HARTFORD PRIMARY SCHOOL

Progression of scientific skills

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| Investigations & tests | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Pattern Seeking | I can notice patterns and relationships with help. | I can talk about what I have done and what patterns I have noticed. | I can make links between 2 sets of observations.  (The size of the feet and the size of legs) (The size of feathers and how they fall) | I can collect data and record it. | I can decide which data to collect and how to record it.  I can suggest improvements to the way I looked for patterns. | I can look for relationships in the data that I have collected. | I can describe how the evidence I have collected supports or refutes my idea. |
| Research | I can talk about my familiar world, such as where I live or the world around me.  I can find pictures of things. | I can talk to people about what they know and how things work.  I can use simple books and web pages to find things out. | I can record in words and pictures what I have found out from secondary sources. | I can recognise when and how secondary sources might help me to answer questions. | I can use secondary sources to answer questions which I understand cannot be answered through practical investigations.  I can record what I have found out in my own words. | I can recognise which secondary sources are most useful to research my ideas.  I can say whether my research has answered my question. | I am beginning to evaluate my research.  I can separate fact from fiction or opinion.  I can draw valid conclusions from my research. |
| Comparative & Fair Tests | I make simple records of what I notice when comparing two things. | I can carry out simple comparative tests.  (Do bigger bubbles float higher?) | I can carry out a simple fair test and explain why if might not be fair to compare two things. | I can set up a comparative test or simple fair test and say why it is fair.  I help to plan a comparative or fair test. | I recognise when a simple fair test is necessary and I can help to decide how to set it up.  I can decide what data to collect. | I recognise when variables need to be controlled and decide when a comparative or fair test is the best way to answer my question.  I recognise the significance of the results of my comparative or fair test. | I can plan a comparative or fair test, selecting variables to measure, change and keep the same.  I can evaluate the effectiveness of my testing and I recognise which variables were difficult to control. |
| Observing Over Time | I can look closely at how things change.  I can talk about what I have noticed.  Uses senses to explore the world around them.  (Playing & exploring) | I can look closely at how things change.  I can make simple records of how things change. | I can use simple equipment to observe and record changes. | I can make careful and systematic observations. | I can help to decide what observations to make, how often and what equipment to record. | I can make my own decisions about what observations to make, how long to make them for and what measurements to make. | I can make and record observations and measurements using a range of methods for different investigations. |
| Identifying and Classifying | I can say how things how objects, materials and living things are similar and different. | I can use simple features to compare objects, materials and living things. | With support I can decide how to sort and group objects, materials and living things. | I can talk about criteria for grouping, sorting and classifying; and use simple keys. | I can think of a range of criteria for grouping, sorting and classifying and can explain how my ideas link scientifically. | I can use and develop keys and other information records to identify, classify and describe living things and materials.  I can identify patterns that might be found in the natural world. | I can make my own keys and branching databases for more than 4 items.  I can use more than one piece of scientific evidence to identify and classify, |
| **Skills** | | | | | | | |
| Questioning | I show curiosity and interest. | With a little help I ask questions about my exploration or observations of the world. | I can ask questions such as ‘what will happen if…’ | I can ask questions and with help suggest how to find an answer.  With others, I can ask questions such as ‘what will happen if…what if we…’ | I can work with a group to suggest questions that can be explored/ observed/ tested/ investigated further. | I can use explorations and experiences to suggest a variety of questions that could be investigated scientifically and decide which would provide the best evidence.  I can decide whether questions can be answered by testing or by research. | I can ask a testable question which includes the change and measure variables. ‘What would happen to…if we changed…?’ What would happen to the time it takes the water to evaporate if we increased the size of the puddle? |
| Predicting | I can make a simple prediction. May not use correct vocabulary and with no detail.  (I think that it will melt) | I can make a simple prediction with a little detail.  (I think that the small pieces will melt first) | I can make a prediction and try to give a reason.  (I think that the small pieces will dissolve first because they are little) | I can make a prediction and give a reason based on my experiences.  (I think that the little pieces will dissolve first because my dad breaks it into little pieces when he makes jelly) | I can make a prediction and give a reason using knowledge of a similar experience.  I think that the little pieces will dissolve first because little pieces of sugar dissolve faster than a sugar lump) | I can make a prediction and begin to think about what will take place.  (I think that the little pieces will dissolve first because water an attack them easily) | I can make a prediction and explain my reasons using scientific knowledge,  (I think that the little pieces will dissolve first because there’s more surface in touch with the water) |
| Planning | I am curious about things.  I can talk about my ideas. | With help I can make some simple suggestions about how to find an answer. | I am beginning to make suggestions on how to carry out a simple test.  I can say what I am trying to find out or what data I might collect. | I can use different ideas and suggest how to find something out.  I can explain why I need to collect information to answer a question. | I can make most of the planning decisions when planning an investigation.  I can suggest the type of investigation to do relevant to my question. | I can independently plan investigations and explain planning decisions.  I can decide when it is appropriate to carry out a fair test, comparative test or other investigation. | I can select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. |
| Equipment and measurement | I can choose an object and make a comparison of size. (bigger/smaller lighter/heavier) | I can make measurements using simple equipment. (non-standard measures)  I can use simple equipment and my senses to make observations. | I can make measurements using non-standard and simple standard measurements (cm, time)  I am beginning to make decisions about which equipment to use. | Make some accurate whole number measurements using standard measures (mm, cm, m, ml, l, °C, seconds)  I can correctly use equipment provided to make observations and simple measures | I am beginning to make accurate observations using standard units and more complex measures (heart beats, breathing rate, dataloggers)  I can select equipment to use from a selection provided. | I can take accurate measurements using a range of scientific equipment.  I am beginning to understand that I need to repeat observations and measurements. | I can identify the range and intervals used for a set of measurements.  I can decide whether to repeat observations/ reading and explain why. |
| Explore/observe | I show curiosity about objects, events and people. | I can explore the world around me.  I can use every day experiences to talk about observations and to help answer a question. | I can use what has been observed to make further predictions. | I can identify differences, similarities or changes within things.  I can use simple scientific words and language to describe and compare correctly. | I can use my own words, clear sentences and correct scientific knowledge to describe observations and ideas. | I can demonstrate correct scientific knowledge and understanding of more abstract ideas by explaining why I think something has happened. | I can use clear sentences, scientific words and symbols correctly when describing abstract ideas. |
| Recording | I can record my ideas as a picture and I can talk about it. | I can record my observations and findings as a labelled drawing or by annotating a photograph.  I am beginning to use a simple table to record. | I can record my observations and findings as:  Labelled drawings and drawings with annotations.  photographs (sequenced/ annotated)  simple prepared tables, tallies and charts (block graphs and pictograms with 1:1 scale.) | I can record my observations using simple scientific vocabulary in:  Labelled drawings  Photographs (annotated)  labelled diagrams  tables (which I have helped to design)  bar charts (1:1, 1:2, 1:5, 1:10 scale provided following discussion) | I can record my observations, data and results using clear scientific vocabulary and symbols in  scientific diagrams and labels  classification keys  tables  bar charts (scale decided by child) | I am beginning to make suggestions how to record.  I can record my observations, data and results using clear scientific vocabulary and symbols in     * pie charts * line graphs | I can decide on the most appropriate format to present my data and my results. |
| Explain results | N/A at this Year | I can give a reason why (may not always be logical) | I can give a simple reason why something happened. (I think…because…) | I can write a simple explanation for an investigation using the word because and using some scientific language correctly. | I can demonstrate scientific knowledge by explaining why something has happened using correct scientific vocabulary. | I can talk about the cause and effect.  I can independently write accurate conclusions which match the evidence. | I can use more than one piece of evidence when forming a conclusion. |
| Trusting and evaluating results | N/A at this Year | N/A at this Year | I can say whether what happened was what I expected. | I can talk about /describe any problems I had with my investigation. | I can compare my results with others. and give reasons why they might be different. | I can say how confident they are that their results are accurate.  I can say why readings were repeated and whether this made the results more reliable | I can describe how to improve planning to produce better results.  I can suggest reasons for anomalies |

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| **Examples of pattern seeking questions:**  Do people with longer legs jump higher?  Do more daisies grow in the shade?  Are the oldest children the tallest?  Do children who wear big t-shirts need big sun hats too?  Does it rain more on warm days or cold days?  Do all feathers fall in the same way? | **Examples of research questions:**  Where does chocolate come from?  How can I make chocolate?  What is space like?  Which animals can run fast? |
| **Examples of comparative and fair test questions:**  Will seeds germinate in salty or oily water?  Which of our shoes will have the bet grip?  Which material will make the best blackout blinds?  Do bees prefer red or yellow flowers? | **Examples of observing over time questions:**  How does the appearance of snow change as it melts?  Do all things rot?  How do we change as we get older?  How does the appearance of the moon change?  Does the moon always look the same?  What happens to food when we leave it out? |
| **Examples of identifying and classifying questions:**  How can we sort the plants in the garden?  What ways can we use to identify the children in the class?  Which clothes will keep us warm/cool/dry on our trip?  How can we sort things by the kind of shadows that they make?  How can we create a key to help us identify the minibeasts? |  |

**References:**

Working scientifically – [www.ciec.org.uk](http://www.ciec.org.uk)

It’s not fair or is it? Turner J et.al

Weaving Scientific Knowledge, Skills and Understanding into the new National Curriculum - Focus science document

Progression of science skills – Lancashire grid for learning