Metric System

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CONCEPT 1

Metric System

Here you'll learn how to measure length in metric units.

Have you ever wondered how to use metrics to measure the height of a plant? Remember Tania from the last concept? Well, now Tania is working on growing tomato plants, and she will be using metric units of measurement.

Tania has decided to begin with tomatoes. It is early spring, so she knows that it is probably the best time to begin. She has gathered her supplies and a pack of seeds. Tania begins reading the package and learns that there are all kinds of measurement issues when planting seeds. The package says that she should plant each seed 3 mm deep. Tania is wondering how deep she should plant each seed.

Guidance

In science classes, and anywhere outside of the United States, we measure length with the ***metric system.*** The most common units that we use to measure length in this system are the millimeter, centimeter, meter, and kilometer. This Concept will give you an overview of each measurement unit. Let's take a look at each.

Millimeter

The ***millimeter*** is the smallest commonly used unit in the metric system. When we measure something in millimeters, we use *mm* as an abbreviation for millimeter. A millimeter would be used to measure something that is very small, like a seed.

Centimeter

The ***centimeter*** is the next smallest unit of measurement. To abbreviate centimeters we write *cm* (for example, 3 cm). Centimeters are even smaller than inches. One centimeter is only the width of a staple. This ruler shows centimeters.

We can use a ruler to measure centimeters and millimeters. On many rulers, we can see both the customary units of measurement and the metric units of measurement. You can see inches, centimeters and millimeters on this ruler. **What about when we have to measure something that is longer than a ruler?** When we are measuring something that is longer it doesn't make sense to use centimeters or millimeters. We could use them, but it would take a very long time to count all of those centimeters or millimeters. **Instead, we can use two larger units of measurement. We can use the** *meter* **and the** *kilometer*.

<u>Meters</u>

The next metric unit we use is the meter. To abbreviate the meter we write *m* (for example, 8 m). A meter is longer than a foot. Actually, a meter is just about the same length as a yard. One meter is roughly the length from your finger tips on one hand to the fingertips on your other hand if you stretch your arms out to your sides. **Go ahead and try this right now with a peer.** As you can see, one meter is much, much longer than one centimeter. It actually takes 100 centimeters to equal one meter. We use meters to measure bigger objects or longer distances, such as the depth of a pool or length of a hallway. We could use a meter stick to measure meters. **A meter stick is exactly one meter long.**

This is a bit complicated, however, when an object or distance is several meters long. We have to make a mark on the object being measured at the end of the meter stick, then move the meter stick down and make another mark to show the next meter. **It is easier to use a tape measure.** Tape measures often show customary units (feet and inches) down one side and metric units (centimeters and meters) down the other.

What about when we want to measure much longer distances and it doesn't make sense to use meters? That is when we use kilometers.

<u>Kilometers</u>

Kilometers are very long. To abbreviate the word kilometer we write *km* (for example, 12 km). Like miles, we use kilometers to measure long distances, such as the distance from your house to the store or from one town to another. Kilometers are only a little more than 1/2 as long as miles, but they are much longer than meters. In fact, there are 1,000 meters in a kilometer!

Here are a items for you to practice measuring using millimeters and centimeters. We will be working with meters and kilometers a little later.

Example A

Solution: 6 1/2 cm

Example B
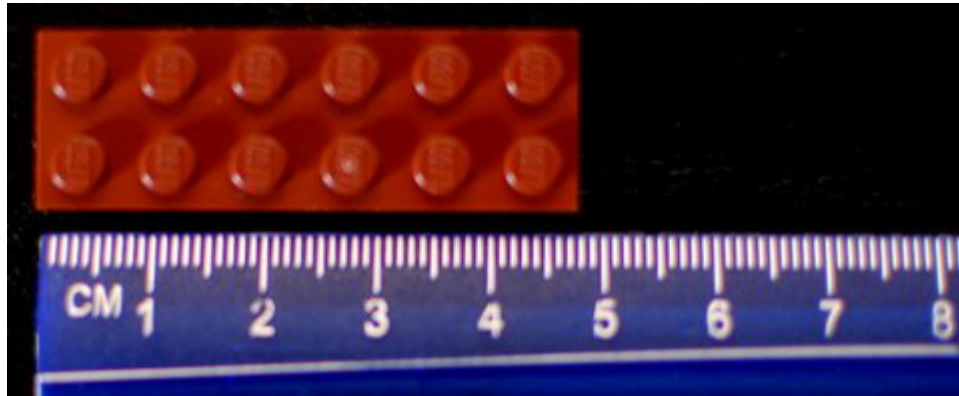
Solution: 4 3/4 cm

Example C

A paper clip

Solution: Answers will vary. Check your measurements with a peer.

Now let's go back to Tania. Tania takes a ruler and measures 3 mm on the plant pot. Then she plants the seed.

You can look at a ruler and find 3 mm on it. This will help you to see the length of Tania's measurement. Tania's next concern is the length of the stem after germination. Tania does not want the stems to be long and leggy. Tania decides to use inches to measure the stems as her plants grow. This way she can be sure that they are the correct size when replanted.

Tania has started her tomato plants.

Vocabulary

Metric units of length
    units of measurement such as millimeter, centimeter, meter and kilometer.

Millimeter
    the smallest common metric unit of length

Centimeter
    a small metric unit of length, best measured by a ruler

Meters
    a unit compared with a foot or yard. 1 meter = a little more than 3 feet

Kilometer
   a metric unit for measuring distances

Guided Practice

Here is one for you to try on your own.

Sasha is making a dress, however the pattern for the dress is measured in metric units. Sasha isn't very familiar with metrics, in fact, she isn't sure which unit she should be using for the measurements. Given what you have learned in this Concept, which metric unit should Sasha use? Which unit will make the most sense when she needs to purchase material?

Answer

A meter can be compared to a little more than 3 feet or to a yard. Since material is often measured in yards, it makes the most sense for Sasha to use meters.

Video Review
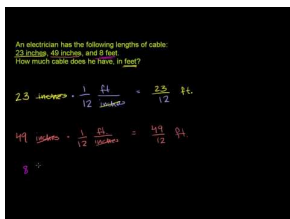
> MEDIA
> Click image to the left for more content.

KhanAcademyAdding Different Units of Length

Practice

Directions: Choose the appropriate unit of length using metric units for each item listed below.

1. The depth to plant a seed in the soil

2. The height of a tree

3. The area of a garden plot

4. The distance from a garden to the local farm store

5. The length of a carrot

6. A stretch of fencing

7. The length of a hoe

8. The distance between two seedlings planted in the ground

9. The height of a corn stalk

10. A road race

11. A grub collected from the garden

12. The width of a garden row

13. The length of a garden row

14. The size of a small seed

15. The distance that a tractor can travel on a large farm per day