	Hindley Junior & Infant School Scientific Enquiry Skills Progression				
Year Group	**Observing over time**	**Identifying and classifying**	**Pattern seeking**	**Research**	**Fair testing**
1	Talk and write about the best ways of observing or measure the change. Create simple charts to show how something changes. Talk to partners about what they think has happened. Begin to think about and talk about connections. Support children to raise questions and suggest what they think will happen. With support plan what to do. (what to observe, how to measure, how often) Experiment with different methods of measuring – non-standard/standard units of measure. Record measurements using writing, drawings, photos or videos. Begin to relate ideas from observations to other known experiences (e.g. puddles drying up	Ask questions about why things are similar or different. Decide what to observe to identify or sort things. Make comparisons between simple features of objects, materials or living things. Look closely using hand lenses, digital microscopes and taking photos. Record observations in simple worlds, pictures and tables. Sort objects by observable features. Use simple sorting circles and tables. Identify similarities and differences and talk about them. Use simple scientific language to talk about how things are similar or different.	Ask questions about why and how things are linked. With support decide what patterns to observe and measure and suggest how to do it. Use non-standard units and simple equipment to record events that might be related. Record in words or pictures, or in simple prepared formats such as tables, tally charts and maps. Identify simple patterns and talk about them. Make links between two sets of observations. Begin to use scientific language to talk about patterns. Discuss whether the pattern was what was expected.	Ask questions about how things are and the way they work. Ask questions to find out what people do and how things work. Help make suggestions about how to find things out. Use simple books and electronic media to find things out. Record in words and pictures what has been found out. Begin to use scientific language tom talk about what has been found out. Talk about whether the information source was useful. Give an opinion about some things found out.	Ask why and how questions. Make comparisons about how things behave. With support, notice links between cause and effect. With support, identify simple variables to change and measure. Plan simple comparative tests with support. Can use non-standard units and simple equipment to record data. Record in words or pictures, or in simple prepared formats such as tables and tally charts. Talk about the data that has been collected. Use comparative data to rank materials or objects. Use simple scientific language to, describe simple causal relationships. With support, identify if the test was fair.

	with a floor being washed at home) Talk about whether changes were what they expected and why. Develop and use key vocabulary.				Decide if the relationship was what was expected.

| 2 | Measure more accurately and record the changes.

Present data in a table or bar chart.

Think about what factors may have affected what they observed and with support set up a test to investigate some of these factors .

Suggest further questions to investigate. | Sort objects by observable and behavioural features.

Record sorting using Venn and carol diagrams.

Use records to help sort or identify other things.

Use secondary sources to find out more about similarities and differences. | Use standard units of measure of whole numbers to measure length/mass/capacity/ Temperature.

Use simple equipment (rulers/scales/thermometers/ and measuring vessels) to record events that might be related.

Compare what has been found with what had been predicted.

Observe more systematically, making more specific observations and keeping pictorial records.

With support, collect numerical data about numbers of things found and compare these. (pictograms and tally charts) | Select information from a wide range of sources, including suitable internet Sites.

Use a graphic organiser to show the differences. (e.g. the different ingredients of chocolate and the effect if one ingredient is missing)

Think about environmental impact. | Suggest more questions that they could investigate.

Test different materials to find out which is best at stopping the sound.

Make their own suggestions about how to make sure that tests are fair. |

3	Raise question Make predictions about what will happen. Plan how, what and when to measure. Record observation in appropriate ways. (scale diagrams, bar charts, tables) Describe findings with each other . Give simple explanations linking cause and effect. Evaluate what they do. Develop and use key vocabulary.	Talk about what criteria I will use to sort and classify things. Decide what equipment to use to identify and classify things. Recognise when questions can be answered by sorting and classifying. Carry out simple tests to sort and classify according to properties or behaviour. Use Carrol diagrams, Venn diagrams and more complex tables to sort things. Use simple classification keys and branching databases to identify, sort or classify. Draw simple conclusions about the things that have been sorted and classified. Discuss similarities and differences identified using some scientific language.	Talk about where patterns might be found and recognise when questions can be investigated by pattern seeking. Decide on which sets of data tom collect, what observations to make and what equipment to use. Use a range of equipment to collect data using standard measures. Make records using tables and bar charts. Draw simple conclusions about simple patterns between two sets of observations. Talk about patterns using scientific language. Suggest improvements to methods used to look for patterns. Choose how to present data. Use scientific and mathematical conventions. (e.g. compare hand size by area in cm2)	Talk about how things are and the way they work and recognise when questions can be answered by research using secondary sources. Use information sources to find the information needed. Use someone else's data Record what has been found out in my own words. Present information in different ways. Draw conclusions from what has been found out from different sources. Talk about what the information and data means using some scientific language. Suggest ways to improve how to find out and use information.	Talk about links between cause and effect and with help pose a fair test question. Help to plan a comparative or fair test. Decide what data to collect. Decide what equipment to use and how to make observations. Use a range of equipment to collect data using standard measures. Make records using tables and bar charts. Draw simple conclusions from comparative and fair tests. Talk about and explain simple causal relationships using some scientific language. Suggest ways that can improve fair tests.

| 4 | Record observations as line graph.

Use simple models to demonstrate understanding. (e.g. torch and an object to create shadows) | Ask questions that need more detailed observations.

Compared guides and keys with published ones.

Try out guides and keys with groups of children.

Make simple branching databases and keys for things that have more than two choices.

Suggest improvements to the way things sorted and identified.

Evaluate which question are most useful when creating a key. | Make records using tables, bar charts, line and time graphs.

Begin to use and interpret data collected through data loggers.

Begin to identify data that doesn't fit the trend and think about why this might be.

Think about when the pattern changes and begin to explain why e.g. height and weight changes.

Identify scientific reasons for some of the pattern that they find. | Ask questions about how the data they are using was collected.

Compare what people knew about a topic. (e.g. now with 500 years ago)

Find more creative ways to share their findings.(e.g. blog/presentation)

Find out about and discuss how scientific and technological developments help us to learn more. | Begin to use and interpret data collected through data loggers.

Make their own plans and carry out a series of fair tests on different aspects.

Make own decisions about how to present data.

Identify new questions to be answered.

Think about issues relating to science and advertising, such as whether all claims are testable or justified. |

| 5 | Suggest how they could observe something over time.

Use digital microscope, visualisers data loggers to observe changes over time.

Make detailed drawings, create sequences of microscope images, mini videos, time lapse videos and photos, use small squared graph paper to measure area/spread.

Draw line graphs.

Use secondary sources to find out more.

Ask questions about how a topic can be investigated.

Plan how to carry out an observation safely and record results systematically.

Take accurate measurements.

Describe what they have observed.

Use scientific knowledge to explain what they have observed.

Make predictions about | Decide when identifying and classifying will be helpful to answer a question.

Decide what equipment, tests and secondary of things. classify information to use to identify.

Use a series of tests to sort and classify materials.

Use secondary sources to identify and classify things.

Make keys and branching databases with four or more items.

Use Venn and Carol diagrams with more than two criteria.

Use more than one piece of scientific evidence to identify and classify things.

Draw valid conclusions when sorting and classifying.

Talk about and explain what has been done using scientific knowledge.

Evaluate how well keys and branching databases have worked. | Recognise when variable cannot be controlled and decide when pattern seeking will help to answer a question.

Decide how detailed data needs to be, and which equipment to use, to make measurements as accurate as possible.

Use equipment accurately to collect observations.

Record data appropriately and accurately.

Present day in a variety of different formats.

Recognise patterns in results Recognise the effect of sample size on reliability.

Draw valid conclusions from data about patterns and recognise their limitations.

Recognise the significance of relationships between sets of data.

Talk about and explain cause and effect patterns using scientific knowledge and understanding.

Evaluate their own success in looking for patterns. | Decide when research using secondary sources will help to answer questions.

Decide which sources of information might answer questions.

Use relevant information and data from a range of secondary sources.

Recognise how data has been obtained.

Start to notice when information and data is biased or based on opinions rather than facts.

Present findings in suitable formats. | Recognise when variables need to be controlled and decide when a comparative or fair test if the best way to answer a question.

Plan a comparative or fair test, selecting variables to measure, change and keep the same.

Decide what equipment to use to make measurements as accurate as possible.

Use equipment accurately to collect observations.

Record data appropriately and accurately.

Present data in line graphs Identify casual relationships.

Draw valid conclusions based on the data.

Recognise the significance of the results of comparative and fair tests.

Talk about and explain causal relationships using scientific knowledge and understanding.

Evaluate the effectiveness of my comparative and fair testing, recognising variables that were difficult to control. |
|---|---|---|---|---|---|

	what would happen in different conditions. Evaluate how effective their investigation was and how the might improve it. Develop and use Key vocabulary.				

| 6 | Be more systematic and accurate in collection of data. Compare data collected in different conditions e.g. mould growth on different foods in different temps. Research ways of changing the outcome of results .(e.g. slowing something down, eliminating or improving) | Find creative ways to record their findings. Evaluate the suitability of materials/products/research following sorting and classifying. | Present data in scatter graphs and frequency charts. Be more systematic and precise in how data is collected. Distinguish between opinion and evidence. Recognise that data sets can be connected without it being a causal relationship. Recognise anomalies in their data and begin to explain them. Evaluate conclusions in terms of the quality and validity of the data collected. | Ask questions that require more detailed information. Explain why some questions don't have definitive answers. Think about how the data they are using were collected and how valid they are. Describe technological and scientific developments in a specific area. Think about ethical and moral issues. Identify reasons why different sources my provide conflicting data. | Be more systematic and precise in how they collect data. Take account of a greater range of variables, recognising which are most significant. Write an article about a topic. Recognise anomalies or inconsistencies in their data and try to explain them. |