQUIRING** Use scientific ideas when describing simple processes. Use simple models to describe scientific ideas. Identify scientific evidence that is being used to support or refute ideas or arguments.
ACQUIRING Identify differences, similarities or changes related to simple scientific ideas and processes. Respond to ideas given to them to answer questions or suggest solutions to problems. Represent things in the real world using simple physical models. Use straightforward scientific evidence to answer questions, or to support their findings.	

Science – Applying and communicating in science

YEAR 7	YEAR 8
MASTERING + Working above a mastering level	**MASTERING +** Working above a mastering level
MASTERING Identify lack of balance in the presentation of information or evidence. Choose forms to communicate qualitative or quantitative data appropriate to the data and the purpose of the communication. Distinguish between data and information from primary sources, secondary sources and simulations, and present them in the most appropriate form. Explain and evaluate the power, limitations and ethical implications of science. Present data to support hypotheses.	**MASTERING** Explain how information or evidence from various sources may been manipulated in order to influence interpretation. Effectively represent abstract ideas using appropriate symbols, flow diagrams and different kinds of graphs to present explanations and arguments. Explain how scientists with different specialisms and skills have contributed to particular scientific or technological developments. Explain and evaluate the power, limitations and ethical implications of science.
SECURING Distinguish between opinion and scientific evidence in contexts related to science, and use evidence rather than opinion to support or challenge scientific arguments. Use appropriate scientific and mathematical conventions and terminology to communicate abstract ideas. Suggest how collaborative approaches to specific experiments or investigations may improve the evidence collected. Appreciate the power, limitations and ethical implications of science.	**SECURING** Identify lack of balance in the presentation of information or evidence. Choose forms to communicate qualitative or quantitative data appropriate to the data and the purpose of the communication. Distinguish between data and information from primary sources, secondary sources and simulations, and present them in the most appropriate form. Explain and evaluate the power, limitations and ethical implications of science. Present data to support hypotheses.
DEVELOPING Select appropriate ways of presenting scientific data. Use appropriate scientific forms of language to communicate scientific ideas and processes. Use scientific and mathematical conventions when communicating information or ideas. Identify some limitations and ethical implications of science. State whether or not data supports the hypothesis.	**DEVELOPING** Distinguish between opinion and scientific evidence in contexts related to science, and use evidence rather than opinion to support or challenge scientific arguments. Use appropriate scientific and mathematical conventions and terminology to communicate abstract ideas. Suggest how collaborative approaches to specific experiments or investigations may improve the evidence collected. Appreciate the power, limitations and ethical implications of science.
ACQUIRING Use scientific forms of language when communicating simple scientific ideas and processes. Identify simple advantages of working together on experiments or investigations. Suggest improvements to their working methods. Identify some things in science that people might disagree with.	**ACQUIRING** Select appropriate ways of presenting scientific data. Use appropriate scientific forms of language to communicate scientific ideas and processes. Use scientific and mathematical conventions when communicating information or ideas. Identify some limitations and ethical implications of science. State whether or not data supports the hypothesis.

Science – Investigative skills

YEAR 7	YEAR 8
MASTERING + Working above a mastering level	**MASTERING +** Working above a mastering level
MASTERING Apply scientific knowledge and understanding in the planning of investigations and making predictions, identifying significant variables, including independent, dependent and control variables. Justify their method choice and number of observations/measurements. Collect data, choosing appropriate ranges, numbers and values for measurements and observations. Independently recognise a range of familiar risks and take action to control them. Evaluate data to identify sources of error.	**MASTERING** Formulate hypotheses using information from a range of sources. Identify key variables in complex contexts, explaining why some cannot readily be controlled and planning appropriate approaches to investigations to take account of this. Explain how to take account of sources of error in order to collect reliable data. Recognise the need for risk assessments and consult, and act on, appropriate sources of information. Explain ways of modifying working methods to improve reliability. Present data to support hypotheses.
SECURING Recognise significant variables in investigations, selecting the most suitable to investigate. Explain why particular pieces of equipment or information sources are appropriate for the questions or ideas under investigation. Repeat sets of observations or measurements in case of error, selecting suitable ranges and intervals. Make, and act on, suggestions to control obvious risks to themselves and others. Evaluate the effectiveness of their working methods, making practical suggestions for improving them.	**SECURING** Apply scientific knowledge and understanding in the planning of investigations and making predictions, identifying significant variables, including independent, dependent and control variables. Justify their method choice and number of observations/measurements. Collect data, choosing appropriate ranges, numbers and values for measurements and observations. Independently recognise a range of familiar risks and take action to control them. Evaluate data to identify sources of error.
DEVELOPING Decide when it is appropriate to carry out fair tests in investigations. Select appropriate equipment or information sources to address specific questions or ideas under investigation. Make sets of observations or measurements, identifying the ranges and intervals used. Identify possible risks to themselves and others. Suggest improvements to their working methods, giving reasons.	**DEVELOPING** Recognise significant variables in investigations, selecting the most suitable to investigate. Explain why particular pieces of equipment or information sources are appropriate for the questions or ideas under investigation. Repeat sets of observations or measurements in case of error, selecting suitable ranges and intervals. Make, and act on, suggestions to control obvious risks to themselves and others. Evaluate the effectiveness of their working methods, making practical suggestions for improving them.
ACQUIRING Identify one or more control variables in investigations from those provided. Select equipment or information sources from those provided to address a question or idea. Make some accurate observations or whole number measurements relevant to questions or ideas under investigation. Recognise obvious risks when prompted.	**ACQUIRING** Decide when it is appropriate to carry out fair tests in investigations. Select appropriate equipment or information sources to address specific questions or ideas under investigation. Make sets of observations or measurements, identifying the ranges and intervals used. Identify possible risks to themselves and others. Suggest improvements to their working methods, giving reasons.

Science – Maths Skills

YEAR 7	YEAR 8
	MASTERING + Working above a mastering level
MASTERING + Working above a mastering level	**MASTERING** Explain how data can be interpreted in different ways and how unexpected outcomes could be significant. Identify quantitative relationships between variables, using them to inform conclusions and make further predictions. Assess the strength of evidence, deciding whether it is sufficient to support a conclusion. Be able to rearrange equations and input data with various different units, selecting the most appropriate one to represent the data. Produce graphs and tables using your own data, or from secondary sources.
MASTERING Suggest reasons based on scientific knowledge and understanding for any limitations or inconsistencies in evidence collected. Select and manipulate data and information and use them to contribute to conclusions. Draw conclusions that are consistent with the evidence they have collected and explain them using scientific knowledge and understanding. Make valid comments on the quality of their data. Be able to rearrange equations to find the missing variable. Present data (their own or a secondary source) using results tables and graphs.	**SECURING** Suggest reasons based on scientific knowledge and understanding for any limitations or inconsistencies in evidence collected. Select and manipulate data and information and use them to contribute to conclusions. Draw conclusions that are consistent with the evidence they have collected and explain them using scientific knowledge and understanding. Make valid comments on the quality of their data. Be able to rearrange equations to find the missing variable. Present data (their own or a secondary source) using results tables and graphs.
SECURING Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. Interpret data in a variety of formats, recognising obvious inconsistencies. Provide straightforward explanations for differences in repeated observations or measurements. Draw valid conclusions that utilise more than one piece of supporting evidence, including results tables and line graphs.	**DEVELOPING** Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. Interpret data in a variety of formats, recognising obvious inconsistencies. Provide straightforward explanations for differences in repeated observations or measurements. Draw valid conclusions that utilise more than one piece of supporting evidence, including results tables and line graphs.
DEVELOPING Identify patterns in data presented in various formats, including line graphs. Draw straightforward conclusions from data presented in various formats. Identify scientific evidence they have used in drawing conclusions. Use simple equations to input data to find the missing variable, changing the units where appropriate.	**ACQUIRING** Identify patterns in data presented in various formats, including line graphs. Draw straightforward conclusions from data presented in various formats. Identify scientific evidence they have used in drawing conclusions. Use simple equations to input data to find the missing variable, changing the units where appropriate.
ACQUIRING Identify straightforward patterns in observations or in data presented in various formats, including tables, pie and bar charts. Present simple scientific data in more than one way, including tables and bar charts. Use simple equations to input data to find the missing variable.	