Warmup:

24 x 60 x 60

86,400 seconds

How many seconds are in a day?

24 hrs = 1 day

60 min = 1 hr

60 sec = 1 min

METRIC CONVERSION

How to convert within the metric system

Do you remember…

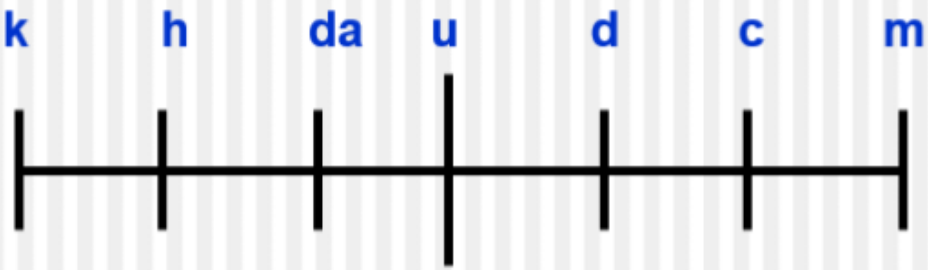
King Henry?

Metric Prefixes

Prefix	Symbol	Factor Number	Factor Word
kilo-	k	1000	Thousand
hecto	h	100	Hundred
deca	da or dk	10	Ten
unit	m, L, or g	1	One
deci	d	.1	Tenth
centi	c	.01	Hundredth
milli	m	.001	thousandth

Use the pneumonic:

Above the tick marks write the first letter for the words in the King Henry pneumonic:



RECALL: Metric Base Units

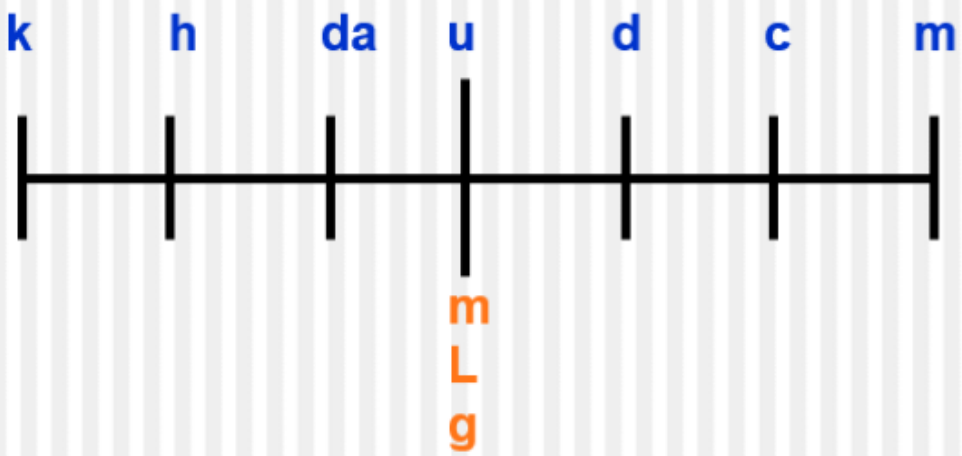
Meters are used to measure length and distance.

Liters are used to measure volume or the capacity of an object.

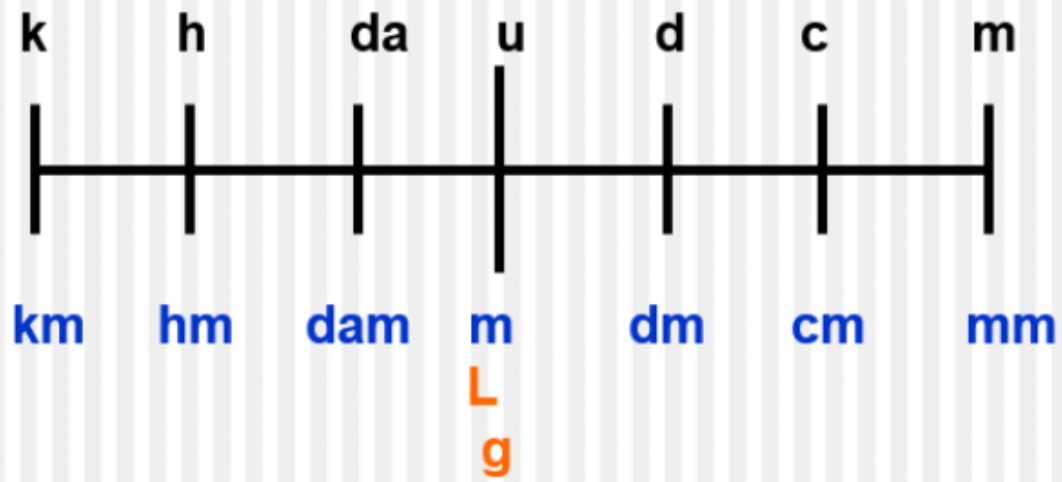
Grams are used to measure mass or the weight of an object.

Use the pneumonic:

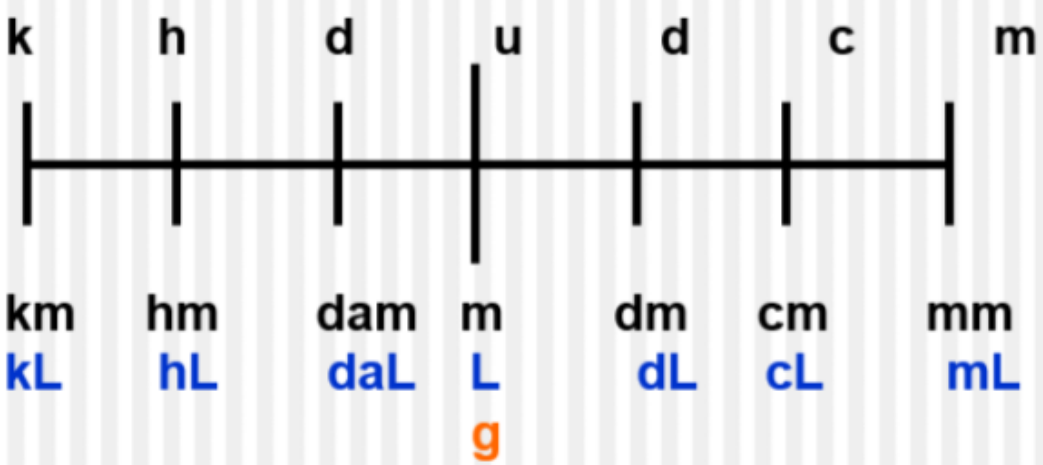
Write the units in the middle under the "U".



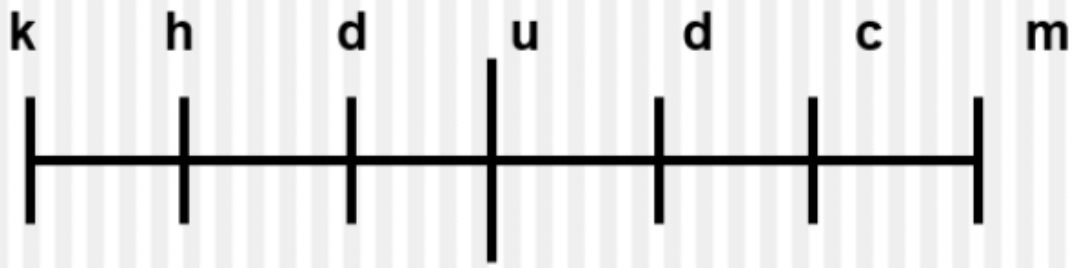
Let's add the meter line:



Let's add the Liter line:



Let's add the gram line:

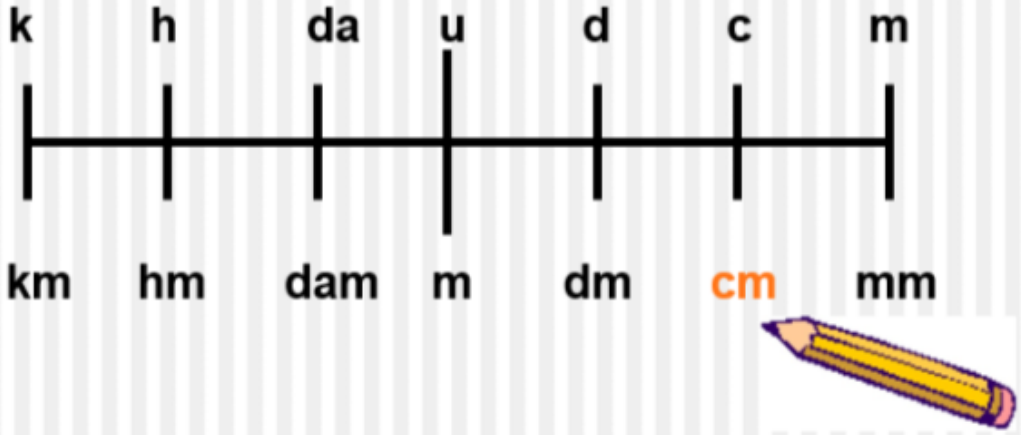


km	hm	dam	m	dm	cm	mm
kL	hL	daL	L	dL	cL	mL
kg	hg	dag	g	dg	cg	mg

Example #1:

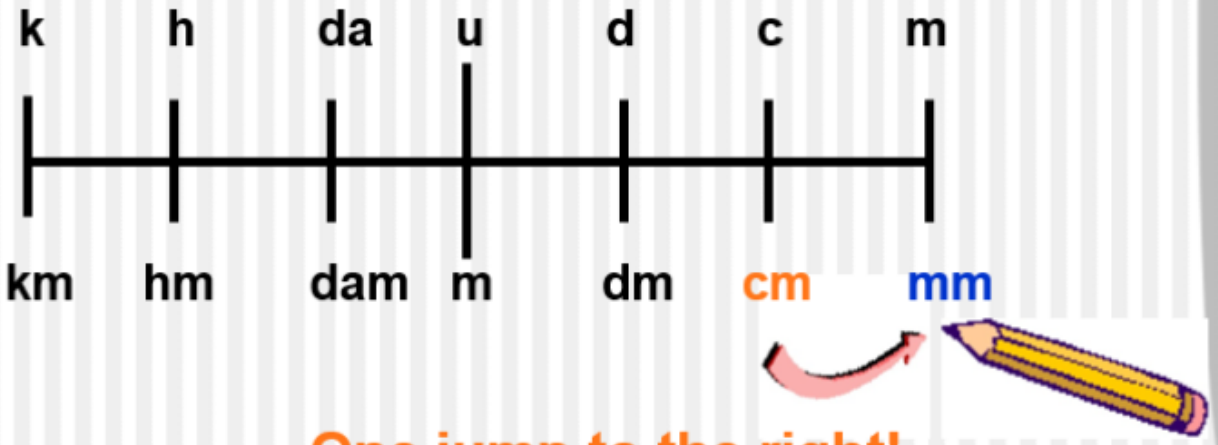
56 cm = _____ mm

Look at the unit given in the problem. 56.cm
Put your pencil on that unit.



Example #1: 56 cm = _____ mm

Move to new unit, counting jumps and noticing the direction of the jump!



One jump to the right!

Example #1: 56 cm = _____ mm

Move decimal in original number the same # of spaces and in the same direction.

56.0

One jump to the right!

Move decimal one jump to the right.
Add a zero as a placeholder.

Example #1:

56 cm = _____ mm

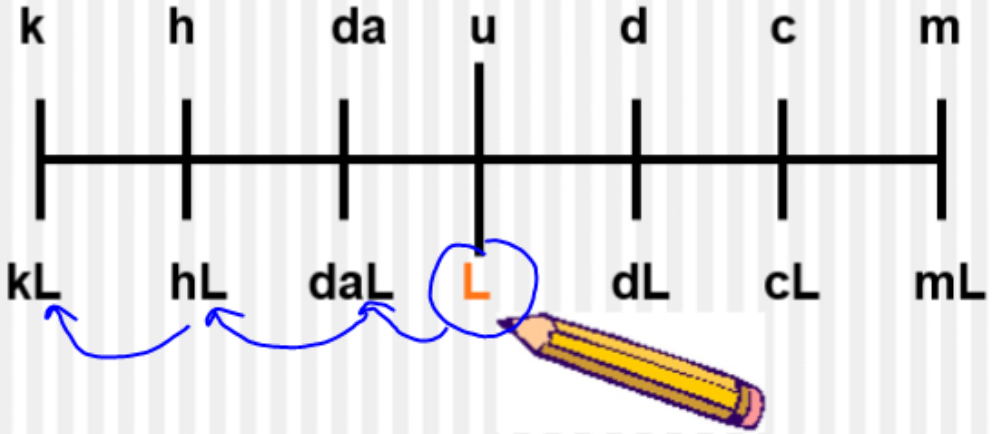
56cm = 560 mm

Example #2:

7.25 L = ____ kL

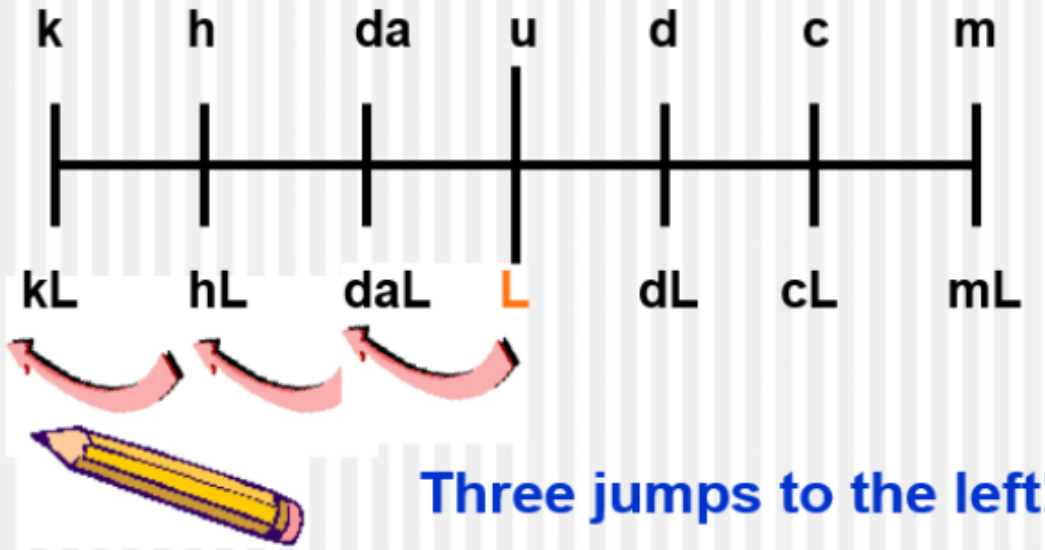
Look at the unit that has a number. 7.25 L

Put your pencil on that unit.



Example #2: 7.25 L = ____ kL

Move to new unit, counting jumps and noticing the direction of the jump!



Three jumps to the left!

Example #2: 7.25 L = ____ kL

Move decimal in original number the same # of spaces and in the same direction.

7.25 L = ____ kL

.007.25

Three jumps to the left!

Move decimal to the left three jumps.
Add two zeros as placeholders.

Example #2:

7.25 L = ____ kL

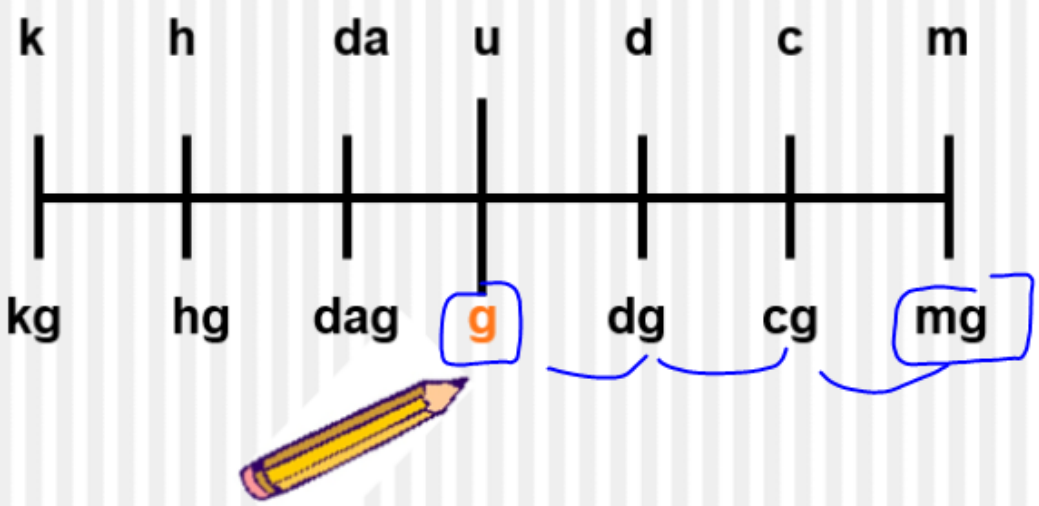
7.25 L = 0.00725 kL

Example #3:

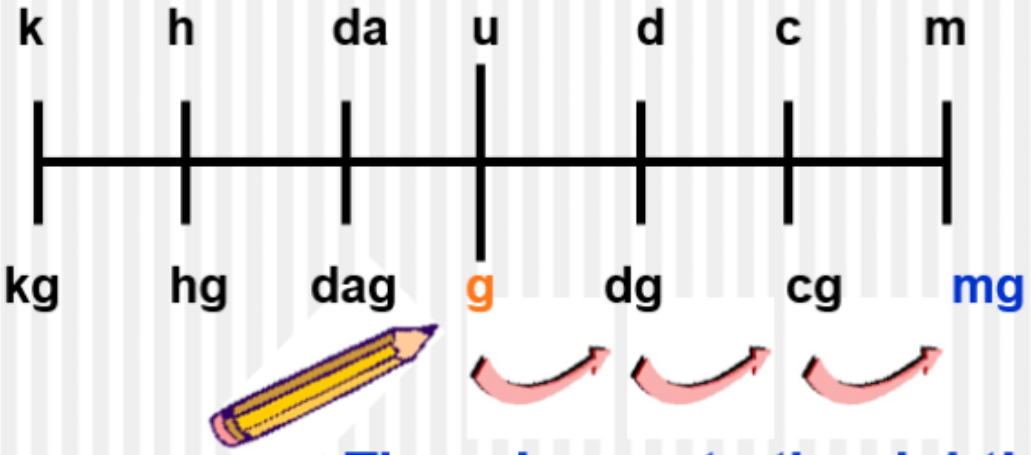
Try this problem on your own:

45,000 g = ____ mg

45,000,000 mg



Example #3: 45,000 g = ____mg



Three jumps to the right!

45,000.000.

Example #3:

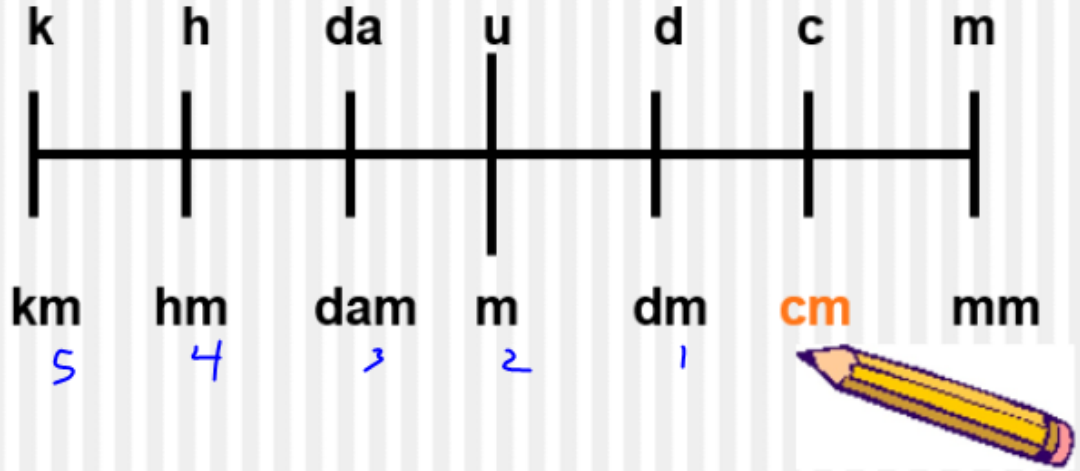
45,000 g = 45,000,000 mg

Three jumps to the right!

Example #4:

Try this problem on your own

5 cm = ____ km



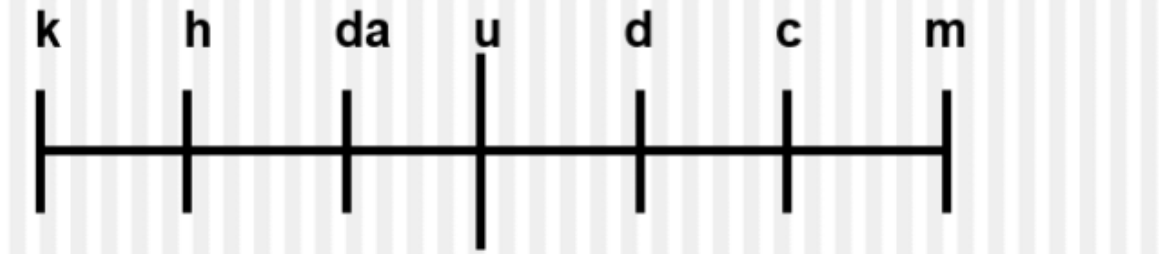
.0005

.00005

.000005

.00005

Example #4: 5 cm = ____ km



km hm dam m dm cm mm

Five jumps to the left!

.00005.

Example #4:

5 cm = 0.00005 km

Five jumps to the left!

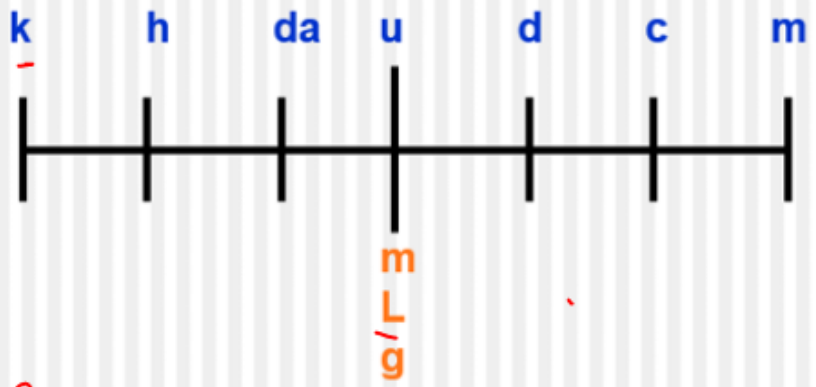
One last caution:

Be careful **NOT** to count the spot you start from, where you put your pencil point.

Only count the jumps!

Examples #5-9:

Try these on your own.



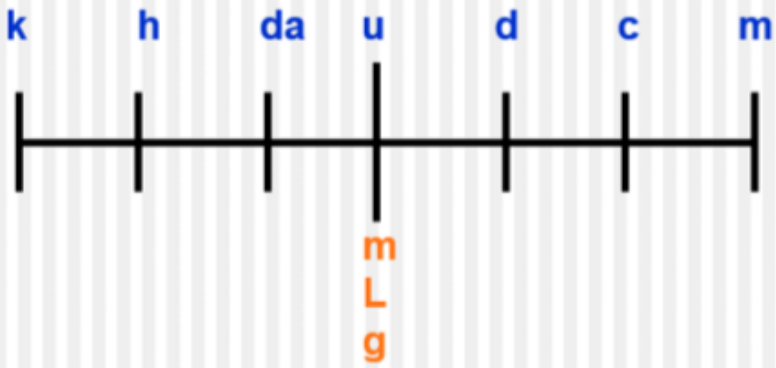
(5) 35 mm = 3.5 cm

(6) 14,443 L = 14.443 kL

(7) 0.00056 kg = .56 g

Examples #5-9:

Try these on your own.



(8) 35,400 mL = 35.4 L

(9) ~~160,000~~ km = 16 mm

~~16~~ .000016 ✓

English Unit Conversions

- **Common Length Conversion Factors**
  - **5280 ft = 1 mile**
  - **12 in = 1 ft**
  - **3 ft = 1 yard**

Example 10:
Convert 2 miles to ft

- 5280 ft = 1 mile
- 12 in = 1 ft
- 3 ft = 1 yard

$$? = \frac{2\text{ mi}}{1} \cdot \frac{1\text{ mi}}{5280\text{ ft}}$$

$$\frac{2\text{ mi}}{1} \left| \frac{5280\text{ ft}}{1\text{ mi}} \right. = \frac{10{,}560\text{ ft}}{1}$$

$= 10{,}560$ ft

$$\frac{4}{3} \cdot \frac{5}{2} = \frac{20}{6} = \frac{10}{3}$$

$$\frac{\cancel{4}^{2}}{3} \cdot \frac{5}{\cancel{2}} = \frac{2 \cdot \cancel{2} \cdot 5}{3 \cdot \cancel{2}} = \frac{10}{3}$$

Example 11:
Convert 7.5 yd to in

- 5280 ft = 1 mile
- 12 in = 1 ft
- 3 ft = 1 yard

$$\frac{7.5\ \text{yd}}{1} \cdot \frac{3\ \text{ft}}{1\ \text{yd}} \cdot \frac{12\ \text{in}}{1\ \text{ft}} = \frac{270}{1}\ \text{in} = 270\ \text{in}$$

English Unit Conversions

- **Common Weight Conversion Factors**
  - 16 oz = 1 pound
  - 2000 lb = 1 ton

Example 12:
Convert 9000 lb to tons

- **Common Weight Conversion Factors**
  - 16 oz = 1 pound
  - 2000 lb = 1 ton

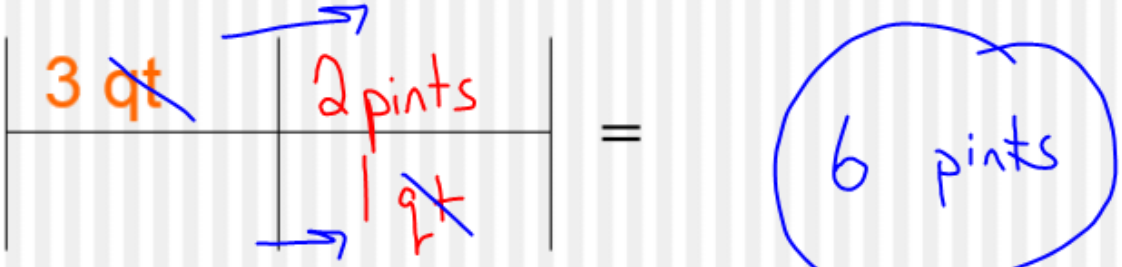
$$\frac{9000\ \text{lb}}{1} \left| \frac{1\ \text{ton}}{2000\ \text{lb}} \right| = \frac{9000}{2000}\ \text{ton} = 4.5\ \text{tons}$$

English Unit Conversions

- **Common Volume Conversion Factors**
  - 8 oz = 1 cup
  - 2 cups = 1 pint
  - 2 pints = 1 quart
  - 4 quarts = 1 gallon

Example 13:
Convert 3 quarts to pints

- **Common Volume Conversion Factors**
  - 8 oz = 1 cup
  - 2 cups = 1 pint
  - 2 pints = 1 quart
  - 4 quarts = 1 gallon



English Unit Conversions

- **Common Time Conversion Factors**
  - 60 sec = 1 minute
  - 60 min = 1 hour
  - 24 hr = 1 day
  - 7 days = 1 week
  - 52 weeks = 1 year
  - 12 months = 1 year

Example 14:
Convert 3 days to minutes

- **Common Time Conversion Factors**
  - 60 sec = 1 minute
  - 60 min = 1 hour
  - 24 hr = 1 day
  - 7 days = 1 week
  - 52 weeks = 1 year
  - 12 months = 1 year

$$\frac{3 \text{ days}}{} \left| \frac{24 \text{ hr}}{1 \text{ day}} \right| \frac{60 \text{ min}}{1 \text{ hr}} = 3 \cdot 24 \cdot 60 \text{ min}$$

$$= 4{,}320 \text{ min}$$

Examples #15-20:

Try these on your own.

(15) 16 pts = 2 gal ✓

(16) 24,000 lb = 12 T ✓

(17) 4.5 days = 108 hr ✓

- 8 oz = 1 cup
- 2 cups = 1 pint
- 2 pints = 1 quart
- 4 quarts = 1 gallon

- 60 sec = 1 minute
- 60 min = 1 hour
- 24 hr = 1 day
- 7 days = 1 week
- 52 weeks = 1 year
- 12 months = 1 year

- 16 oz = 1 pound
- 2000 lb = 1 ton

- 5280 ft = 1 mile
- 12 in = 1 ft
- 3 ft = 1 yard

Examples #15-20:

Try these on your own.

(18) 5 miles = 26,400 ft ✓

(19) 504 hr = 3 weeks ✓

(20) 17 cups = 8.5 pt ✓

- 8 oz = 1 cup
- 2 cups = 1 pint
- 2 pints = 1 quart
- 4 quarts = 1 gallon

- 60 sec = 1 minute
- 60 min = 1 hour
- 24 hr = 1 day
- 7 days = 1 week
- 52 weeks = 1 year
- 12 months = 1 year

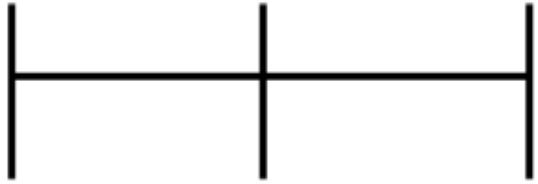
- 16 oz = 1 pound
- 2000 lb = 1 ton

- 5280 ft = 1 mile
- 12 in = 1 ft
- 3 ft = 1 yard

Length	Weight	Volume	Time
12 inches = 1 foot	16 ounces = 1 pound	2 cups = 1 pint	60 seconds = 1 minute
3 feet = 1 yard	2000 pounds = 1 ton	2 pints = 1 quart	60 minutes = 1 hour
5,280 feet = 1 mile		4 quarts = 1 gallon	24 hours = 1 day
1,760 yard = 1 mile			7 days = 1 week
			52 weeks = 1 year

21. I biked 8.5 miles and my friend biked 36, 960 ft. Who biked the **longer** distance?

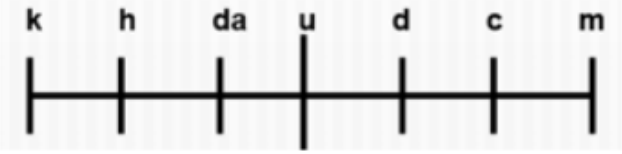
Prove your answer:



Length	Weight	Volume	Time
12 inches = 1 foot	16 ounces = 1 pound	2 cups = 1 pint	60 seconds = 1 minute
3 feet = 1 yard	2000 pounds = 1 ton	2 pints = 1 quart	60 minutes = 1 hour
5,280 feet = 1 mile		4 quarts = 1 gallon	24 hours = 1 day
1,760 yard = 1 mile			7 days = 1 week
			52 weeks = 1 year

22. I need 4 m of cloth to make a blue blanket and 360 cm to make a red blanket. Which blanket is **shorter**?

Prove your answer:



Length	Weight	Volume	Time
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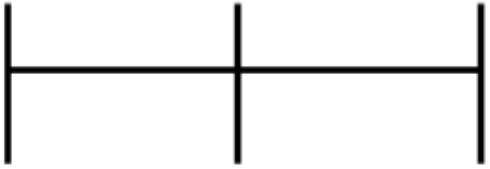
5,280 feet = 1 mile		4 quarts = 1 gallon	24 hours = 1 day
1,760 yard = 1 mile			7 days = 1 week
			52 weeks = 1 year

23. In June my air conditioner ran for a total of 156 hours. In July my air conditioner ran for 6.5 days. Was my bill the **same** for each month?

Prove your answer:



HW #1:
Dimensional Analysis