STATISTICS

St. Nicholas School
Mathematics Scheme of Work

Statistics

EYFS Milestones – M4

About this unit: This unit shows the way mathematical skills may progress in the early stages (EYFS milestones) and latter stages (Bridging level 1– M3).

The units provides possible cross-curricular links as well as a list of vocabulary. This list is presented in order so that pupils can develop their knowledge and use of language to support their understanding of mathematics.

This unit should focus on solving problems by matching, sorting, classifying and organising objects and information. It is important to link work to the context of real life and classroom topics. The key skills for problem solving include; **perception** (recognising problems), **thinking** (planning how to solve them), **action** (remembering ways to solve them and doing it) and **evaluation** (recognising when plans and strategies need changing). Possible approaches to solving problems are; **practical investigation** ("how many…"), **enquiry** ("what flavour…") and **trial and improvement** ("how can we find out…"). Pupils will need to develop the skills needed to address specific problems (express questions in terms of data needed); plan (decide the data that should be collected); collect data (through surveys); represent data (putting raw data into lists, tables and charts) and interpret (relating data to the initial question).

Resources: Some resources have been highlighted within the Scheme of Work, but many more can be used as the possibilities are infinite. Use imaginative resources that will attract the pupils' attention and engage them as well as linking to everyday situations. Included with this unit is a 'Data Representation' guide. This shows the different types of tables and charts and should be used as a reference when teaching representation techniques.

Area	Objectives	Suggested Activities		Vocab
		Cross-curricular links		
		There are many cross-curricular links with other areas or mathematics such as number and geometry. Make links between the two on your plans. Art – Create art pieces by matching and sorting shapes/ materials (collage). Encourage children to give out materials 1:1 or count 'how many' they have or say which they have more or less of. Give children choices of materials PE – children share out equipment, they sort into types e.g. balls and hoops, they match equipment when helping tidy up. Children estimate how many balls they will get in a hoop. Children show if they have one or two. They keep a simple tally of scores. They compare scores e.g. number of balls children have – who has more or less? They use ordinal numbers for races. Literacy – children count pictures in stories. Use counting books. ICT – use computer activities that help the children sort and match or anticipate. Children take photographs to record their findings. History – children sort and match items linked to topics. Geography – children sort, match and classify things in nature. Children collect data using simple group tally charts and frequency tables about things they see in the local environment e.g. transport. Science – children sort, match and classify materials e.g. rocks. They record results in simple group tally charts or frequency tables. Music – children indicate how many beats in a tune or anticipate if music will get louder or quieter. RE – sort, match and classify religious artefacts. PSHE – set up role play jobs that involve sorting things into sets e.g. in shops. Cooking – children look at ingredients and compare which there are more or less of. They sort and classify them e.g. things that are fruits or meat or vegetables. They share 1:1.		
0 – 3 years (8–20 months)	To understand that objects, pictures and signs are a way of communicating.	• Use a range of exploratory play using objects to show different meanings e.g. the car driving or the bear climbing. • Model language using objects e.g. pouring water. Support with pictures. • Use Speech and Language activities. • Introduce the language using objects and pictures during 'The Bucket' and 'Attention Builder' activities. • Use symbols when giving instructions.		Same Different One Two More
	To point or use objects/pictures/signs to communicate.	• Use exploratory play encouraging children to explore and point to objects they want or are using. Ask simple questions if able to respond by pointing. • Use Speech and Language strategies and activities. • Say a word and children point to object/picture or sign e.g. 'dog', 'cat', 'sit', 'star'.		

	To remember events or responses.	• Deliberately make mistakes for the children to respond to and remember e.g. overfilling the water cup. Do they remember and show stop. • Use 'The Bucket' – children remember event. • During structured play allow the children to discover events, respond and remember them such as blowing bubbles. Ask questions such as 'do you want it again?' 'How many times has it happened?' Model ways of keeping track. Link to Objective 4 and choices.	
0 – 3 years (16–26 months)	To respond to choices. To understand one to one correspondence.	• Use symbols/objects/signs to make simple choices in a range of situations e.g. during fruit and drink time, if they want their coat or not, what toy they want to play with or art materials they want. Begin with a choice of two. • Use containers to support 1:1 placing, for example, younger children place monsters on each bed or cups on each saucer and for older children, putting things in particular places or matching each CD to its own case. • Give daily experiences of 1:1 matching, for example, pass out snacks, put pegs in holes or inset puzzle pieces in holes, give out bags or pencils. Increase the number of factors to see if the children have awareness that there is too much or too little. • Make ice for cooking getting the children to put water in 1 section of the ice tray at a time. • Add ingredients 1 at a time to things e.g. putting cake mixture in the paper cases. • Use Numicon shapes, baseboards and pegs. Children match them to the shapes. • Children label belongings or put coats on their hooks or put things away.	
0 – 3 years (22-36 months)	To understand the process of exchange (giving, taking and receiving in practical situations). To organise things/items. To know that counting tells us 'how many'.	• Play games where the children collect tokens/objects e.g. snap. • Play games encouraging children to exchange token/objects. • Use role play situations – shops, buses, trains, cinemas, cafes. • Involve children in tasks such as giving out water or fruit. • Involve children in tidying up activities – putting items in boxes or trays. • Older children could arrange the books on the book shelves. • Encourage children to organise their clothes after changing for PE. • Use the Numicon shapes and pegs to develop the children's understanding of the cardinal number. • Link to everyday activities e.g. encouraging children to say how many fruit they have.	

		During a range of counting activities and games emphasise the last number in the count. Always repeat the last number in the count and encourage the children to do so. Change the intonation of your voice for the last number. See counting games and activities suggested above.	
		• Use computer activities such as Percy's World of Numbers.	
		• Encourage children to join in the counts by using finger tally or finger touch pointing.	
	To experience anticipation and prediction.	• Use 'The Bucket' for children to anticipate and predict what will happen – look at toys with actions. • Use exploratory play e.g. adding food colour to water, mixing paints. Children anticipate and predict what will happen. Ask questions, 'Will it happen again?' 'Will it be different?' • Use narratives. • Use Kim's game. • Play the game 'What is in the bag?'	
	To indicate one and two.	• Children use their body e.g. fingers, arms, legs, feet to show one and two. • Use instruments or clapping beats to indicate one or two. • Make one or two prints in paint or wet sand. • Giving out one or two items to peers with adult support. • Counting one or two steps, jumps, bounces, throws, hits or kicks in PE. • Give pictures containing one or two objects and encourage children to indicate how many using signs or words. • Encourage children to line up in ones or twos. • Hide and find Numicon Shapes, encouraging children to sign/say what shape they have. • When using role play areas, such as shops, encourage children to show one or two items including coins or pennies. • Play games (age appropriate) where points are given in ones or twos – children record points using tally marks or pictures or objects etc. • When offering things such as food ask how many the children would like, one or two? • On visits look at the number of things the children can see e.g. can you see one bus or two buses? • Use computer activities such as MathBase 1. • Play games asking the children if you score 1 or 2 points.	
3- 4 years **(30-50 months)**	To match pairs of identical objects.	• Put all the balls in a basket, all the hoops on a hook or sort cups and plates or other equipment in the cooking room and classroom. • Use Percy's Thinking Skills.	

	To sort and match by recognising similarities and differences.	- Symbolic play, classifying objects according to function, such as objects we drink from. - Help to tidy up e.g. put all the tennis balls in this box and footballs in the other box or sort coins from notes. - Put a number of identical or similar items in a feely bag with an object that is significantly different. Challenge the children to find the one that is 'different'. - Sort train tracks into straight and curved. Make tracks with the piles and discuss how they are different. - Sort coins by shape, size and colour. - Group objects with a similar main feature or function e.g. all pens. - Put all red Numicon pegs in one pot, the yellow in another. - Put all the red cups in one place, blue in another and green in another. - Indicate which object is the 'odd one out' e.g. snake in the knife drawer. - Match associated objects such as toothpaste and toothbrush. - Sort clothes such as socks. - Sort objects according to function e.g. plates, bowls, cups. - Use Percy's Thinking Skills.	
	To make sets.	- Give two sweets/raisins/pens to each child. - Ask the children to match a pile of socks into pairs. How can they tell which one goes with which? - Make desk organisers with the children (older children). Include pens, glue, scissors, and pencils as appropriate. - Find round and square things in a magazine and cut them out to make sets. - Make sets of children who are having school dinners or those having packed lunch.	
	To collect and arrange or order things.	- Use exploratory play and observe how they collect and arrange or order things. - Model collecting objects and arranging them in play or for tasks e.g. how arrange animals for a zoo or pieces/equipment for their art work? - Children collect cups and distribute them to place maths. - Make equal groups by arranging objects in parallel lines – use in number work and counting. - Explore patterns – use baseboards and Numicon shapes/pegs or use shapes to represent numbers e.g. triangular shapes for three. - Older children could arrange or order social routines.	

Reception (40-60 months)	To demonstrate an understanding of contrasting quantities.	• Develop understanding of more by encouraging pupils to ask for more during a variety of activities such as fruit and drink, art, cooking or during experiments in science. Highlight that what they have is getting bigger. Repeat for less by removing objects and highlighting that what they have is getting smaller. Use signs and symbols. • Have plates/boxes/containers of motivating items. Discuss which has more or which has less. Children choose the one they want. • In games, compare the score/tokens/cards. Who has more or less? Or who won the most or least games for shorter activities. • Build towers comparing the number of cubes/height. • Look at children's art work, in particular, collage. Who has more or less of different materials stuck on? • In shops, who has more or less coins? • Things in the Room – children compare objects in the room and decide what there is more or less of. Place 'Things in the room' cards face down. Children turn two over and compare e.g. the number of windows and pencils. • Comparing names – have rows of squares. Children write their names putting each letter in its own square. In the row underneath they write a friends/peers name. Compare which name has more or less letters. • Measure height or body parts using strips of paper and compare them. • Use Numicon shapes and pegs to explore contrasting quantities.	
	To experience recording.	• Invite children to record various counts of sets – use a range of recording methods appropriate for the children. • Use recording in other subjects such as science and test results. • Use recording in simple games – children track the scores. • See suggested activities for Objective 16. • Use apparatus such as cubes, pennies, Numicon, compare bears, Dienes to represent and compare sets.	
	To experience comparisons.	• Look at objects with distinct contrasts and model the language for how they are different or similar. • Give children objects to explore and contrast (make sure the differences are obvious). Use symbols for support. • Compare items in cooking e.g. hot/cold and sweet/sour.	

		• Use Attention Building activities such as 'Anyone for Tennis' but link to mixing different paints and comparing colours. • Explore the Numicon shapes using the feely bags or hiding them in sensory materials. Children match similar ones and find the different one. • Write children's names under one another on paper and compare them. • Compare the heights and other body measurements of children (link with Measures). • Compare times e.g. children hold their legs out in front of them when sitting on a chair. Who can hold them up the longest? (Measures Link).	
	To understand the concept of 'more'.	• Look at Numicon shapes and explore 'more'. • Explore contrasting quantities using Numicon shapes and which is 'more'. • On actions that motivate pupils ask if they would like more. Give prompts for the child to sign or say so that the action can continue. • Use motivating activities to encourage the use of more e.g. snow spray, bubbles, bouncing balls, Lego etc. • Present the child with plates or containers of motivating items (one with a lot, the other with only a little). Pupil indicates which has more (label it). • On school trips look at different objects around you (in a farm – animals, in a park – trees). Encourage the pupil to indicate where or which has more. • Look around the school and identify more e.g. more girls or boys, blue or red mats/spots. • During fruit and drink encourage children to ask for more.	
	To make simple estimations.	• Use Numicon pegs and baseboards – children make very simple estimations of how many are there. Keep numbers low. • Ask children to estimate how many children had breakfast or a certain thing for lunch or chairs that are needed. • Estimate changes in items such as adding food colouring to water/sand or putting cold water in a kettle or mixing paints.	
	To count 'how many' items share a particular property.	• Give a property using symbols/signs – children explore objects and make a set of ones that have them. Use motivating objects. • Use feely bags – give a property. Children feel shapes and find all the ones with the property. They count 'how many'. • Let children explore objects and find a property that they share – use signs/symbols/words.	

	To use objects, pictures, symbols or marks as a way of recording.	• Encourage children to record in all subjects and activities above and below using objects/pictures/symbols or marks as appropriate e.g. children can stick on cut out numerals by pictures of objects when recording how many they have	
	To begin classify objects.	• Sort objects by category such as fruit, animals. • Create storage trays for objects in the classroom such as transport, toy fruit, animals – children help tidy up, putting objects in the correct place and classifying them. • Look at a selection of different types of cards. Ask children which they would send for a birthday. Children classify the cards. • Use Speech and Language classifying activities.	
	To sort objects by a given criterion (with a less obvious difference).	• Sort children. Increase the number of differences (boys/girls, eye colour, hair colour, height). Can they sort by one attribute? Make active by using arrows on the floor to sort children e.g. 'all the children with black hair follow the blue arrow, all the children with brown hair follow the green arrow and all the children with blond hair follow the white arrow. • Make towers of three/four/five cubes that are all the same colour or two different colours. • Give children a variety of animals and paper backgrounds/objects representing a farm and zoo. Children sort the animals. Link to topics on rainforests or habitats. • Make a Christmas or birthday card. Have a selection of envelopes. "Which envelope should we use to the send the card?" Encourage the children to think about which criteria they would use if the card fits more than one envelope. • A group of 3/4 children spread large shapes out on the floor and follow the teacher's directions e.g. 'Step on all the squares', 'step on all the blue shapes', 'step on all the thin shapes'.	
	To understand the concept of 'less'.	• Hide objects in sand – pupils scoop up the objects and identify who has less in their scoop. • Children match picture cards and show which cards has less on it. • Play the water/sand game. Children roll the die (they have a set number of turns). They count the dots on the die and put that many cups of water/sand in a container. They then compare the two containers showing which person has less. That person is the winner. • Play treasure hunt in pairs. Pupils hunt specific items related to class topics or things that motivate them. Who has collected the least? • Present the child with plates or containers of motivating items (one with a lot, the other with only a little). Pupil indicates which has less (label it).	

Area	Objectives	Suggested Activities	Vocab
		• On school trips look at different objects around you (in a farm – animals, in a park – trees). Encourage the pupil to indicate where or which has less • Look around the school and identify less e.g. less girls or boys, blue or red mats/spots. • In fruit and drink time encourage pupils to indicate who has less fruit or drink. • Provide pupils with items to complete an activity e.g. in art. Ask them if they would like more or less of something. • Compare Numicon shapes – which is 'less'?	

Area	Objectives	Suggested Activities	Vocab
		Cross-curricular links	
		Art – *sort and classify materials needed for projects.* **PE** – *gather information on scores and collect the data in tables.* **Literacy** – *investigate favourite authors/books etc. Children collect and record data on it.* **ICT** – *use computer programs such as Excel (or simpler) to produce tables and graphs of data. Use data loggers.* **Geography** – *collect data linked to topics e.g. transport. Children record them in tables and graphs and interpret their findings.* **Science** – *children sort and classify materials e.g. rocks. They record results in tables and graphs and interpret them. Use data loggers depending on topic.* **Music** – *children listen to music and collect data in tables on the number of times they hear different instruments. They could measure how the volume changes.* **RE** – *sort and classify religious artefacts.* **PSHE** – *set up role play jobs that involve sorting things into sets e.g. in shops. Collect data on information linked to families or birthdays or jobs.* **Cooking** – *children sort ingredients.*	
Bridging 1	To sort objects.	• Provide a range of objects to sort focusing on colour and size. Encourage children to sort them independently and say how they have been sorted. • Model sorting when necessary. • Use computer activities such as Topmarks (games) and Education City. • Organise the classroom by sorting items into different trays/areas. Older children could arrange an area of the room saying what they have done. • Children sort equipment/materials ready for various activities including art or topic. • Sort junk materials asking the children questions about the properties of the junk and how they are sorting them.	Guess Share Group Count Match Sort Which one Belong Odd one out Add

		• Sort using the children's senses – give them food to taste and sort using describing words such as sweet, sour, spicy, or salty. Alternatively, focus on touch by blind folding the children and describing the weight, size, texture. Also, sound, by asking children to close their eyes and sort the noises into groups of loud, quiet, near or far (science link).	Take away Order How many Vote Tally Table List Less Properties Set
Bridging 2	To sort objects.	• Provide a range of objects to sort e.g. coins, shapes, animals, transport or motivating items. Encourage children to sort them independently and say how they have been sorted. • Model sorting when necessary.	
	To classify objects, showing how.	• Build on suggested activities above but encouraging the children to classify independently and show/say how. • Take learning walks around the school or local area – children observe objects, which they record and classify.	
Bridging 3	To sort and classify objects using more than one criterion.	• Model sorting by more than 1 criterion – use sorting hoops to help arrange items. • Adapt suggested activities for Bridging 1 and 2 to include more than one criterion. • Use computer activities such as Topmarks (games) and Education City. • Read My Mind - explain to the children that they are going to play a silent game and put a star on the board as a signal. No one is allowed to talk until the star is erased, not even the teacher. Place some shapes on white construction paper and some on black construction paper according to certain attributes. Hold up a shape you are about to place and indicate first one pile and then the other, looking questioningly at the children. The children predict where the shape will go. They predict with a cube. Once they have predicted, put the shape on the correct paper. Continue in this way until all the shapes are placed. By looking at the cubes you can see if they have spotted the attributes you are sorting by. Remove the star on the board and discuss their ideas. • Children to answer question based on the data they have sorted. **Sort Objects**	

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		• Children sort groups of objects by characteristics before they count them (B3). Encourage children to sort objects into groups in a variety of ways, for example, sorting a group of children into girls and boys or sorting counters by colour. Children should be encouraged to line sorted objects up to link to the early representations of bar models. • Sort fruit into groups and explain how they sorted them • How many ways can you sort the children into groups? • How have these objects been grouped? How else can you group them?	
Milestone 1	To construct and interpret pictograms To record information in tally charts	**White Rose Maths Year 1 Autumn Term Move to statistics** **Represent Objects** • Children learn that one object can be represented by another e.g. one elephant can be represented by 1 cube, 1 counter or 1 picture. • Using counters, show how many pineapples there are, then write the numerals for each • How many whales can you see on the wrapping paper? Pace counters on the whales to help you. What else can you count? Which animal is represented the most? Which animal is represented the least?	

- Complete the table

| Picture	Draw It	Number	Write It
🐘🐘🐘			

NB Children short still be encouraged to sort groups of objects either using criteria given them or their own criteria.

Count Objects

- Once objects are sorted, children begin to count from 1-10 to work out how many there are. Encourage children to place the objects in a line to improve accuracy when counting. They should also be exposed to what 0 looks like.
- How many red cubes and how many green cubes are there?
  There are _____ red cubes. There are _____green cubes. There are _____cubes altogether.
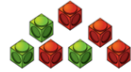
- Match the numbers to the correct count of teddies

  3   1   0
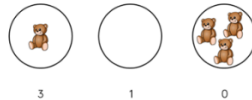
- Group the items, and then count how many there are in each group. Compare your groups with a partner's.

- Children use tally charts to produce pictograms. They build pictograms using concrete apparatus such as counters or cubes then move to drawing their own picture. They need to be able to complete missing columns or rows. They should use the same picture to represent all the data in the pictogram and line this up carefully. It is important that children see pictograms both horizontally and vertically.
- Complete the pictogram:

Hair Colour		Total
Black	○○○○○	5
Blonde	○○○○○○○	9
Brown		9
Ginger	○○○○	4

Key

○ = 1 person

- Answer simple questions on pictograms

- Children are introduced to tally charts as a systematic method of recording data. They should already be able to count in 5s and understand the vocabulary of total, altogether, more, less and difference.
- Use Tally Chart from 'Representing Data' sheet. Children collect information relating to class topics. Model what they show.
- Use computer activities such as Topmarks (games) and Education City.
- Complete the tally chart

Favourite Colour	Tally	Total
Blue	Ж III	
Red	Ж Ж II	
Yellow	II	
Green	IIII	

What does the data tell you? Tell me the story?

- Answer questions on tally charts.
- Children can also answer and interpret simple question on block diagrams

Milestone 2	To record information in simple tables	- Use Frequency Table and Table from 'Representing Data' sheet. Children collect information on a variety of subjects, such as hair colour, colours, names, foods, drinks, transports etc. Link to topic areas e.g. transport seen in the local area. - Children use simple tables to record findings in science experiments. - Model what they show. - Use computer activities such as Topmarks (games) and Education City.	
	To record information in tally charts	- Children are introduced to tally charts as a systematic method of recording data. They should already be able to count in 5s and understand the vocabulary of total, altogether, more, less and difference. - Use Tally Chart from 'Representing Data' sheet. Children collect information relating to class topics. Model what they show.	

|		
	To construct and interpret pictograms	• Use computer activities such as Topmarks (games) and Education City. • Complete the Tally chart for Year 2 and year 3 	Year Group	Tally	Total
Year 1	IIII IIII	10
Year 2		19
Year 3	IIII IIII IIII IIII II	

Year 4	IIII IIII IIII II	17 |
		
		• Make a tally chart about one of the following topics:
		    o Equipment in class (scissors, glue etc)
		    o Favourite sport
		    o Favoruite fruit
		    o Favourite tv show or character
		• Children use tally charts to produce pictograms. They build pictograms using concrete apparatus such as counters or cubes then move to drawing their own picture. They need to be able to complete missing columns or rows. They should use the same picture to represent all the data in the pictogram and line this up carefully. It is important that children see pictograms both horizontally and vertically.
		
		• Use the tally chart to help you complete the pictogram:
		
		| Fruit
			Tally		Fruit		Key

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Banana	IIII I		Banana		O = ___
Grape	IIII		Grape		
Pear	IIII III		Pear		
Apple	III		Apple	O O O	| • Complete the pictogram using the data given: | Name	Tally
---	---
Teddy	II
Annie	IIII IIII
Amir	IIII
Whitney	IIII I | Key ⚽ = 1 goal • Children use data they have collected or given data (relate to class topics) to construct pictograms. Extend the ratio e.g. 1 picture = 2 or 5 or 10. • Ask questions about pictograms they have constructed encouraging the children to explain what the information shows.	

- Children use their knowledge of 1:1 correspondence to help them interpret and answer questions about the data presented in pictograms. It is important that children are able to compare data within the pictograms.
- Here is a pictogram to show Class 5s favrouite t-shirts.

Colour		Key
Blue	👕👕👕👕👕👕👕👕	
Green	👕👕	👕 = 1 T-shirt
Red	👕👕👕👕	
Purple	👕👕👕👕👕👕👕	

What is the most popular colour t-shirt? What colour is the least popular t-shirt? How many more children chose blue t-shirts than red? How many children are in Class 5?

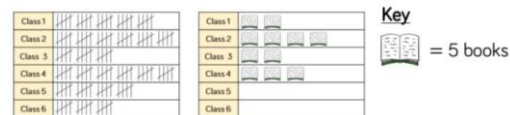- Here is a pictogram to show minibeasts collected by Class 5.

Minibeast		Key
Woodhouse	⬤⬤⬤⬤⬤⬤⬤⬤	
Ladybird	⬤⬤⬤⬤⬤	
Centipede	⬤⬤	⬤ = 1 minibeast
Worm	⬤⬤⬤⬤⬤	
Spider	⬤⬤⬤⬤	
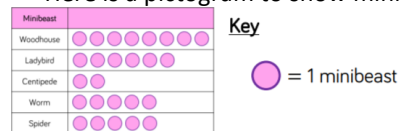
There are ___ ladybirds. There are ____centipedes and worms altogether. There are ___ more worms than centipedes. What else does the pictogram tell us?

- Children draw pictograms where the symbols represent 2, 5 or 10 items. The children will need to interpret part of a symbol, for example, half of a symbols representing 10 will equal 5. Children count in twos, fives and tens to complete and draw their own pictograms.
- Use the tally chart to complete the pictogram:

Pet	Tally
Dog	JHT JHT
Cat	JHT JHT IIII
Rabbit	JHT JHT II
Fish	JHT JHT JHT I

Pet	
Dog	⬜⬜⬜⬜⬜
Cat	⬜⬜
Rabbit	⬜⬜⬜⬜⬜
Fish	⬜⬜⬜⬜⬜

⬜ = 2 animals

- Use the information to complete the pictogram about the number of books read in each class.

Class 1	JHT JHT JHT JHT JHT
Class 2	JHT JHT JHT JHT JHT JHT
Class 3	JHT JHT JHT
Class 4	JHT JHT JHT JHT JHT JHT
Class 5	JHT JHT JHT
Class 6	JHT JHT JHT

Class 1	📖📖📖
Class 2	📖📖📖
Class 3	📖
Class 4	📖📖
Class 5	
Class 6	

Key
📖 = 5 books

- Year 2 sell cakes at a bake sale. The tally chart shows the data. Draw a pictogram to represent the data.

Chocolate																	
Lemon																													
Red Velvet																								
Mint																					
Carrot	|||| |||| |||| |||| |||| |||| |||| ||||

- To help children to fully understand pictograms, it is important they have collected their own data previously in tally charts and constructed larger scale pictograms practically. Children also need to be able to halve 2 and 10. It is important the children are exposed to both horizontal and vertical pictograms.
- How many more sparrows are there than robins? What is the total number of birds? How did you calculate this? Can you think of your own question to ask a friend?
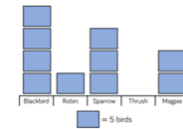
- Which is the most popular sport? How many children voted for football and swimming altogether? What could the title of this pictogram be?

- Use the pictogram to decide if the statements are true or false?

Animal	Number on farm
Pigs	☆☆☆☆☆
Sheep	☆☆☆☆⸍
Horses	☆
Chickens	☆☆☆⸍
Cows	☆☆☆☆☆☆☆

☆ = 10 animals

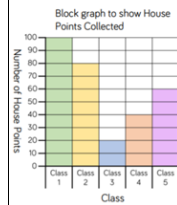| Statement	True or False?
Horses were the least popular animal.	
The number of chickens seen was half the number of cows seen.	
The total amount of pigs and sheep is 70	
There were 8 cows on the farm.	
There were 10 fewer chickens than sheep.	

- Moving from concrete to pictorial, children build block diagrams using cubes and then move to drawing and interpreting block diagrams. Children use their knowledge of number lines to read the scale on the chart and work out what each block represents. Children ask and answer questions using their addition, subtraction, multiplication and division skills.
- Class 4 are collecting data about favourite colours. Make a block diagram suing cubes to represent the data. Now draw the block diagram. What will the title be? Remember to label the blocks and draw a clear scale.

Colour	Number of children
Red	5
Green	8
Blue	7
Yellow	2

To record information in block diagrams

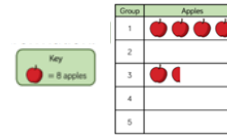| | To ask and answer simple questions by counting the number of objects in each category and sorting them by quantity

To ask and answer questions about totalling and comparing

To interpret information from table, tally charts, block diagrams and lists. | ●5 classes collected their house pints. Here are their results. Which class collected the most house points? Which class collected the fewest house points? How many more points did Class 2 get than Class 4? How many fewer points did Class 3 get than Class 5? How many points did Class 2 and Class 3 get altogether?

• Use 'Representing Data' sheet for an example of a block diagram. Children use the data they collect in their tables and convert them to block diagrams.
• Give children tables on relevant topics to convert to block diagrams.
• Explore block diagrams and model what they show.

• Revise classifying activities – asking questions about the categories. Children count the objects and sort the quantities. Link categories to topics. Think of different ways of sorting the quantities (smallest to biggest, odd/even).

• Extend understanding of interpreting data.   Look at tables, block diagrams and pictograms and ask the children to find totals of two amounts e.g. how many children liked cats and dogs? Compare results e.g. how many more children liked cats? What is the difference between cats and dogs? How many children liked cats and dogs compared to rabbits? Link to topics. Use a range of resources such as cubes and Numicon shapes to support understanding of the number work.

• Look at a range of tables, tally charts, block diagrams that relate to class topics and ask questions about what they show the children e.g. daily routines or favourite healthy foods.
• Use computer activities such as Topmarks (games) and Purple Mash 2 Count. | |

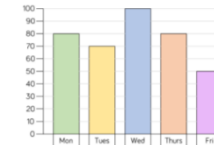| Milestone 3	To interpret and present data using bar charts, pictograms and tables	• Children build on their understanding of pictograms. They continue to read and interpret information in order to answer questions about the data. It is important that children understand the value of each symbols used and what it means when half a symbols is used. Children construct pictograms and choose an appropriate key. Encourage children to carry out their won data collection.	
		• 4 classes are recording how many books they read in a week. Here are the results of how many books they read last week. Which class read the most books? Which class read the least books? How many more books did class 4 read than class 2?	
		• Complete the pictogram using the information. Group 2 collected 40 apples. Group 4 collected half as many apples as Group 1. Group 5 collected 20 more apples than Group 3. How many apples did each group collect?	
		• Class 3 are counting the colour of cars that pass the school Draw a pictogram to represent the findings.	
			Red	Blue	Black	Silver	White	Other
---	---	---	---	---	---
12	6	14	10	14	2		
		• Children interpret information in pictograms and tally charts in order to construct bar charts. They interpret information from bar charts and answer questions relating to the data. Children read and interpret bar charts with scales 1, 2, 5 and 10. They decide which scale will be the most appropriate when drawing their own bar charts.	
		• Use the information from the pictogram to complete the bar chart:	
		• The bar chart show how many children attend after school clubs. Which day is the most popular? Which day is the least popular? What is the difference between the number of children attending on Tuesday and on Thursday? What information is missing from the bar chart?	
		• Here is a tally chart showing the number of children in each sports club. Draw a bar chart to represent the data:	
			Sport	Tally	Total
---	---	---
Football	ЦНГ ЦНГ ЦНГ	15
Tennis	ЦНГ ЦНГ IIII	
Rugby	ЦНГ ЦНГ ЦНГ III	
Cricket	ЦНГ ЦНГ II	
Basketball	ЦНГ III			

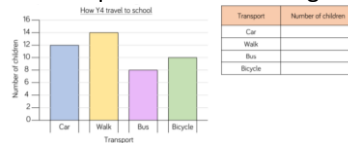|		
	To solve one-step and two-step questions using information presented in scaled bar charts and pictograms and tables	• Children interpret information from tables to answer one and two step problems. They use their addition and subtraction skills to answer questions accurately and aks their own questions about the data in tables. • The table shows which sports children play: How many children play tennis? Which sports does Mo play? Which children play football and tennis? Which child plays the most sport? • The table shows the increase in bus ticket prices. The cost of Ron's new ticket is 60p. How much was his ticket last year? How much has the ticket increased by? Which ticket has increased the most from 2016-2017? Which ticket price has increased the least? • Set problem solving questions e.g. look at a bar chart on people and the transport they use and ask questions such as 'If the bus breaks down how many people will walk?' (One-step) or 'If the bus breaks down but 3 people get a lift, how many people will walk?' (Two-step). Use examples from the NRICH website, TES, Education City and Topmarks.
Milestone 4	To be able to interpret and present discrete data.	• Children revisit how to use bar charts, pictograms and tables to interpret data and present discrete data. They decide which scale will be the most appropriate when drawing their own bar charts. Children gather their own data using tally charts and then present the information in a bar chart. Questions about the data they have gathered should also be explored so the focus is on interpreting rather than drawing. • Complete the table using the information in the bar chart: What is the most/least popular way to get to school? How many children walk to school? • Produce your own table, bar chart or pictogram. • Represent that data in each table as a bar chart:
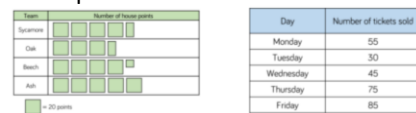
	To solve comparison, sum and difference problems	• Children solve comparision, sum and difference problems using discrete data with a range of scales. They use addition and subtraction to answer questions accurately and ask their own questions about the data in pictograms, bar charts and tables. Although examples of data are given, children should have the opportunity to ask and answer questions relating to data they have collected themselves.	
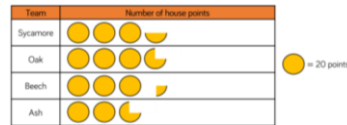
•   How many points did the Sycamore team have than the Ash team? How many points do Beech and Oak teams have altogether? How many more points do Ash need to be equal to Oak?

• How many people voted in total? ¼ of the votes were for _____ 7 more people voted for _____ than _____.

Activity	Number of votes
Bowling	9
Cinema	10
Swimming	7
Ice-skating	14

As a class, decide on some data you would like to collect, for example: favourite food, books, film, food. Collect and record the data ina table. Choose a pictogram or a bar chart to represent your data, giving reasons for your choices. What questions can you ask about the data?