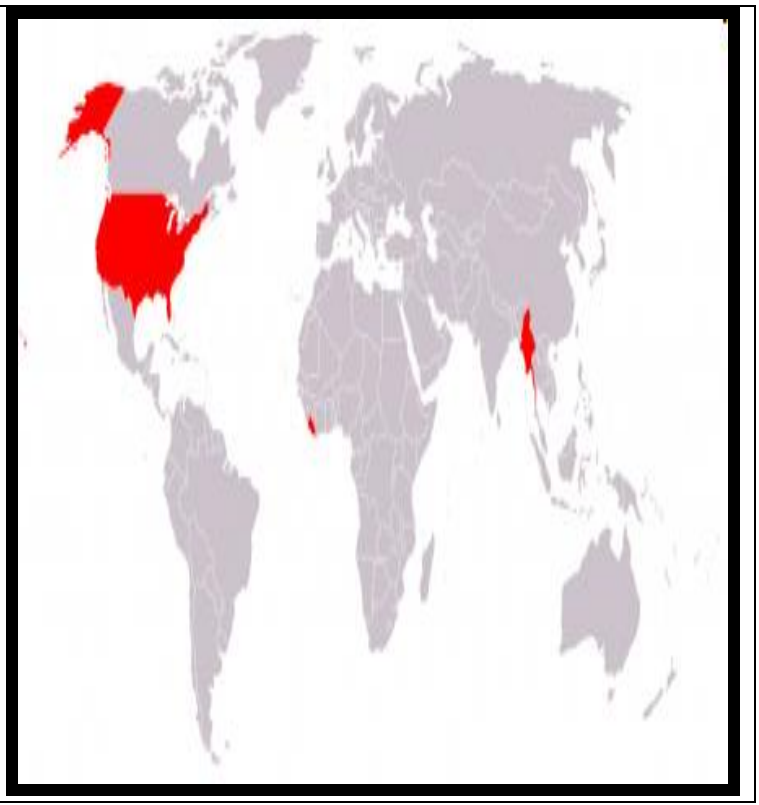
Part 2 Metric System

Name:

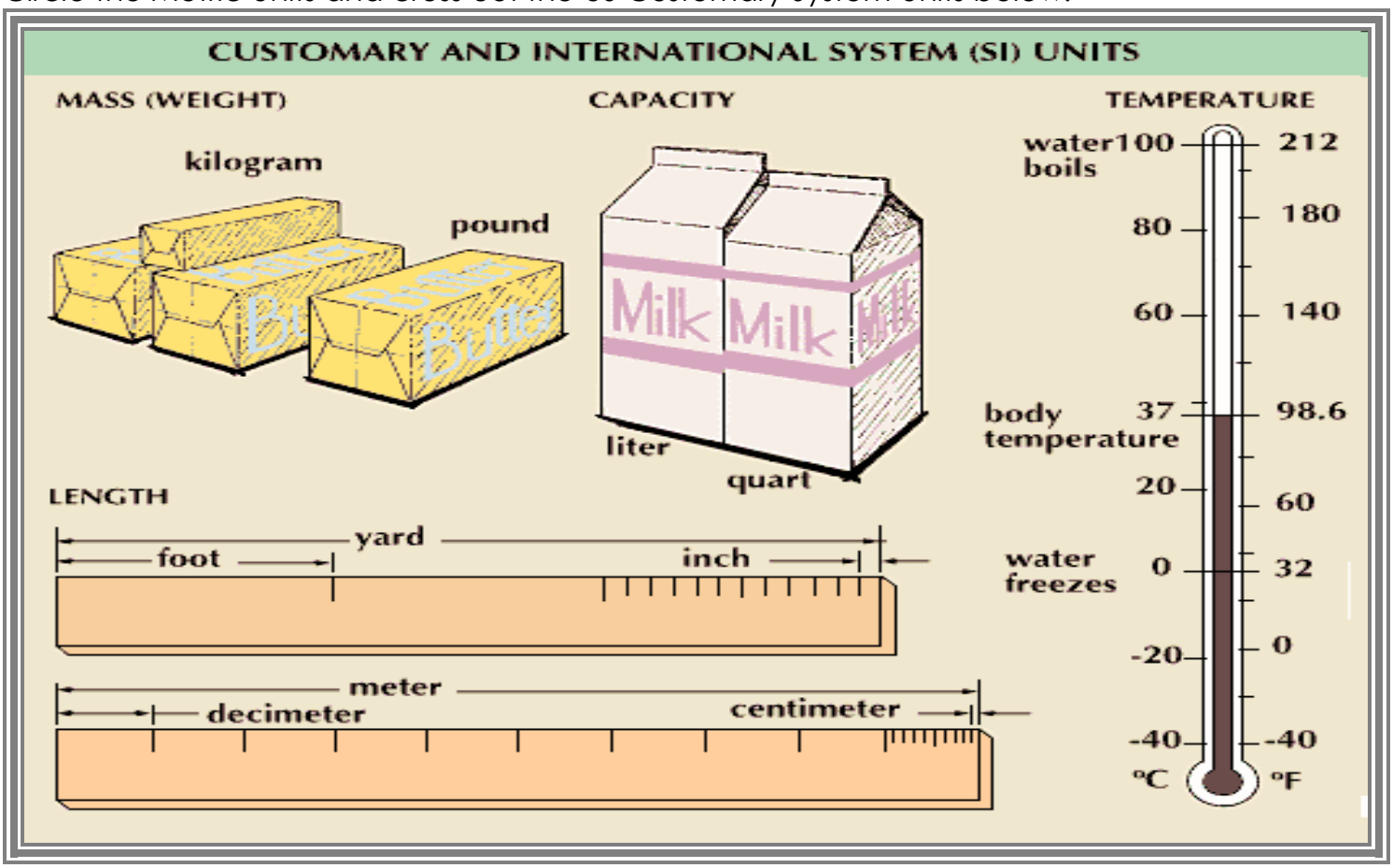
Part 2 Lesson 1 Introduction to the Metric System

Name some of the units of the US Customary System / Old English System of Measurement

What system is more popular worldwide? The US Customary System or the Metric System? Explain below.



Circle the Metric Units and cross out the US Customary System Units below.



Part 2 Lesson 2 Metric System

The _____ System of Units (SI) also known as the metric system.

The Metric System : A measurement system based on the powers of _____.

Why the Metric System is better

A.) _____ unit of measure for each quantity.

- No inch, foot, yard, pole, perch, fathom for length. Ex-It's the meter! One clear unit.

B.) Prefixes can _____.

- Combinations of prefix and unit make for a plethora of convenient combined units. Simple and easy.

C.) _____ System

- No fractions! Units are expressed in decimal notation! Allows unit conversion without doing math - simply by shifting the decimal point.

Which is not a reason why the Metric System is better

A.) One unit of measure for each quantity.

B.) Prefixes can scale.

C.) Historic-Developed and used in the United States after the American Revolution and based on a subset of the English units used in the Thirteen Colonies.

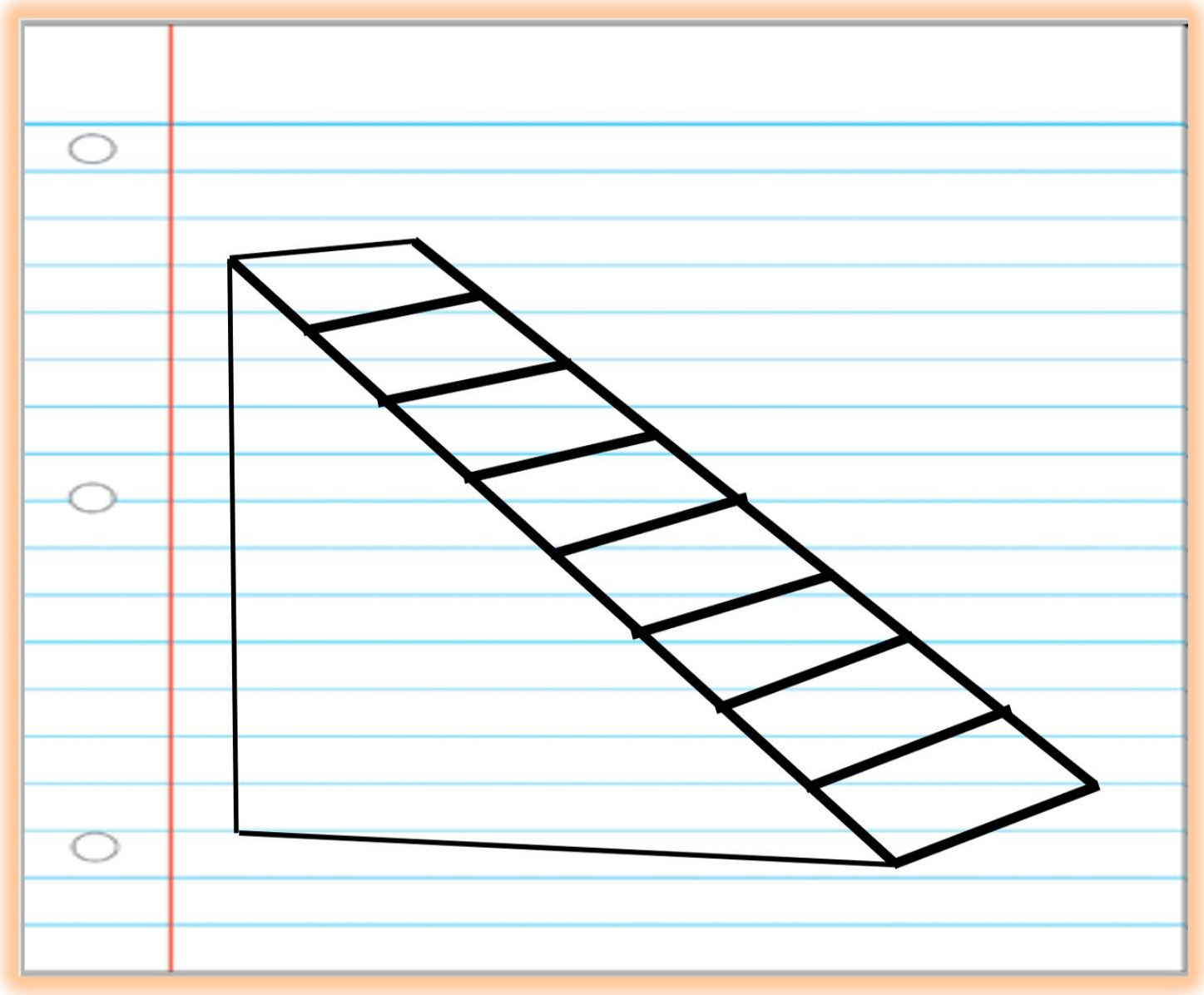
D.) Decimal System

What are the positives of using the International System of Units over the US Customary System (Old English System).

Please fill in the blanks below with the correct number or metric prefix. Use this chart to help you throughout work bundle.

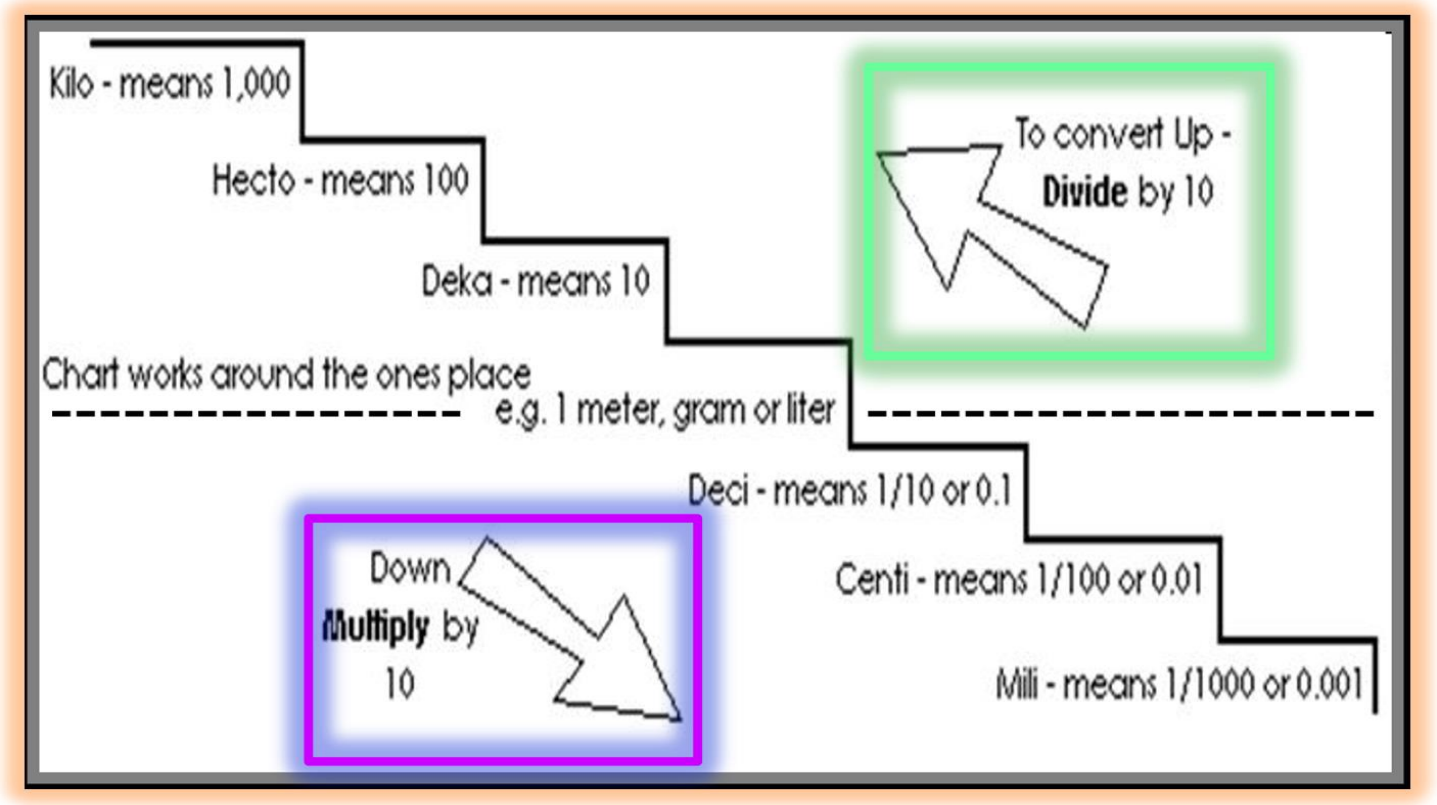
Prefix	Symbol	Multiplier	
exa	E	10^{18}	1,000,000,000,000,000,000
peta	P	10^{15}	1,000,000,000,000,000
tera	T	10^{12}	1,000,000,000,000
giga	G	10^{9}	
mega	M	10^{6}	1,000,000
kilo	k	10^{3}	1,000
h	h		
deka	da	10^{1}	10
deci	d	10^{-1}	0.1
c	c		
milli	m	10^{-3}	0.001
micro	μ	10^{-6}	
nano	n	10^{-9}	0.000,000,001
pico micro micro	p $\mu\mu$	10^{-12}	0.000,000,000,001
femto	f	10^{-15}	0.000,000,000,000,001
atto	a	10^{-18}	0.000,000,000,000,000,001

Please complete the diagram below as provided in the slideshow.



Use the above chart to assist you if needed to do the SI conversions below.

Convert the following number into the units below.	Convert the following number into the units below.	Convert the following number into the units below.
Kilometer	Kiloliter	**Kilogram 5**
Hectometer	Hectoliter	Hectogram
Decameter	Decaliter	Decagram
Meter 1	Liter	Gram
Decimeter	Deciliter	Decigram
Centimeter	Centiliter	Centigram
Millimeter	**Milliliter 750**	Milligram
Micrometer	Microliter	Microgram

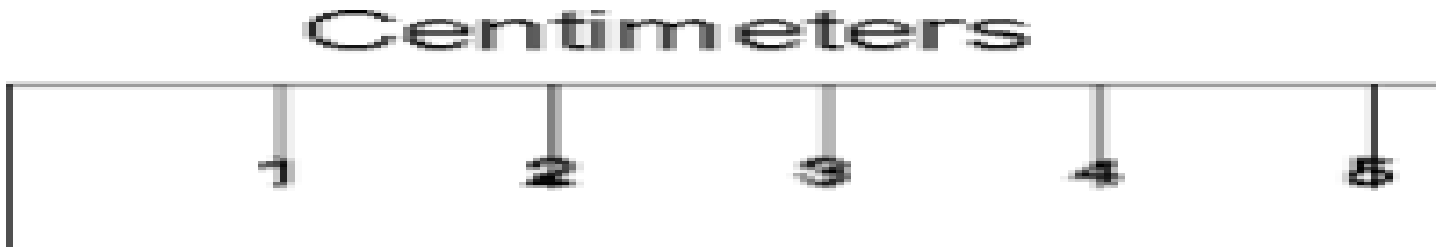


K H D B D C M

How many centimeters are in 1.29 meters?	How many millimeters are in 5.3 meters?
How many kilometers are in 5.3 meters?	How many Hectometers are in 4.4 meters?
How many Decimeters are in 14.9 meters?	How many Meters are in 6.1 Kilometers?
3.2 grams is how many milligrams?	Make up a question and have a peer solve?

How many millimeters (mm) are in 4.7 meters (m)?	22.5 cm = _____mm?
How many kilometers (km) are in 9.3 meters (m)?	22.4 L = _____mL?
How many centimeters (cm) are in 1.65 meters (m)?	55.8 kg =_____ mg
How many Hectometers (hm) are in 4.87 meters (m)?	582.2 mL = _____kL
How many Decimeters (dm) are in 9.9 meters?	.0051 kg = _____ g
How many Decameters (dkm) are in 11.9 meters (m)?	121.75 mg = _____ hg
How many Meters (m) are in 1.15 Kilometers (km)?	1L = _____ mL, 1000 mL =_____ L

Add some the correct amount of millimeters to the centimeters below. 1 meter - _____cm = _____ mm



Part 2 Lesson 3 Conversions

W	M	C

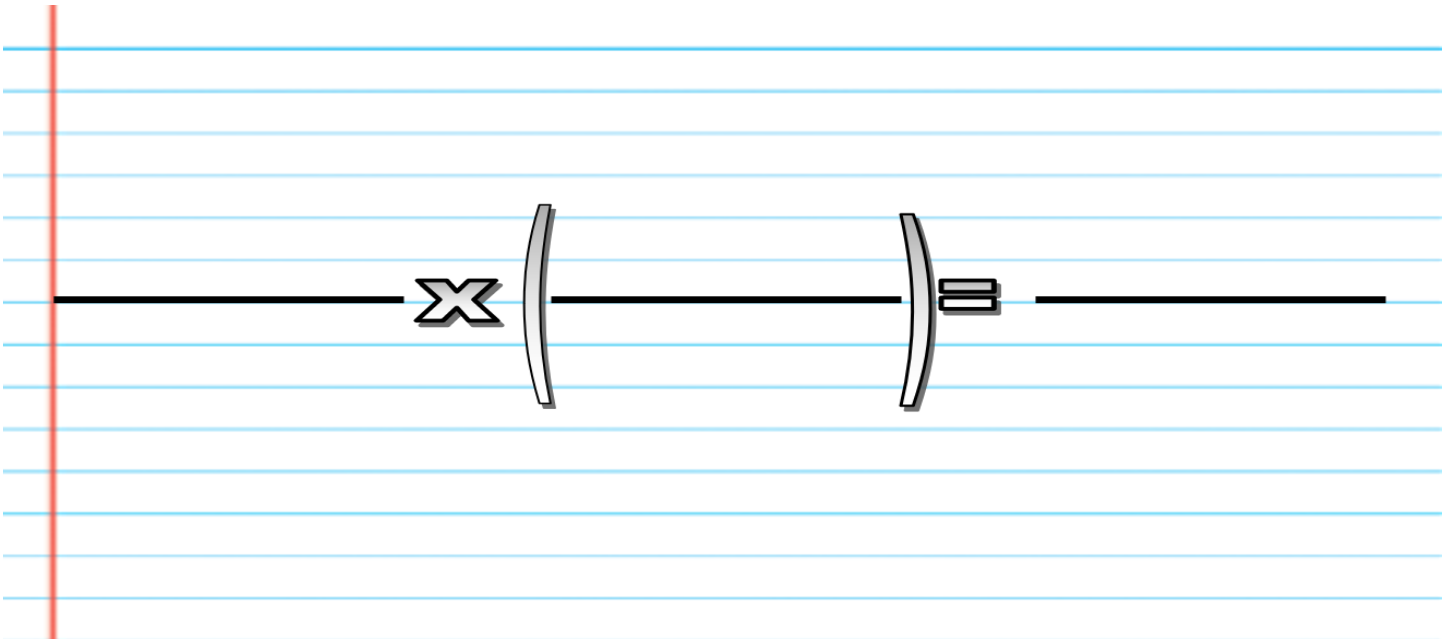
How many nickels are in $20 dollars? ---------- =

The ratios we created are called unit factors because they are equivalent to 1 unity. Any number multiplied by 1 will be equal to itself.

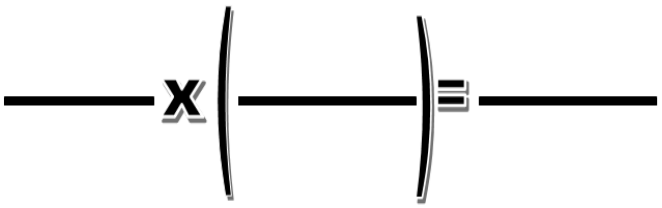
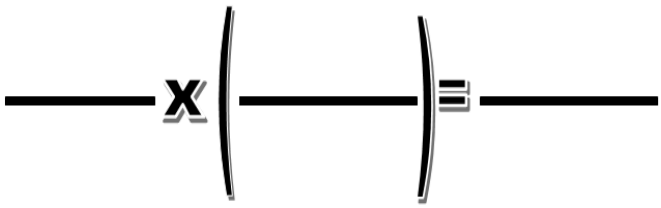
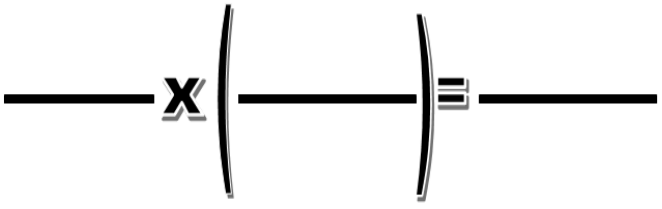
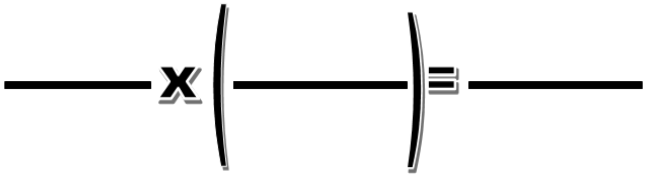
As a result, we can multiply any quantity by a unit factor to change the unit of measure without changing the physical quantity.

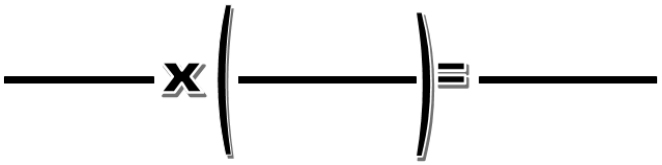
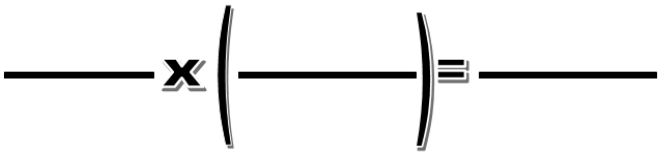
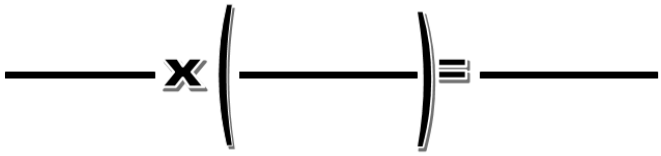
How many pennies is 15 nickels? X ---------- =

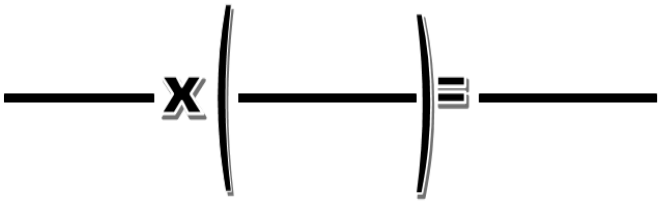
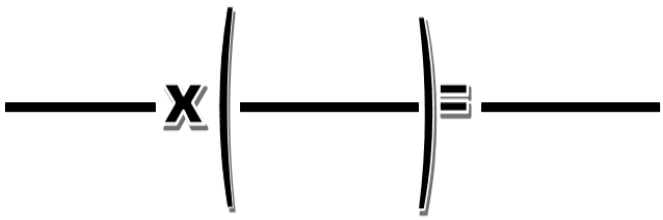
How many quarters are in 16 dollars? X ---------- =

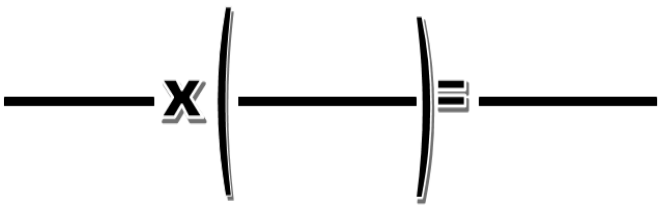
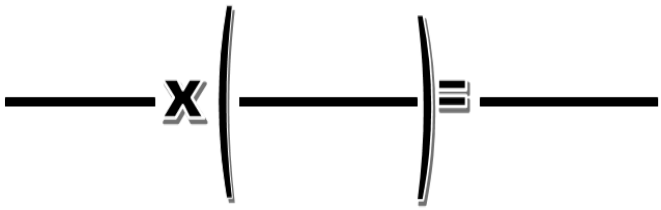


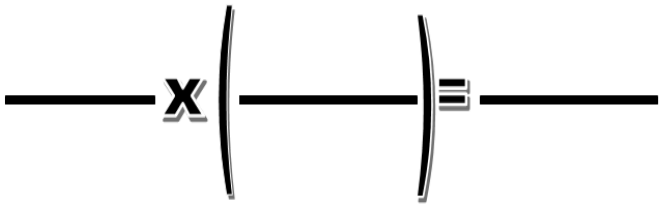
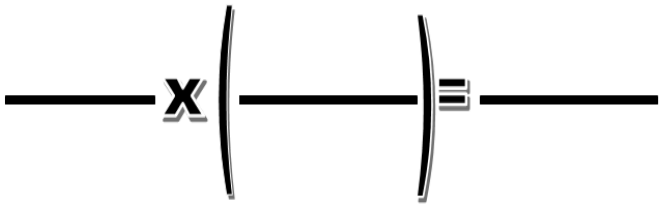
Please complete as described in the slideshow.

Please convert 50 miles (mi) into kilometers (km). (1 mile = 1.609 km). 	Please convert 14 pounds (lbs) to grams (g). (1 pound = 453.59 grams) 
Please convert 7 feet to meters. (1 meter (m) = 3.28 ft) 	Please convert seven US Dollars into Canadian Dollars. (1 USD. Dollar = 1.028 Canadian CAN$) 

Please convert 7.6 miles into kilometers (km) (1km = 0.6mi) 	Please convert 6 feet into centimeters (1ft = 30cm) 
Please convert 11.4 gallons into liters. (1 gal = 3.8L) 	Please convert 75 lbs into kilograms (1kg = 2.2lb) 

Please convert 112 pecks (p) into bushels (bu). (4 pecks = 1 bushel) 	Please convert 296 dekagram into grams (1 dekagram (dag) = 10 grams) 

Please convert 156 centimeters to inches (1 inch = 2.54 cm) 	Please convert 296 grams into dekagrams (1 dekagram (dag) = 10 grams) 

Please convert 17 miles into feet. (1 miles = 5280 feet) 	Please make your own problem and solve it. 

How many seconds are in one week?
7 days in a week, 24 hours in a day, 60 min in an hour, and 60 seconds in a minute

7 days x ---------- X --------- X --------- =

Your grandfather needs to take 10,000 mg of his daily medication. Each pill is .5 grams.
-How many pills does he need to meet is daily dose? Remember… (1 g is 1000 mg)

10,000 mg x ---------- x ---------- = pills

Part 2 Lesson 4 SI Notation

Scientific notation: A method for expressing, and working with, extremely _____ or extremely _____ numbers.

To write a number in scientific notation:
Put a decimal point after the first digit and drop the zeroes.
146,000,000 = 1.46×10^8

To find the exponent, count the number of places from the decimal to the end of the numbers.
In 1.<u>46000000</u> there are 8 places.
12345678
Therefore we write 146,000,000 as 1.46×10^8

The first number 1.46 is called the coefficient. It must be greater than or equal to 1 and less than 10

The second number (10^8) is called the base . It must always be 10 in scientific notation. The base number 10 is always written in exponent form.

What's 95,200 in scientific notation?

What's 250,000 in scientific notation?

What's 40,100,000,000,000 in scientific notation?

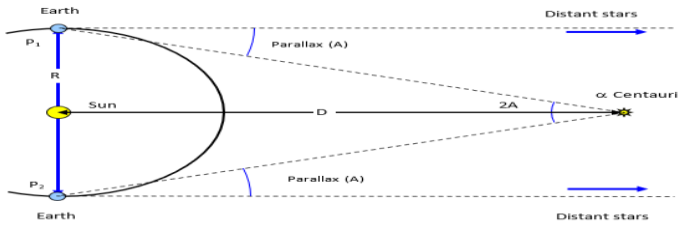
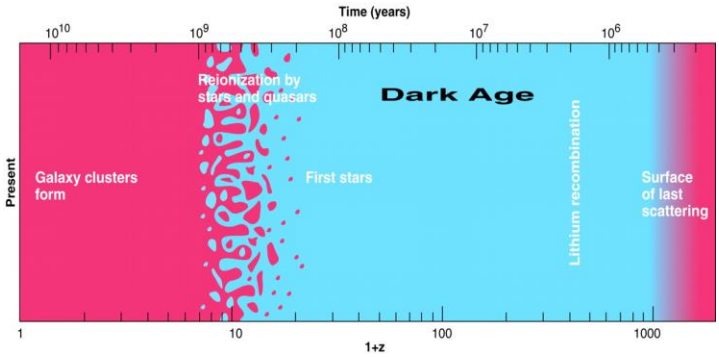


Figure 2

This is the distance from Earth to the nearest star Proxima Centauri

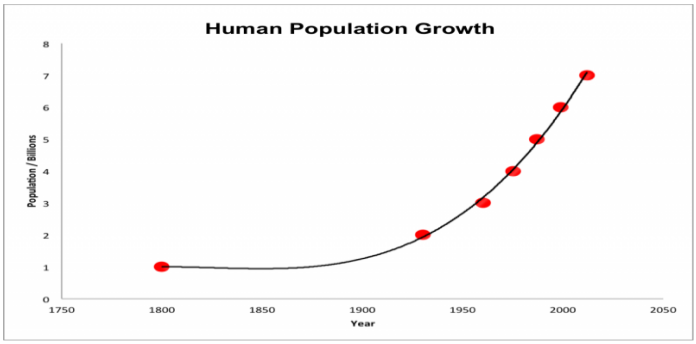
What's 14,000,000,000 in scientific notation?



This is the approximate age of the universe in years.

Try this one! What's 1.28×10^8?

What's 8,000,000,000 in scientific notation?



A projected figure for human population 2025

What is 9.9×10^7?

This is the distance from the earth to Mars in Kilometers.

What's 3.844×10^5 ?

The distance in kilometers from the earth to the Moon.

What's 4.0075×10^4 km

The approximate circumference of the earth.

What is $(2 \times 10^4)(4 \times 10^3)$?

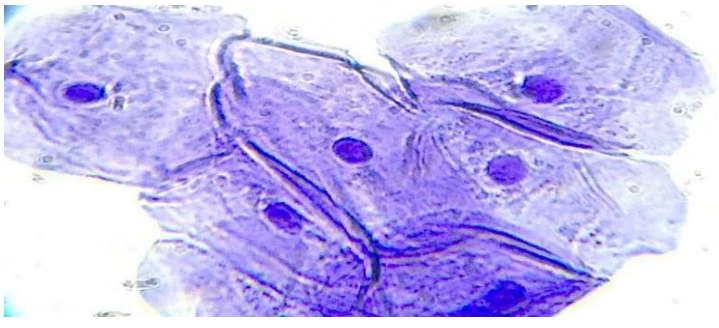
What is $(2 \times 10^4)(3 \times 10^4)$?

Which one of the choices below is the smallest number?

- A) (7×10^4)
- B) (4×10^3)
- C) (3×10^8)
- D) (6×10^3)
- E) (9×10^{-3})

What's 0.00053 in scientific notation?

What's 0.00000042 in scientific notation?



What's 5.73 x 10-4? 	What's 9,780,000,000,000,000,000,000,000,000 in scientific notation? 

Please convert the following number into scientific notation. 93,000,000	What's 156,000 in scientific notation?	What is 4.56 x 10 -9?
What's 9.76 x 10^{13}	What's 946,000,000,000?	What's $(4 \times 10^6)(2 \times 10^3)$

Notes:

Part 2 Review Game

Name:

1-20 = 5 pts Lesson 5

Due: Today

*20-*25 * = Bonus + 1 pt,
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Score ____ / 100

METRIC MATTERS	UP OR DOWN	VIRTUCON	BIG OR SMALL	WAY TOO MANY Bonus round 1pt each
1)	6)	11)	16)	*21)
2)	7)	12)	17)	*22)
3)	8)	13)	18)	*23)
4)	9)	14)	19)	*24)
5)	10)	15)	20)	*25)

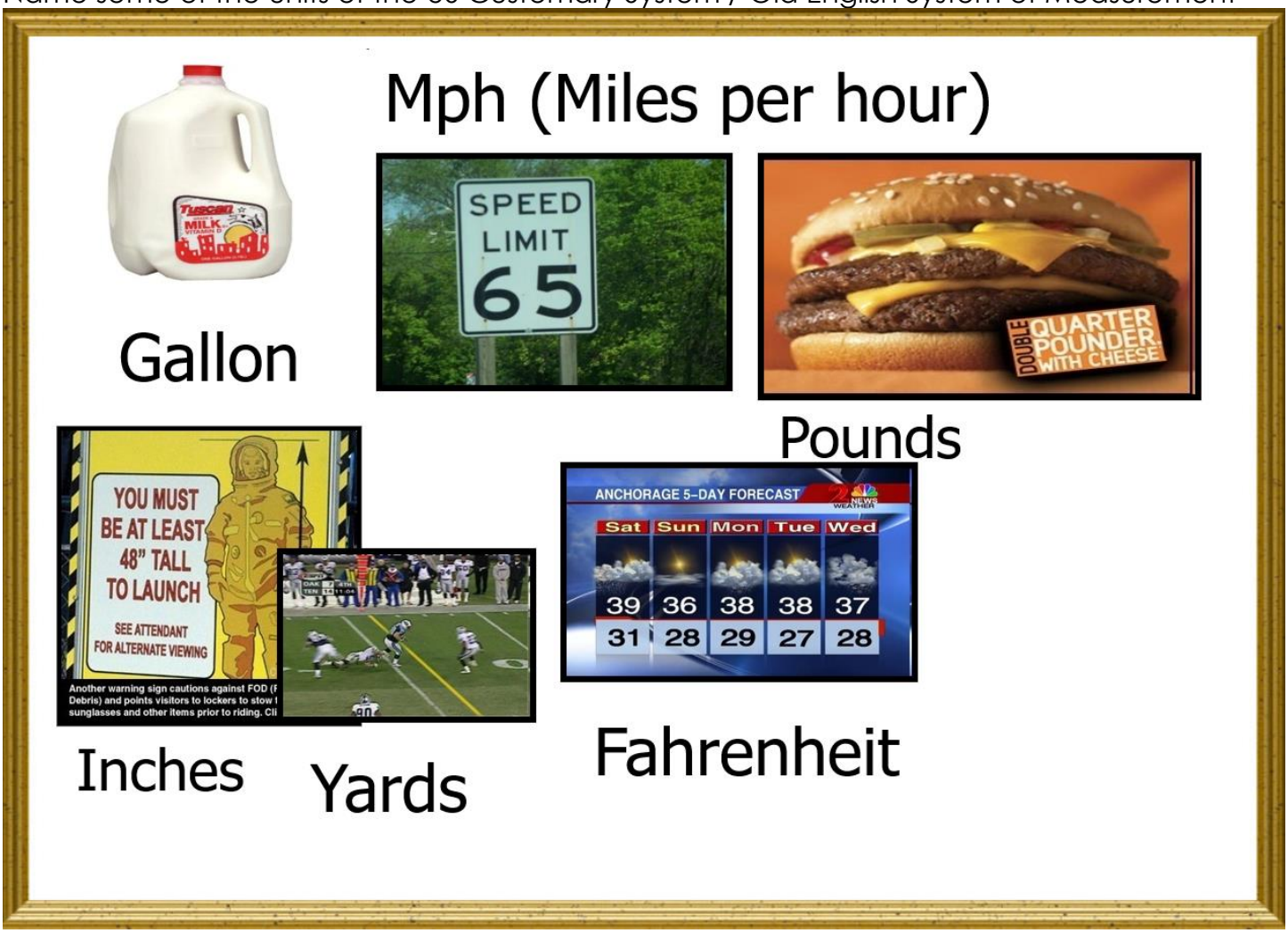
Final Question Wager ___/5 Answer: _____

Part 2 Metric System

Name:

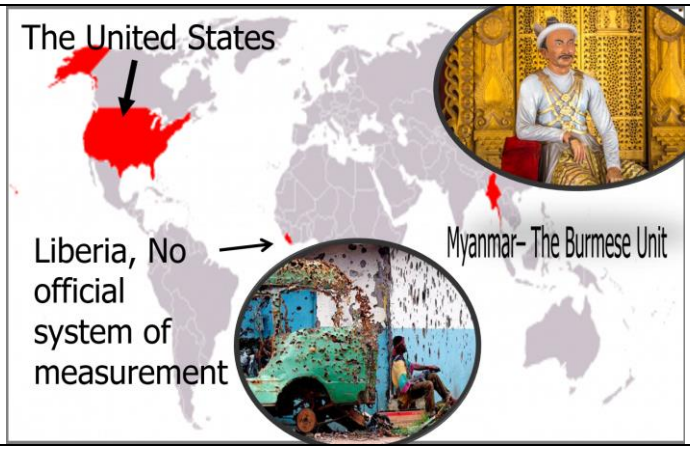
Part 2 Lesson 1 Introduction to the Metric System

Name some of the units of the US Customary System / Old English System of Measurement

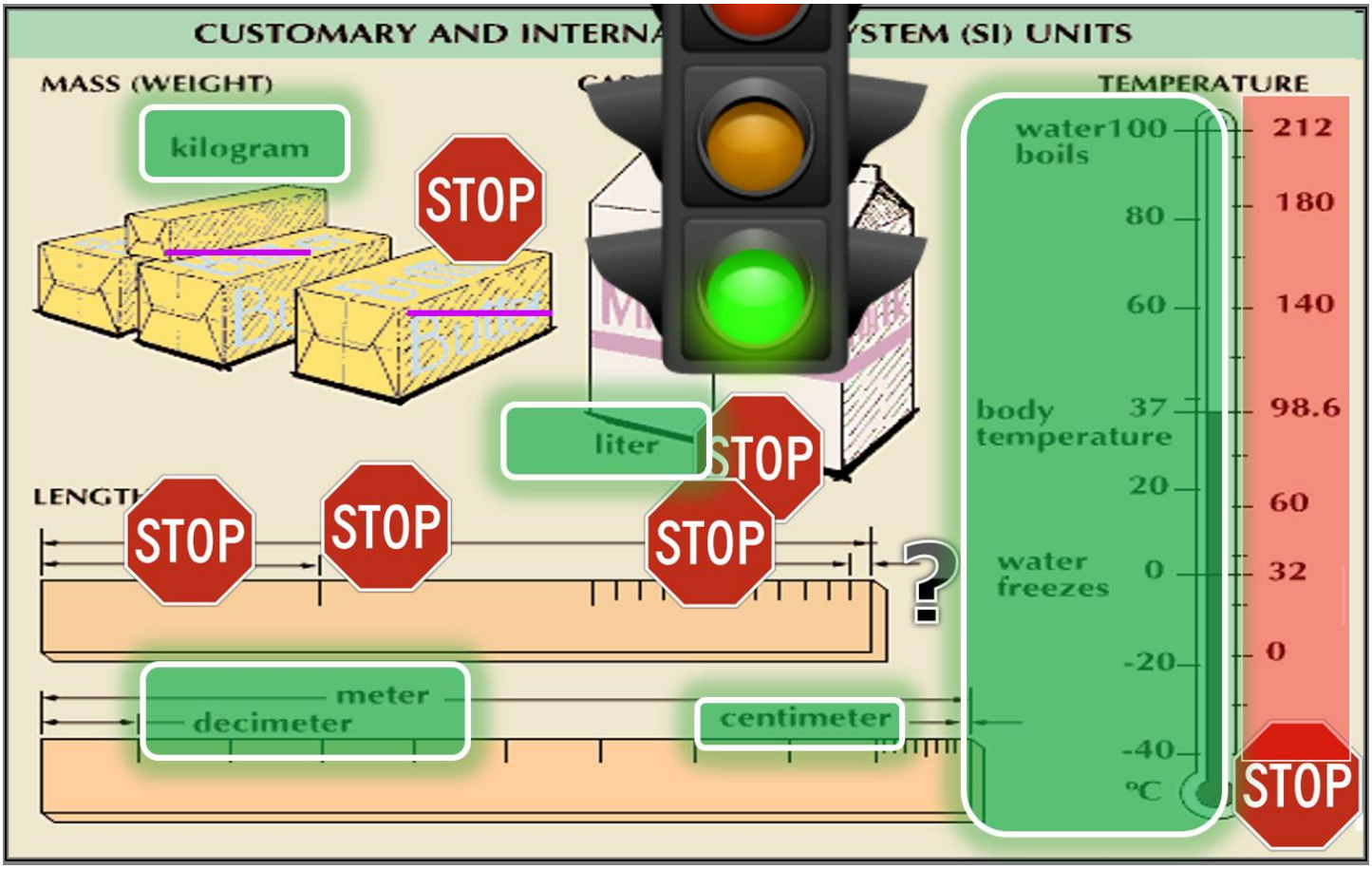


What system is more popular worldwide? The US Customary System or the Metric System? Explain below.

Countries that have not "officially" adopted the metric system (The United States, Myanmar, and Liberia). The US has adopted the SI system, we just don't have full compliance yet. It's a continuum to full conversion and we're just not getting their quickly.



Circle the Metric Units and cross out the US Customary System Units below.



Part 2 Lesson 2 Metric System

The International System of Units (SI) also known as the metric system.

The Metric System : A measurement system based on the powers of 10.

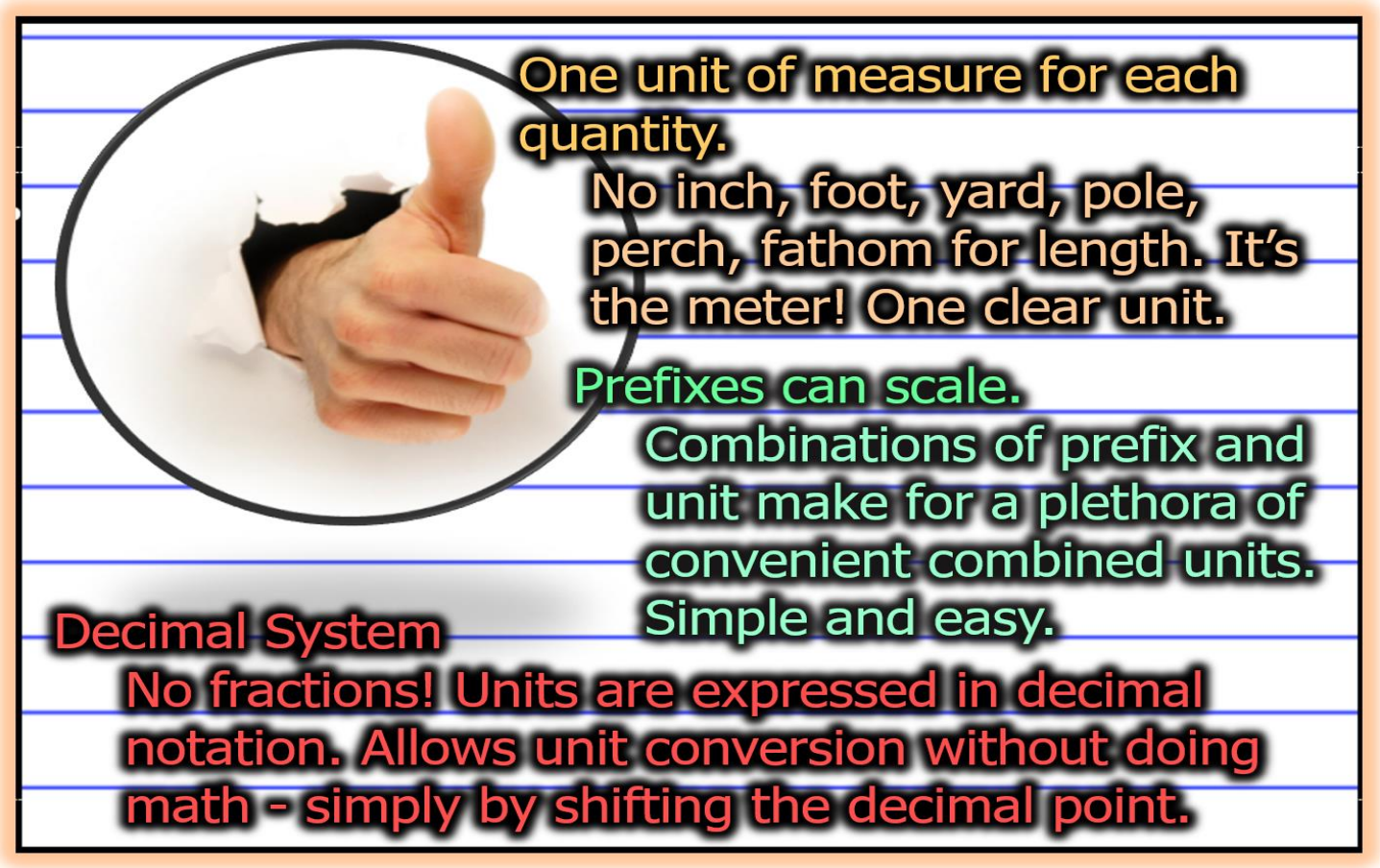
Why the Metric System is better
A.) One unit of measure for each quantity.
- No inch, foot, yard, pole, perch, fathom for length. Ex-It's the meter! One clear unit.

B.) Prefixes can scale.
- Combinations of prefix and unit make for a plethora of convenient combined units. Simple and easy.

C.) Decimal System
- No fractions! Units are expressed in decimal notation! Allows unit conversion without doing math - simply by shifting the decimal point.

Which is not a reason why the Metric System is better
A.) One unit of measure for each quantity.
B.) Prefixes can scale.
C.) Historic-Developed and used in the United States after the American Revolution and based on a subset of the English units used in the Thirteen Colonies.
D.) Decimal System

What are the positives of using the International System of Units over the US Customary System (Old English System).



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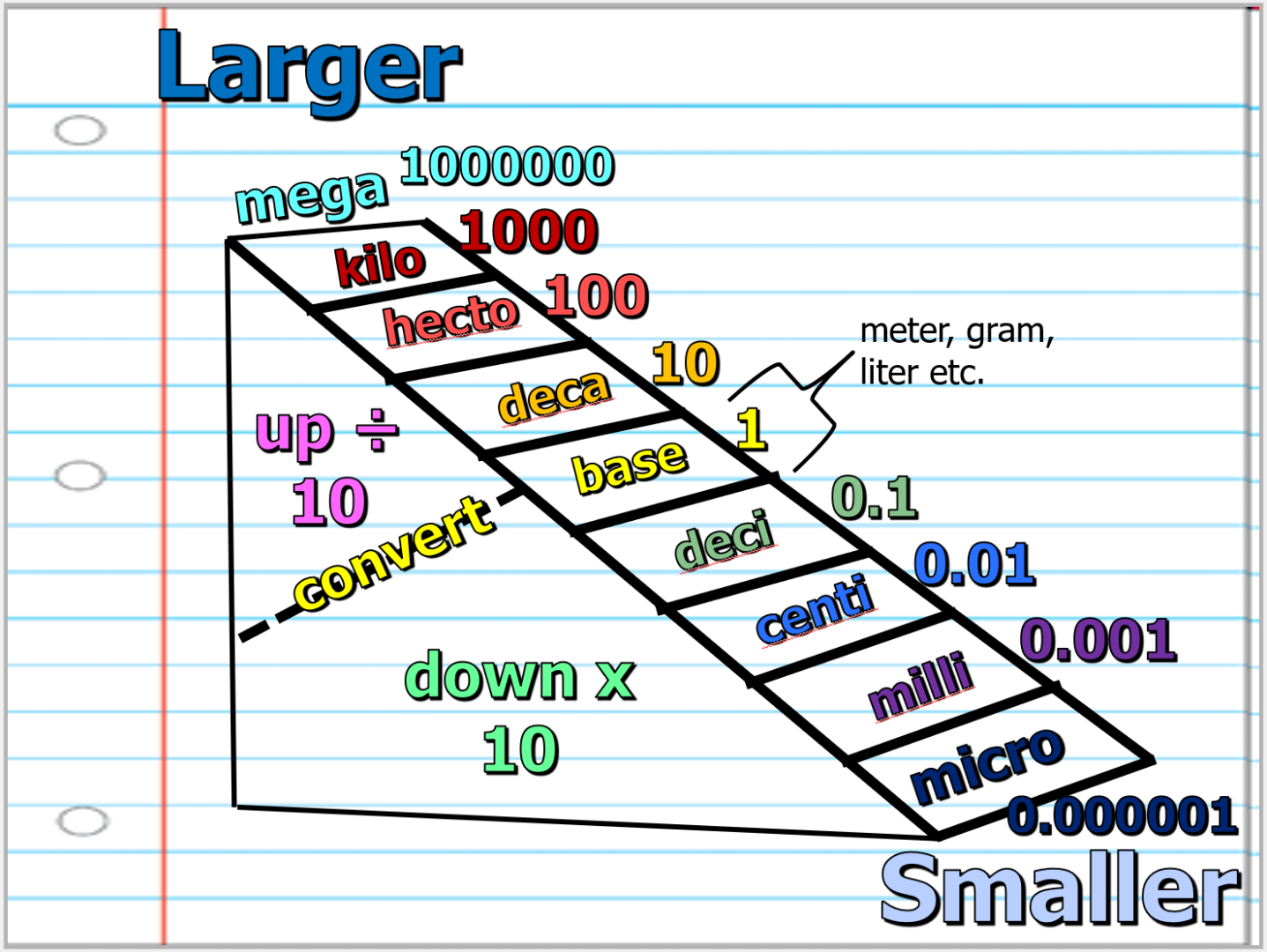
giga	G	10^{9}	100, 000, 000
mega	M	10^{6}	1,000,000
kilo	k	10^{3}	1,000
h hecto	h	10^{2}	100
deka	da	10^{1}	10
deci	d	10^{-1}	0.1
c centi	c	10^{-2}	.01
milli	m	10^{-3}	0.001
micro	μ	10^{-6}	.000,001
nano	n	10^{-9}	0.000,000,001
pico micro micro	p $\mu\mu$	10^{-12}	0.000,000,000,001
femto	f	10^{-15}	0.000,000,000,000,001
atto	a	10^{-18}	0.000,000,000,000,000,001

Please complete the diagram below as provided in the slideshow.



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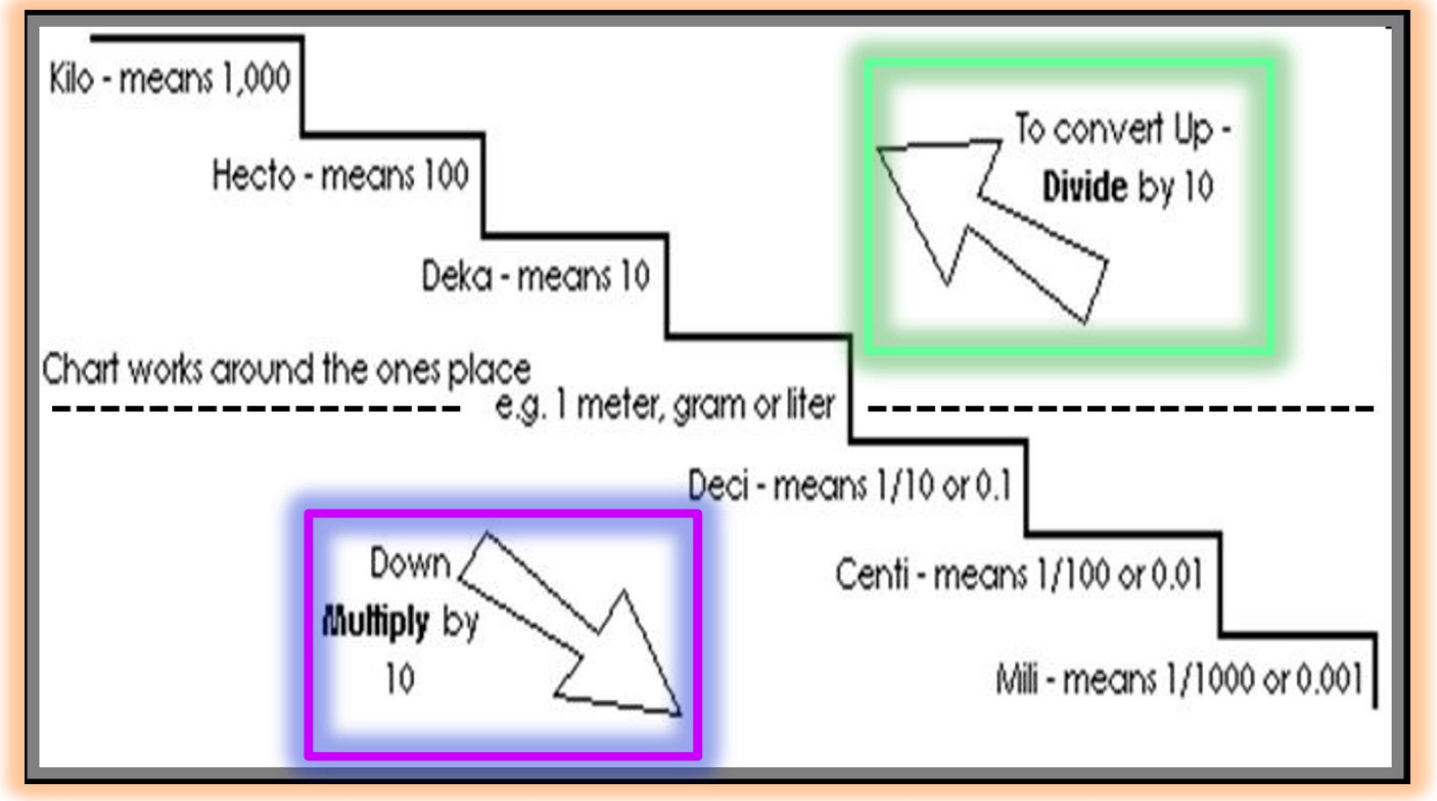
Convert the following number into the units below.		Convert the following number into the units below.		Convert the following number into the units below.	
	1,000,000				
Kilometer	1000	Kiloliter	.00075	**Kilogram**	5
Hectometer	100	Hectoliter	.0075	Hectogram	50
Decameter	10	Decaliter	.075	Decagram	500
Meter	1	Liter	.75	Gram	5000
Decimeter	.1	Deciliter	7.5	Decigram	50,000
Centimeter	.01	Centiliter	75	Centigram	500,000
Millimeter	.001	**Milliliter**	750	Milligram	5,000,000
Micrometer	.000,001	Microlit	7500	Microgram	5,000,000,000



K H D B D C M

How many centimeters are in 1.29 meters? 1.29 meter → cm 1.29 X 100 = 129 cm	How many millimeters are in 5.3 meters? 5.3 meter → mm 5300. mm
How many kilometers are in 5.3 meters? 5.3 meter → km .0053km	How many Hectometers are in 4.4 meters? 4.4 m = .044 h
How many Decimeters are in 14.9 meters? 14.9 meters = 149 d	How many Meters are in 6.1 Kilometers? 6.1 Kilometers = 6100 m
3.2 grams is how many milligrams? 3.2 grams = 3200 mg	Make up a question and have a peer solve? Complete now!

How many millimeters (mm) are in 4.7 meters (m)? **4.7 m is equal to 4700 mm**	22.5 cm = **225** mm?
How many kilometers (km) are in 9.3 meters (m)? **9.3 Meters is equal to 0.0093 km**	22.4 L = **22400 ml**
How many centimeters (cm) are in 1.65 meters (m)? **1.65 m = 165 cm**	55.80 kg = **55,800,000 mg**
How many Hectometers (hm) are in 4.87 meters (m)? **4.87m = .0487 hm**	582.2 mL = **.0005822 kl**
How many Decimeters (dm) are in 9.9 meters? **9.9 = 99 dm**	.0051 kg = **5.1** g
How many Decameters (dkm) are in 11.9 meters (m)? **11.9m = 1.19 dam**	121.75 mg = **.0012175 h**
How many Meters (m) are in 1.15 Kilometers (km)? **1.15km =1015 m**	1L = **1000** 1000 mL = **1** L

Add some the correct amount of millimeters to the centimeters below. 1 meter – 100 cm = 1000 mm

Part 2 Lesson 3 Conversions

Write the conversion as a fraction	Multiply	Cancel units from the top and bottom
W	M	C

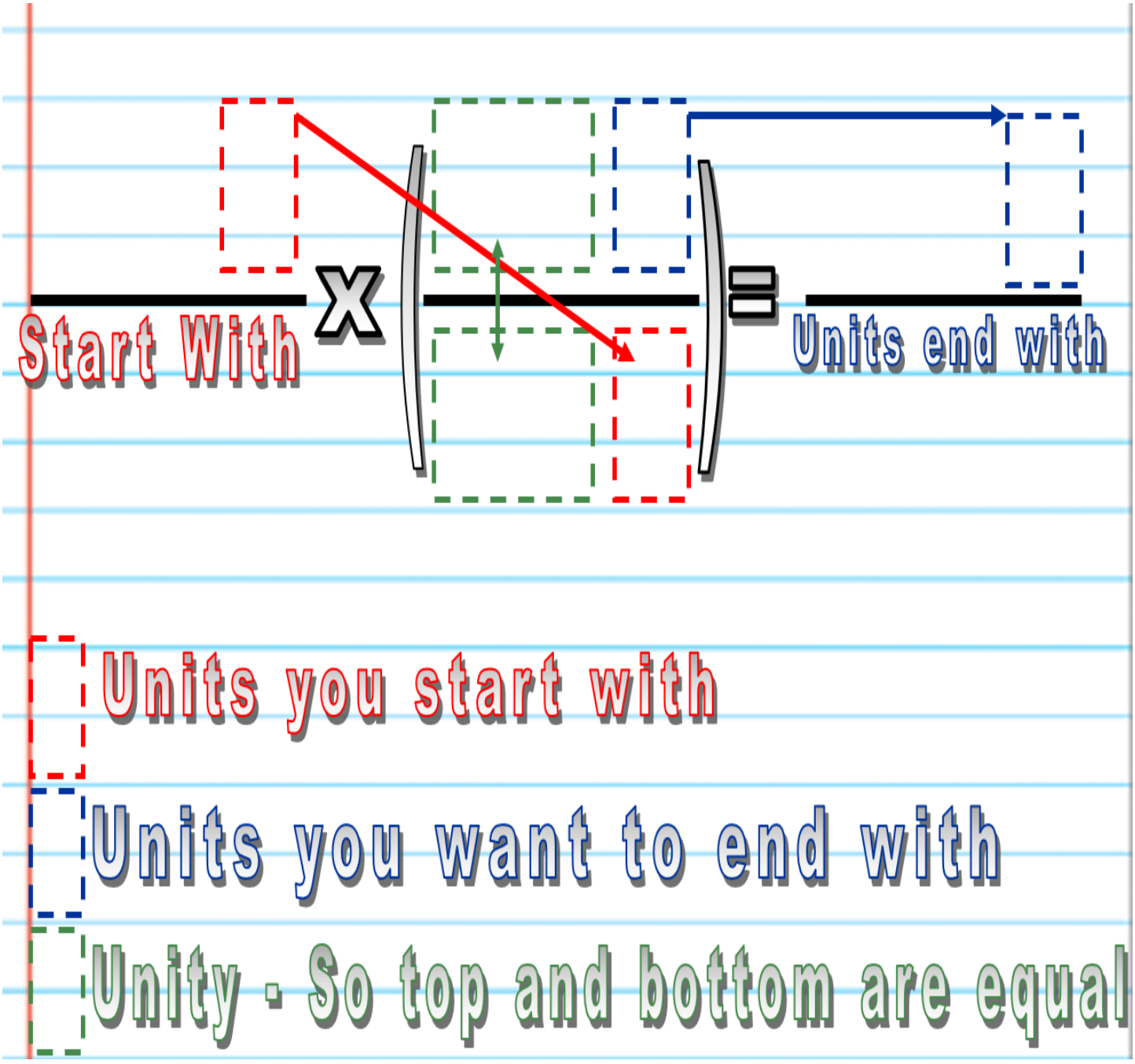
How many nickels are in $20 dollars? $20 / 400 nickels = 1

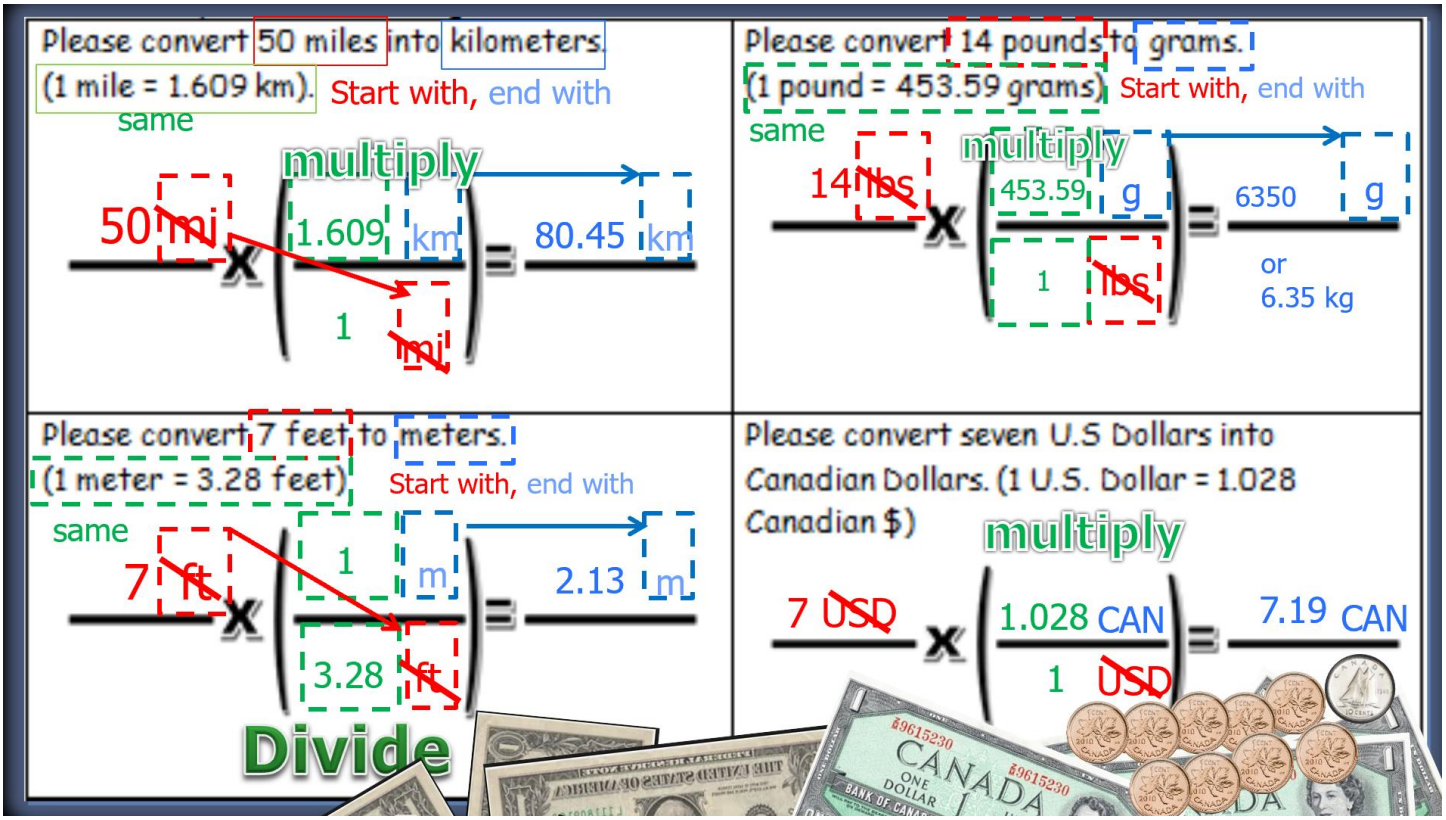
The ratios we created are called unit factors because they are equivalent to 1 unity.
Any number multiplied by 1 will be equal to itself.
As a result, we can multiply any quantity by a unit factor to change the unit of measure without changing the physical quantity.

How many pennies is 15 nickels? 15 Nickels x 5 pennies / 1 Nickel = 75

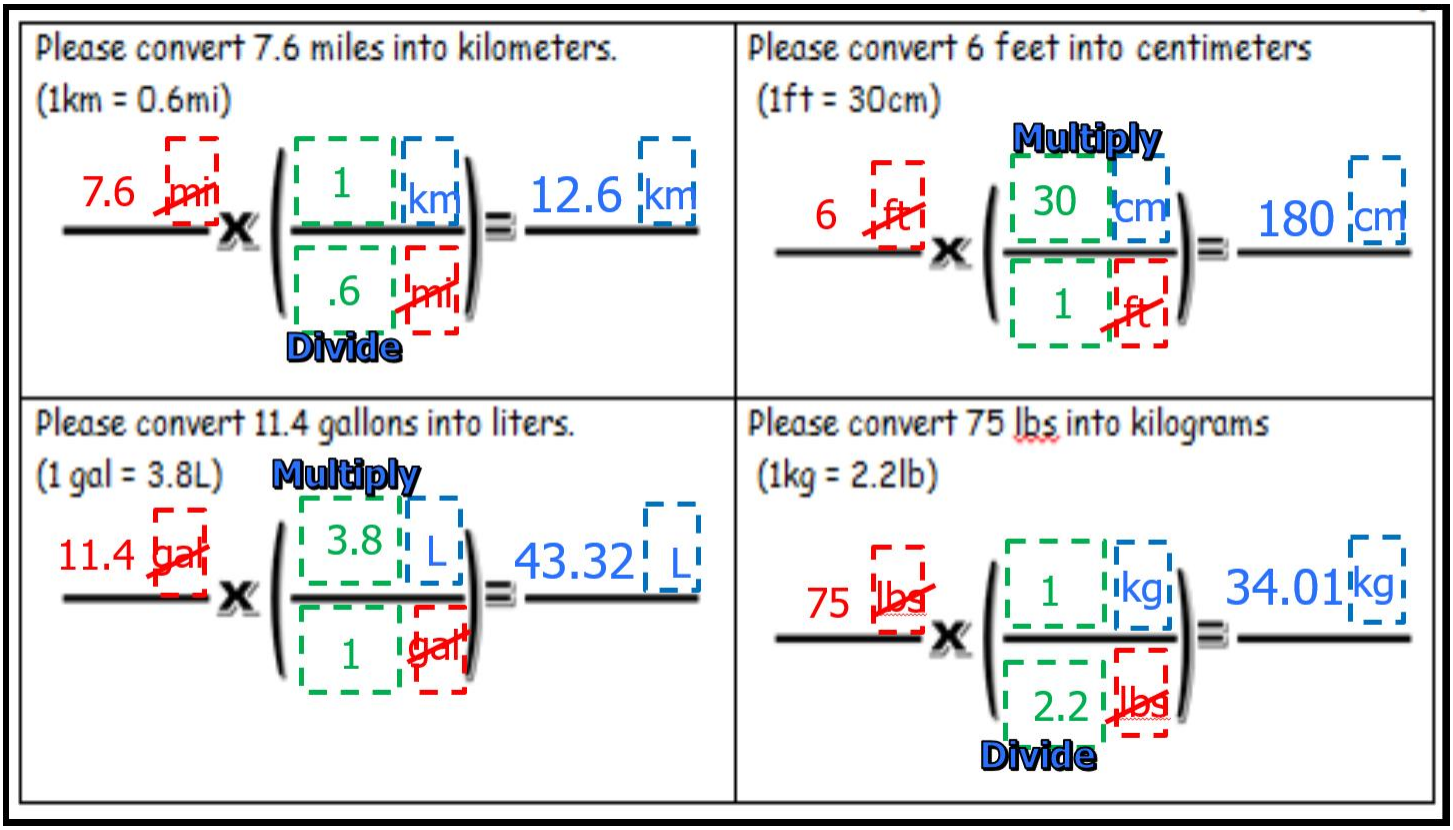
How many quarters are in 16 dollars?

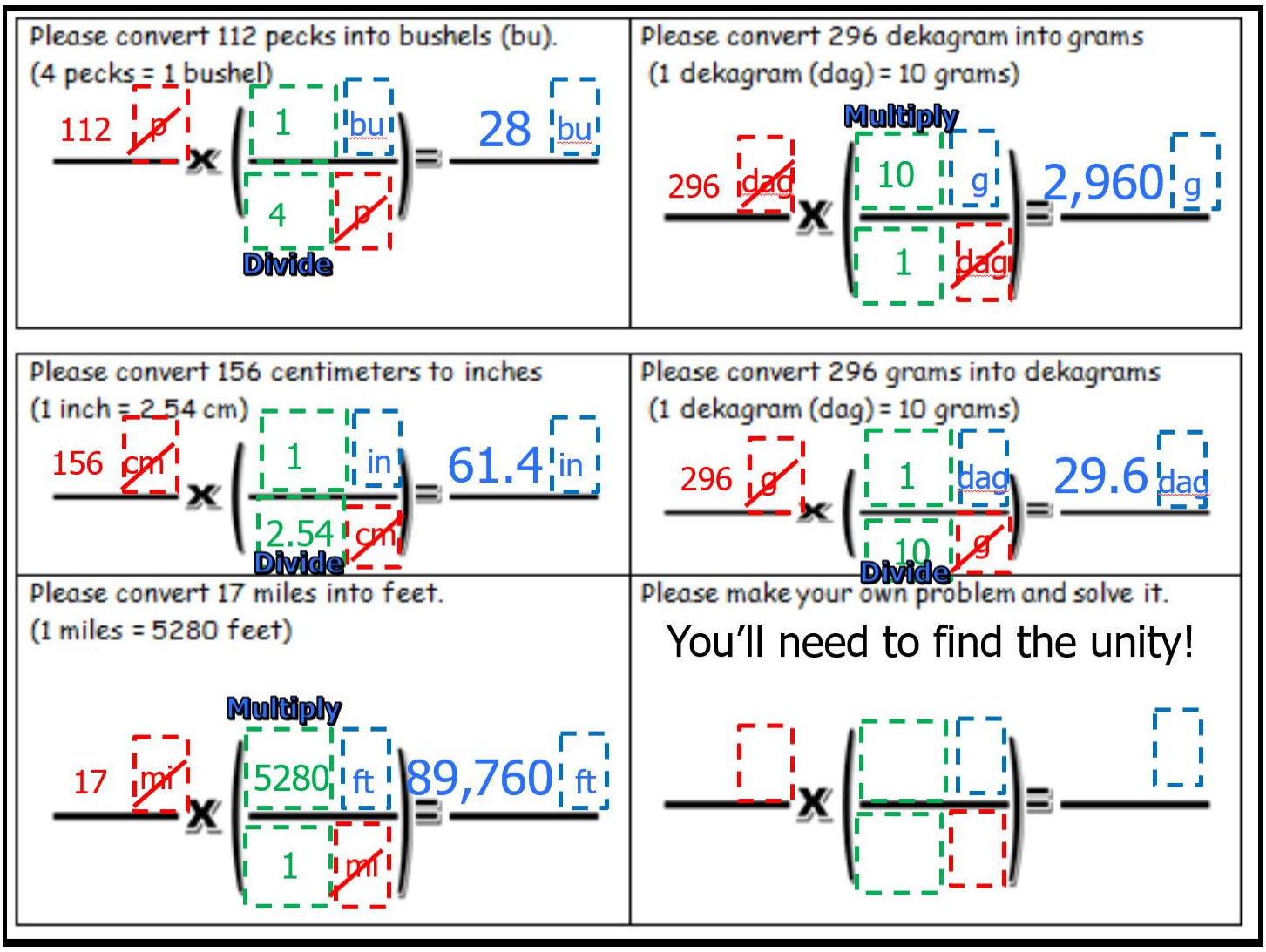
$$16 \text{ dollars} \times \frac{4 \text{ quarters}}{1 \text{ dollar}} = 64$$





Please complete as described in the slideshow.



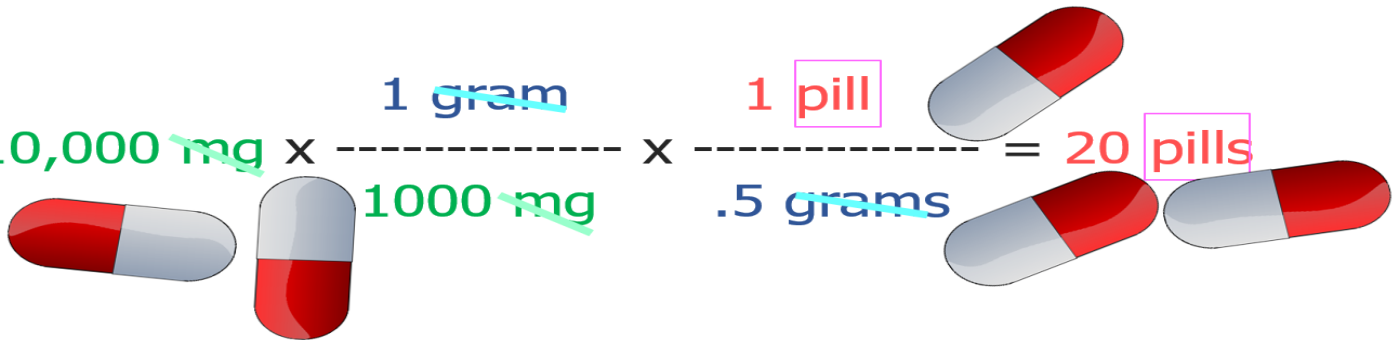


How many seconds are in one week?
7 days in a week, 24 hours in a day, 60 min in an hour, and 60 seconds in a minute

$$7 \text{ days} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{60 \text{ sec}}{1 \text{ min}} = 604{,}800 \text{ sec}$$

Your grandfather needs to take 10,000 mg of his daily medication. Each pill is .5 grams.
-How many pills does he need to meet is daily dose? Remember… (1 g is 1000 mg)

$$10{,}000 \text{ mg} \times \frac{1 \text{ gram}}{1000 \text{ mg}} \times \frac{1 \text{ pill}}{.5 \text{ grams}} = 20 \text{ pills}$$



Part 2 Lesson 4 SI Notation

Scientific notation: A method for expressing, and working with, extremely large or extremely small numbers.

To write a number in scientific notation:

Put a decimal point after the first digit and drop the zeroes.

146,000,000 = 1.46 x 10^8

To find the exponent, count the number of places from the decimal to the end of the numbers.

In 1.46000000 there are 8 places.

12345678

Therefore we write 146,000,000 as 1.46 x 10^8

The first number 1.46 is called the coefficient. It must be greater than or equal to 1 and less than 10

The second number (10^8) is called the base . It must always be 10 in scientific notation. The base number 10 is always written in exponent form.

What's 95,200 in scientific notation?

9.52 x 10^4

What's 250,000 in scientific notation?

2.5 x 10^5

What's 40,100,000,000,000 in scientific notation?

4.01 x 10^{13}

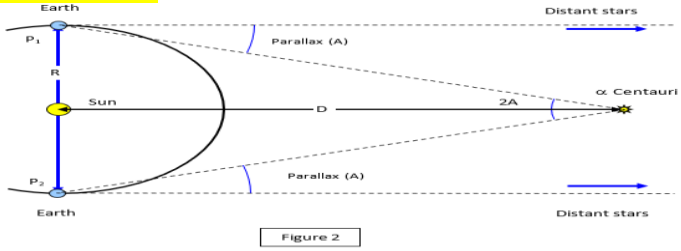
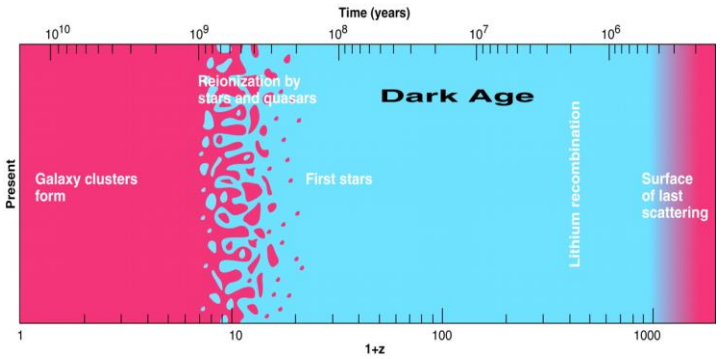


Figure 2

This is the distance from Earth to the nearest star Proxima Centauri

What's 14,000,000,000 in scientific notation?

1.4 x 10^{10} (14 Billion)



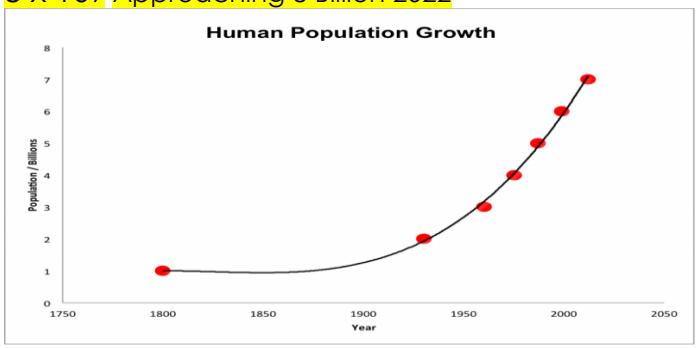
This is the approximate age of the universe in years.

Try this one! What's 1.28×10^8?

128,000,000

What's 8,000,000,000 in scientific notation?

8×10^9 Approaching 8 Billion 2022



A projected figure for human population 2025

What is 9.9×10^7?

99,000,000 kilometers

This is the distance from the earth to Mars in Kilometers.

What's 3.844×10^5 ?

384,400 km

The distance in kilometers from the earth to the Moon.

What's 4.0075×10^4 km

40,075 km

The approximate circumference of the earth.

What is $(2 \times 10^4)(4 \times 10^3)$?

8×10^7 or 80,000,000

What is $(2 \times 10^4)(3 \times 10^4)$?

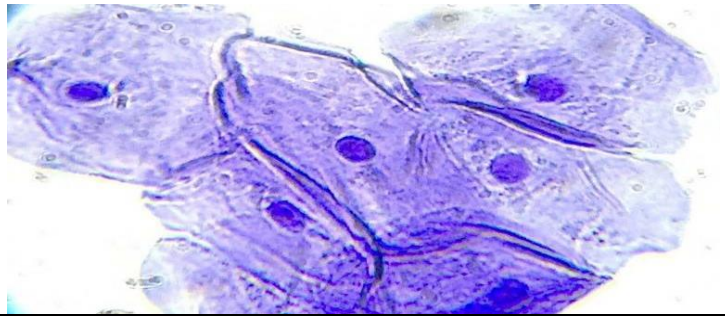
Answer = 600,000,000

Which one of the choices below is the smallest number?

- A) (7×10^4)
- B) (4×10^3)
- C) (3×10^8)
- D) (6×10^3)
- E) (9×10^{-3})

What's 0.00053 in scientific notation?
5.3 x 10-4

What's 0.00000042 in scientific notation?
4.2 × 10–7



What's 5.73 x 10-4?
0.000573

What's 9,780,000,000,000,000,000,000,000,000 in scientific notation?
9.78 x 10^{27}

Please convert the following number into scientific notation. 93,000,000 **$9.3*10^{7}$**	What's 156,000 in scientific notation? **$1.56*10^{5}$**	What is 4.56×10^{-9}? **.00000000456**
What's 9.76×10^{13} **9,760,000,0000**	What's 946,000,000,000? **$9.46*10^{11}$**	What's $(4 \times 10^{6})(2 \times 10^{3})$

Part 2 Review Game

Name:

Due: Today

1-20 = 5 pts

Lesson 5

*20-*25 * = Bonus + 1 pt,
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Score ____ / 100

METRIC MATTERS	UP OR DOWN	VIRTUCON	BIG OR SMALL	WAY TOO MANY Bonus round 1pt each
1) Letter A uses the Metric System	6) 3.9 X 100 = 390cm	11) True	16) 628,730,000 km	*21) Lego Clones
2) Letter B	7) 12.3 / 1000 =.0123km	12) 42.15 km	17) 3.41 x 10-6	*22) Nerd Candies
3) Number 10 & Number 12	8) 100 Centimeters	13) 45.35 kg	18) 628,730,000 km	*23) Pillow Pets
4) International Systems of Units	9) 10 mm	14) 22,526. m	19) 9.46 x 1012 km	*24) Gremlins
5) 10 1 .1 .01 .001	10) 124 Quarters	15) Extremely large and small entities	20) 88,200,000	*25) Oompa Loompa's

Final Question Wager ___/5 Answer: kilo, hector, deca, base, centi, deci, milli