Lab safety

ANNOUNCE

OBJECTIVE

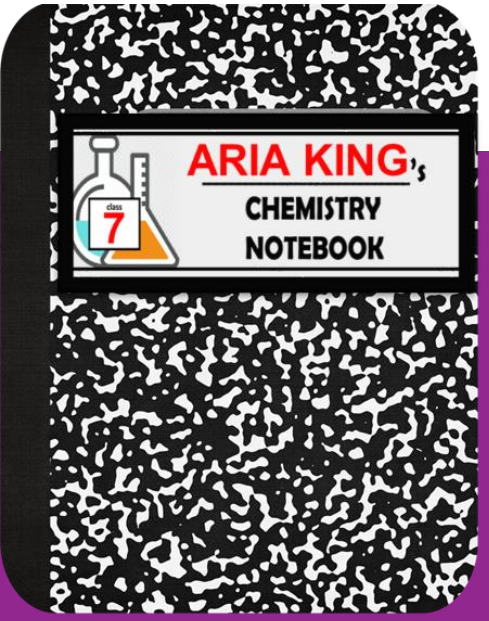
Announcements

- Classroom procedure
- Remind 101
- Teams

Objective

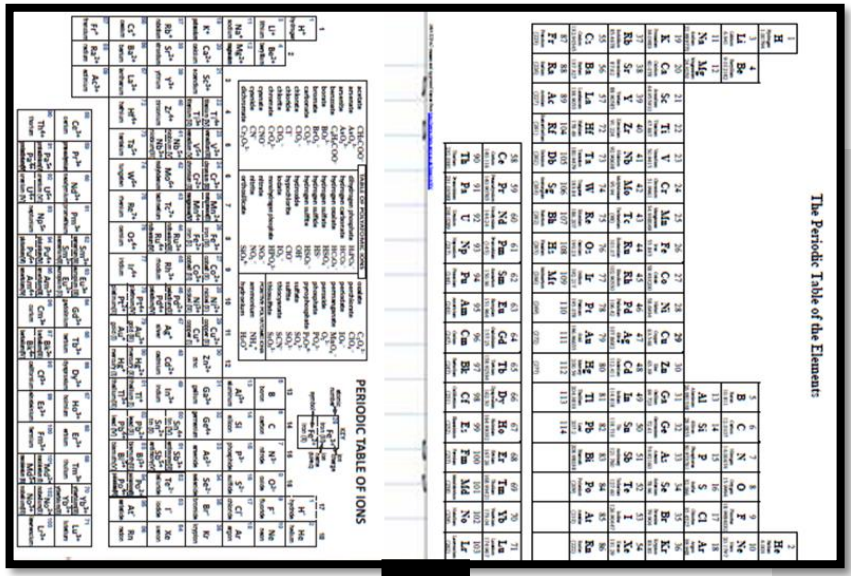
- SWBAT explain the importance of lab safety.
- SWBAT discuss proper lab safety procedures for various situations in the laboratory.

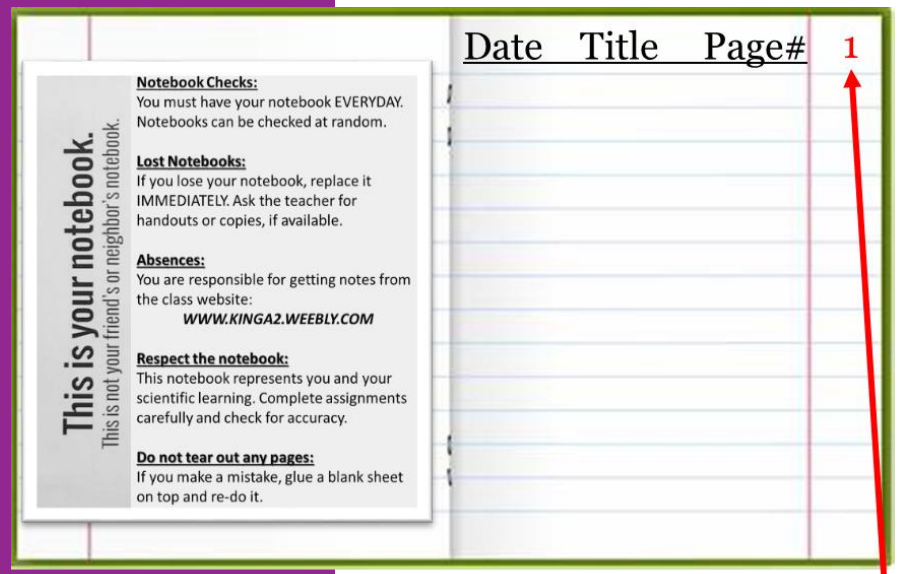
Journal



FRONT COVER

- Number each page
- No tearing out pages
- Design your cover (appropriate)





Inside front cover

Page 1 table of contents

Last page & Back cover

Do's and Don'ts of Lab Safety

Page 9

DO	DONT
1.	
2.	
3.	
4.	
5.	

(LEAVE SPACE FOR YOUR LAB SAFETY KIT)

- Glue Your Envelope Here-

Lab Safety Gallery Walk

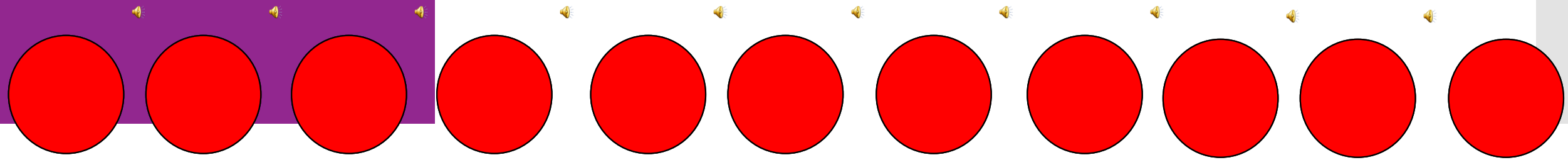
C – 2 (small group voice)

H – use notes and your group

A –Lab Safety Gallery Walk

M – stay with YOUR group

P – complete assignment



Independent Practice

Page 8

- ALL: Memorize the first 10 elements of the periodic table
- Standard: Lab Safety Menu Pick 1 Entrée
- Hon/Pre AICE: Lab Safety Menu Pick 1 Entrée and 2 Side dishes

Lab Equipment

ANNOUNCE

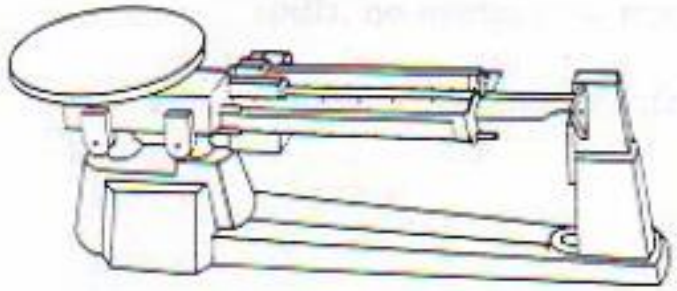
- Classroom procedure
- TEAMS
- Homework
  1. ALL: Memorize the first 10 elements of the periodic table

Quiz Next Class!

2. Any assignments you have not completed in class

OBJECTIVE

- SWBAT identify and accurately use a variety of lab equipment and glassware.



Triple Beam Balance

For measuring mass

Thermometer

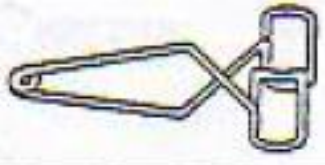
For measuring temperature

Test Tube

for heating a small amount of substance

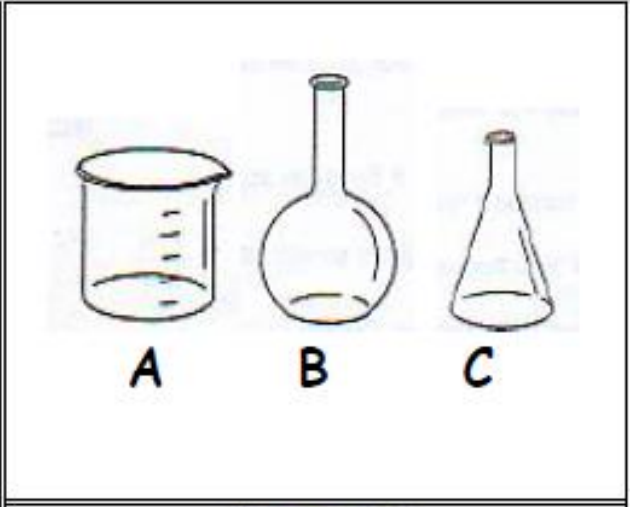
Spring Scale

For measuring weight / force



Test Tube Clamp

for holding an individual test tube



A - Beaker

B – Florence Flask

C – Erlenmeyer Flask

for measuring and pouring liquids;
for heating or mixing substances

Wire Gauze

to protect the bottom of a beaker or flask from flame;
to support a beaker or flask on a ring clamp

Graduated Cylinder

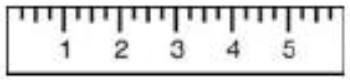
for measuring and pouring liquids;
not for heating or mixing substances

Forceps or Tweezers

for plucking or handling small objects

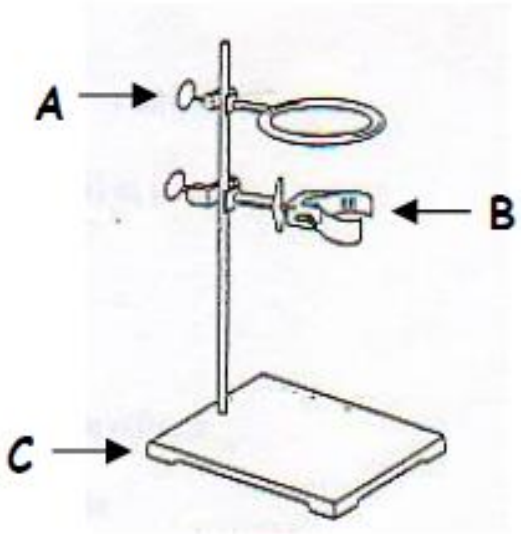
Beaker Tongs

For removing / holding a hot beaker



Ruler or Meter Stick

for measuring length or distance



A – ring clamp

B – Test Tube Holder

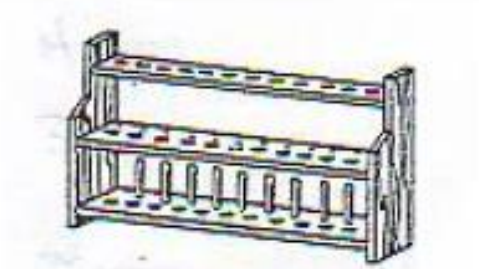
for holding a flask, a beaker, or a test tube on a ring stand

C – ring stand

platform holds heating unit; pole holds clamps

Funnel

to aid in pouring a liquid from a wide-mouth container to a small-mouth container;
to filter substances when filter paper is used

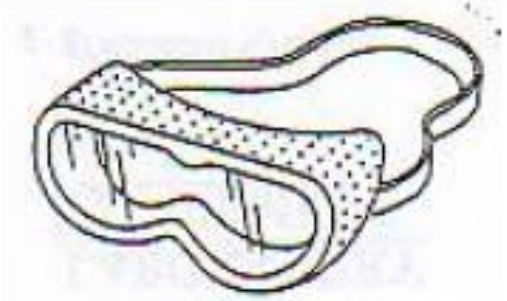


Test Tube Rack

for holding one or more test tubes

Medicine / Eye Dropper

for transferring a small amount (drops) of liquid



Goggles

To protect the eyes

Test Tube Brush

For cleaning inside a test tube

Bunsen Burner

for heating, sterilization, and combustion

Glass Stirring Rod

to mix or stir substances;
made of glass to resist heat, stains, corrosion

Scientific Notation
Significant figures

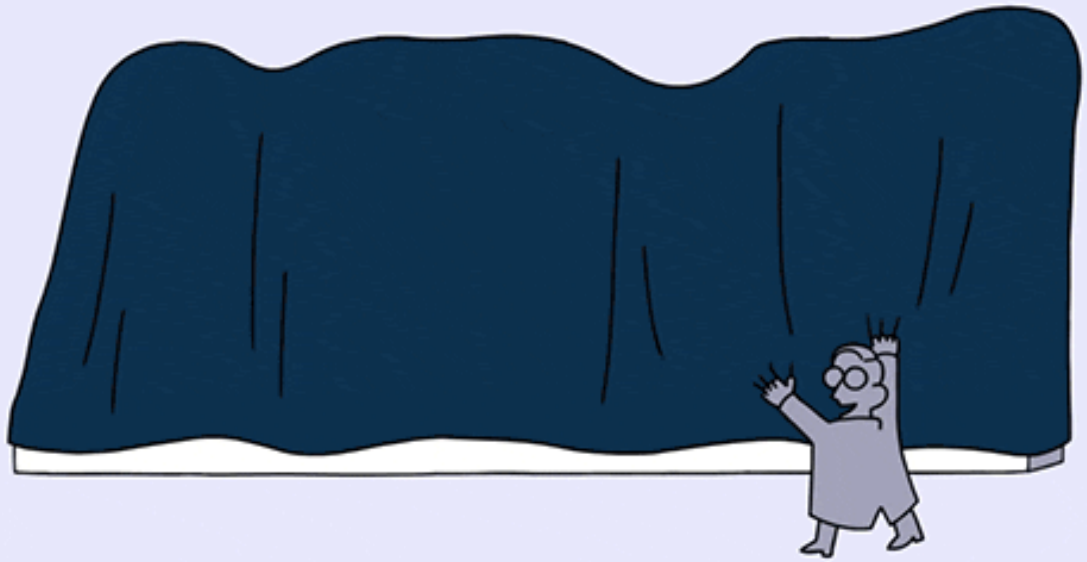
ANNOUNCE

OBJECTIVE

- Classroom procedure

- SWBAT convert between scientific and standard notation.
- SWBAT determine the amount of significant figures a number represents.

Scientific Notation



Used to express the very large and the very small numbers so that problem solving will be made *easier*.

?

Scientists can work with very large and very small numbers more easily if the numbers are written in scientific notation.

- The mass of one gold atom is **3.27×10^{-22} grams**

0.000 000 000 000 000 000 000 327 grams

- One gram of hydrogen contains **6.02×10^{22} atoms**

602 000 000 000 000 000 000 000. atoms

Scientific ↓ Standard

- Exponents that are positive
  - Decimal moves right
  - Large numbers

- Exponents that are negative
  - Decimal moves left
  - Small numbers

4.08×10^{3} 4.08×10^{-3}

CHECK FOR UNDERSTANDING:

Try changing these numbers from Scientific Notation to Standard Notation:

1) 9.6780×10^{4} — 96780
2) 7.4521×10^{-3} — .0074521
3) $8.513904567 \times 10^{2}$ — 851.3904567
4) 4.09748×10^{-5} — .0000409748

Standard ↓ Scientific

1. Move the decimal so that the number is between 1 and 10

Examples:

96780

.0074521

851.3904567

.0000409748

Standard ↓ Scientific

2. Add your multiplication sign and your base (10).

$$9.6780_{o} \quad x \quad 10$$

3. Count how many spaces the decimal moved and this is the exponent

$$9.6780 \quad x \quad 10^{4}$$

3. If the number you started with is:
   - **Greater than 1** = positive exponent
   - **Less than 1** = negative exponent

CHECK FOR UNDERSTANDING:

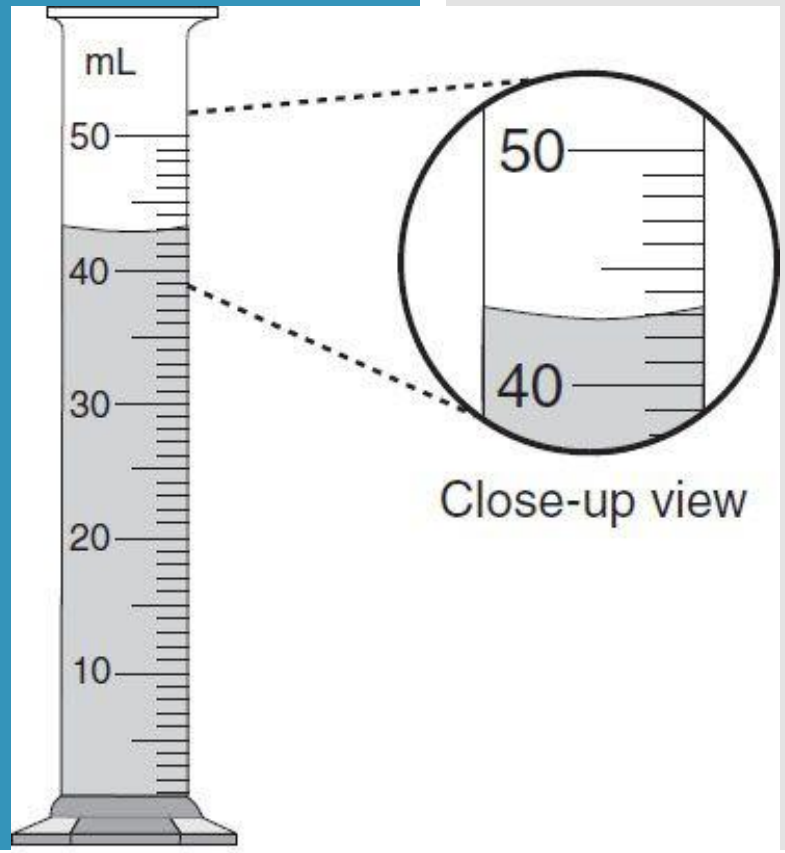
Try changing these numbers from Standard Notation to Scientific Notation:

1) 9872432 — 9.872432×10^{6}
2) .0000345 — 3.45×10^{-5}
3) .08376 — 8.376×10^{2}
4) 5673 — 5.673×10^{3}

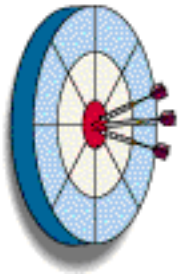
Significant Figures

Every measurement has UNITS.

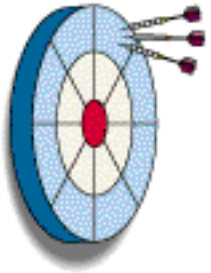
Every measurement has UNCERTAINTY.



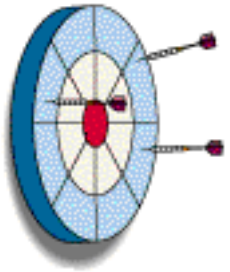
Accuracy and Precision in Measurements



Good accuracy
Good precision



Poor accuracy
Good precision



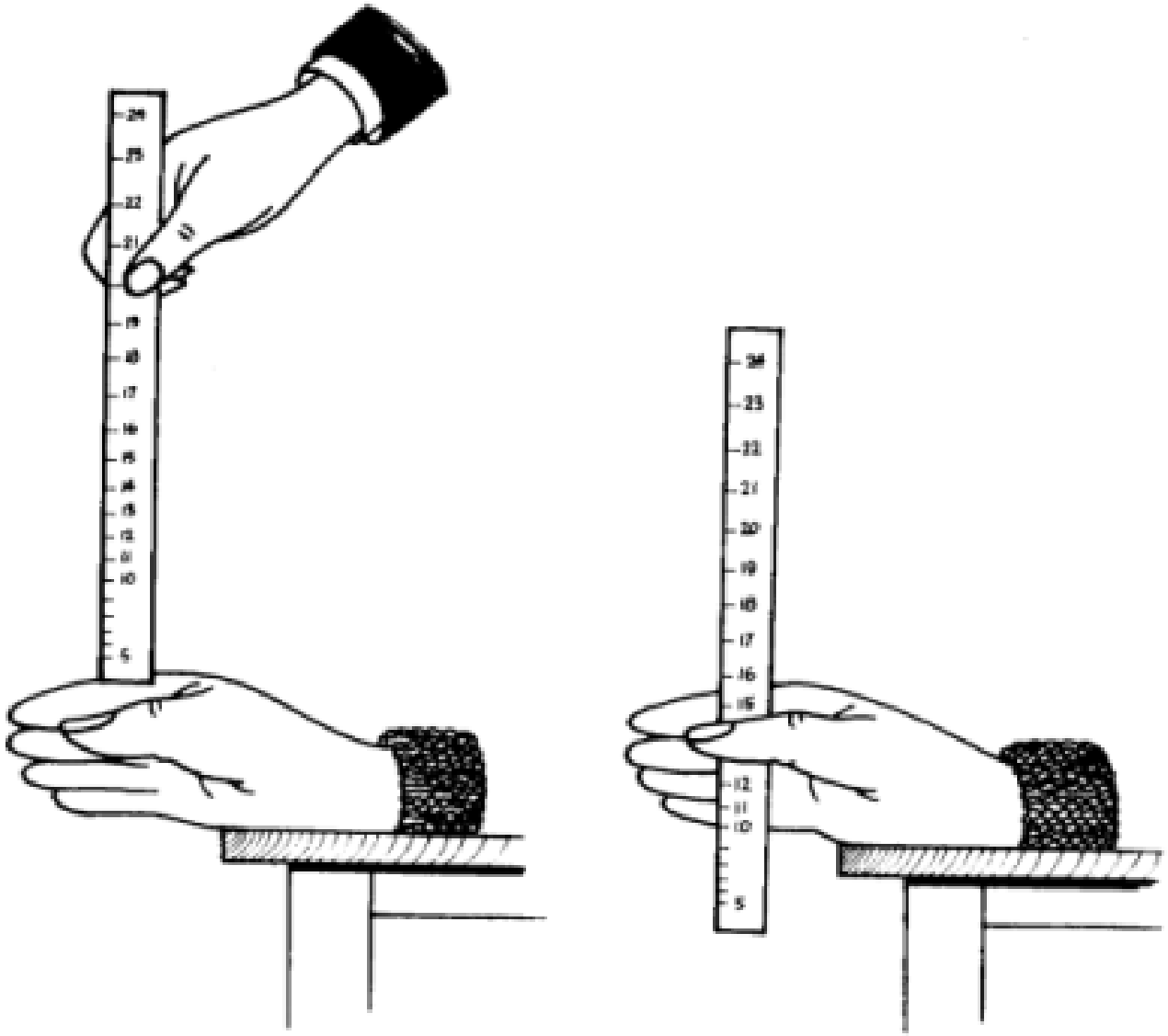
Poor accuracy
Poor precision

Accuracy is

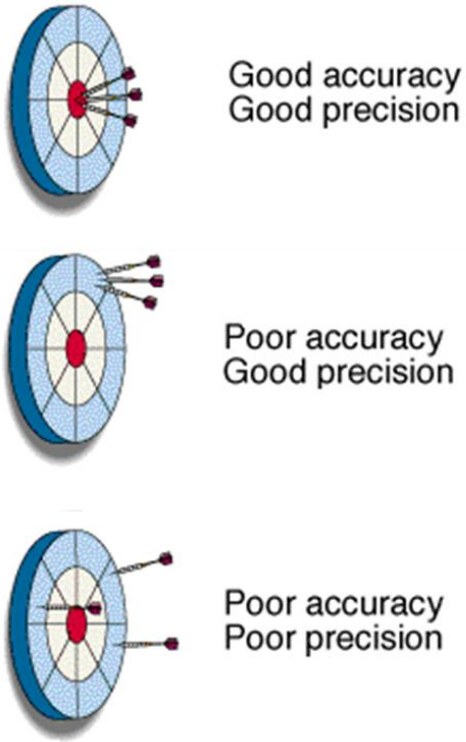
Precision is

A measurement can have high precision, but not be as accurate.

Reflex Test



1. 3 tries each
2. Would you consider your data to be:



Significant Figures

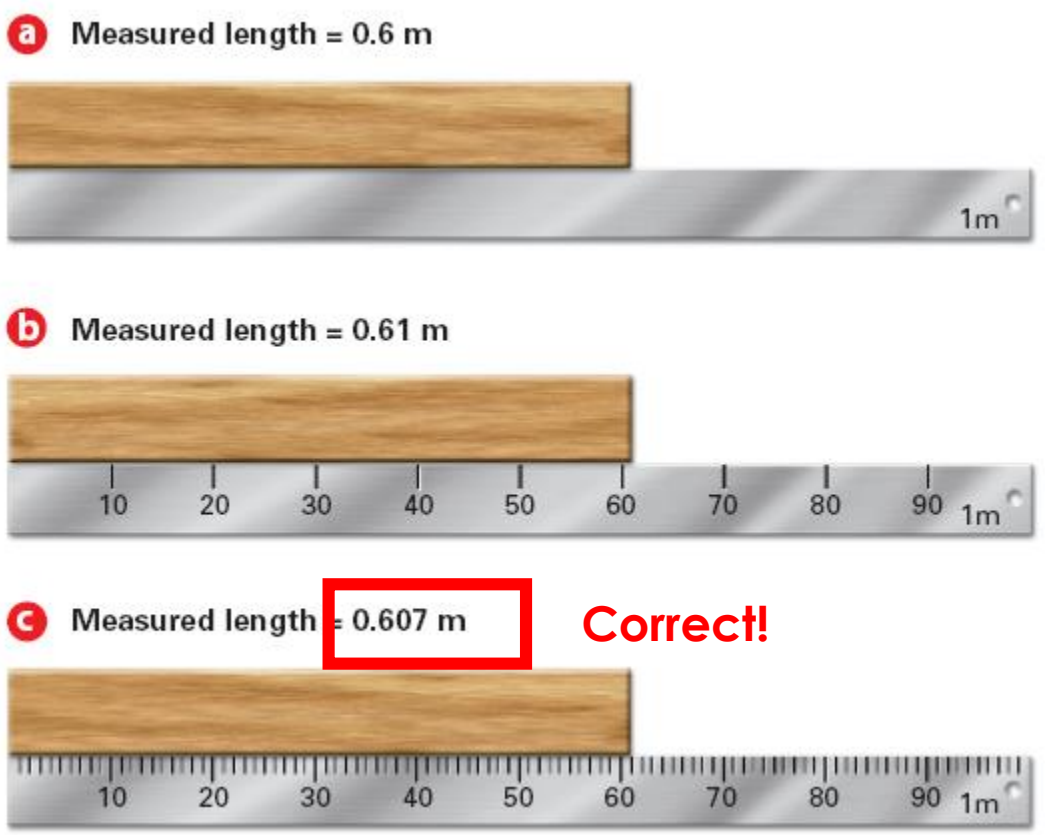
- All measurements are *essentially* inaccurate
  - –Faulty technique
  - –Precision of measuring device
  - –Human error

- Measurements need to convey precision
- Must include degree of uncertainty

Significant Figures

Significant figures in a measurement include :

1. **all of the digits that are known precisely**
2. **plus one last digit that is estimated**



Homework

- ALL: Memorize elements 11-20 of the periodic table
  - Name
  - Symbol
  - Atomic number

- Standard:
  - **Complete any incomplete classwork**

- Hon/Pre AICE:
  - **Complete any incomplete classwork**

Dimensional Analysis

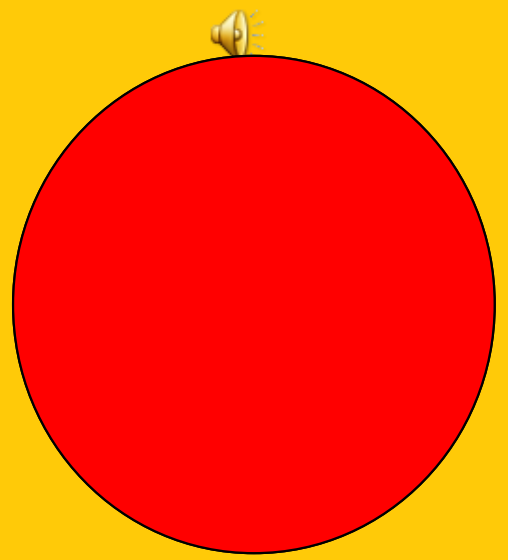
ANNOUNCE

OBJECTIVE

- Classroom procedure
- Homework includes anything you have NOT completed in class

- SWBAT identify a word problems question, known variables, equivalence statement, and solve with the appropriate units.
- SWBAT convert between different units.

5 MIN STARTER ACTIVITY



Unit 1-lec5- Dimensional Analysis Name:_____ Period:____

Starter Activity: *Perform each of the indicated measurements with your group.*

1. Length of a pencil:

Find the length of the pencil in cm (include uncertainty): _____cm

What would the length of the pencil be in mm (smallest lines): _____mm

2. Volume of a bottle:

How much volume can the bottle at your table hold? _____ ml or _____ oz.

DIMENSIONAL ANALYSIS:

Equivalence statements:

Conversion factors:

Dimensional Analysis…

Converting from a _____unit to an _____ unit

3 steps:

1. 2. 3.

Starter activity

- Although the pencil length and water bottle volume did not change, you were able to record the values in more than one unit.

"Do you need to always re-measure an object if you want to record a new unit value?"

Used to convert between units…

- **Equivalence Statement:** Relates the same amount in different units.
  - Ex: 2.54 cm = 1 inch.
- **conversion factors:** relates equivalence in a ratio
  - Ex: $\frac{2.54\text{cm}}{1\text{ in}}$ or $\frac{1\text{ in}}{2.54\text{ cm}}$.

Converting from a known unit to an unknown unit

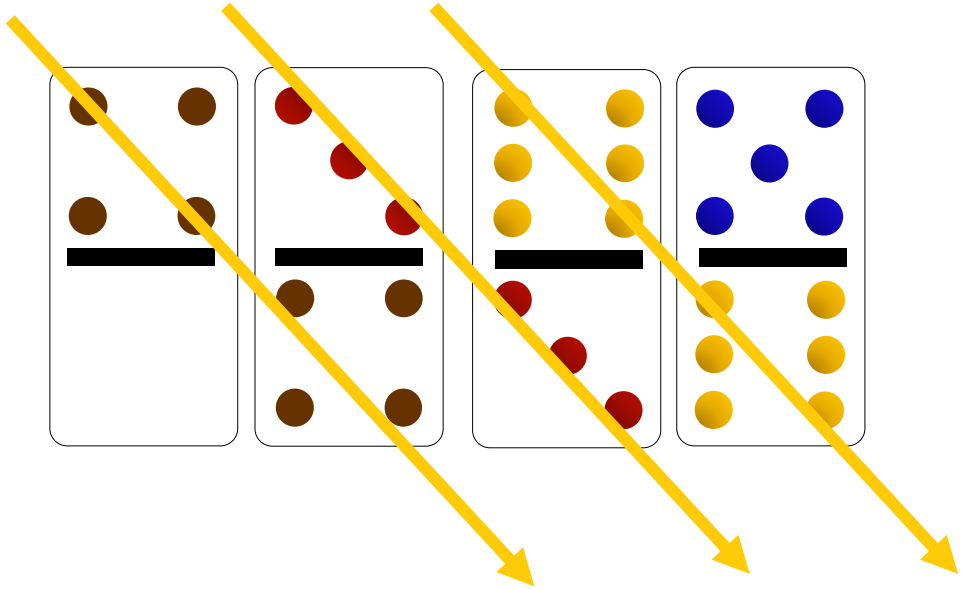
Steps:

L – circle what your looking for

G – underline what your given

R – write the relationship (equivalence statement)

S – box the solution



These dominos are set up in a pattern… can you see it?

What would be the next 3 dominos in the series?

Look only at the units, is this unit conversion set up like the dominos?

$$\frac{1\ \text{day}}{1} \cdot \frac{24\ \text{hours}}{1\ \text{day}} \cdot \frac{60\ \text{min}}{1\ \text{hour}} \cdot \frac{60\ \text{sec}}{1\ \text{min}}$$

Ex.A. You've collected 1,200 pennies. How much is this in dollars?

equivalence statement → 100 pennies = 1 dollar

L:

G:

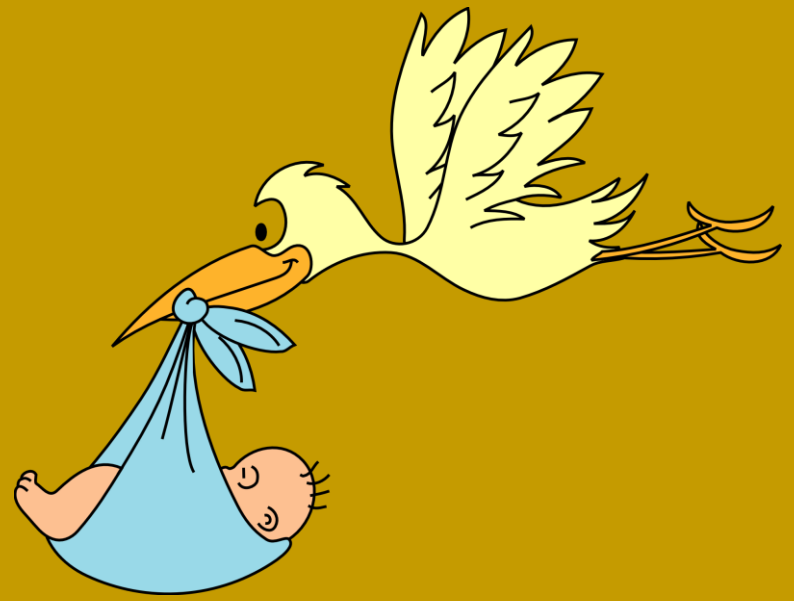
R:

S:

= 12 **dollars**

Ex.B. A new baby weighs 7.8 lb, What is it's mass in kilograms?

equivalence statement → 1kg = 2.205 lb.



L:

G:

R:

S:

= 3.5 kg

Ex.C. How many seconds are in 2 days?

equivalence statement(s) → ?

L:

G:

R:

S:

=172800 s

Practice Appointments

- Find 1 partner & complete the word problem
- Find a new partner for each question
- You will have 4 minutes a question

- SHOW YOUR WORK!

Examples: Convert the following:
show all of your work!!!!

Appt A: 360 seconds to milliseconds

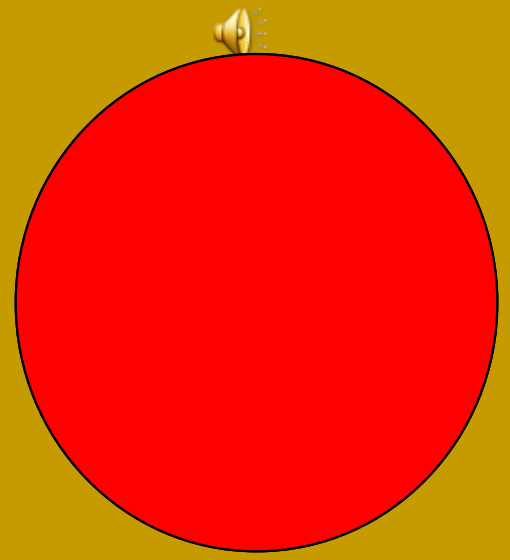
(note: 1000 milliseconds = 1 second)

L:

G:

R:

S:



4 MINUTES

How did you do?

A. 360 seconds to milliseconds →

$$360\ s \times \frac{1000\ ms}{1\ s} = 360{,}000\ ms$$

Examples: Convert the following:
show all of your work!!!!

Appt B: 4.98 feet to centimeters

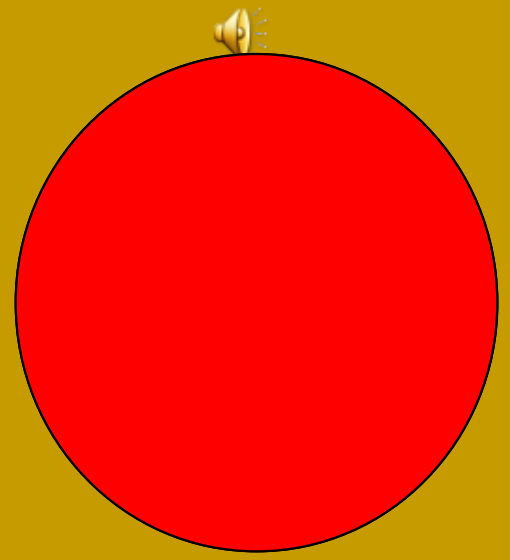
(note: 1 ft = 12 in and 2.54 cm = 1in)

L:

G:

R:

S:



4 MINUTES

How did you do?

B. 4.98 feet to cm→

$$4.98 \text{ ft} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} = 152 \text{ cm}$$

Examples: Convert the following:
show all of your work!!!!

Appt C: 1500 seconds to hours

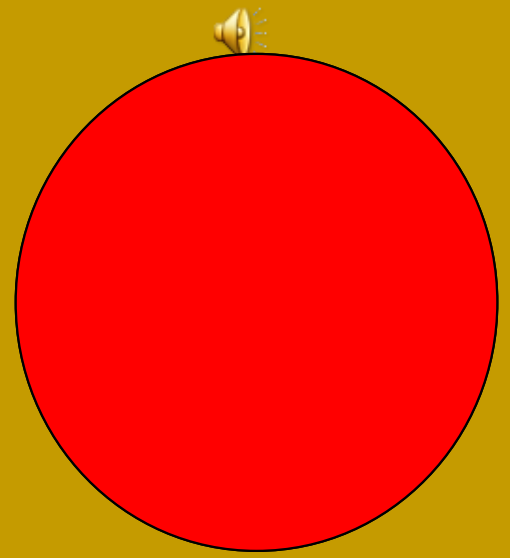
(note: 60 sec = 1min and 60 min= 1 hr)

L:

G:

R:

S:



How did you do?

C. 15000 seconds to hours →

$$1500\text{s} \times \frac{1\text{ min}}{60\text{ s}} \times \frac{1\text{ hr}}{60\text{ min}} = \frac{1500\text{hr}}{3600} = .42\text{ hr}$$

Examples: Convert the following:
<u>show all of your work!!!!</u>

Appt D: 75 m to km

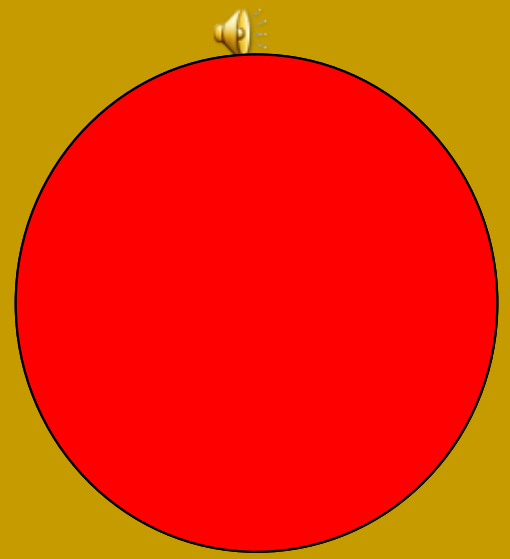
(note: 1000m = 1km)

L:

G:

R:

S:



4 MINUTES

How did you do?

D. 75 m to km →

$$\frac{75\ \text{m}}{} \times \frac{1\ \text{km}}{1000\text{m}} = 0.075\ \text{km}$$

Dimensional Analysis Enrichment

- Read card game directions
- Complete the card game score sheet as you play the game
- You must complete 6 chains

- **Homework:**
  - Complete enrichment Q on back when done
  - ALL: Memorize elements 11-20 of the periodic table
    - Name
    - Symbol
    - Atomic number

Quiz Next Class