HANDLING DATA

Transport to school

Learning focus

- Collect data in a tally chart
- Present data in a frequency table
- Create a pictogram where the symbol represents more than one unit
- Interpret data displayed in tally charts and pictograms

Key vocabulary

- Tally marks
- Tally chart
- Frequent
- Frequency table
- Pictogram
- Scale
- Axes
- Key
- Horizontal
- Vertical
- Interpret
- Popular
- Most/least

Resources

- Chalk
- String
- Sticks (or leaves)

Activity

Introduce the activity by discussing the different ways in which children travel to school.

> *How do you travel to school?*
> *What other types of transport could be used?*
> *What are the benefits and drawbacks of each type of transport?*

Explain that the principal would like their help in collecting data on how pupils travel to school to make sure that there is sufficient space for 'drop-offs', sufficient bicycle racks, and so on.

Teaching point

The process of data handling involves 5 main stages:

1. PROBLEM: Posing a question
2. PLAN: Planning for data collection
3. DATA: Collecting the data
4. ANALYSIS: Representing the data
5. CONCLUSION: Interpreting the data in order to answer the original question posed

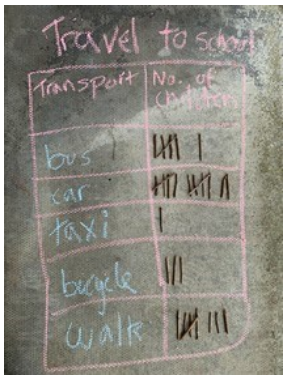
Children should be encouraged to collect data as part of a purposeful enquiry. This will involve formulating specific questions: What do we want to find out? Why? Once the data has been collected and represented in appropriate ways, the children should be given sufficient time to analyse what has been found in order to answer the original question.

Invite the children to suggest how they might help.

What do we need to find out?
What data will we need to gather?
How will we gather and record this data?

Begin by collecting data on how the children travel to school. Create a large tally chart using chalk on the school grounds. Ensure that the chart has a title and column headings.

Transport	Tally marks
Bus	
Car	
Taxi	
Bicycle	
Walk	



Each child should then take a short stick and place it on the chart to indicate how they travel to school. Initially pupils could set their sticks out vertically and then count them one by one to find the total. They should then progress to using the bar-gate convention.

Teaching point

Tallying is a simple way of counting; a mark is made to represent each item counted, with every fifth mark used to make a group of five. Tally marks date back to ancient times when people used to make notches on sticks in order to keep count. It was easy to lose count with lots of notches and so they crossed four out with a fifth in order to count in fives – bar-gate convention.

Once the children have placed their sticks on the tally chart, encourage them to calculate the total for each category. They could record the totals in a separate frequency table. Discuss the meaning of frequent and introduce the term frequency table.

Transport	Number of pupils
Bus	
Car	
Taxi	
Bicycle	
Walk	

What is the total for each type of transport? How did you calculate that?
Why is tallying helpful?
Why is it helpful to record the totals?

Teaching point

We often use tallies when gathering information but a frequency table can be used to present data in a clearer way. A frequency table records total numbers instead of tallies.

Encourage children to answer questions about the data shown on the tally chart (and/or frequency table).

What does the tally chart show?
How many pupils travel to school by car? How many walk?
What is the most popular type of transport in our class? What is the least popular? How can you tell?
How many more pupils travel by car than by taxi?
How many pupils are driven to school?

Include questions which encourage the children to read beyond the data.

Would the tally chart be different in the summer? In the winter? Explain your response.
Would the tally chart be different for another class? Explain your response.

To develop the activity further, encourage children to suggest other ways in which they could display the data. For example, they could represent the data in a simple pictogram. They should already be familiar with creating pictograms where the symbol represents one. Progress to creating a pictogram where the symbol represents more than one. In this case, they could use one stick to represent two children; half a stick could represent one child.

Teaching point

A pictogram is a way of representing discrete data, in which each member of the population is represented by an icon lined up both horizontally and vertically. With larger populations, each icon may represent a number of individuals rather than just one.

It is important to consider the ratio carefully. In some cases, many-to-one correspondences in pictograms are inappropriate with small populations. For example, using an icon to represent 10 people and fractions of the icon to represent numbers less than 10 would not be helpful with a population of approximately 30 children.

Work with the children to create a large pictogram beside the tally chart. Use ropes to create the axes. Label the vertical axis to indicate the different types of transport and label the horizontal axis with ‘number of children’. Add a title and a key showing what each stick represents.

Invite the children to place the sticks in the correct place on the chart, ensuring that the sticks are lined up both horizontally and vertically. This is relatively straightforward when using one stick to represent one child. The children may need some support when using one stick to represent two children. Discuss what to do when there is an odd number of pupils.

What does one stick represent?
What does half of a stick represent?
How many children travel to school by bus? How many sticks are needed?

Once the children have finished creating their pictogram, encourage them to interpret the data. Include questions which can be answered directly as well as questions which invite them to make additional observations and questions which invite them to reflect and make deductions.

The children could also compare and contrast the different representations (tally chart, frequency table and pictogram) used.

> *How are they the same? How are they different?*
> *Which is most helpful? Why?*

Finally, encourage the children to consider how they will respond to the principal. They should recognize that they have only collected data from one class and will therefore need to collect data from all of the other classes. The children could be organized into small groups and each group assigned to another class in the school. They could create a tally chart to collect data from their given class. The results could then be collated to give an overall response to the principal.

Taking ideas further

The children could research the history of counting and ancient numeral systems.

They could explore other ways of representing the same set of data. For example, they could create a bar chart or a bar-line graph, using an appropriate scale. They could also use a simple computer graphing program to display data.

Data handling is best taught when a real purpose is involved. Give children opportunities to suggest other questions which might be worth asking and provide opportunities for them to collect the appropriate data in order to answer them.

Assessment opportunities

Are the children able to:

- Collect data and present the results in a tally chart
- Present data in a frequency table
- Create a pictogram where the symbol represents more than one
- Use an appropriate title and labels when presenting data in tally charts, frequency tables and pictograms
- Ask and answer questions about the data displayed in tally charts, frequency tables and pictograms