

Year 5 Block C - Handling data and measures Unit 2

Learning overview

In this learning overview are suggested assessment opportunities linked to the assessment focuses within the Assessing Pupils' Progress guidelines. As you plan your teaching for this unit, draw on these suggestions and on alternative methods to help you to gather evidence of attainment, or to identify barriers to progress, that will inform your planning to meet the needs of particular groups of children. When you make a periodic assessment of children's learning, this accumulating evidence will help you to determine the level at which they are working. To gather evidence related to the three Ma1 assessment focuses (problem solving, reasoning and communicating), it is important to give children space and time to develop their own approaches and strategies throughout the mathematics curriculum, as well as through the application of skills across the curriculum.

In this unit the illustrated assessment focuses are:

- **Ma1, Problem solving**
- **Ma4, Processing and representing data**
- **Ma4, Interpreting data**

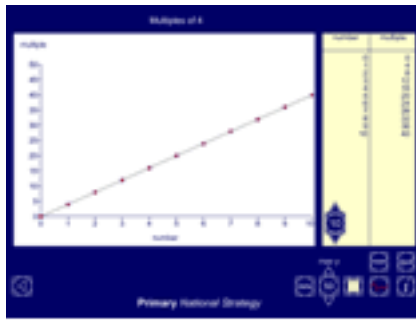
Children **create and interpret bar-line charts and bar charts**. For example, they create a graph with a scale of 0 to 10 along the horizontal axis and 0 to 100 along the vertical axis. For each number 0 to 10 along the horizontal axis they draw a vertical bar line to show the answer when the number is multiplied by 7. They label their graph and use it to respond quickly to questions such as: *What is the product of 7 and 6? What is 56 divided by 7?* They understand that this bar-line chart is similar to a bar chart.

Children draw similar axes and mark the location for each multiple of 7 with a cross. They join the crosses with a line to create a line graph and use this to answer questions such as:

What is 3×7 ?

Approximately, what is 3.8×7 ? Find an approximate answer for 40 divided by 7.

They understand that they can join the tops of the bars on the bar-line chart to create a line graph because all the points along the line have meaning. They then create a line graph for multiplication by 4 and make up questions that they can answer using the graph. They use the ITP 'Data handling' to help them.



Assessment focus: Ma4, Processing and representing data

Look for evidence of how children choose an appropriate scale for a graph. Using a computer database, for example, they might experiment with different scales to decide which represents the information most clearly. When drawing a bar graph to record, for example, wrist and neck measurements for a group of children, they might decide to begin a scale at 15 because all of the measurements are greater than 15 cm, but to then use 1 cm on the axis to represent 1 cm of length because they want to be able to see small differences in the lengths that they record. Alternatively, they might decide to use 1 cm on the axis to represent 2 cm of length so that they can represent a wider range of measurements on one page.

Children **understand the language of probability**. They use previous experience or research to say how likely events are to happen, using vocabulary such as *likely*, *unlikely*, *impossible*, *certain*, *even chance*. They place on a probability scale statements such as:

Tomorrow will be Sunday.

It will rain this month in Delhi.

I will eat five portions of fruit and vegetables today.

Children **consolidate their understanding of likelihood through practical activity**. For example, they play 'Play your cards right'. They shuffle 1 to 9 digit cards and turn over the top card. They discuss the probability of the next card being higher or lower, using the language of probability. They decide which of these it will be before turning the next card over. If their prediction is correct, they continue to play; if not, they start again. Children see how long a run of cards they can get.

Assessment focus: Ma4, Interpreting data

Look out for evidence of children using the language of probability accurately to describe events as 'likely', 'unlikely', 'even chance', 'fair', 'unfair', 'certain' or 'impossible'. For example, they can make statements about rolling a dice, such as the following.

- *It is impossible to score 7.*
- *The score is likely to be higher than...*
- *There is an even chance of rolling an odd number.*

Children **test a hypothesis** such as: *Each child in our class uses over 100 litres of water each day.* They decide what data is needed and discuss how they will collect the data. For example, they may decide to keep a diary of when they use water and how they use it for a day, or to create a frequency table to keep track of how many times a day they wash their hands, take a drink, and so on. They appreciate that they need to work out how much water they use, say, to clean their teeth, wash their hands, take a shower or flush the toilet. Children estimate the amount of water used for each of these, then work in groups to find the approximate amounts of water used per day. They consider the units that they will use to measure the actual amount of water used for some of the activities (for example, hand-washing, teeth-cleaning, a typical drink) and how accurate their measurements need to be.

Children work as a class to decide how they should record the total amount of water used by each child to help them to respond to the initial hypothesis, possibly using ICT. Children comment on the results of their investigation and suggest extensions to it. For example, they may suggest that they should find out ways of saving water and what difference it would make.

Assessment focus: *Ma1, Problem solving*

Look for children who make suggestions about how to solve the problem, such as designing a data collection sheet for recording how much water is used at home. Look out for children who pose further questions and make links with previous learning, for example those who refer back to work on using appropriate measuring units for capacity. Look for children who evaluate the process and identify where the collection or representation of the data could have been improved.

Objectives	Assessment for learning
<p><i>Children's learning outcomes are emphasised</i></p>	
<ul style="list-style-type: none"> Plan and pursue an enquiry; present evidence by collecting, organising and interpreting information; suggest extensions to the enquiry <i>I can collect and organise data to find out about a subject or to answer a question</i> 	<p>What are you trying to find out? What information are you aiming to collect? How?</p> <p>What other questions could you ask now that you have finished your enquiry?</p> <p>What would you do differently if you carried out the enquiry again?</p>
<ul style="list-style-type: none"> Explain reasoning using diagrams, graphs and text; refine ways of recording using images and symbols <i>I can use graphs to show findings about a subject or to help explain my answer to a question</i> 	<p>What does the data tell you about your original question?</p> <p>Why did you choose this type of table, graph or chart?</p> <p>What did you find out? What evidence do you have to support your conclusions?</p> <p>Are your results what you expected or were there any surprises?</p>
<ul style="list-style-type: none"> Answer a set of related questions by collecting, selecting and organising relevant data; draw conclusions, using ICT to present features, and identify further questions to ask <i>I can decide what information needs to be collected to answer a question and how best to collect it</i> <i>I can explain what a table, graph or chart tells us and consider questions that it raises</i> 	<p>What information will you need to collect to answer these questions?</p> <p>How will you collect it?</p> <p>What does this graph tell you?</p> <p>What makes the information easy or difficult to interpret?</p> <p>Does anything surprise you?</p> <p>Look at this graph, table or chart. Make up three questions that can be answered using the data that is represented.</p> <p>What were the advantages of using a computer?</p> <p>What further information could you collect to answer the question more fully?</p>
<ul style="list-style-type: none"> Construct frequency tables, pictograms and bar and line graphs to represent the frequencies of events and changes over time <i>I can explain why I chose to represent data using a particular table, graph or chart</i> 	<p>How will you display your data?</p> <p>How did you decide on the scale for this axis?</p> <p>What labels have you put on the axes?</p> <p>What titles have you given your graphs and charts?</p> <p>Why did you choose this type of graph?</p>
<ul style="list-style-type: none"> Describe the occurrence of familiar events using the language of chance or likelihood <i>I can describe how likely an event is to happen and justify my statement</i> 	<p>'It will snow tomorrow.' Suggest a place where this event is unlikely to happen and one where it is likely to happen. Tell me an event that is impossible. When you roll a normal dice, how likely are you to roll a number bigger than 2?</p>

<ul style="list-style-type: none"> Read, choose, use and record standard metric units to estimate and measure length, weight and capacity to a suitable degree of accuracy (e.g. the nearest centimetre); convert larger to smaller units using decimals to one place (e.g. change 2.6 kg to 2600 g) <p><i>I can measure capacity in litres and millilitres, using appropriate measuring instruments. I can use decimal numbers to record measurements</i></p>	<p>Suggest some objects whose capacity could be measured using a 1-litre measuring jug. Suggest a sensible estimate for the capacity of a kettle. How did you decide on this estimate?</p> <p>Which measurement is equivalent to 1.3 litres: 130 ml, 1003 ml, 1300 ml or 103 ml?</p> <p>How do you know?</p>
<ul style="list-style-type: none"> Interpret a reading that lies between two unnumbered divisions on a scale <p><i>I can find the value of each interval on a scale and use this to give approximate values of readings between divisions</i></p>	<p>What is the value of each interval on this scale? What information did you read on the scale to help you? What calculations did you do?</p> <p>What measurement would fall halfway between these two unnumbered divisions on this scale?</p> <p>Find out how many butter beans weigh between 65 g and 70 g.</p>
<ul style="list-style-type: none"> Understand the process of decision making <p><i>I can explain why I decided to use a particular piece of measuring equipment or unit of measurement</i></p>	<p>Why did you decide to change all the units to metres rather than centimetres?</p> <p>Why did you decide to use the scales rather than the balance?</p>