Mount Primary School

Science

Curriculum Design

Working Scientifically Progression

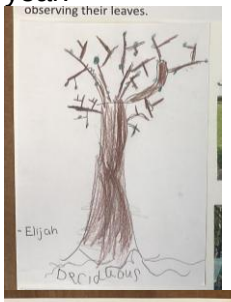
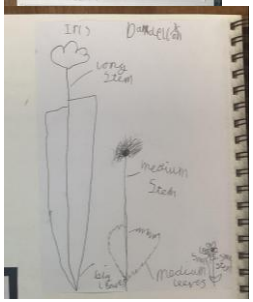
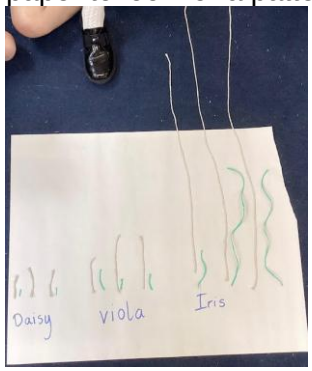
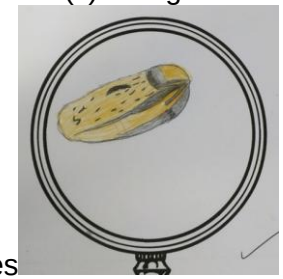
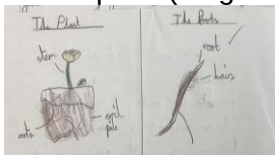
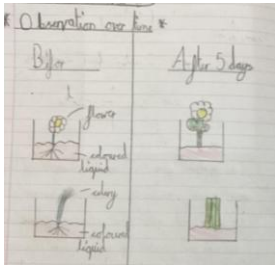
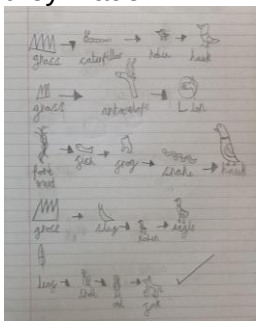
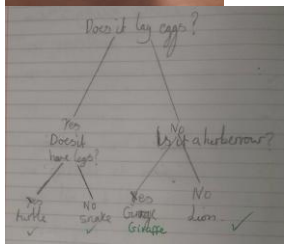
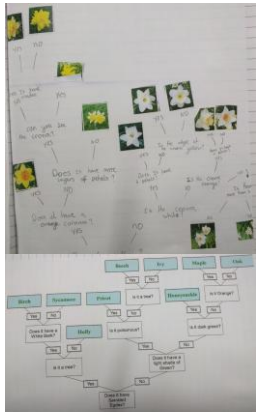
Plants					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs
KS1		Draw weed roots (observe using a hand lens) Draw the same deciduous tree at different times of the year.   	Use ID sheets to identify and classify different trees and flowering plants. https://www.treetoolsforschools.org.uk/menu/  	Measure the circumference of trees with string and line these up in order matched to each tree. Measure the height of the stem of 3 different plants in string. Measure the length of a leaf on the same plants with garden twine.	Lay stem/leaf measurements out on paper to look for a pattern 
KS1		Draw seed(s) - magnified images 	Sort seeds using rings/hoops	Table (provided) to record results of plant growth measurements etc	

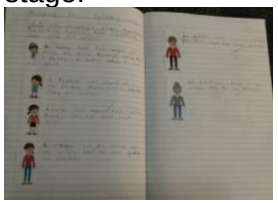
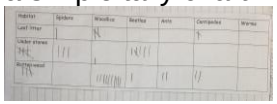
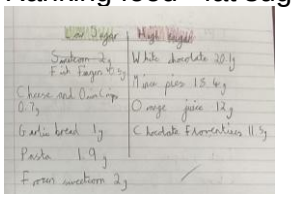
		Table of drawings of seed observations - germination			
3/ 4		Labelled diagram of roots from a plant (magnified)  Wilting white mustard - draw plants before and after water  Draw stems/flowers before/after adding food gel.		Table to record root length over time. Model how to construct a table. Provide a blank template (with no headings) to support those that need it.	

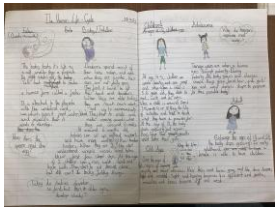
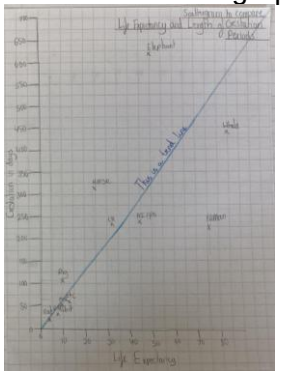
Living things and their habitats					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs
KS1		Draw a habitat and add labels to describe it. Draw an animal and label it to show what helps it survive in its habitat	Sort items into groups - living, dead and never been alive - could use hoops	Construct a tally chart of living things	Construct a simple pictogram of animals found in different habitats

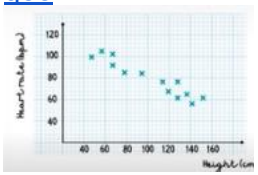
		Draw simple food chains they made. 			
3/ 4		Draw an animal and annotate to explain how it is suited to its habitat.	Using and creating branching keys post it notes (at least 5 items to sort)  	Tally chart - animals found in school grounds. The majority of children should be able to do this independently.	
5/6		Children given a choice of how to present lifecycle work which will probably include diagrams. Plants reproduction - draw diagrams of their observations.			

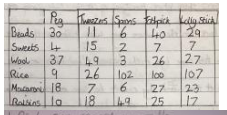
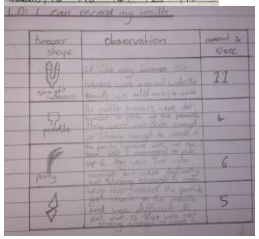
			Children create their own branching key directly into books or using technology. 	Yeast investigation - results table of observations/ measurements	

Animals, including humans					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs
KS1		Drawing of part of the body eg eye NB model how to use hand lenses Use chalk/twigs to make a model of the human body and label it. Draw an animal they observed in the school grounds or researched.	Sorting animals into groups based on features.  Sorting animals as carnivores, herbivores and omnivores using separate hoops.	Measure length of legs and arms using pieces of string and lay out on large paper to compare Tick chart of animals found on a survey of the school grounds - limit to 4 animals NB model first	

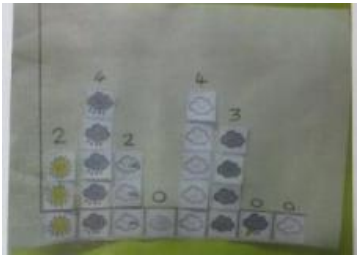
					
		Draw a picture of each stage in human life and add comments about each stage.  Draw animals and label with what they need to survive Draw a healthy and unhealthy lunchbox	Classify foods into groups as red, amber or green	Construct a simple table - modelled by teacher. Tally chart - model to the children how to construct a simple tally chart 	Construct a simple block diagram to show different exercises and number of breaths - Teacher to model how to do this.
3/ 4		Annotated drawing of a balanced meal	Use Venn diagram (template provided) to sort food into groups. Ranking food - fat sugar 	Reaction times results table - template as above. Longer legs/ jumping pattern seeking enquiry - record results in a table.	

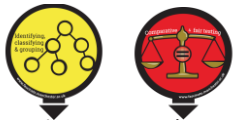
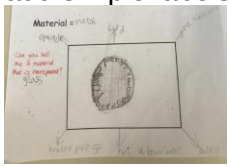
		Annotated drawing of teeth Draw a flow diagram to show what happened to the bread when they ate. Draw food chains and label with key vocabulary.			
5/ 6		Draw and label main stages of human growth as a timeline. 		Table to rank the animals according to gestation period.	**Scatter graph -** Graph paper with pre-prepared axes and units should be provided for children. Children plot results but teacher models step by step how to do this (first time children will have created a scatter graph). 
		Draw and label a diagram of the circulatory system		Pulse rate investigation - table of results	**Line or scatter graph** (depends on enquiry chosen) - pulse rate investigation. Use GSS video from 3 mins to model how they should construct a scatter graph and remind them they did one in Y5: https://youtu.be/xs9S4T1O

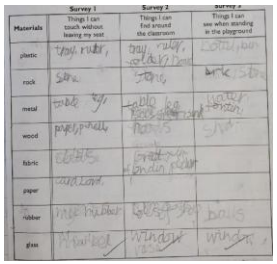
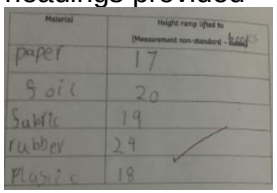
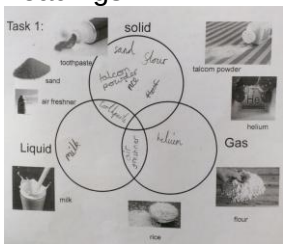
					goo 

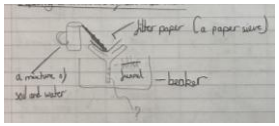
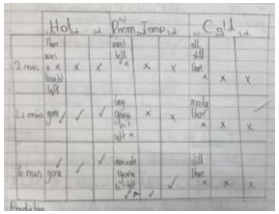
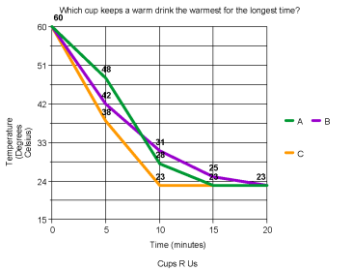
Evolution and inheritance					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs
5/ 6	 	Inherited characteristics - annotated drawings of Mr Men/ Little Miss and offspring. Labelled diagrams to support explaining the peppered moth story.		Battle of the beaks investigation - results table  	Battle of the beaks - **bar chart**

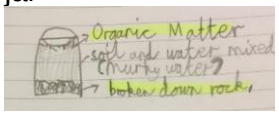
Seasonal changes					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs

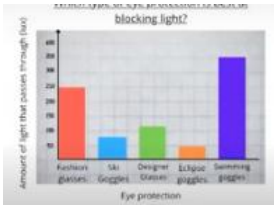
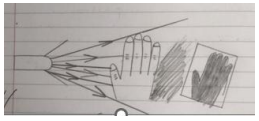
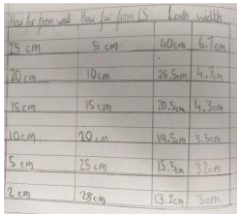
KS1		Draw pictures of the same (deciduous) tree in each season.	Children sort and classify using things they find hoops. Do not use terminology of Venn diagram.	Use a range gauge to measure (with teacher support) rainfall in each season.	Create a class pictogram of weather data. 

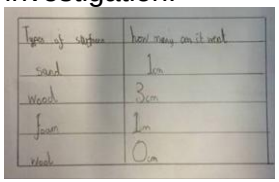
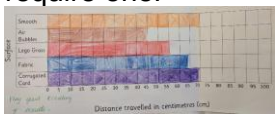
Materials					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs
KS1		Draw a diagram of the same type of object made from different materials - add simple labels.  Draw materials before and after strength test.	Grouping materials using hoops or circles		Complete a block graph for materials investigation that has been pre-prepared with labelled axes for them on squared paper.
		Waterproof test - draw materials and say if they are waterproof How flexible are plastics? draw each container and record how far the water travelled.	Children sort and classify using hoops. Introduce the children to the idea of overlapping the hoops for items that have common properties. Do not need to use the terminology of Venn diagram.	Uses of everyday materials Record results from sorting materials in a chart - pre-prepared with headings.	

				 Record investigation results in a table with headings provided 	
3/ 4		Draw diagrams at different stages in do all liquids freeze investigation. Labelled diagrams of water to describe what happens over a period of time (evaporation).	Use a Venn diagram (3 circles template provided). They need to provide their own headings 	Table of results - melting investigation	Bar chart to show temperature that different materials melted. This is the first bar chart in Y4 - link back to work done last year and recap on how to construct them. Use squared or graph paper.
5/ 6		Scientific diagrams to show how they separated a mixture, including the equipment used. Reversible/ irreversible changes - before and after annotated diagrams	Sort materials in a table (or other) - electrical conductor/insulator. Sort materials in a table (or other) - magnetic/not magnetic	*Table of results to analyse as a class - sugar dissolving.*  Draw a results table for their own dissolving investigation.	*Graph showing which cup keeps a warm drink warmest for longest to analyse and discuss as a class.*

				 Record observations of burning in a table.	 Heat transfer investigation: Children draw their own **line graph** on graph paper. Teacher to model how to draw axes and units step by step.

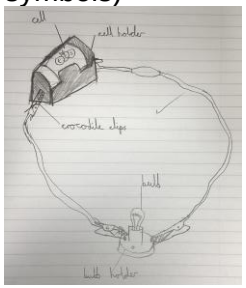
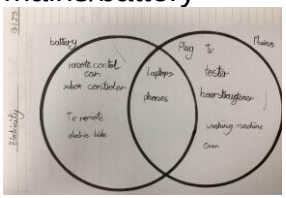
Rocks					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs
3/ 4		Magnified drawing of a rock - annotated Labelled diagrams of types of rocks. Labelled diagram of different layers of soil in jam jar 	Use a Carroll diagram (template provided). Introduce creating a simple branching key - post it notes (3 items). Use template to classify soil types (branching key template)	Rank results according to permeability. Table to rank rocks in order of hardness.	

Light					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs
3/ 4		Labelled diagrams to show how shadows are created.	Sort materials according to how visible they are in different lighting - Use carroll diagram (template provided).	Table of results - reflected light NB this is linked to use of data logger. Shadow investigation - table of results.	Blocking light/eye protection test - bar chart. Use GSS video from 3 mins to model how they should do this: https://youtu.be/xs9S4T1Ogoo 
5/ 6		Draw a labelled diagram of the model they made of light travelling in a straight line. Draw diagrams with arrows to show the path of light from a source to their eye.  Annotated diagram of periscope with explanation. Drawings of the path that light takes - shadow formation. 		Reflecting light test and Shadow investigations - results table 	Materials reflecting light - **bar chart**. Children draw it Independently but recap first on previous learning.

Forces					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs
3/ 4		Labelled diagram of how they set up friction investigation Diagrams of NN/SS and NS poles labelled with attract/repel incl arrows Labelled diagrams of magnets at a distance experiments.	Sort materials as magnetic/not magnetic in a table or hoops.	Table of results - friction investigation.  Table of results that is ranked to show the strength of magnets.	**Bar chart** of results - friction experiment. Children's first time drawing a bar chart - use squared paper and model step by step how to draw and label the axis. Provide a template for children that require one. 
5/ 6		Draw labelled diagrams - gravity Annotated diagrams of simple machines (levers, gears, pulleys)		Table to include repeated measurements and an average - spinner investigation. Friction & water resistance investigations - table of results. Lever and pulley investigations - table of results	**Line graph** - paper spinner air resistance investigation. NB this is their first line graph so needs modelling. Use squared paper with axes pre-drawn for those that need it.

Sound					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs

3/ 4		Use annotated drawings to explain what 'What is sound?' activities. Draw one investigation to support their explanation of how pitch was changed.	Use a carroll diagram to sort sounds heard on listening walk. This could be drawn on the playground using chalk.	Children will use the data logging app in lessons - they need to be reminded how to use it. Table of results (independently drawn) - distance and volume of sound. Sound insulator investigation - table of results including predictions.	

Electricity					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs
3/ 4		Draw & label circuits (no symbols)  Draw switch designs. Labelled drawing of circuit that contains the switch they made.	Electricity Venn diagram - mains/battery 		

5/ 6		Draw circuit diagrams using correct symbols		Voltage/brightness of the bulb - results table	**Line grap**h - number of batteries and brightness of bulb investigation. Use GSS video from 5:45-8:20 mins to remind them how they should construct a line graph. https://youtu.be/xs9S4T1Oqoo

Earth and Space					
Year	Scientific enquiry types to be covered	Drawings and diagrams	Sorting and classifying	Gathering and recording data - tables, tally charts	Presenting data - graphs
5/ 6	 	Draw the moon each evening on a moon diary template (observing over time enquiry). Draw and label pictures of how the moon's shape appears to change Annotated diagrams to explain how day and night occur Annotated diagrams to explain how day and night occur		Table to show how shadow length changes over a day.	Length of shadow over a day - children draw a **line graph** on graph paper. Link back to previous graphs drawn.