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## Lesson 5:

Convert measurements and describe relationships between metric units.

**CCSS Standard –5.MD.A.1**

**FLUENCY** (10-min)

**Whiteboard Exchange: Estimate Products**



$$18 \times 3 \approx \frac{\square}{\quad} \times 3$$

$$18 \times 3 \approx \frac{\square}{\quad}$$

*What is 18 rounded to the nearest ten?*

*This statement reads “18 x 3 is **about** 20 x 3”. Repeat this statement.*

*Now solve for 20 x 3.*

**Let's try some more! Get your whiteboards ready.**

FLUENCY (10-min)

## Whiteboard Exchange: Estimate Products



$$32 \times 4 \approx \frac{\boxed{\phantom{000}}}{\phantom{000}} \times 4$$
$$32 \times 4 \approx \frac{\boxed{\phantom{000}}}{\phantom{000}}$$

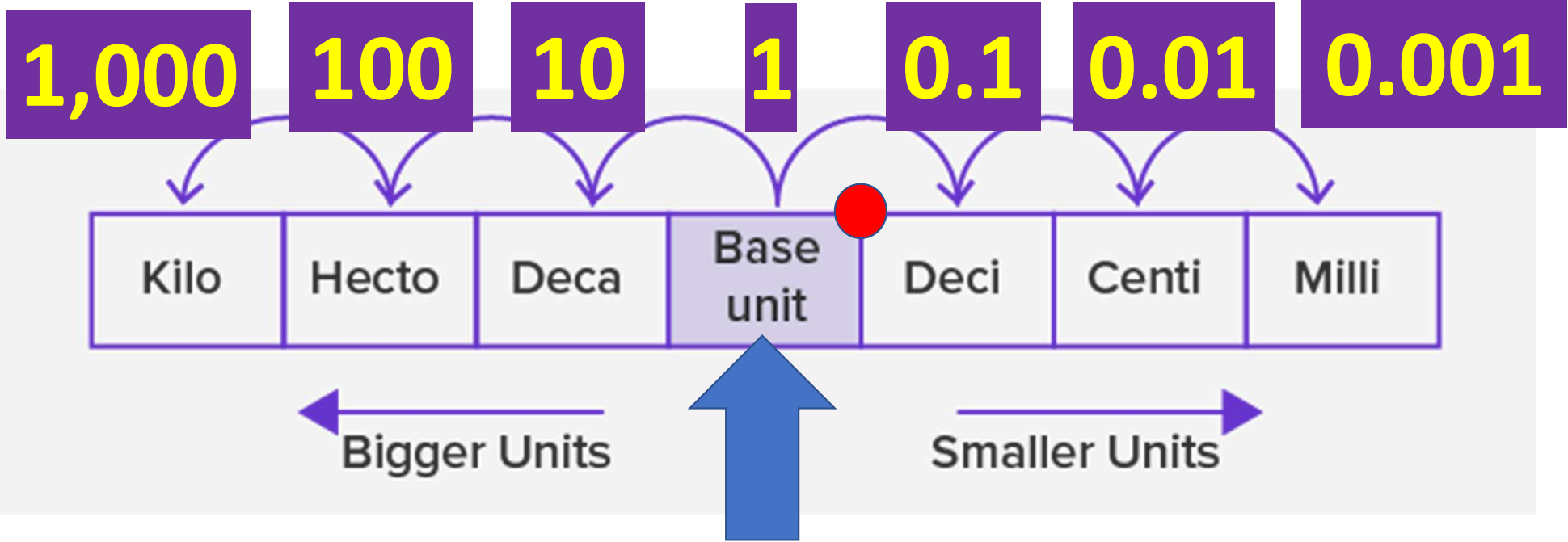
What is 32 rounded to the nearest ten?

This statement reads “32 x 4 is **about** 30 x 3”. Repeat this statement.

Now solve for 30 x 3.

**FLUENCY** (10-min)

**Choral Response: Convert Metric Units**



**Meter** (measures length)

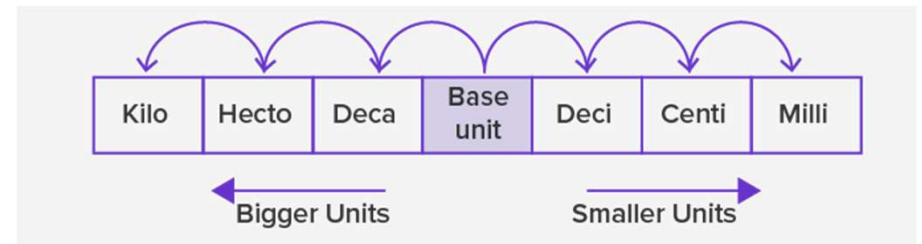
**Liter** (measures liquid capacity)

**Gram** (measures weight)

**FLUENCY (10-min)****Choral Response: Convert Metric Units**

*How many meters are equal to 1 kilometer?*

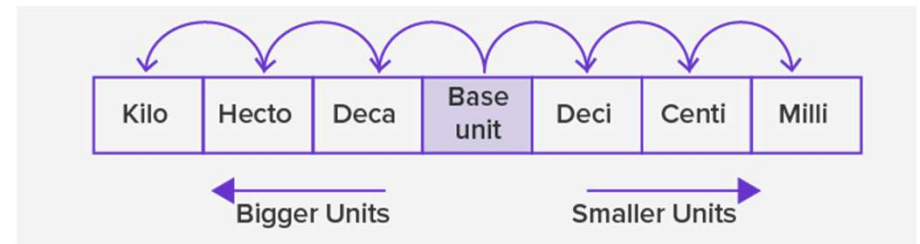
Kilometers (km)	Meters (m)
1	<input type="text"/>
2	<input type="text"/>
4	<input type="text"/>
8	<input type="text"/>
10	<input type="text"/>



**FLUENCY (10-min)****Choral Response: Convert Metric Units**

*How many grams are equal to 1 kilogram?*

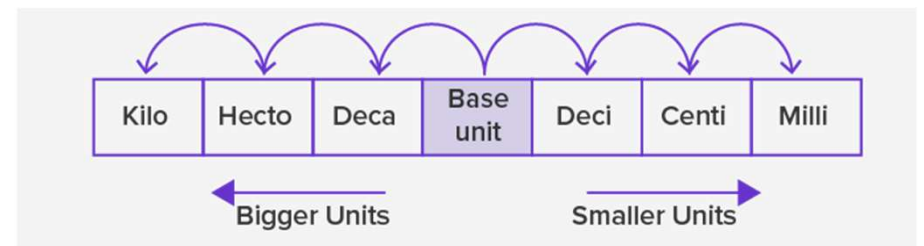
Kilograms (kg)	Grams (g)
1	<input type="text"/>
2	<input type="text"/>
7	<input type="text"/>
9	<input type="text"/>
10	<input type="text"/>



**FLUENCY (10-min)****Choral Response: Convert Metric Units**

*How many milliliters are equal to 1 liter?*

Liters (L)	Milliliters (mL)
1	<input type="text"/>
2	<input type="text"/>
6	<input type="text"/>
8	<input type="text"/>
10	<input type="text"/>



**LAUNCH** (5-min)

Discuss real-world objects with given metric measurements



*What did you notice about the measurement units in the video?*

*What do you wonder about the measurement units?*

*In what ways can you describe the size of the units?*

*Why might we choose to measure the length of an object with centimeters instead of meters?*

<https://digital.greatminds.org/planning/teacher/guidance/1852>



**LEARN** (35-min)

**Relative Size of Metric Units**

**Length**

**kilometer, meter, centimeter, millimeter**

longest ←————→ shortest

**Weight**

**kilogram, gram, centigram, milligram**

heaviest ←————→ lightest

**Liquid  
Capacity**

**kiloliter, liter, centiliter, milliliter**

greatest capacity ←————→ least capacity

**LEARN** (35-min)

Relative Size of Metric Units

# Length

kilometer, meter, centimeter, millimeter

longest ← → shortest

Where have you seen or heard the prefixes  
“centi” and “milli” before?

How many centimeters do you see in 1 meter?

How many millimeters do you see in 1 centimeter?

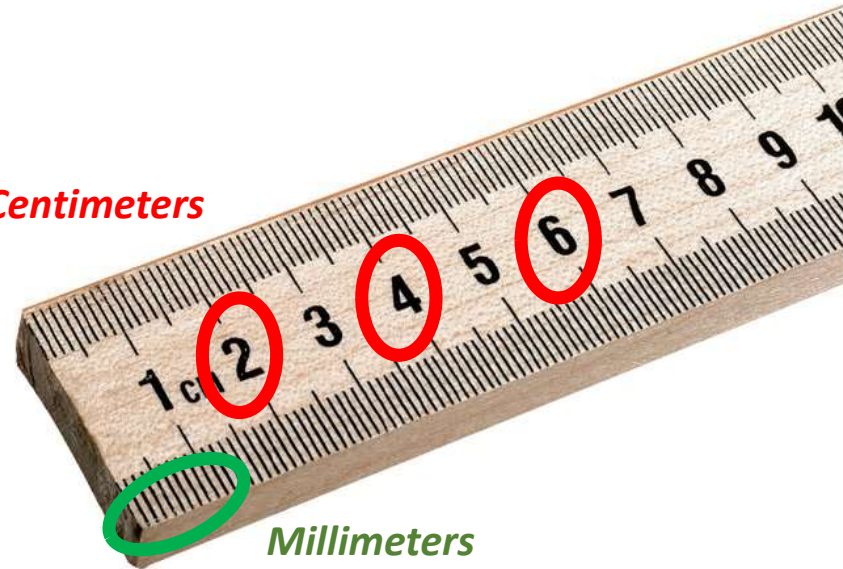
10

If there are **10 millimeters** in **1 centimeter** and there are **100 centimeters** in **1 meter**, how many millimeters are in 1 meter?

How do you know?

**1,000 millimeters are in 1 meter.  $10 \times 100 = 1,000$**

Centimeters



Millimeters

**LEARN** (35-min)

## Relative Size of Metric Units

# Length

## kilometer, meter, centimeter, millimeter

longest ←————→ shortest

*Does a meter stick show kilometers? Why or Why not?*

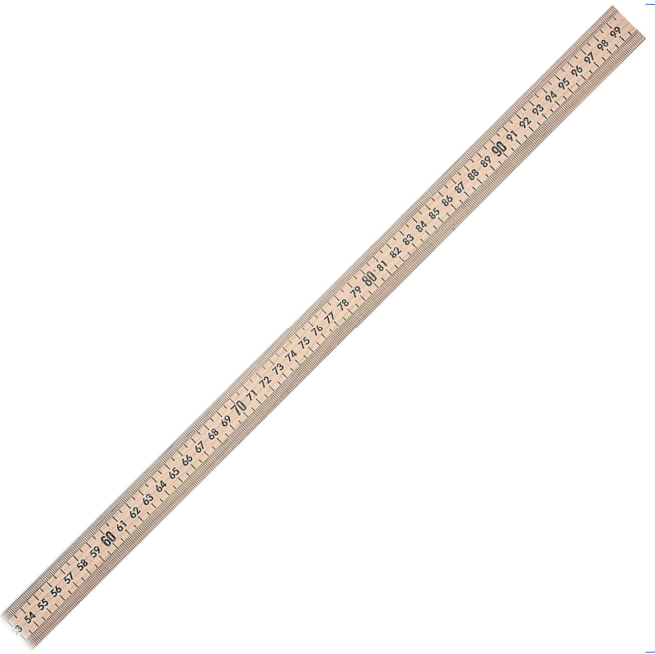
*No. We need **1,000 meter** sticks end to end to equal a kilometer!*

*1 kilometer is **1,000** times as long as 1 meter.*

*1 meter is **100** times as long as 1 centimeter.*

*1 meter is **1,000** times as long as 1 millimeter.*

*1 centimeter is **10** times as long as 1 millimeter.*



**LEARN** (35-min)

## Relative Size of Metric Units

# Weight

# kilogram, gram, centigram, milligram

heaviest ←————→ lightest



*How are metric units for weight similar to the metric units for length?*

*They use the same prefixes!!! Except for the base unit!*

*1 kilogram is **1,000** times as long as 1 gram.*

*1 gram is **100** times as long as 1 centigram.*

*1 gram is **1,000** times as long as 1 milligram.*

*1 centigram is **10** times as long as 1 milligram.*

LEARN (35-min)

Relative Size of Metric Units

# Liquid Capacity

kiloliter, liter, centiliter, milliliter

greatest capacity ←————→ least capacity

**Liter vs. Milliliter**



Holds a liter



Holds a few milliliters

*How are metric units for weight similar to the metric units for capacity?*

*They use the same prefixes!!! Except for the base unit!*

*1 kiloliter is **1,000** times as long as 1 liter.*

*1 kiter is **100** times as long as 1 centiliter.*

*1 liter is **1,000** times as long as 1 milliliter.*

*1 centiliter is **10** times as long as 1 milliliter.*

**LEARN** (35-min)

**Convert Metric Units**



*How many meters is shown?*

**2 m**

*How many centimeters is shown?*

**200 cm**

*How many millimeters is shown?*

**2,000 mm**

*In your head, you might have added twice or multiplied to find the number of centimeters or millimeters. Either way is correct. But what if **32 students** were standing with meter sticks end to end?*

*How many centimeters in 32 meters?*

**$32 \times 100 \text{ cm} = 3,200 \text{ cm}$**

*How many millimeters in 32 meters?*

**$32 \times 1,000 \text{ mm} = 32,000 \text{ mm}$**

**LEARN** (35-min)

## Convert Metric Units

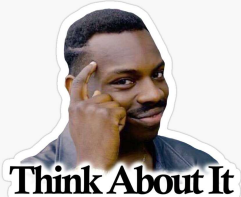
Let's convert 456 kiloliters to liters.

$$456 \text{ kL} = \underline{\hspace{2cm}} \text{ L}$$

kiloliter, liter, centiliter, milliliter

greatest capacity ← → least capacity

$$\begin{aligned} 456 \text{ kL} &= 456 \times 1 \text{ kL} \\ &= 456 \times 10^3 \text{ L} \text{ or } 456 \times 1,000 \text{ L} \\ &= 456,000 \text{ L} \end{aligned}$$



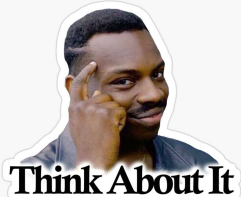
*If 1,000 liters equals 1 kiloliter and you have 456 kiloliters, you have 456,000 liters.*

**LEARN** (35-min)**Convert Metric Units**

Let's convert 6,985 grams to milligrams.

$$6,985 \text{ g} = \underline{\hspace{2cm}} \text{ mg}$$

$$\begin{aligned} 6,985 \text{ g} &= 6,985 \times 1 \text{ g} \\ &= 6,985 \times 10^3 \text{ mg} \text{ or } 6,985 \times 1,000 \\ &= 6,985,000 \text{ mg} \end{aligned}$$

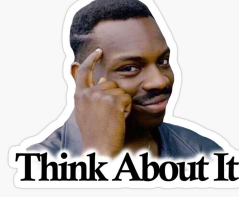


*If 1 milligram is 1,000 grams and you have 6,985 grams, you need to multiply 6,985 x 1,000 to get milligrams.*

Let's convert 308 meters to centimeters

$$\underline{\hspace{2cm}} \text{ cm} = 308 \text{ m}$$

$$\begin{aligned} 308 \text{ meters} &= 308 \times 1 \text{ m} \\ &= 308 \times 10^2 \text{ cm} \text{ or } 308 \times 100 \\ &= 30,800 \text{ cm} \end{aligned}$$



*If 100 centimeters makes 1 meter and you have 308 meters, you need to multiply 308 x 100 to get centimeters.*



**LAND** (10-min)

## Exit Ticket



Convert each measurement.

1. 4 km = \_\_\_\_\_ m

2. 9,430 cL = \_\_\_\_\_ mL

3. 108 kg = \_\_\_\_\_ g

After Exit Ticket:

Work on page 47 in  
workbook.

**Small Group Time:**  
Review Exit Ticket &  
Problem Set page 49