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| SCIENTIFIC ENQUIRY | | EYFS | YEAR 1 | | YEAR 2 | | YEAR 3 | | YEAR 4 | YEAR 5 | YEAR 6 |  |
| **QUESTION** | | **Ask simple questions** about immediate environment. | **Ask questions** and know some can be answered using scientific enquiry. | | | | **Identify scientific questions.** ie can be investigated through scientific enquiry. | | | **Raise scientific questions** and **hypothesise** | |
| **SCIENTIFIC ENQUIRY** | **OBSERVE** | **OBSERVATIONS**  Talk about similarities and differences.  Make observations linked to answering the question**.** | **OBSERVATIONS** | | | | **OBSERVATIONS** | | | **OBSERVATIONS** | |
| Observe change  over time.  Use Senses/ equipment.  Make observations linked to answering the question. | | | Measure change over time e.g. plant growth.  Select equipment  Ask a question about what might happen in the future based on an observation. | Systematic/ careful observations. Use bar charts, pictograms, tables.  Be able to compare objects based on more sophisticated, observable features. Present observations on labelled diagrams. | Accurate measurements. Use time graphs and other graphs.  Be able to compare objects based on more sophisticated, observable features.  Present observations on labelled diagrams. | | Accurate/ precise measurements, Diagrams, tables, bar and line graphs  .  Be able to ask a range of Yes/No questions to aid sorting and decide which ways of sorting will be useful to gain information. | Take repeat readings when appropriate.  Scatter graphs.  Be able to answer their questions identifying patterns. |
| **CLASSIFY AND FIND PATTERNS** | **Talk and Sort** | **Identify and Classify** | | | | **Classify and Find Patterns** | | | **Classify and Find Patterns** | |
| Use simple scientific criteria.  Be able to ask Yes/No questions to aid sorting.  Be able to compare objects based on obvious, observable features, e.g. size, colour, texture etc.  Be able to ask a range of questions to aid sorting. | e.g. familiar plants, animals,  materials  Compare and contrast.  Be able to compare objects based on obvious, observable features, e.g. size, colour, texture etc | e.g. living/ dead/ never alive;  materials.  Ask a question that is looking for a pattern based on observations.  Compare  differences**.**  Record data in simple prepared tables, pictorially or by taking photographs and tally charts. | | | Classify animals/ materials. Link two variables e.g. *the closer the magnet the bigger the force.*  Be able to compare objects based on more sophisticated, observable features. Present observations on labelled diagrams. | Use simple classification keys.  Link two variables  e.g. *the more cells in a circuit, the brighter the bulb.*  Sort objects and living things into groups using Venn and Caroll Diagrams.  To spot patterns in data particularly two criteria with no examples, *e.g .*there are no living things with wings and no legs. | | Use complex  classification keys.  Identify causal relationships.  Sort objects and living things into groups using Venn and Caroll Diagrams.  To spot patterns in data particularly two criteria with no examples, *e.g .*there are no living things with wings and no legs. | Develop  classification keys. Identify evidence that supports/ refutes causal relationship.  Be able to explain using evidence that the branching database or classification key will only work for the living things or materials it was created for. |
| **CONTROL INVESTIGATIONS: comparative and fair testing** | **Explore** objects/ materials/ living things/ resources designed to model scientific processes. | **Simple comparative tests** | | | | **Comparative and fair tests** | | | **Design own comparative and fair tests** | |
| e.g. *What is the best material for an umbrella?*  Choose equipment and decide what to do and what to observe in order to answer the question.  Present what they have learned verbally or using labelled diagrams. | e.g. *What if plants do not get light and water?*  Record data in simple prepared tables, pictorially or by taking photographs.  When appropriate, measuring using standard units where all the numbers are marked on the scale.  Present what they have learned verbally or using labelled diagrams. | | | Predict. Fair tests e.g. *How does distance affect magnet strength?*  Decide what to change and what to measure or observe.  Decide on how to take a measurement.  To use Standard measurements.  To use Data Loggers to take measurements over time.  Present what they have learned verbally or using labelled diagrams. | Predict. Language of independent and control variable.  To take repeat measurements where necessary.  To prepare own tables to record data.  Present data in bar charts/time graphs.  To use ICT packages to present data as a scattergram.  Be able to answer their questions using simple scientific language.  To refer directly to their evidence when answering their question. | | Identify when and how to use tests.  Recognise and control variables.  Make predictions based on previous test results.  Recognise and control variables where necessary.  Measure using standard units using equipment that has scales involving decimals.  Prepare own tables to record data, including columns for taking repeat readings.  Choose an appropriate form of presentation, including columns for taking repeat readings.  Be able to answer their questions, describing causal relationships.  Provide oral or written explanations for their findings.  Use test results to make predictions for further investigations. | |
| **RESEARCH** | **Listen and respond to stories** about scientific processes/ events/ objects.  **To ask a range of questions linked to a topic** | **Find information** using given sources. e.g. *animals.* | **Select information** from a range of given sources**.** | | | **Research** using given sources. e.g. *research different food groups and how they keep us healthy* | **Select information** to support findings.  e.g. *research animals* | | **Explore relevant information by using a wide range of secondary sources.** | |
| Explore how  scientific ideas have developed over time. | Identify evidence that has been used to support or refute ideas. |
| **MODEL** | **Concrete** context.    Create drawings and models of their environment. | **Concrete**  context    Draw diagrams e.g. *parts of plants/ the body.* | **Explore** and **create**    Drawings and physical models e.g. *habitats.* | | | **Abstract** contexts  e.g. processes and phenomena such as forces/ light. **Use** labelled diagrams and drawings and physical models. | **Abstract** contexts  e.g. processes and phenomena such as sound/ electricity.  **Create** labelled diagrams and drawings and physical models. | | **Abstract** contexts.  **Evaluate** diagrams/ modelse.g. states of matter; solar system. | **Abstract** contexts.  **Create** own versions of models. e.g. circulatory system; light. |
|  | **CONCLUDE** | **Explain** simple phenomena:  How? Why?  Present what they have learnt verbally, using pictures**.** | **Describe** what has happened or been observed.  Present what they have learnt verbally, using pictures. | **Explain** why a simple observation occurred. **Evaluate** the effectiveness of observations.  Answer their question in a simple sentence using their observations. | | | **Explain an observation or an event in scientific terms.** Distinguish between what has been observed and why it happened. Begin to link evidence from secondary sources as well as primary.  Suggest improvements.  Draw simple conclusions, when appropriate, for patterns e.g. a flying insect with no legs might always crash land.  Where appropriate provide ORAL or Written explanations for their findings.  Suggest new questions arising from the investigation. | | | **Evaluate original hypothesis against observed evidence and reach appropriate conclusions.** Identify causal relationships. Begin to identify how reliable the data is.  Explain their degree of trust in their results e.g. precision in taking measurements, variables that may not have been controlled, and accuracy of results. | |

* **Children in Key Stage 1 are NOT expected to draw conclusions. They are expected to make observations which will help them to answer questions. They do not have the subject knowledge to give reasons for what they observe so they cannot draw scientific conclusions.**
* **Children in Key Stage 1 are NOT expected to make predictions, they do not have the subject knowledge to do this. That does not mean that you should not ask children what they think may happen, but this will be based on experience or may simply be a guess.**
* **Children in Key Stage 1 are NOT expected to make evaluations. However children should be encouraged to consider their method and adapt this where necessary.**