Lesson - Length, mass and capacity

Year: Year 1

Hello, I am Otto! How long is your pencil? How heavy is your bag? How much water is in a bottle? Today we learn how to measure and compare lengths, masses and capacities. These words sound big, but the ideas are easy.

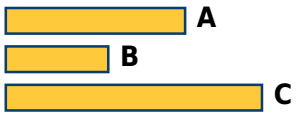
Starter activity

Find 3 things in your room, for example a pencil, a book and a shoe. Which is the longest? Which is the shortest? Now hold two things, one in each hand. Which feels heavier? Which feels lighter? Use words, not numbers.

Length: long, short, tall

Definition: length

Length tells us how long something is. We can say that a thing is **long** or **short**. For height we say **tall** or **short**. For distance across we say **wide** or **narrow**.



Look at the three bars. Bar C is the **longest**. Bar B is the **shortest**.

Rule: comparing lengths

To compare two lengths, start both things at the same line. Then look at which one reaches further. Use the words *longer than*, *shorter than*, *taller than* and *the same as*. For three or more, use *longest* and *shortest*.

Example 1

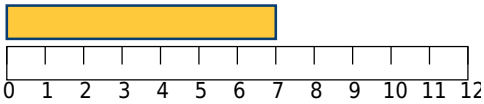
Bar A is 7 cubes long. Bar B is 4 cubes long. Which is longer? How much longer?

7 is more than 4, so Bar A is longer. $7 - 4 = 3$. Bar A is **3 cubes longer**.

Measuring length

Definition: unit

A **unit** is a fixed size we use to measure. At first we can use cubes, hand spans or paper clips. Later we use a ruler. On a ruler the small units are **centimetres** (cm). 100 centimetres make 1 **metre** (m).



Method: measuring with a ruler

1. Put the zero of the ruler at one end of the object.
2. Keep the object straight along the ruler.
3. Read the number at the other end of the object.
4. Write the number and the unit, for example 7 cm.

Example 2

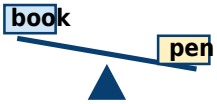
How long is the yellow bar on the ruler?

The bar starts at 0 and ends at 7. The yellow bar is **7 cm** long.

Mass: heavy and light

Definition: mass

Mass tells us how heavy something is. We say a thing is **heavy** or **light**. We compare with *heavier than*, *lighter than* and *the same as*. We use balance scales to compare. The heavier side goes down.



The book side is lower, so the book is **heavier** than the pen. The pen is **lighter**.

Key fact: balance scales

- The heavier side goes down.
- The lighter side goes up.
- If both sides stay level, the two things are the same mass.

Example 3

An apple weighs the same as 5 cubes. A pear weighs the same as 8 cubes. Which is heavier?

8 cubes is more than 5 cubes, so the **pear** is heavier.

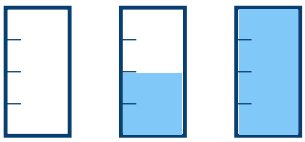
Grams and kilograms

Heavy things are measured in **kilograms** (kg). Light things are measured in **grams** (g). A bag of sugar weighs 1 kilogram. A paper clip weighs about 1 gram.

Capacity: full and empty

Definition: capacity

Capacity tells us how much a container can hold. A container can be **full**, **half full**, **nearly full** or **empty**. We measure liquids in **litres** (l) and **millilitres** (ml).



The first container is empty, the second is half full and the third is full.

Rule: comparing capacity

A container that holds more has a bigger capacity. We can pour water from one container to another to compare. The words are *holds more*, *holds less* and *holds the same*.

Example 4

A cup holds 3 spoons of water. A mug holds 5 spoons of water. Which holds more?

5 is more than 3. The **mug** holds more. It holds 2 spoons more.

Using what we know

Example 5: a measuring story

Sam's train track is 12 cm long. Ella's track is 9 cm long. How much longer is Sam's?

$12 - 9 = 3$. Sam's track is **3 cm longer**.

Example 6: add lengths

A red ribbon is 6 cm long. A blue ribbon is 5 cm long. What is the length if they are put end to end?

$6 + 5 =$ **11 cm**.

Watch out

- Start measuring from zero, not from 1.
- Compare things fairly: use the same unit for both.
- A tall thing is not always heavy, and a big thing is not always heavy. A big balloon is very light!
- Always write the unit: cm, m, kg, g or litres.

Did you know?

Long ago, people measured with parts of the body: a hand, a foot or a stride. The word *foot* comes from that. But feet are different sizes, so people agreed on fixed units like the metre, which is the same everywhere in the world.

Otto's tip

Say a measuring word and a unit together: "7 centimetres", "2 kilograms", "a full litre". And line things up before you compare them. A fair test gives a fair answer!