	AF1	AF2	AF3	AF4	AF5
Level 8	1. Describe or explain processes or phenomena, logically and in detail, making use of abstract ideas and models from different areas of science 2. Select and justify an appropriate approach to evaluating the relative importance of a number of different factors in explanations or arguments 3. Analyse the development of scientific theories through the emergence of new, accepted ideas and evidence. 4. Analyse the development of scientific theories through the emergence of new, accepted ideas and evidence.	1. Describe ways in which the values of a society influence the nature of the science developed in that society or period of history. 2. Explain the unintended consequences that may arise from scientific and technological developments. 3. Evaluate the effects of scientific or technological developments on society as a whole, Make balanced judgements about particular scientific or technological developments by evaluating the economic ethical/moral, social or cultural implications. *4..*	1. Present robust and well structured explanations, arguments or counter arguments in a variety of ways. 2. Present robust and well structured explanations, arguments or counter arguments in a variety of ways. 3. Critically evaluate information and evidence from various sources, explaining limitations, misrepresentation or lack of balance. 4. Suggest the specialisms and skills that would be needed to solve particular scientific problems or to generate particular new scientific or technological developments.	1. Justify their choice of strategies for investigating different kinds of scientific questions, using scientific knowledge and understanding. 2. Justify their choice of strategies for investigating different kinds of scientific questions, using scientific knowledge and understanding. 3. Choose and justify data collection methods that minimise error, and produce precise and reliable data. 4. Adapt their approaches to practical work to control risk by consulting appropriate resources and expert advice.	1. Suggest and justify improvements to experimental procedures using detailed scientific knowledge and understanding and suggest coherent strategies to take particular investigations further. 2. Propose scientific explanations for unexpected observations or measurements, making allowances for anomalies. Critically interpret, evaluate and synthesise conflicting evidence. 3. Process data, including using multi step calculations and compound measures to indentify complex relationships between variables. 4. ..
Level 7	1. Make explicit connections between abstract ideas and/or models in explaining processes or phenomena 2. Employ a systematic approach in deciding the relative importance of a number of scientific factors when explaining processes or phenomena 3. Explain the processes by which ideas and evidence are accepted or rejected by the scientific community. 4. Explain how different pieces of evidence support accepted scientific ideas or contribute to questions that science cannot fully answer.	1. Suggest ways in which scientific and technological developments may be influenced Suggest economic, ethical/moral, social or cultural arguments for and against scientific or technological developments 2. Explain how creative thinking in science and technology generates ideas for future research and development. 3. Explain how scientific discoveries can change worldviews. 4. .	1. Effectively represent abstract ideas using appropriate symbols, flow diagrams and different kinds of graphs in presenting explanations and arguments . 2. Effectively represent abstract ideas using appropriate symbols, flow diagrams and different kinds of graphs in presenting explanations and arguments. 3. Explain how information or evidence from various sources may been manipulated in order to influence interpretation. 4. Explain how scientists with different specialisms and skills have contributed to particular scientific or technological developments	1. Formulate questions or ideas that can be investigated by synthesising information from a range of sources. 2. Identify key variables in complex contexts, explaining why some cannot readily be controlled and planning appropriate approaches to investigations to take account of this. 3. Explain how to take account of sources of error in order to collect reliable data. 4. Recognise the need for risk assessments and consult, and act on, appropriate sources of information	1. Explain ways of modifying working methods to improve reliability. 2. Assess the strength of evidence, deciding whether it is sufficient to support a conclusion. 3. Explain how data can be interpreted in different ways and how unexpected outcomes could be significant. Indentify quantative relationships between variables, using them to inform conclusions and make further predictions. 4..
Level 6	1. Use abstract ideas or models or multiple factors when explaining processes or phenomena 1. Identify the strengths and weaknesses of particular models *2.* Describe some scientific evidence that supports or refutes particular ideas or arguments, including those in development *3.* Explain how new scientific evidence is discussed and interpreted by the scientific community and how this may lead to changes in scientific ideas. *4.* Describe some scientific evidence that supports or refutes particular ideas or arguments, including those in development.	1. Describe how different decisions on the uses of scientific and technological developments may be made in different economic, social or cultural contexts 2. Describe how particular scientific or technological developments have provided evidence to help scientists pose and answer further questions. 3. Explain how societies are affected by particular scientific applications or ideas. 4. Describe how aspects of science are applied in particular jobs or roles	1. Choose forms to communicate qualitative or quantitative data appropriate to the data and the purpose of the communication. 2. Distinguish between data and information from primary sources, secondary sources and simulations, and present them in the most appropriate form. 3. identify lack of balance in the presentation of information or evidence. 4. ..	1. Collect data choosing appropriate ranges, numbers and values for measurements and observations. 2. Apply scientific knowledge and understanding in the planning of investigations, identifying significant variables and recognising which are independent and which are dependent Justify their choices of data collection method and proposed number of observations and measurements. 3... 4. Independently recognise a range of familiar risks and take action to control them.	1. Make valid comments on the quality of their data. 2. suggest reasons based on scientific knowledge and understanding for any limitations or inconsistencies in evidence collected. 3. 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. 4..
Level 5	1. Use abstract ideas or models or more than one step when describing processes or phenomena 1. Explain processes or phenomena, suggest solutions to problems or answer questions by drawing on abstract ideas or models 2. Identify the use of evidence and creative thinking by scientists in the development of scientific ideas 3. Identify the use of evidence and creative thinking by scientists in the development of scientific ideas 4. Recognise scientific questions that do not yet have definitive answers	1. Describe different viewpoints a range of people may have about scientific or technological developments Identify ethical or moral issues linked to scientific or technological developments 2. . 3. Indicate how scientific or technological developments may affect different groups of people in different ways Link applications of science or technology to their underpinning scientific ideas. *4..*	1. Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. 2. Use appropriate scientific and mathematical conventions and terminology to communicate abstract ideas. 3. Distinguish between opinion and scientific evidence in contexts related to science, and use evidence rather than opinion to support or challenge scientific arguments and use evidence rather than opinion to support or challenge scientific arguments. 4. Suggest how collaborative approaches to specific experiments or investigations may improve the evidence collected.	1. Explain why particular pieces of equipment or information sources are appropriate for the questions or ideas under investigation. 2. Recognise significant variables in investigations, selecting the most suitable to investigate 3. Repeat sets of observations or measurements where appropriate, selecting suitable ranges and intervals. 4. Make, and act on, suggestions to control obvious risks to themselves and others	1. Evaluate the effectiveness of their working methods, making practical suggestions for improving them. 2. Provide straightforward explanations for differences in repeated observations or measurements. 3. Interpret data in a variety of formats, recognising obvious inconsistencies. Draw valid conclusions that utilise more than one piece of supporting evidence, including numerical data and line graphs. 4..
Level 4	1. Use simple models to describe scientific ideas. 2. Identify scientific evidence that is being used to support or refute ideas or arguments. 3. Use scientific ideas when describing simple processes or phenomena 4. Identify scientific evidence that is being used to support or refute ideas or arguments.	1. . 2. . 3. Describe some simple positive and negative consequences of scientific and technological developments Recognise applications of specific scientific ideas. 4. **Identify aspects of science used within particular jobs or roles**	1. Select appropriate ways of presenting scientific data 2. Use appropriate scientific forms of language to communicate scientific ideas, processes or phenomena Use scientific and mathematical conventions when communicating information or ideas. *3..* *4..*	1. Select appropriate equipment or information sources to address specific questions or ideas under investigation. 2. Decide when it is appropriate to carry out fair tests in investigations. 3. Make sets of observations or measurements, identifying the ranges and intervals used. 4. Identify possible risks to themselves and others.	1. Suggest improvements to their working methods, giving reasons. 2. .. 3. Identify patterns in data presented in various formats including line graphs. Draw straightforward conclusions from data presented in various formats. 4. Identify scientific evidence they have used in drawing conclusions.
Level 3	1. Represent things in the real world using simple physical models. 2. Identify differences, similarities or changes related to simple scientific ideas, processes or phenomena. Use straightforward scientific evidence to answer questions, or to support their findings. 3. Respond to ideas given to them to answer questions or suggest solutions to problems. 4.	*1.* *2..* *3.* Explain the purposes of a variety of scientific or technological developments Link applications to specific characteristics or properties *4.* **Identify aspects of our lives, or of the work that people do, which are based on scientific ideas.**	1. Use scientific forms of language when communicating simple scientific ideas, processes or phenomena. 2.. Present simple scientific data in more than one way, including tables and bar charts. 3.. 4. Identify simple advantages of working together on experiments or investigations	1. Select equipment or information sources from those provided to address a question or idea under investigation. 2. Identify one or more control variables in investigations from those provided. 3. Make some accurate observations or whole number measurements relevant to questions or ideas under investigation. 4. Recognise obvious risks when prompted	1. Suggest improvements to their working methods. 2. .. 3. Identify straightforward patterns in observations or in data presented in various formats including tables, pie and bar graphs. Describe what they have found out in experiments or investigations linking cause and effect. 4..