Lesson - Pictograms, tally charts and block diagrams

Year: Year 2

Hello, I am Otto! Data is information. We collect data by asking questions and counting. Then we show the data so that it is easy to read. In Year 2 we use tally charts, tables, pictograms and block diagrams. We also answer questions about data and compare the numbers.

Starter activity

Ask 10 friends or family members, "What is your favourite pet?" Write down each answer with a tally mark. Then count the marks for dogs, cats and fish. Which pet is the most popular? Which one is the least popular? How could you show the answers in a picture?

Tally charts

Definition: tally chart

A **tally chart** uses a little line for each thing counted. We group the lines in fives: four lines with a fifth line across them. We count in fives and then count on the extra lines.



This tally shows 13: two groups of five and three more lines. 5, 10, 11, 12, 13.

Method: making a tally chart

1. Decide the question and the choices, for example "favourite pet": dog, cat, fish.
2. Ask each person and make a tally mark in the right row.
3. Count the marks in each row and write the total.

Item	Tally	Total
Dogs		7
Cats		5
Fish		3

Worked example 1

Look at the tally chart. How many children chose dogs? How many more chose dogs than fish?

The dogs row shows 7 lines. The fish row shows 3 lines. $7 - 3 = \mathbf{4}$. So 4 more children chose dogs than fish.

Pictograms

Definition: pictogram

A **pictogram** uses pictures or symbols to show data. It needs a **key** that tells you what each picture stands for. A key can say that one picture stands for 1, 2, 5 or 10 things.

Dogs	★★★
Cats	★★
Fish	★

Key: each star stands for 2 children. Dogs have 3 stars, so 6 children chose dogs. Half a star stands for 1 child.

Rule: reading a pictogram with a key

1. Read the key first.
2. Count the pictures in a row.
3. Multiply the number of pictures by the number in the key.

Worked example 2

Each star stands for 2 children. A row has 4 stars. How many children is that?

$4 \times 2 = \mathbf{8\ children}$. Count in twos: 2, 4, 6, 8.

Worked example 3

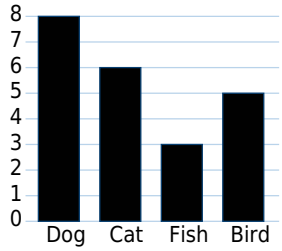
A pictogram has the key: 1 star = 10 books. Tom has 3 and a half stars. How many books?

3 stars is $3 \times 10 = 30$ books. A half star is half of 10, which is 5 books. $30 + 5 = \mathbf{35\ books}$.

Block diagrams

Definition: block diagram

A **block diagram** (or bar chart) uses blocks or bars to show data. The height of each bar shows the number. The numbers up the side are the **scale**.



The dog bar reaches 8, so 8 children chose dogs. The fish bar reaches 3.

Method: reading a block diagram

1. Read the labels under the bars.
2. Look at the scale up the side. Find how much each step is worth.
3. Go across from the top of the bar to the scale and read the number.

Worked example 4

Use the block diagram. How many more children chose dogs than birds?

Dogs 8 and birds 5. $8 - 5 =$ **3** more children.

Answering questions about data

Key fact: types of question

- **How many?** Read the number from the chart.
- **Most and least popular:** find the biggest and smallest numbers.
- **How many more or fewer?** Find the difference by subtracting.
- **Total:** add all the numbers together.

Worked example 5

The numbers of children who chose each pet are: dogs 8, cats 6, fish 3, birds 5. How many children were asked?

Add all the numbers: $8 + 6 + 3 + 5 = 14 + 8 =$ **22 children**.

Tables

Definition: table

A **table** shows data in rows and columns. Each row is across and each column is down. We read the heading of the row and the heading of the column to find the number.

Day	Rain (mm)	Sun (hours)
Monday	2	5
Tuesday	0	8
Wednesday	6	2

Worked example 6

Use the table. On which day were there the most hours of sun? How many more hours than Monday?

Tuesday has the most sun, with 8 hours. $8 - 5 =$ **3 hours** more than Monday.

Watch out

Always read the key and the scale! In a pictogram a star might stand for 2 or 10, not 1. In a block diagram the scale may go up in 2s. Also, a tally is grouped in fives: do not count the line across as 1 extra, because it makes a group of 5 with the other four.

Did you know?

Tally marks are very old. People made scratches on bones about 30 000 years ago to keep count. Today, scientists and shopkeepers still use tally marks. In some countries, tally marks are grouped in sets of five dots forming a square with a line across.

Otto's tip

When you answer a data question, write the numbers first, then work out the answer. For "how many more?", subtract. For "how many altogether?", add. Check your answer with the picture: does it make sense?