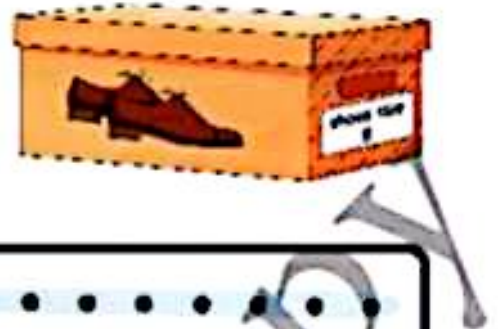


* 4.1. Exploring volume

Let's investigate.

How could you find out how much space there is inside this shoe box?



Remember

The amount of space inside an object is a measure of the volume of the object.


You can find the volume of a box by filling it with identical items, then counting them.

 This box holds 21 apples.

It has a volume of about 21 apples.



We use "about" to describe the volume because the items do not fill the space completely.

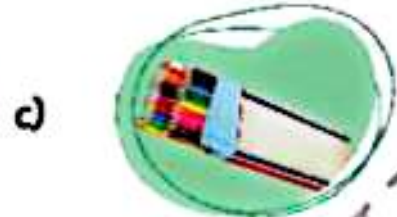
 This box holds 32 sugar cubes.

It has a volume of 32 sugar cubes.



The sugar cubes fill the box without leaving any spaces.

What is the volume of each object?



Remember

A centimetre cube has a volume of one cubic centimetre (1cm^3).
 The length of each edge of this centimetre cube is 1cm.
 We can use cubic centimetres to measure volume.



This box holds 2 layers of cubes.

There are 2 rows of 4 cubes, or 8 cubes in each layer.

So, the volume of this box is 16 cubic centimetres, or 16cm^3 .



1. Make each object with centimetre cubes.

Find the volume of each object.

Order the objects from least to greatest volume.



* 4.2. Exploring capacity: the litre

Remember

When you measure how much a container holds, you measure its capacity.

This bottle has a capacity of one litre (1l).

The bottle holds 1 l of water.

One litre fills about 4 glasses.



Here are some other things that are measured in litres.

orange juice
1 l



milk
1 l



laundry detergent
2 l



vinegar
4 l



Which containers hold less than 1 l?

Which hold more than 1 l?

- a) a mug
- b) a baby's bottle
- c) a garbage can
- d) a rain barrel
- e) a kitchen sink
- f) an eyedropper



4.3. Exploring capacity: the millilitre

Remember

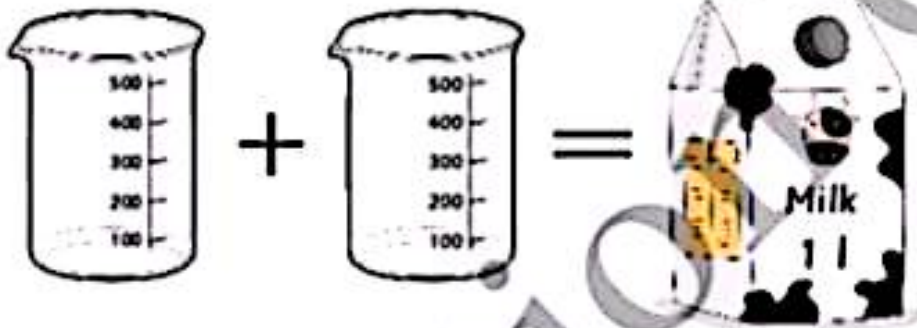
The millilitre (ml) is a small unit of capacity.

This teaspoon has a capacity of 5 ml.

This measuring cup has a capacity of 500 ml.

It holds 500 ml of water.

It takes 2 of these measuring cups to fill a 1-L container.



$$500 \text{ ml} + 500 \text{ ml} = 1000 \text{ ml}$$

One litre is equal to one thousand millilitres.

$$1 \text{ l} = 1000 \text{ ml}$$

Which unit would you use to measure each amount, millilitre or litre?

- The amount of gasoline in a car
- The amount of water in a raindrop
- The amount of nail polish in a bottle
- The amount of water in a swimming pool

* 4.4. Mass and capacity

Let's investigate

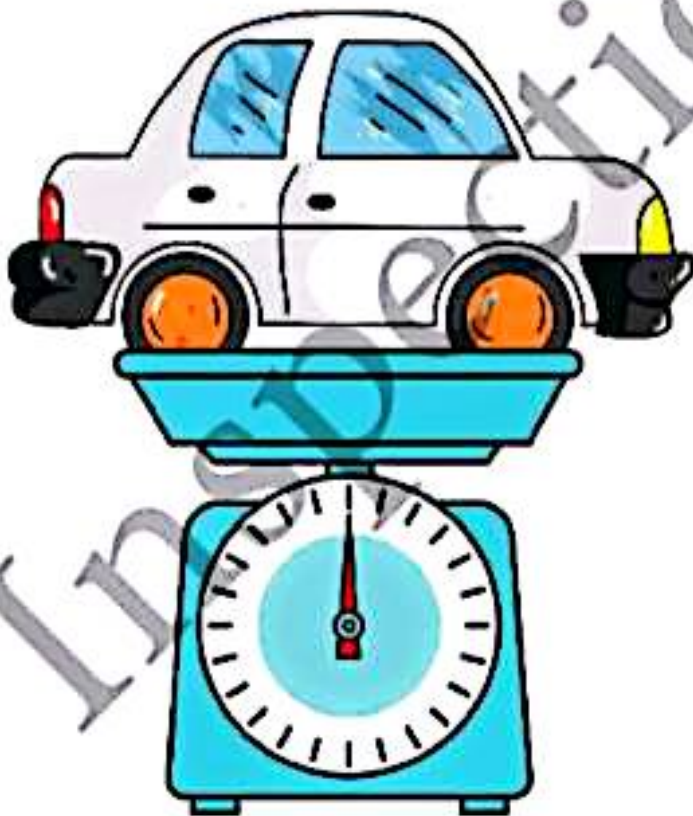
One litre of petrol weighs approximately 700g.

The mass of my car was 1228 kg when I started my journey. At the end of the journey it was 1214.7 kg.

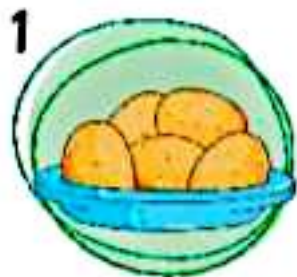
If I did not change the mass of the car in any way, except using the petrol, how many litres of petrol had I used?

Look and learn

- ◆ **Capacity:** the amount a container can hold.
- ◆ **Litre:** a unit of capacity or liquid volume.
- ◆ **Millilitre:** a unit of capacity or liquid volume, one thousandth of a litre.
- ◆ **Mass:** quantity of matter in an object.
- ◆ **Gram:** a unit of mass.
- ◆ **Kilogram:** a unit of mass, one thousand grams.



Look at the scales on the measuring equipment on the page opposite. Match each ingredient to the equipment showing the same amount. Write the number of the ingredient and the letter of the equipment.



1.3 kg



850 ml



950 g



275 g



0.33 g



280 ml



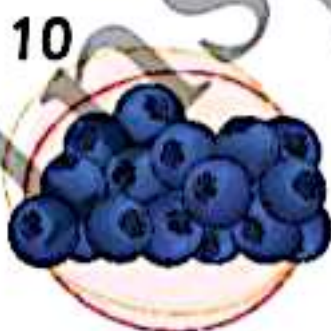
2.4 kg



1.81



68 g



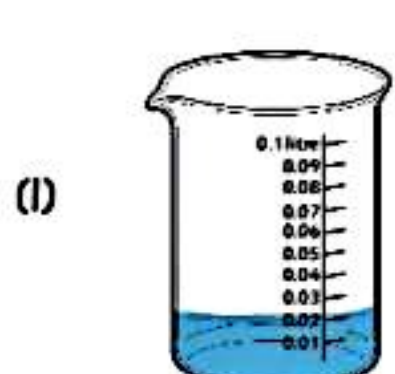
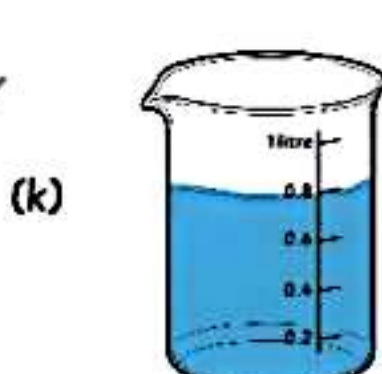
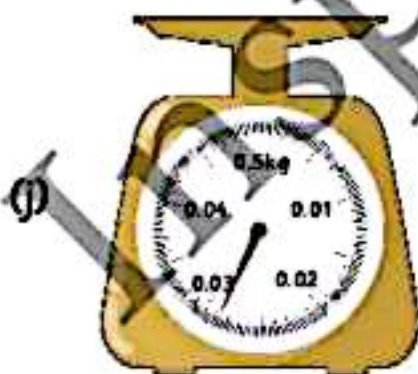
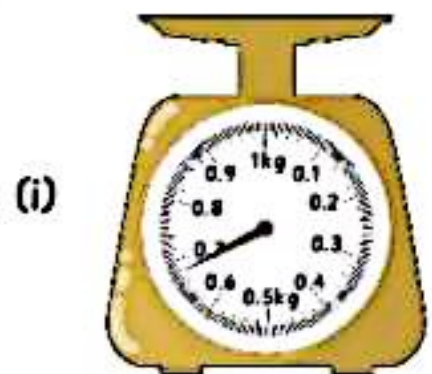
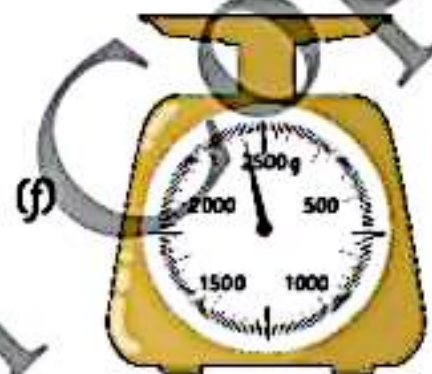
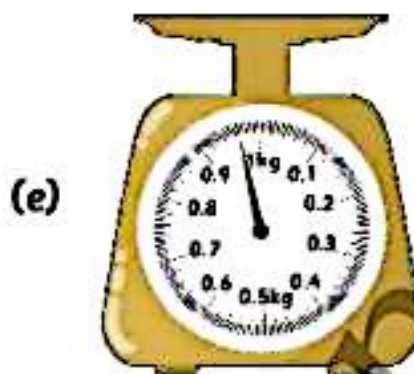
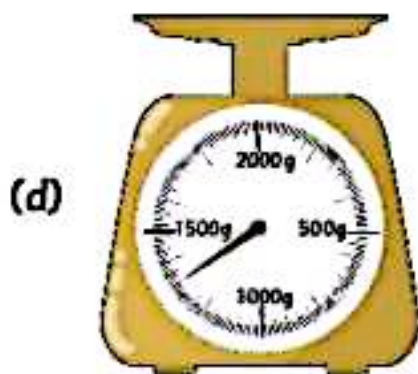
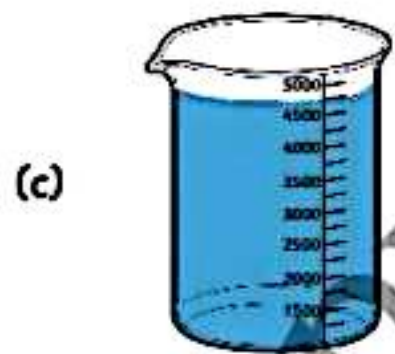
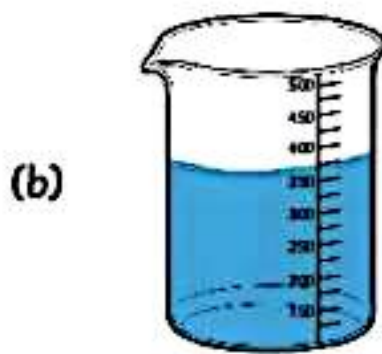
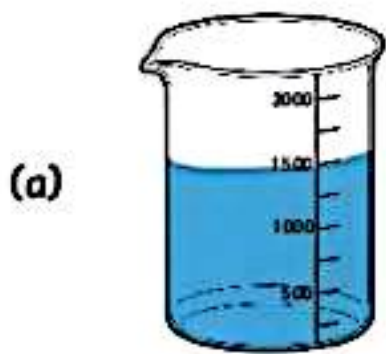
1.72 kg



25 ml



4.61



This is a recipe for vegetable soup.



Country Vegetable Soup

Recipe for 1 person

Ingredients:

70 g carrots

25 g onion

20 g mushrooms

90 g leek

225 g potato

8 g garlic

330 ml water

15 ml vegetable oil



Calculate the amounts of each ingredient needed for the recipe if it was for 20 people. Convert grams to kilograms and millilitres to litres.