



Willow Dene School Scheme of Work

MATHS: Handling Data

About this Scheme of Work: This unit focuses on providing children with opportunities to problem solve through perception (recognising and identifying problems); thinking (breaking problems down, planning how to solve them); action (remembering ways to solve a problem, working through plans); evaluation (evaluating how a plan worked, recognising when existing plans need adapting or changing). Children also work on the five stages of the data-handling cycle which are: specify the problem; plan; collect data; process and represent; interpret and discuss.

Work on handling data should focus on solving problems by matching, sorting, classifying and organising objects and information. Work on this topic is much more valuable if it is set in the context of real life situations – e.g. organising for a party, organising a trip, etc. Because of this, chances for solving problems and handling data exist throughout the day, not just during the mathematics lesson. Take advantage of these opportunities!

- The key skills of problem solving are: **perception** (recognising and identifying problems); **thinking** (breaking problems down, planning how to solve them); **action** (remembering ways to solve a problem, working through plans); **evaluation** (evaluating how a plan worked, recognising when existing plans need adapting or changing)
- The approaches to problem solving are: **practical investigation** (“how many...” or “what if...” problems); **enquiry** (what flavour...” or “which one...” problems); **trial and improvement** (“how can we find out...” problems)
- The five stages of the data-handling cycle are: **specify the problem** (formulate questions in terms of data needed and the type of inference to be made from them, e.g. “What type of sandwiches shall we take on our picnic?” could be framed as “What is your favourite sandwich filling?”); **plan** (decide on what data should be collected, including sample size and data format e.g. all children and staff, favourite from 5 choices, represented as a pictogram) ; **collect data** (from a variety of sources including surveys, primary and secondary sources, e.g. survey from primary sources); **process and represent** (reduce raw data into summary information, including lists, tables and charts, e.g. a tally chart showing how many people like each type of sandwich filling); **interpret and discuss** (to provide insight into the problem by relating data to the initial question, e.g. decide on which two types of sandwich to make for the picnic)

VOCABULARY:

Own names, yes, no, more, finished, like, don't like, stop, go, ready

- Words relating to matching, e.g. match, same, different
- Words relating to sorting, e.g. sort, which one
- Words relating to classifying, e.g. belong, odd one out, properties, group, set, order
- Words relating to counting, e.g. count, how many, vote, tally
- Words relating to handling data, e.g. table, list, pictogram, pie chart, diagram, chart, Venn diagram, block graph

RESOURCES:

- Variety of objects to sort: balls / bricks / coins / clothing / books / soft toys / animals / beads / home corner objects / play foods / etc.
- Pairs of associated objects, such as toothbrush and toothpaste or flannel and soap
- Saucepans, pots or jars with lids
- Pairs of shoes and socks
- Beads and threading string
- Train tracks or road ways
- Photos of children to represent choices
- Selections of cards and envelopes
- Blocks or cubes to represent votes
- Real life objects, such as knives and forks for laying the table; cakes or biscuits for giving out as snacks; party foods for a party; sun hats for taking on a trip; etc.

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES
<ul style="list-style-type: none"> • To match pairs of identical objects • To learn the and begin to use the vocabulary (words/ signs/symbols) match, same, different, sort, which one, count • To use symbols to represent events, people and items • To begin to sort two sets of objects according to a single attribute • To make sets that have the same small number of objects in each • To begin to classify objects e.g. farm animals / wild animals • To sort objects and materials according to a given criteria, e.g. “Put all the red things in this bowl” 	<ul style="list-style-type: none"> • Match cups to children, so there is one each • Put all the balls in a basket / all the hoops on a hook / sort plates and cups • Symbolic play, classifying objects according to function, such as which object do we drink from? • Give two sweets / crisps / pens to each child • Help to tidy up, e.g. put all the footballs in this box, and all the tennis balls in this box, or sort out money, putting the paper money in the wallet and the coins in the purse • Put a number of identical or similar items (e.g. golf balls or a selection of balls) in a feely bag with an object that is significantly different. Challenge the children to find the “odd one out” or the thing that is “different” • Sort train track into straight and curved piles. Make a track with the two piles. How are they different? Include items that do not comfortably fit into either pile, such as a bridge. • Sort a pile of coins by shape, by size, by colour, by the name of the coin... • Group different objects that have similar main features or functions, e.g. all the keys • Put all of the red cups on the shelf and the blue cups in the cupboard • Indicate which object is “the odd one out”, e.g. a snake in with the cutlery, etc. • Match associated objects, such as toothpaste and toothbrush • Ask someone to give each child an apron for art – make sure there is one too few and encourage the child to solve problems by fetching one more • Lids – give the students a selection of pots with the lids removed. Ask them to match the lids to the correct vessels. Which one was easiest to match? Which was hardest? Why? • Sort the socks and jumpers into piles • Ask the students to match a pile of socks into pairs. How can they tell which ones go together – shape, size, colour, etc. • Supply, or make with students, desk organisers for pens, scissors, glue • Find round and square things in a magazine and cut them out to make a collage • Make a tall house and a wide house with Duplo – initially give the children unlimited bricks, then challenge them to make each house with a fixed number of bricks, e.g. ten • Make sets of children who are having school dinners / packed lunches by placing their names inside a circle for school dinners and outside for packed lunch • Sort objects according to their function – give students a selection of plates, bowls, cups, beakers etc.

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES
<ul style="list-style-type: none"> • To begin to identify when an object is different and does not belong to a given category • To identify when an object is different and does not belong to a given familiar category • To begin to classify information in simple ways, such as in a list or table 	<p>and ask them to sort them into things that we eat from and those that we drink from</p> <ul style="list-style-type: none"> • Sort objects by category into sets (such as fruit, animals) • Make a table with help, collecting data on things like “How many cubes can you hold in one hand?”. Do the practical activity. Ask children to find their name and the numeral and stick them on the table. • Sort children. Increase number of differences (girls / boys, eye colour, hair colour). Can the students sort by one attribute? • Keep a tally of number of bean bags thrown in hoop. Increase complexity by recording bean bags thrown inside hoop and those that miss, in a table. • Unifix towers – make towers of three / four / five cubes that are all the same colour • Give student a variety of animals and paper representing a farm and a zoo. Which animals live on the farm and which live at the zoo? • We would like to send X a Christmas card. Which card should we send him? Have variety of cards for different occasions. • Make a Christmas (or other) card. Have a selection of envelopes available. “Which envelope should we use to send our card?”. Encourage the children to think about which criteria to use if the card fits in more than one envelope. • Organise a Christmas party and discuss issues and solve problems, such as “How many bottles of drink will we need?” (How many cups are people likely to drink? How many cups are in each bottle?); “What types of drink should we buy?” (What are favourite?; least favourite?; drinks nobody likes? Do a survey); “What food should we buy”; “What time should the party be?” (Will there be enough time before it’s time to go home? Is it before dinner? – Will this have an impact on the amount/type of food?); “What games shall we play?” • Organise a trip to the park and discuss issues and solve problems, such as “Which park shall we go to?” (What do we want to see? How long is the journey?); “How shall we get there?” (Is the minibus booked? How long will it take to walk? What if it’s raining?); “What do we need to take?” (What will the weather be like – do we need umbrellas, sun cream; which hats would be best to take?) • Have we got enough Smarties / crisps for everyone to have one? Ensure that there are more than enough of some items, and less than enough of others • Ask children to solve problems, such as how many eggs will fill this box? • Ask the children to lay the table for dinner and ensure that there is not enough forks or too many knives, etc.

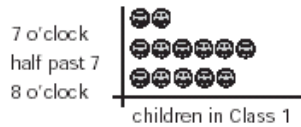
Ways of Representing Data

1. Our favourite colours

Favourite colours	Votes
blue	6
green	4
pink	8
red	7

Frequency Table

2. Our bed times



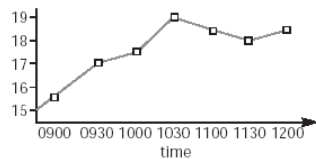
Pictogram

3. Our names

3 letters	4 letters	5 letters	6 letters
Ann	Kate	Halim	Pritam
Sam	Ajit	David	Sophie
Ali	Tara	Jyoti	
	Mark		

Table

4. Room temperature on 19 May



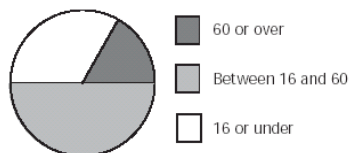
Line Graph

5. Our illnesses

German measles	###	///	
Mumps	///		
Chicken pox	###	###	
Flu	###	###	///
Measles	/		

Tally Chart

6. Ages of the population of Ham village



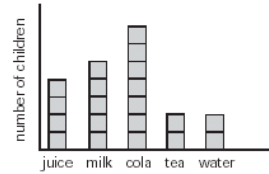
Pie Chart

7. Our favourite crisps

	boys in our school	girls in our school
prefer plain crisps	15	11
prefer flavoured crisps	20	14

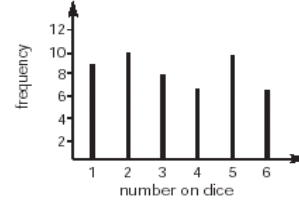
Carroll Diagram

8. What we like to drink



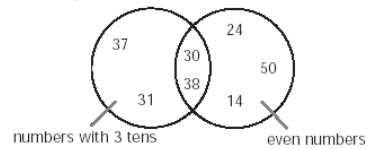
Block Diagram

9. Rolling a dice



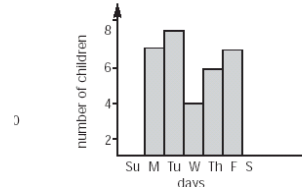
Bar Line Chart

10. Sorting numbers



Venn Diagram

11. Children absent from school



Bar Chart