Portfields Primary School Medium Term Plan

Year Group – **5** Subject - **Science** Strand – **Science Enquiry** Term - **Summer 1**

National Curriculum

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

Using test results to make predictions to set up further comparative and fair tests

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

Identifying scientific evidence that has been used to support or refute ideas or arguments.

Notes and guidance (non-statutory)

Use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.

Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.

Make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately.

Decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas.

Use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

Key Questions

How do see-saws work?
What equipment will you use? Why?
What observations will you make? Why?
What measurements will you take? Why?
What do you predict will happen when you move this weight closer to/further from the fulcrum?
Is it possible to make weights with different masses balance on different sides of a lever?
What do you observe as you conduct your investigation?
Do you need to make any changes to the measurements or observations you planned to make?
Have you selected appropriate units of measurements?
Are there an anomalies in your data?
Do you need to take any repeat readings?
What forms of graphs and charts are you familiar with?
What form of graph or chart will you use to present your results? Why?
Do you think your data is reliable?
What could you do next time to make your data more reliable?

Technical Questions

What is the difference between mass and weight?
Mass = the amount of 'stuff' inside an object, measured in kilograms (kg) or grams (g).
Weight = the strength of gravity acting on an object, measured in Newtons (N).

What are you investigating?
How the distance of weights from a fulcrum affects the balance of a lever.

What is a fulcrum?
The pivot point that a lever turns around.

Would it be suitable to measure the length of a car journey in mm?
No, this unit of measurement is too small for this situation.

How should results be recorded?
In an organised table with clear headings.

What are anomalies?
Results that are unexpected and do not fit the pattern of the other results.

What are the benefits of taking repeat readings?
Anomalies can be spotted and results are more likely to be accurate and reliable.

What type of data is best suited to different forms of charts and graphs?
Pie chart = show proportions of a whole
Bar chart = compare different categories
Line graph = show changes over time
Scatter graph = show relationship between two things

What is the difference between numerical and categorical data?
Numerical data = data in the form of numbers
Categorical data = data sorted into categories

What does it mean for data to be 'reliable'?
The investigation has been conducted fairly so the data can be trusted.

How can data be made more reliable?
By ensuring all of the control variables are controlled e.g. the same person taking the measurements, the same equipment used each time.

Substantive Knowledge

Understand that units of measurements and observations need to be suitable for the investigation being carried out.

Understand the difference between mass and weight.

Know that anomalies are results that are unexpected and do not fit the pattern of the other results.

Understand that taking repeat readings allows anomalies to be spotted and results are more likely to be accurate and reliable.

Understand the types of data that are best represented in different forms of charts/graphs (pie, bar, line, scatter).

Know that data can be made more reliable by ensuring all of the control variables are controlled.

Disciplinary Knowledge

Choose the appropriate equipment for an investigation.

Plan the observations to be made and the measurements to be taken in an investigation.

Investigate how the distance of weights from a fulcrum affects the balance of a lever.

Examine results for anomalies and take repeat readings.

Present results in a chosen form of chart/graph (pie, bar, line, scatter).

Present the findings of an investigation to peers in the form of a poster, considering reliability.

Key Vocabulary

Conclusion
Distance
Equipment
Evaluation
Investigation
Prediction
Reliable
Results

Technical Vocabulary

Anomaly
Bar chart
Force
Fulcrum
Lever
Line graph
Mass
Pie chart
Pivot
Pivot point
Scatter graph
Weight

Real-Life Links

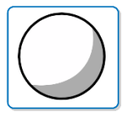
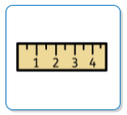
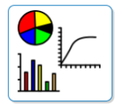
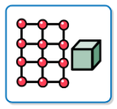
See-saws in playgrounds

Key Scientists

<u>Archimedes</u>
Explained that it is possible to move extremely heavy objects with much less effort using levers and pivots – "*Give me a lever and a place to stand, and I'll move the world.*"

Lesson Breakdown			
Lesson 1	**Lesson 2**	**Lesson 3**	**Lesson 4**
Learning Objective To plan an investigation using chosen observations and measurements. Success Criteria I can choose appropriate equipment for an investigation. I can plan the observations I will make in an investigation. I can plan the measurements I will take in an investigation. **Star Knowledge** Units of measurements and observations need to be suitable for the investigation being carried out.	Learning Objective To carry out an investigation about the relationship between mass and distance from a fulcrum. Success Criteria I can use appropriate equipment for an investigation. I can record measurements and observations using appropriate units. I can record results in a clear, organised table. I can spot anomalies in my results and repeat readings where necessary. **Star Knowledge** Anomalies are results that are unexpected and do not fit the pattern of the other results. Taking repeat readings allows anomalies to be spotted and results are more likely to be accurate and reliable.	Learning Objective To present the results of an investigation and draw conclusions. Success Criteria I understand the suitability of different forms of data presentation. I can present my results in the form of a suitable graph or chart. I can use my data to draw conclusions. **Star Knowledge** Different types of data are best suited to different forms of charts and graphs: Pie chart = show proportions of a whole Bar chart = compare different categories Line graph = show changes over time Scatter graph = show relationship between two things	Learning Objective To present the findings of an investigation, considering reliability. Success Criteria I can present my findings to peers as a presentation. I can consider how reliable my results are. I can suggest ways to make results more reliable. **Star Knowledge** Data is reliable if the investigation has been conducted fairly so the data can be trusted. Data can be made more reliable by ensuring all of the control variables are controlled.

Summer 1 – Science Enquiry – Flashback Four

Lesson 1		Lesson 2		Lesson 3		Lesson 4	
	Last Topic Y5 space L1 Why is Earth an oblate spheroid shape?  **Gravity pulls everything towards the Earth's centre.**	**Last Lesson** Y5 science enquiry L1 Why would you not measure you journey to school in centimetres?  **The units of measurement is not suitable. It is too small.**	**Last Topic** Y5 space L2 Why are the plants ordered Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune?  **They are arranged in order of distance from the Sun.**	**Last Lesson** Y5 science enquiry L2 What are results that are unexpected and do not fit the pattern of the other results known as? **Anomalies**	**Last Topic** Y5 space L3 Which scientist first explained the Sun at the centre of the Solar System 'heliocentric model'?  **Nicolaus Copernicus.**	**Last Lesson** Y5 science enquiry L3 Which type of graph displays changes in data over periods of time?  **Line Graph**	**Last Topic** Y5 space L4 Why does the Earth experience seasons?  **The Earth is tilted on its axis. Parts of the Earth tilted towards the Sun are in summer and those pointed away are in winter.**
Last Year Y4 States of Matter L1 What are the three states of matter?  **The three main forms of matter are solids, liquids and gases.**	**Previous Key Stage** Y3 Light 1 Describe what light and darkness? **Light is energy that allows us to see. Dark is the absence of that light energy.**	**Last Year** Y4 States of Matter L2 Which of the following describes what cooling can cause matter to do? a) Melt or evaporate b) Freeze or condense c) Boil or become a gas **Freeze or condense**	**Previous Key Stage** Y3 Light 2 If the surface is smooth, the reflecting light will: a) reflect cleanly and evenly b) be absorbed c) scatter in different directions. **Reflect cleanly and evenly**	**Last Year** Y4 States of Matter L3 What is the solid state of water known as?  **Ice**	**Previous Key Stage** Y3 Light 3 In order for a mirror to work well, the surface must be: a) rough and scratched b) smooth and polished c) bumpy and rippled **Smooth and polished**	**Last Year** Y4 States of Matter L4 Water changes into water vapour when it is a) heated b) filtered c) cooled? **Heated.**	**Previous Key Stage** Y3 Light 4 What part of the eye can be damaged by the Sun's UV rays?  **The retina**