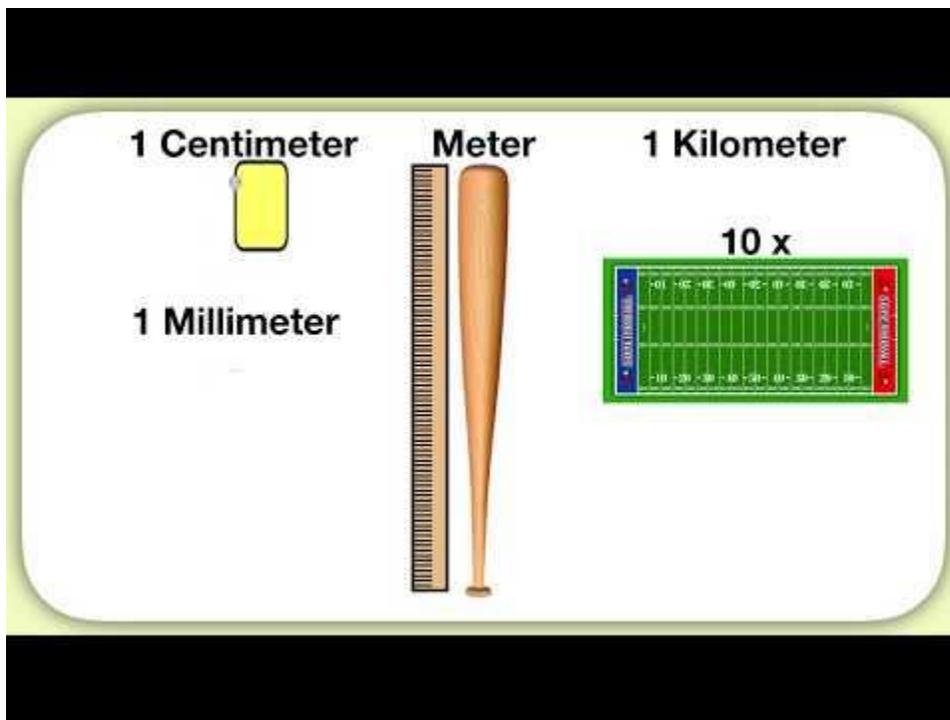


Hello everyone!

Last week I gave you the activity "When to Estimate". It is always important to try an estimate of a given quantity first, to give us an idea of what the actual measurement might be. It allows us to make sense of what we are working with.

Our lessons this week will focus on measurement, starting with measuring length. To develop a basic understanding, let's start with this video.



The video gave us a basic understanding of the relative sizes of each unit of measurement with reference to the others.

Let's focus now, on measuring distances with a ruler. Again, we'll use a short video to help explain before we try on our own.



In this video, we are introduced to a few basic points to remember.

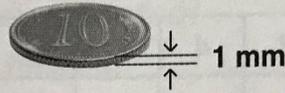
- a. Always measure the length of an object starting at zero (0).
- b. The longer lines indicate full centimetres and the shorter lines, millimetres.
- c. $10 \text{ mm} = 1 \text{ cm}$
- d. $1 \text{ mm} = 0.1 \text{ cm}$

These facts allow us to measure in both centimetres and millimetres.
Let's look at the following example:

Connect

You can use millimetres to measure the length, width, height, or thickness of small objects.

A dime is about 1 mm thick.



You can use the thickness of a dime as a **referent** for 1 mm. A referent is used to estimate a measure.

This pine needle is about 6 cm long.

To be more precise, you read the length in millimetres.

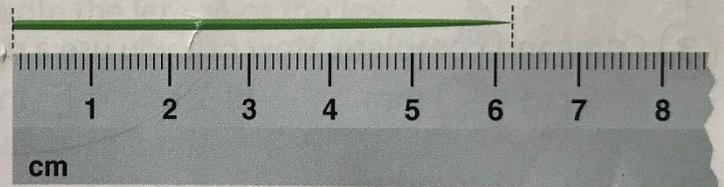
The pine needle is 62 mm long.

One millimetre is one-tenth of a centimetre.

So, you can also read the length of the pine needle in centimetres.

The pine needle is 6.2 cm long.

You say: 6 and 2 tenths centimetres



Centimetres and millimetres are related.



A referent for 1 cm is the width of my little finger. There are 10 mm in 1 cm.

So, that means 1 mm is $\frac{1}{10}$ of a centimetre, or 0.1 cm.

Here, you see that the pine needle being measured is first recorded in mm. Remember that since every centimetre is 10mm, and there are a little over 6 cm in the pine needle, we can count by 10's to 60 mm and then add the 2 extra mm for a length of 62mm.

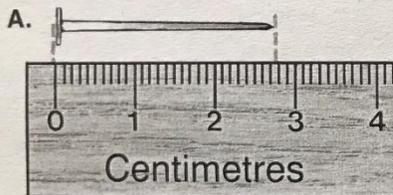
Reading in centimetres, again, starting from zero, we see the pine needle is just over 6cm. the next two short lines represent mm, so we have 6.2cm, recording to tenths of a centimetre. Let's try again.

1. Read these lengths to tenths of a centimetre.

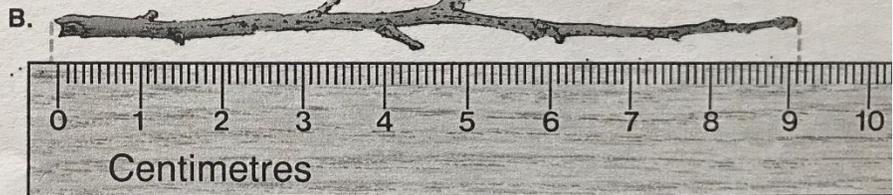
Record your answers in a table like this.

Object	A	B	C	D
Length	■ cm	■ cm	■ cm	■ cm

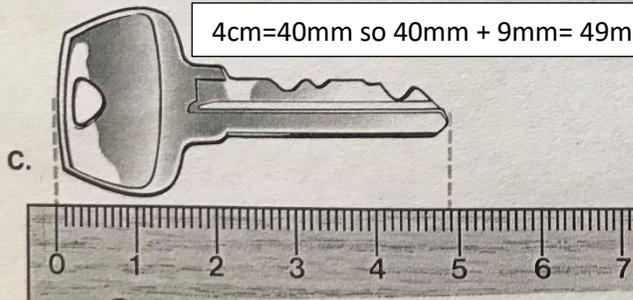
2cm=20mm so 20mm + 8mm=28mm



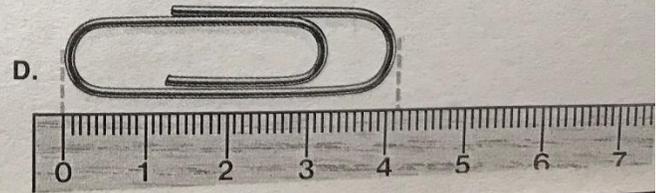
9cm=90mm so 90mm + 1mm = 91mm



4cm=40mm so 40mm + 9mm= 49mm



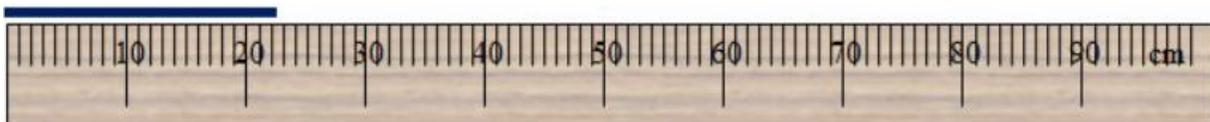
4cm=40mm so 40mm + 2mm = 42mm



Let's record our answers in tenths of a centimetre and also in millimetres.

Object	A	B	C	D
Length (cm)	2.8cm	9.1cm	4.9cm	4.2cm
Length (mm)	28mm	91mm	49mm	42mm

Now that we are able to measure with a ruler, let's look at the relationship between other units of measure. Consider a **metre stick**.



As you can see, there are 100cm in 1 metre, so we write:

1m = 100cm, this means that 1cm is 1/100 of a metre, or 1cm = 0.01m

1m = 1000mm, meaning 1mm is 1/1000 of a metre, or 1mm = 0.001m

To measure the blue bar above the metre stick, we can clearly see it is not one whole metre so let's measure in cm first. We see it is 22cm long, and because it is 22 out of the 100cm in one metre, it also measures 0.22m (read 22 hundredths of a metre)

To review then, there is a relationship between metric measures:

$1\text{mm} = 0.1\text{cm}$ (because it takes 10mm to make 1cm)

$1\text{mm} = 0.001\text{m}$ (because it takes 1 000mm to make 1m)

$1\text{cm} = 10\text{mm}$

$1\text{cm} = 0.01\text{m}$ (because it takes 100cm to make a metre)

$1\text{m} = 100\text{cm}$

$1\text{m} = 1\,000\text{mm}$

$1\text{m} = 0.001\text{km}$ (because it takes 1 000 m to make 1km)

$1\text{km} = 1\,000\text{m}$

Let's try converting between units of measure with a few examples. In terms of conversions, let's consider some of the basic information from the above list.

$1\text{cm} = 10\text{mm}$

$1\text{m} = 100\text{cm}$

$1\text{km} = 1\,000\text{m}$

$1\text{m} = 1\,000\text{mm}$

Watch the following video:

LENGTH CONVERSIONS

The base unit for length is the metre (m).

$$1 \text{ km} = 1000 \text{ m}$$

$$1 \text{ m} = 100 \text{ cm}$$

$$1 \text{ cm} = 10 \text{ mm}$$

BIG \Rightarrow *SMALL*, we multiply

SMALL \Rightarrow *BIG*, we divide

Examples

Complete the conversions:

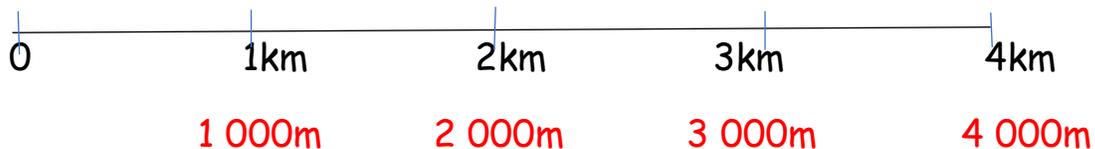
(a) $4 \text{ km} = \dots\dots\dots \text{ m}$

A closer look at the questions again, to review what you heard.

a. $4 \text{ km} = \underline{4\ 000} \text{ m}$

Here, he points out that since $1 \text{ km} = 1\ 000 \text{ m}$,

$4 \text{ km} \times 1\ 000 = 4\ 000 \text{ m}$ We can provide a visual representation as well.



b. $7.5 \text{ m} = \underline{750} \text{ cm}$

Here, he points out that since $1 \text{ m} = 100 \text{ cm}$, $7.5 \text{ m} \times 100 = 750 \text{ cm}$

Taking a closer look at the parts, since $1 \text{ m} = 100 \text{ cm}$ we can easily see

$7 \text{ m} = 700 \text{ cm}$ and the $.5 \text{ m}$ (which is half a metre) = 50 cm , so

$$700 \text{ cm} + 50 \text{ cm} = 750 \text{ cm}$$

c. $19.6 \text{ cm} = \underline{196} \text{ mm}$

Here, he points out that since $1 \text{ cm} = 10 \text{ mm}$, $19.6 \text{ cm} \times 10 = 196 \text{ mm}$

Taking a closer look at the parts, since $1\text{cm} = 10\text{mm}$ we can easily see $19\text{cm} = 190\text{mm}$ and the $.6\text{cm}$ (six tenths of a cm) = 6mm , so

$$190\text{mm} + 6\text{mm} = 196\text{mm}$$

d. $0.25\text{m} = \underline{250}$ mm

Here, he broke this conversion into two steps, changing from metres to centimetres first, then from centimetres to millimetres. He reasoned that since $100\text{cm} = 1\text{m}$, $0.25\text{m} \times 100 = 25\text{cm}$ and then since $1\text{cm} = 10\text{mm}$, $25\text{cm} \times 10 = 250\text{mm}$.

We could also use here, $1\text{m} = 1\,000\text{mm}$ and solve by

$$0.25\text{m} \times 1\,000 = 250\text{mm}.$$

Let's take what we have learned and try the circled questions from the text. (see next 2 pages)

Practice

Use a ruler or metre stick when it helps.

1. Copy and complete each table.

a)	cm	1	2	3	4	5	6	7	8	9	10	11	12
	mm	10	20										
b)	mm	1	2	3	4	5	6	7	8	9	10	11	12
	cm	0.1	0.2										
c)	m	1	2	3	4	5	6	7	8	9	10	11	12
	mm	1000	2000										

2. What patterns do you see in each table in question 1?

3. Copy and complete. How can you use a ruler to help you?

a) $8 \text{ cm} = \square \text{ mm}$ b) $20 \text{ cm} = \square \text{ mm}$ c) $63 \text{ cm} = \square \text{ mm}$

4. Copy and complete.

a) $60 \text{ mm} = \square \text{ cm}$ b) $40 \text{ mm} = \square \text{ cm}$ c) $100 \text{ mm} = \square \text{ cm}$

5. Copy and complete.

a) $2000 \text{ mm} = \square \text{ m}$ b) $6000 \text{ mm} = \square \text{ m}$ c) $9000 \text{ mm} = \square \text{ m}$
 d) $5 \text{ m} = \square \text{ mm}$ e) $2 \text{ m} = \square \text{ mm}$ f) $8 \text{ m} = \square \text{ mm}$

6. Name another referent for each unit of measure. Explain each choice.

a) 1 mm b) 1 cm c) 1 m

7. Draw each item. Measure its length in millimetres.

a) a pencil b) a needle

8. Draw a picture of each thing. Use grid paper when it helps.

a) a feather 15 cm long b) an insect 14 mm long
 c) a label 6 cm long and 4 cm wide d) a flower 10 cm tall

9. Use a ruler to draw each item.

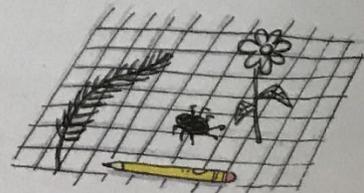
Write each measure.

Trade pictures with a classmate.

Check your classmate's measures.

a) a worm 8.5 cm long

b) a straw 13.8 cm long



10. Which items would you measure in millimetres?
Which units would you use to measure the other items?
Explain your choice.

- a) the length of a driveway
- b) the length of the sash of a "Coureur de bois"
- c) the depth of a footprint in the sand
- d) the width of a baby's finger

11. a) How are millimetres and centimetres related?
b) How are millimetres and metres related?

12. Which is longer? How do you know?

- a) 6 cm or 80 mm
- b) 25 cm or 200 mm
- c) 9 m or 7000 mm

13. Suppose you found a leaf that was 88 mm long.

- a) Is its length closer to 8 cm or 9 cm? How do you know?
- b) What other way could you write the length of the leaf?
Show your work.



To follow up, there is one activity on Netmath, at www.netmath.ca called:

Understanding conversions.

Tuesday / Thursday activities:

- a. Practice your facts 😊
- b. Metric scavenger hunt (University of Waterloo) - you are at home so you will have to use your family as the people in your group.
Have fun! (see next page)

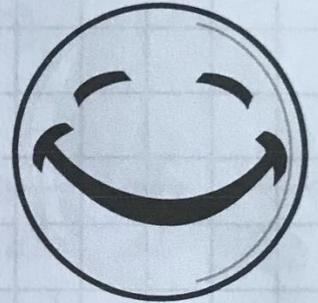
BLM 1: Metric Scavenger Hunt

Work with a partner or in small groups.

Find the following items in your classroom. Write the names of the items or people in the blanks.

The group that does the best work is the Metric Winner.

- Find:
1. the tallest person in your group _____
 2. the person whose wrist measurement is closest to 12 cm _____
 3. something that is about 1 m long _____
 4. something that weighs about 1 kg _____
 5. something that weighs less than 1 kg _____
 6. something that holds more than one litre _____
 7. something that is more than 4 m long _____
 8. something that holds between 2 L and 5 L _____
 9. something about 10 cm long _____
 10. someplace in the room warmer than 2°C . _____
 11. the person in your group with the warmest hand _____
 12. the longest anyone in your group can stand on one foot with his/her eyes closed _____ seconds
 13. the smallest footprint in your group _____ cm^2
 14. the average height of your group _____ cm
 15. the average arm length of your group _____ cm
 16. the fastest someone in your group can write the alphabet _____ seconds
 17. something in the classroom that has an area of about 600 cm^2 _____
 18. the person in your group with the widest smile _____



(see last page)

To finish for this week, I'm leaving you with a fun video of a metric conversion song. Maybe learning it will help you remember your conversion facts 😊 Enjoy!

Follow the link to:

<https://numberock.com/lessons/mm-cm-m-km-3rd-5th-grade-lesson/>

Have a fantastic week Grade 5! 😊