

# Lesson Plan

## MEASUREMENT (मापन/ मोजमाप)

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### Summary

1. Subject(s): MATHEMATICS
2. Topic or Unit of Study: Measurement
3. Grade/Level: 2 (class 4 and 5)
4. Objective:
  - a. Revise basic
  - b. Conversion of different units (length, weight, volume)

### What the child should know before:

1. Different units of weight, length and volume
2. Addition, subtraction, multiplication and division
3. Basic concepts related to Money and Time

## Weight (वजन)

### Fun activity

Tell them to bring any form of packaged food and ask them to read the quantity on the packet. **Let them observe that it's always in kgs or grams.**

### Real life example

Here is the list of things that Neha's mother has asked her to bring from the grocery shop.

- Rice- 1 kg
- Sugar- 2 kg
- Wheat- 10 kg
- Masala- 50 gm
- Cardamom- 20 gm

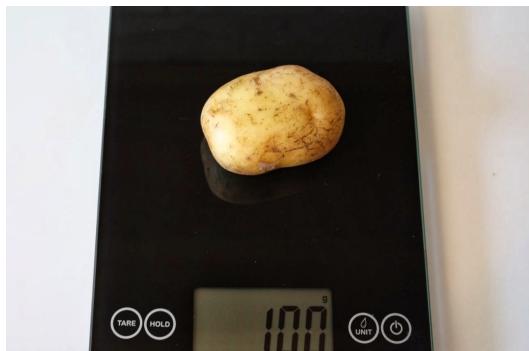
So what does this kg and gm stand for?

[kg stands for kilogram and gm stands for gram]

As we saw earlier, we can measure weight in Grams, tola, kilograms, quintal etc but in everyday life we mostly make use of kilograms and grams.

So which quantity is bigger kilogram or gram?

Below are the images of 100 gram potato and 100 kg of potatoes.



100 gm



100 kg

**So which quantity do you think is bigger?**

We have a relation between kilograms and grams as follows:

$$1 \text{ kilogram} = 1000 \text{ grams}$$

So if I ask for 2 kg of rice, the shopkeeper will give me how many grams of rice?

$$2 \text{ kilograms} = 2 \times 1000 \text{ grams}$$

$$2 \text{ kilograms} = 2000 \text{ grams}$$

So now half kilograms will be equal to how many grams?

$$1 \text{ kg} = 1000 \text{ gm}$$

$$1 \text{ kg} = 500 \text{ gm} + 500 \text{ gm}$$

From this we can say that half kg = 500gm

Similarly can you tell how many gm will a quarter kilogram be?

Solution:

$$500 = 250 + 250$$

So half of 500 is 250 and half of half is a quarter

$$\text{So half of 500 grams} = 250 \text{ grams}$$

$$\text{So a quarter kilogram} = 250 \text{ grams.}$$

But now how will a shopkeeper know exactly what quantity of any material will be equal to 1 kg?



Just by looking, can you tell which one of these is 1 kg?

So in order to be sure, he makes use of weights.

[Maths - Measurement Weight - English](#) (from 2:25 to 6:14)



So as you can see, we have 1kg weight, 500g weight, 200g weight etc.

Given below is an image of a balance.



Suppose you want to buy 400 grams of poha, then the shopkeeper will put 2 weights of 200 grams in one pan of balance and poha in the other.

Question: So suppose I want to buy 600g of sugar, what will the shopkeeper do?

## Conversion of kg to gm.

1. How many kilograms is 5kg?

$$1\text{kg} = 1000 \text{ gm}$$

$$5\text{kg} = 5 \times 1000$$

$$= 5000 \text{ gm}$$

### ❖ How many grams is one and three quarter kilograms?

One and three quarter kilograms means 1 kilogram and half a kilogram and a quarter kilogram.

$$1000 \text{ grams} + 500 \text{ grams} + 250 \text{ grams} \\ = 1750 \text{ grams.}$$

Therefore, one and three quarter kilograms are 1750 grams.

## Word problems:

1. Suppose the shopkeeper has only 100 grams weights and he wants to measure 1kg, then how many weights will he use?
2. How many weights of 50 grams will the shopkeeper use in order to weigh a quarter kilogram of apples?
3. What weights will the shopkeeper use to measure 3 and a half kilograms of wheat?
4. How many grams is 3 and a half kilograms of wheat?
5. What is the maximum quantity that a person can weigh using 2 weights of 1kg, 5 weights of 200 grams, 3 weights of 100 grams and 1 weight of 50 grams.

## Fun story (mentioned in the txt book):

The story of how they weighed the elephant

Link:

<https://storyestogrowby.org/story/early-reader-weighing-elephant-english-stories-kids/#:~:text=%E2%80%9CYou%20>

[put%20the%20elephant%20in,boat%20out%20on%20the%20water.&text=When%20the%20boat%20sinks%20to,how%20much%20the%20elephant%20weighs!%22](#)

## Length (लांबी)

### Activity



Get a ruler (preferably a 30cm one).

1. **Objective** - Identify different units which can be measured using this ruler.  
**[mm, cm, inches, feet]**
  - A. Give the students an object to measure using a ruler. What if the object is more than 5cm and less than 6cm. How do we measure it?
    - Make use of smaller markings between cm. Introduce them to kids **[Millimetre]**
    - Ask them to count the number of those smaller lines between two cm units.  
**[1cm = 10mm]**
  - B. Introduce kids with the concept of feet. Is there any significance of these 12 inches on the ruler?  
**[1 foot = 12 inches]**. Feet and inches are more convenient while measuring heights. (Explain them that cm would be much smaller unit and metre would be a much bigger unit while measuring heights or smaller distances)

**Note:** To avoid confusion, please clarify with kids that foot is for a single unit of measurement while feet is plural. And both are the same units.

2. Why use a ruler and not other means of measuring like a handspan? [Revision level 1]

### # Important Points (while using ruler)

1. Hold the scale in a straight line while measuring.
2. Start measuring from the '0' mark. [Is this a necessary condition?]

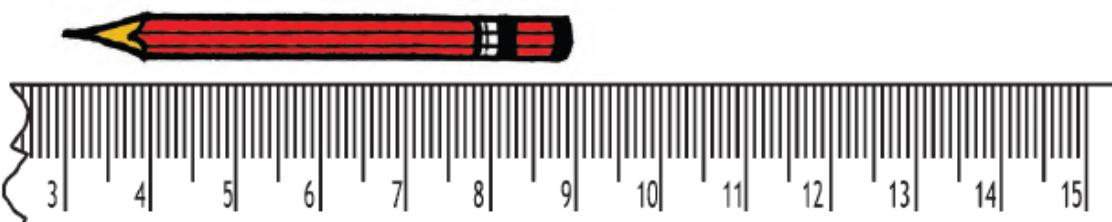
### Activity

Get a broken ruler (Or ask students to visualise a broken scale - preferably broken from '0' mark)



Ask students now to measure using this scale. Understand what problems they face while not having a '0' mark as a starting point.

- Start from next visible cm unit [Let's say in this case from unit 3]
- Start measuring the object



- The pencil measures from unit 3 to unit 9
- Make them understand that when they measure the object as 9 cm, they are counting an extra 3 cm. So we just need to adjust(subtract) those extra units.
- Thus the length of pencil is

$$[9 \text{ cm} - 3 \text{ cm} = 6 \text{ cm}]$$

### Fun Activity

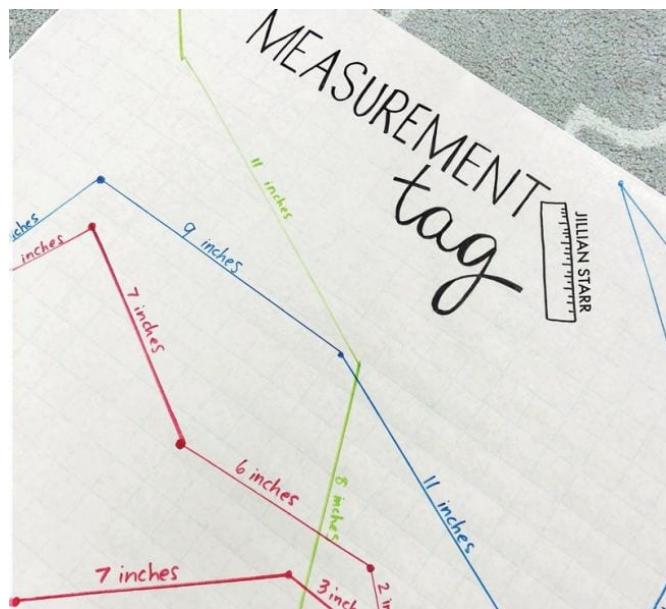
Length of a book	Thickness of an eraser	Length of a pencil	Length of the edge of a notebook	Length of a table

Ask students to take a ruler and a sheet of paper, and measure the following. **Which unit would be best suited to measure each of them?** After taking the measurements, try converting from one unit to another.

**Note:** The basic rule is: If you need to convert from a larger unit to a smaller unit, **multiply**. If you need to convert from a smaller unit to a larger unit, **divide**.

### Fun Activity (Game)

#### Measurement Tag



You'll need chart paper, colored markers, and a pair of dice for this one. Each player starts in a corner and rolls the dice to find the number of inches for that turn. They use a ruler to make a line in any direction. The goal is to catch another player at exactly their last stopping point. This is the kind of game that can go on for days; leave it posted in a corner for students to take their turns when they have a few spare minutes.

## Activity

- Measure distance from their current position to the nearest gate or neighbours house. Ask them to devise some way to measure such lengths. Can we use rulers or metre scale in such cases.
- What if I want to measure the larger distances like distance between Mumbai and Pune?



Ask students if they have seen similar boards while travelling. What are these milestones about? What do these numbers tell you?

– Introduce kilometres as a metric to calculate large distances.

**Note:** Please inform kids that in general, "Kilo" means a thousand

**Note:** Also, the standard unit (SI unit) for lengths in metres(m)

**[1 kilometre (km) = 1000 m]**

## Practice Problems

Match the following.

- |                            |       |
|----------------------------|-------|
| • Half a metre             | 25 cm |
| • Three quarter kilometres | 500 m |
| • Quarter metre            | 75 cm |
| • Quarter kilometre        | 50 cm |
| • Half a kilometre         | 250 m |
| • Three quarter metres     | 750 m |

1.

Match the following.

- |                 |                 |
|-----------------|-----------------|
| • 3 metres      | 40 millimetres  |
| • 3 kilometres  | 200 centimetres |
| • 2 metres      | 300 centimetres |
| • 4 centimetres | 20 millimetres  |
| • 4 kilometres  | 3000 metres     |
| • 2 centimetres | 4000 metres     |

Convert.

- |                                     |  |
|-------------------------------------|--|
| (1) 7 metres into centimetres.      | (2) 8 kilometres into metres.                |
| (3) 9 centimetres into millimetres. | (4) $5 \frac{1}{2}$ metres into centimetres. |
| (5) 11 kilometres into metres.      | (6) 4 centimetres into millimetres.          |
| (7) 8 metres into centimetres.      | (8) 7 kilometres into metres.                |

Match the following.

- |         |         |
|---------|---------|
| • 2 km  | 50 mm   |
| • 5 cm  | 800 cm  |
| • 8 m   | 2000 m  |
| • 11 cm | 900 cm  |
| • 9 m   | 12000 m |
| • 12 km | 110 mm  |

2.

3. Fill in the blanks.

- |                    |   |                      |    |                      |             |
|--------------------|---|----------------------|----|----------------------|-------------|
| • 530 centimetres  | = | <input type="text"/> | m  | <input type="text"/> | centimetres |
| • 1240 metres      | = | <input type="text"/> | km | <input type="text"/> | metres      |
| • 845 centimetres  | = | <input type="text"/> | m  | <input type="text"/> | centimetres |
| • 1250 centimetres | = | <input type="text"/> | m  | <input type="text"/> | centimetres |
| • 2275 metres      | = | <input type="text"/> | km | <input type="text"/> | metres      |
| • 4090 metres      | = | <input type="text"/> | km | <input type="text"/> | metres      |

## Word Problems

1. If one dress requires 3 m 25 cm of cloth, how much do 4 dresses need ?
2. At a speed of 90 km per hour, what distance will a train cover in two and a half hours ?

3. If a wire that is 9 m 50 cm long is cut into pieces of 5 cm each, how many pieces will be made ?
4. Under the Rural Cleanliness Mission, college students cleaned 1 km 750 m of a village road that is 2 km 575 m long. How much remained to be cleaned?
5. Renu took part in a 100 m race. She tripped and fell after running 80 m 50 cm. How much distance did she have left to run ?

## Volume (छंड)

(Revising the different units of volume)

Activity: Bring with yourself a packet of milk and or a bisleri bottle with quantity written on it. Help them revise the different units of volume (as they have already done it in the last sem)

So as you can see, 1 litre of milk looks like this. This is a very big quantity But suppose if we want to buy something in a small quantity, what will we do? For this purpose, we make use of millilitres.

Millilitre is a very small unit used to measure the quantity of a liquid.

$$1 \text{ litre} = 1000 \text{ millilitres}$$

But how small exactly is millilitres?

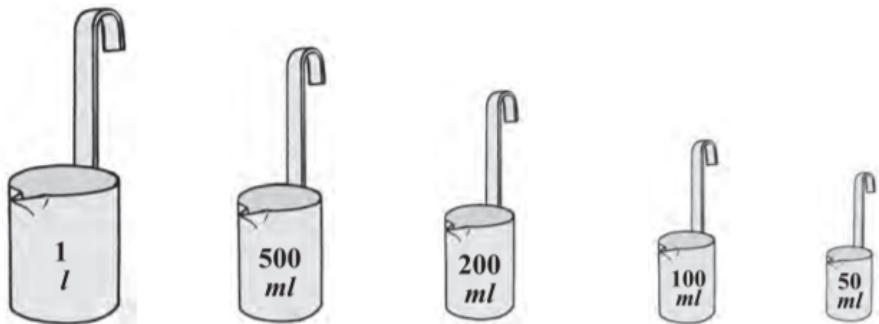


A bottle having capacity of 5ml



A bottle having a capacity of 5L

So now in order to measure the quantity, we make use of some standard measures like these:



For example, if we want 300mL of milk, we will use 1 measure of 200ml and another measure of 100ml.

Question:

How can you obtain 600 ml of milk? Tell us 3 different ways.

**Fun puzzle:**

People buy milk in the range of 1 litre to 40 litres. You can have only 4 jars (of different or same capacities, depending on you) and you can use these jars only once to measure the milk. What should be the capacity of the jars?

Solution:

▶ Milk and Jars PUZZLE

Now let's try to solve some questions:

2 litres is equal to how many millilitres?

So 1 litre = 1000 millilitres

$$2 \text{ litres} = 2 \times 1000$$

$$2 \text{ litres} = 2000 \text{ millilitres}$$

Similarly can you tell:

1. How many millilitres are there in 5 litres?
2. How many millilitres are there in 3 and a half litre?
3. How many millilitres are there in one a quarter litre?
4. Which measures will be used to pour three and a half litres of milk and how many times will they be used?

## Word problems

1. Raju has a cup measuring 250 ml. How many times will he have to use the cup in order to obtain 2 litres of water.
2. There is 478 litres and 360 millilitres of water in the tank. 239 litres and 125 millilitres of water is consumed. How much water is left in the tank?
3. Sana buys half litre cow milk, quarter litre buffalo milk and 1 litre goat milk. Total how many millilitres of milk does Sana buy?

## Testing activity

1. If 1 litre of petrol costs 100 rupees, then 5 and a three quarter litres of petrol will cost me how much?
  2. Reshma has 2 and a half kg of rice. If she wants to divide it equally among her 5 friends, then how much rice will she give to each of her friends?
- 
- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>1. For his birthday, Ajay gave 20l 450ml of milk to the children in an Ashramshala and 28l 800ml to the children in an orphanage. How much milk did Ajay donate?</li><li>2. Under the Rural Cleanliness Mission, college students cleaned 1 km 750 m of a village road that is 2 km 575 m long. How much remained to be cleaned?</li><li>3. Babhulgaon used 21,250 litres of treated waste water in the fields. Samvatsar used 31,350 litres of similar water. How much treated waste water was used in all?</li><li>4. If half a litre of milk costs 22 rupees, how much will 7 litres cost?</li><li>5. If the speed of a motorcycle is 40 km per hour, how far will it travel in an hour and a quarter?</li><li>6. If a man walks at a speed of 4 kmph, how long will it take him to walk 3 km?</li><li>7. If a rickshaw travels at a speed of 30 kmph, how far will it travel in three quarters of an hour?</li><li>8. During Cleanliness Week, children cleaned the public park in their town. They collected three quarter kilograms of plastic bags and five and a half kilograms of other garbage. How much garbage did they collect in all?</li></ol> | <ol style="list-style-type: none"><li>9. If one shirt needs 2m 50cm of cloth, how much cloth do we need for 5 shirts?</li><li>10. If a car travels 60 km in an hour, how far will it travel in<ol style="list-style-type: none"><li>(1) 2 hours?</li><li>(2) 15 minutes?</li><li>(3) half an hour?</li><li>(4) three and a half hours?</li></ol></li><li>11. If one gold bangle is made from 12 grams 250 milligrams of gold, how much gold will be needed to make 8 such bangles? (<math>1000\text{ mg} = 1\text{ g}</math>)</li><li>12. How many pouches of 20g cloves each can be made from 1kg 240g of cloves?</li><li>13. Seema's mother bought 2m 70cm of cloth for a kurta and 2m 40cm for a shirt. How much cloth did she buy in all?</li><li>14. A water tank holds 125l of water. If 97l 500ml of the water is used, how much water remains in the tank?</li><li>15. Harminder bought 57kg 500g of wheat from one shop and 36kg 800g of wheat from another shop. How much wheat did he buy altogether?</li><li>16. Renu took part in a 100m race. She tripped and fell after running 80 m 50cm. How much distance did she have left to run?</li></ol> |
|---|---|

17. A sack had 40kg 300 grams of vegetables. There were 17kg 700g potatoes, 13kg 400g cabbage and the rest were onions. What was the weight of the onions?
18. One day, Gurminder Singh walked 3km 750m and Parminder Singh walked 2km 825m. Who walked farther and by how much?
19. Suresh bought 3kg 250g of tomatoes, 2kg 500g of peas and 1kg 750g of cauliflower. How much was the total weight of the vegetables he bought ?
20. Jalgaon, Bhusawal, Akola, Amravati and Nagpur lie serially on a certain route. The distances between Akola and these other places are given below. Use them to make word problems and solve the problems.  
Amravati - 95 km, Bhusawal - 154 km, Nagpur - 249 km, Jalgaon - 181 km

21. Complete the following table and prepare the total bill.

Foodstuff	Weight (kg)	Rate (₹ per kg)	Cost
Sugar	2.5	32	
Rice	4.0	35	
Chana Dal	1.5	60	
Toor Dal	3.0	70	
Wheat	7.0	21	
Oil	1.5	110	
<b>Total</b>			