Lesson - Bar charts, pictograms and tables

Year: Year 3

Hello, I am Otto! Every day people collect information: what pets children have, how many goals a team scores, how much rain falls each month. This information is called data. A good chart or table helps us see the answer at a glance. In Year 3 you read and draw bar charts, pictograms and tables, and you use them to answer questions.

Starter activity

Ask ten friends: "What is your favourite fruit: apple, banana or strawberry?" Make a mark for each answer, using a tally. Then count each group. You might find 4 apples, 3 bananas and 3 strawberries. Which fruit is the most popular? How many more people like apples than bananas? You have just done a mini survey, and the rest of the chapter shows how to show your results clearly.

Collecting data with tally charts

Definition: tally chart

A **tally chart** is a way of counting as you go. For each item you draw one mark. Every fifth mark is drawn across the four before it, so a group of 5 is easy to count. After the survey you count the tallies and write the **frequency**, which is the total for each group.

Pet	Tally	Frequency
Dog	|||| |||	8
Cat	||||	5
Fish	|||	3

In this tally chart 8 children have a dog, 5 have a cat and 3 have a fish. In total 8 + 5 + 3 = 16 children took part.

Example 1

A tally shows ||||| ||| for rabbits. What is the frequency?

The group of five (|||||) counts as 5, and there are 3 more marks: 5 + 3 = **8**.

Reading tables

Definition: table

A **table** organises data in rows and columns. The headings tell you what each column shows. To read a table, find the row you need, then look across to the right column.

Day	Rainfall (mm)
Monday	4
Tuesday	0
Wednesday	7
Thursday	3

Example 2

Use the table: on which day was the rainfall the greatest, and what was the total for the four days?

The biggest number is 7, so Wednesday. The total is 4 + 0 + 7 + 3 = **14 mm**.

Pictograms

Definition: pictogram

A **pictogram** uses pictures or symbols to show data. A **key** tells you what each symbol stands for. Sometimes one symbol means more than one item, for example one circle stands for 2 books. A half symbol then means half as many.

Mon	● ● ●
Tue	● ● ● ● ●
Wed	● ●

Key: one circle stands for 2 books

Method: reading a pictogram

1. Read the key first. Find what one symbol stands for.
2. Count the symbols in the row you need.
3. Multiply the number of symbols by the value of one symbol.
4. Check your answer by looking at the question again.

Example 3

In the pictogram, one circle stands for 2 books. How many books were read on Tuesday?

There are 5 circles on Tuesday. 5 × 2 = **10 books**. On Monday: 3 × 2 = 6 books. On Wednesday: 2 × 2 = 4 books.

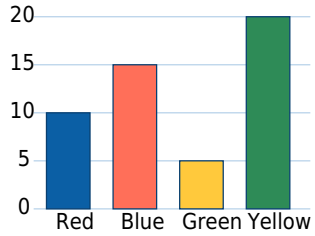
Watch out

Always read the key. If one symbol means 5, then 3 symbols mean 15, not 3. Also remember that a half symbol means half of the value of a whole symbol.

Bar charts

Definition: bar chart

A **bar chart** shows data using bars. The height (or length) of each bar shows the frequency. The chart needs a **title**, labels on both **axes** and a **scale** on the vertical axis. The scale is the number each gridline stands for.



This chart shows favourite colours. The scale goes up in steps of 5. Red is 10, blue is 15, green is 5 and yellow is 20.

Method: reading a bar chart

1. Read the title and the labels on both axes.
2. Look at the scale: what does each step stand for?
3. Find the top of the bar and read across to the scale.
4. If the top of the bar is between two lines, estimate halfway.

Example 4

Use the bar chart: how many more children chose yellow than blue? How many children took part?

Yellow is 20 and blue is 15. $20 - 15 =$ **5 more**. Total: $10 + 15 + 5 + 20 =$ **50 children**.

Drawing a bar chart

Method: drawing a bar chart

1. Choose a sensible scale so that the biggest number fits on the vertical axis, for example steps of 2, 5 or 10.
2. Draw and label the axes, and give the chart a title.
3. Draw each bar with the same width and a gap between bars.

4. Check that each bar matches its number in the table.

Example 5

Show these results in a bar chart: swimming 12, football 20, tennis 8, dance 16. Which scale would you choose?

The biggest number is 20, so the vertical axis needs to go up to 20. Steps of 4 give gridlines at 0, 4, 8, 12, 16, 20, and every number sits exactly on a gridline. So the scale in steps of **4** is a good choice.

Comparing and solving problems

Rule: one-step and two-step questions

- "How many more" or "how many fewer": subtract the smaller number from the bigger.
- "How many in total" or "altogether": add the numbers.
- "Two-step" questions need two calculations, for example find the total and then subtract a number.

Example 6

The table shows how many books were borrowed each day: Mon 14, Tue 9, Wed 17. How many more books were borrowed on Wednesday than on Tuesday? How many were borrowed in the three days?

Wednesday − Tuesday: 17 − 9 = **8 more**. Total: 14 + 9 + 17 = **40 books**.

Example 7

In a pictogram where one symbol stands for 4 children, football has 6 symbols and tennis has 4. How many more children chose football?

Football: 6 × 4 = 24. Tennis: 4 × 4 = 16. 24 − 16 = **8 more children**. Or compare the symbols: 6 − 4 = 2 symbols, and 2 × 4 = 8.

Did you know?

The bar chart was invented by a Scottish engineer called William Playfair about 240 years ago. He used it to show how much money a country sold and bought. Today newspapers, scientists and businesses all use charts to understand data quickly.

Otto's tip

Before you answer a question about a chart, ask three things: what is the title, what

does the scale or key say, and what exactly is the question? Then circle the numbers you need.