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| PROGRESSION IN WORKING SCIENTIFICALLY | | | |
|  | KS1 | LKS2 | UKS2 |
|  | By the time children leave The Grove, they will be able to:   * Evaluate their work and make suggestions for improvement. * Identify several variables and select the best one/s to investigate. * Say why equipment is appropriate to the task. * Make suggestions to control risks. * Decide which format is best to present data. * Use scientific conventions to explain abstract ideas. * Know the difference between scientific evidence and opinion. * Understand that people have different ideas about science. * Say how science affects them and other people in different ways. * Understand that science can be used in positive and negative ways. * Use more than one step to describe a process. * Explain scientific ideas in a clear and detailed way. * Identify strengths and weaknesses in science models and thoughts | | |
| WORKING SCIENTIFICALLY | To use the following practical scientific methods, processes and skills…….  Experience different types of science enquiry, including practical activities. | To use the following practical scientific methods, processes and skills……  Have a range of scientific experiences including different types of science enquiries to answer questions. | To use the following practical scientific methods, processes and skills……  Have a range of scientific experiences including different types of science enquiries to answer questions.  Talk about how scientific ideas have developed over time. |
| QUESTIONING AND ENQUIRING PLANNING | Explore the world around them and raise their own simple questions.  Begin to recognise different ways in which they might answer scientific questions. | Raise their own relevant questions about the world around them.  Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions.  Use different types of scientific enquiry to answer questions. | Use their scientific experiences to explore ideas and raise different kinds of questions about scientific phenomena.  Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions.  I can decide which types of variables to control. |
| OBSERVING AND MEASURING PATTERM SEEKING | Use simple equipment eg hand lenses  Observe changes over time.  Say what they are looking for and what they are measuring.  Measure with non-standard units and begin to use simple standard units eg mm, cm, m, l, degrees C.  With guidance, they should begin to notice patterns and relationships. | Make systematic and careful observations.  Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.  Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them.  Observe and measure accurately using standard units using a range of equipment  Mm, cm, m, ml, l, degrees C, seconds, minutes | Make their own decisions about what observations to make, what measurements to use and how long to make them for and whether to repeat.  Choose the most appropriate equipment and explain how to use it accurately.  Make accurate and precise measurements: N, g, kg, mm, cm, m, mins, secs, km, h, pie, line, bar graph  Identify patterns that might be found in the natural environment.  Interpret data and find patterns.  Look for different causal relationships in their data and identify evidence that refutes or supports their ideas. |
| INVESTIGATING | Carry out simple tests.  Discuss ideas.  Say what happened in an investigation. | Set up simple practical enquiries, comparative and fair tests.  Recognise when a simple fair test is necessary and hep to decide how to set it up.  Help decide which variables to keep the same and which to change. | Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.  Suggest improvements to my test, giving reasons.  Use test results to make predictions to set up further comparative and fair tests. |
| RECORDING AND REPORTING FINDINGS | Use simple measurements and equipment (eg hand lenses, egg timers) to gather data.  Record simple data.  With help, they should gather, record and communicate their findings in a range of ways and begin to use simple scientific language to help in answering questions.  Show results in a table. | Take accurate measurements using standard units.  Learn how to use a range of (new) equipment, such as data loggers/thermometers appropriately.  Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data.  Use relevant, simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including written explanations, displays or presentations of results and conclusions. | Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately.  Take repeat measurements where appropriate.  Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.  Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas, use oral and written forms such as displays and other presentations to report conclusions, causal relationships and explanations of degree of trust in results. |
| IDENTIFYING GROUPING AND CLASSIFYING | Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying).  Identify and classify.  Observe and identify, compare and describe. | Talk about criteria for grouping, sorting and classifying and use simple keys.  Identify differences, similarities or changes related to simple scientific ideas and processes.  Compare and group according to behaviour or properties based on testing. | Use and develop keys and other information records to identify, classify and describe living things and materials and other scientific phenomena.  Identify patterns and changes that might be found in the natural environment. |
| RESEARCH | Ask people questions and use simple secondary sources to find answers.  Find information to help me from books and computers with help. | Recognise how and when secondary sources might help them to answer questions that cannot be answered through practical investigations.  Begin to decide when research will help in my enquiry.  Carry out simple research on my own. | Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.  Carry out research independently. |
| CONCLUSIONS | Use their observations and ideas to suggest answers to questions.  Talk about what they have found out and how they found it out.  Say what happened in my investigation.  Say whether they were surprised at the results or not.  Say what they would change about their investigation. | Use results to draw simple conclusions. Say what they have found out linking cause and effect in their explanations.  With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions.  With support, they should develop new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. | Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.  Identify scientific evidence that has been used to support or refute ideas or arguments.  Draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings.  Use their results to make predictions and identify when further observations, comparative and fair tests might be needed.  Separate fact from opinion.  Draw conclusions and identify scientific evidence.  Use simple models.  Know which evidence proves a scientific point. |
| VOCABULARY | Use simple scientific language and scientific words.  Use comparative language. | Use some scientific language to talk and later write about what they have found out.  Use relevant scientific language.  Use comparative and superlative language. | Read, spell and pronounce scientific vocabulary correctly.  Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas. |
| UNDERSTANDING | Talk about how science helps us in our daily lives.  Begin to understand how science can be dangerous.  SCIENTISTS. | Know which things in science have made our lives better.  Understand there is some risk in science.  SCIENTISTS. | Talk about how scientific ideas have changed over time.  Explain the positive and negative effects on scientific development.  See how science is useful in everyday life.  Say which parts of our lives rely on science.  Understand there is some risk in science.  SCIENTISTS. |
| YEAR 7 – FOR INFORMATION | Interpret data from a variety of formats and recognise inconsistencies.  Give explanations for differences in repeated results.  Draw valid conclusions that use more than one piece of supporting evidence. | | |

I have my own ideas…

I test my ideas……

I question why things happen…

**EARLY YEARS**

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I notice similarities and differences……

I use science words…

I can create simple representations of people and objects…

I can use my senses and look closely…

I can talk about things like plants, animals, natural and found objects…

I use equipment and tools carefully…

I ask simple questions…

I recognise that questions can be answered in different ways…

I perform simple tests…

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I use simple scientific language…

I can compare things. I sort and group them……

**KEY STAGE ONE**

I gather and record simple data in different ways…

I observe closely…

I can talk what I have found out…

I use simple equipment to make measurements…

I ask my own questions. I use different ways to answer them…

I suggest improvements and raise further questions…

I set up my own simple tests…

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**LOWER KEY STAGE TWO**

I make careful observations……

I use relevant scientific language…

I gather, record, classify and present data in different ways including drawings, labelled diagrams, keys, bar charts and tables…

I explain what I have found out using speaking and writing…

I use different equipment to measure accurately in standard units…

I draw simple conclusions and make predictions for new values…

I ask different kinds of questions…

I plan different types of scientific enquiries to answer questions…

I use results to make predictions and set up more tests (including fair tests) …

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I use relevant scientific language and illustrations…

I can set up fair tests when necessary……

**UPPER KEY STAGE TWO**

I use different scientific equipment to measure with precision. I take repeat readings when appropriate…

I report and present findings using speaking and writing including displays and presentations.…

I decide what observations and measurements to make…

I decide how to record data and results. I can use scientific diagrams, labels, classification keys, tables, scatter, bar and line graphs…