ÁNIMO PHILLIS WHEATLEY
CHARTER MIDDLE SCHOOL

8th GRADE PHYSICAL SCIENCE

Name: _____

Period: _____

STUDENT JOURNAL – Week 5 – Metric System Application

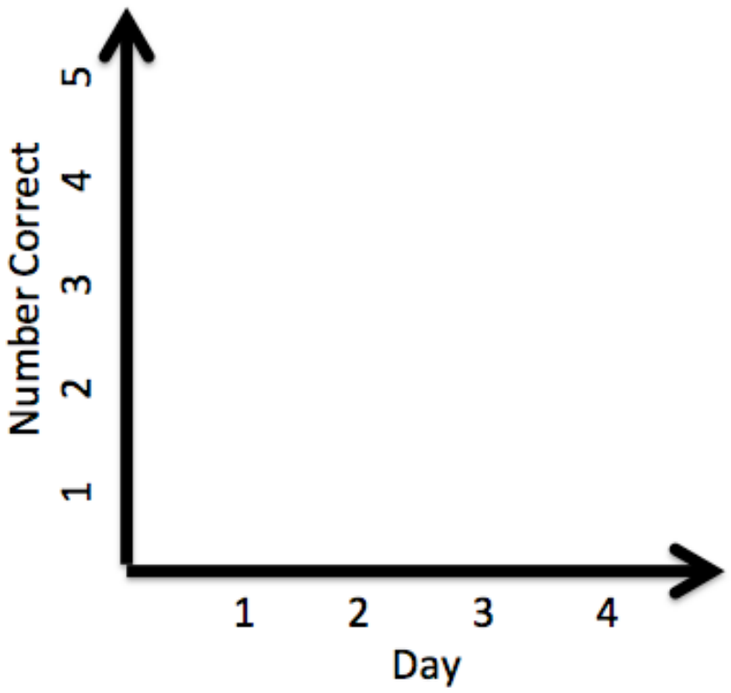
Overarching Goal for the Week:

- Become familiar with scientific instruments
- Apply knowledge of the metric system and instruments to practical situations

Learning Objectives:

- **Distinguish** between metric units and their appropriate use
- **Read** a triple beam balance accurately
- **Read** a graduated cylinder accurately
- **Determine** appropriate metric unit and instrument to be used given a situation

My Mad Minute Graph



Day #5 Mad Minute:

Question #1 - Are you satisfied with your overall average for this week? Why or why not?

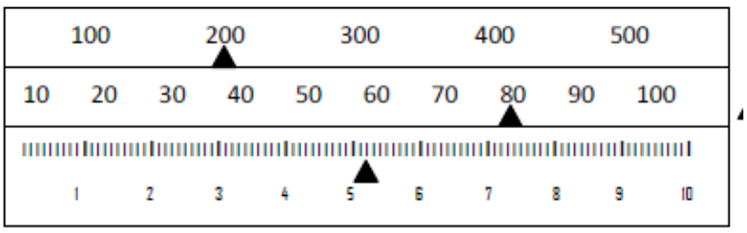
What's Your Average?

Day 1 ____
Day 2 ____
Day 3 ____
+ Day 4 ____
Total ____/ 4
= _____

http://apwscience8.weebly.com

DAY 1 - Monday

Kickoff:



What is the reading on this balance?

A. 285.2g

B. 285g

C. 28.82g

D. 248 g

Pencils down! Wait for Mad Minute

Mad Minute

1 L = _____ mL

1.239 km = _____ m

78mm = _____ km

What is the base unit for measuring length?

Which prefix means 1/10th?

Grade and graph your Mad Minute!!!

http://apwscience8.weebly.com

Metric Mania

Name _____

Lesson 2: Mass

1. Which is larger? Circle your choice for each one.

1 Pound or 100 Grams 1 Kilogram or 1 Pound 1 Ounce or 1000 Milligrams

2. 1 lb = _____ g 100 kg = _____ lb 1 oz = _____ mg

3. _____ refers to the amount of matter in an object.

4. The base unit of mass in the metric system in the _____ and is represented by _____.

5. A kilogram is equal to the mass of the _____ _____ _____ (IPK), a platinum-iridium cylinder kept by the BIPM at Sèvres, France.

6. Complete each statement.

1 kg = _____ g 1 g = _____ mg

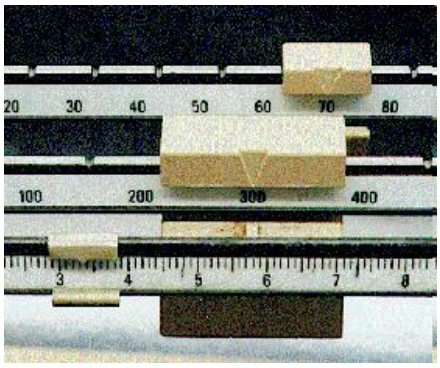
7. Which is larger? Circle your choice for each one.

A. 1 kilogram or 1500 grams C. 12 milligrams or 12 kilograms

B. 1200 milligrams or 1 gram D. 4 kilograms or 4500 grams

8. What instrument will we use to find the mass of objects? _____

9. What would be the mass of the object measured in the picture?



_____ + _____ + _____ = _____ g

10. How do you use a triple-beam balance? Fill in the blanks.

1st – Place the film canister on the _____.

2nd – Slide the large _____ to the right until the arm drops below the line and then move it back one notch.

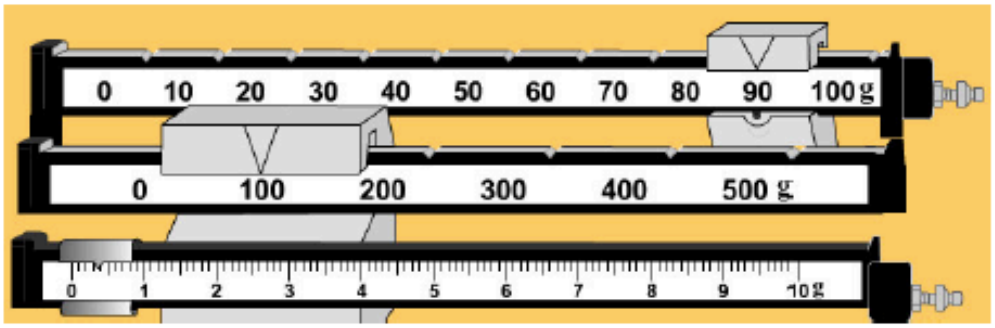
3rd – Repeat this process with the _____ weight. When the arm moves below the line, back it up one groove.

4th – Slide the _____ weight on the front beam until the _____ match up.

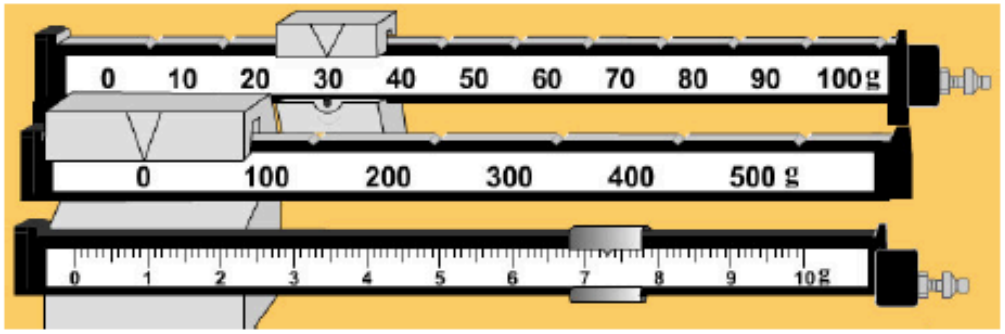
5th – Add the amounts on each beam to find the total _____ to the nearest tenth of a gram.

Triple Beam Balance Practice

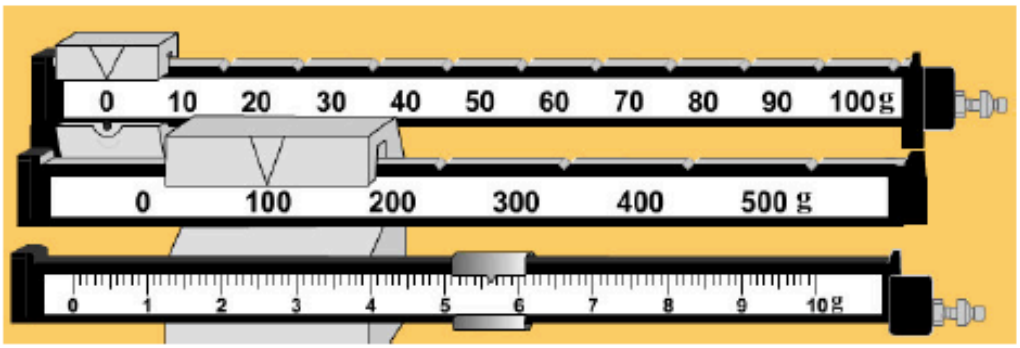
Record the mass show on each balance. Remember to include both the value on the beams and the unit of measurement.



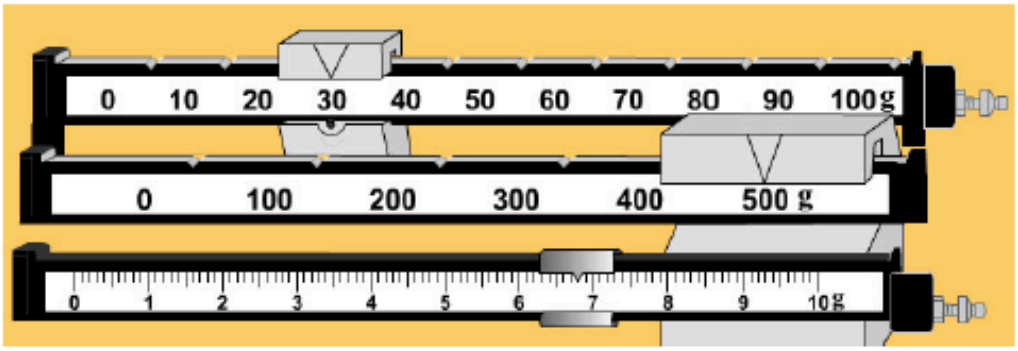
1. _____



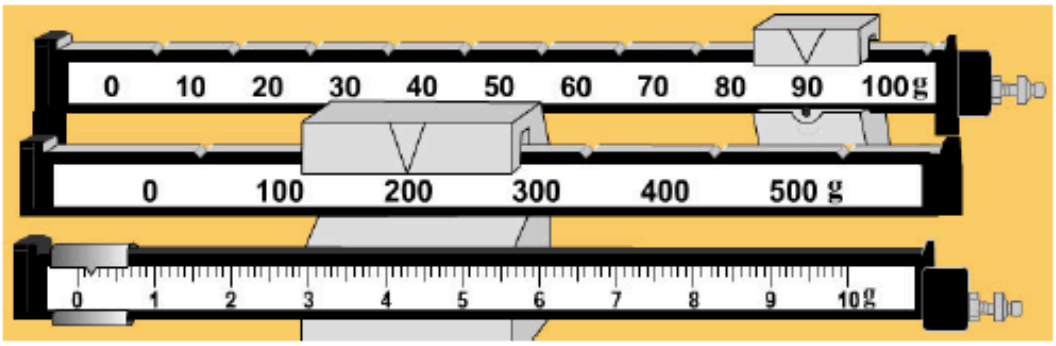
2. _____



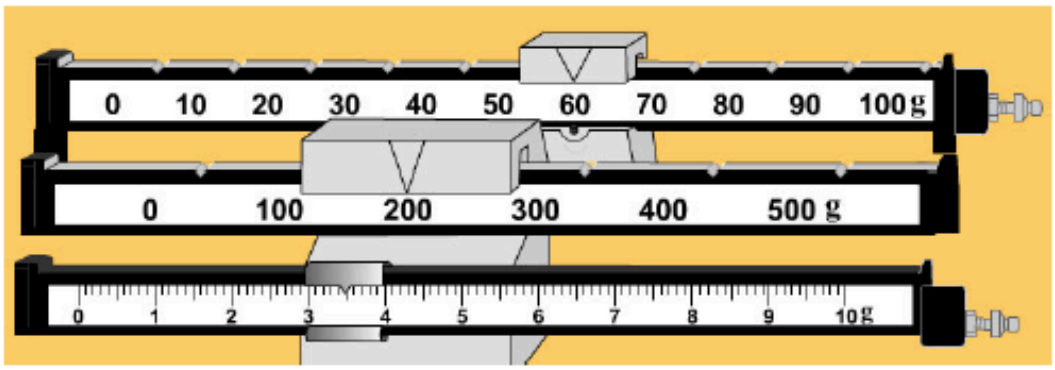
3. _____


0 10 20 30 40 50 60 70 80 90 100g
0 100 200 300 400 500 g
0 1 2 3 4 5 6 7 8 9 10g

4. _____


0 10 20 30 40 50 60 70 80 90 100g
0 100 200 300 400 500 g
0 1 2 3 4 5 6 7 8 9 10g

5. _____


0 10 20 30 40 50 60 70 80 90 100g
0 100 200 300 400 500 g
0 1 2 3 4 5 6 7 8 9 10g

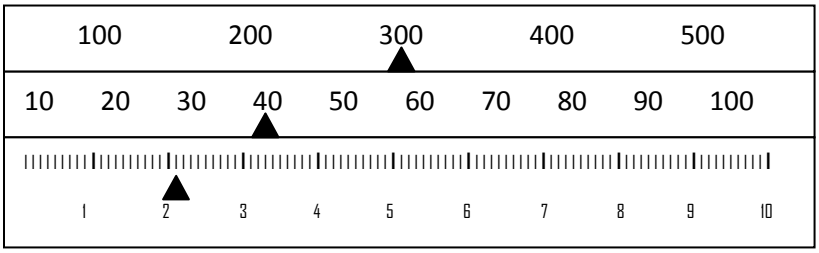
6. _____

NAME:_____ HR:_____

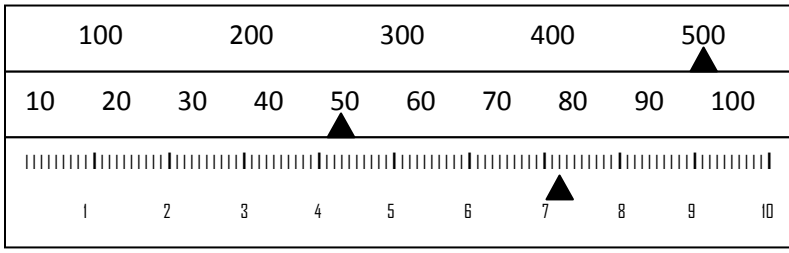
Measuring Mass Practice

Read the following triple beam scales and determine the masses. Triple Beam Balances measure in grams.

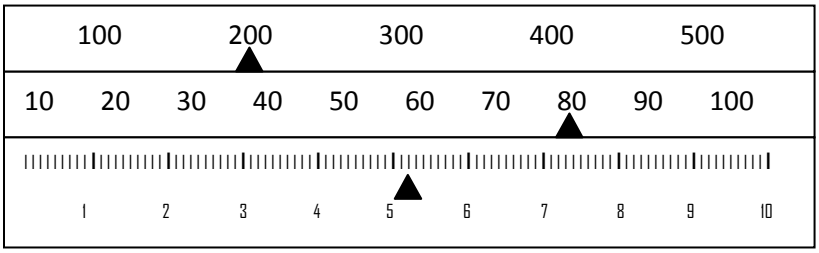
1. _____g



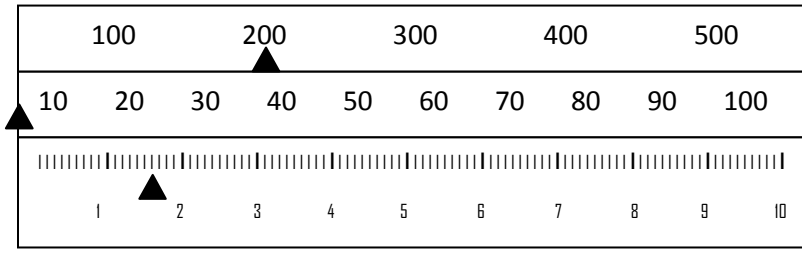
2. _____g



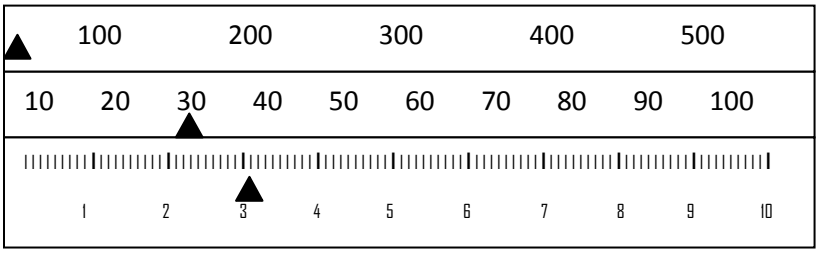
3. _____g



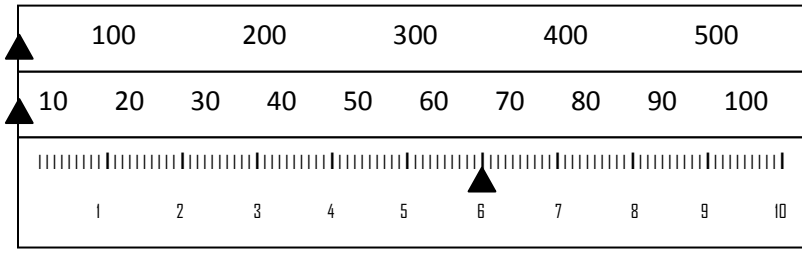
4. _____g



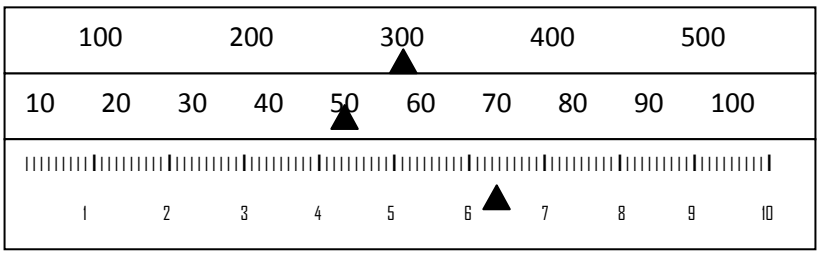
5. _____g



6. _____g



7. Read the triple beam balance below . What is the mass in grams? _____g
8. Read the triple beam balance below. What is the mass in mg? (THINK: how many mg in 1g?) _____mg



NAME:_____ HR:_____

9. Looking at the triple beam balance:
    a. What is the largest mass that can be weighed on the balance? _____g
    b. What is the smallest mass that can be weighed on the balance? _____g
10. If you had to explain the procedure on how to use a triple beam balance to a new student, what would the steps be? (start with calibrating and explain step by step. You may bullet or number the procedure).

11. Which is larger?
    a. 178 g or 1kg
    b. 300g or 3000kg
    c. 1200mg or 1 kg
    d. 70 mg or 7 g
    e. 34 g or 3.4kg
    f. 12 g or 1.2mg

Now you really have to take your time and be a thinker! Do not let all the words intimidate you. You have all the knowledge you need to answer these questions. Use you notes, worksheets and mostly your NOODLE!

Show your work!

12. There was a 1m stick that has a mass of 5 grams. What would 2m of the same stick's mass be? _____g

13. My shoe has a mass of 1,200 grams. How many grams would 2 of my shoes be? _____g
    a. How many mg would both shoes be? _____mg

14. My calculator has a mass of 200 grams. How many caculators would it take to make a mass of 1kg? _____ calculators

15. How much would I weigh in kg? 2.2lb = 1kg

    my estimated weight _____lbs my calculated weight _____kg

16. Once you finished the worksheet show your teacher and you can weigh yourself on the scale to check your answers! Write down your answers from the scale. My measured weight was _____kg.

Questions /Examples/ Workspace:

Guided Practice

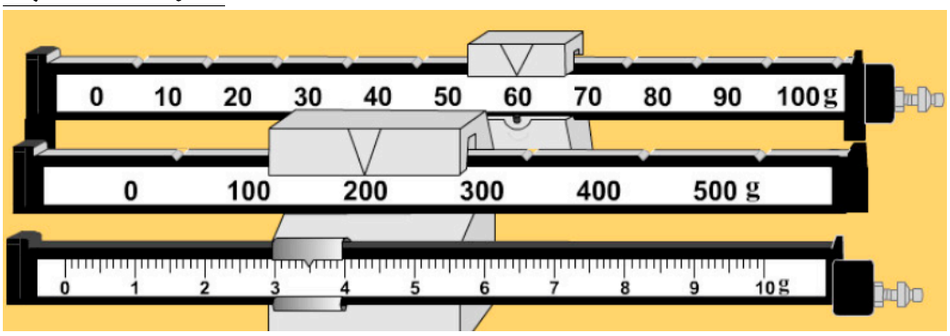
- Triple beam Worksheet 1

Independent Practice

Once you have finished your Guided Practice work, move on to the Independent Worksheet at the end of this packet.

- Triple beam Worksheet 2

Exit Ticket



Wait for answer choices to be posted

DAY 2 - Tuesday

Kickoff:

If you're going to take the mass of your pencil, what would be the most appropriate unit?

A. Liter

B. Gram

C. Kilogram

D. Meter

Pencils down! Wait for Mad Minute

Mad Minute

What is the best metric unit to measure:

Length of a pencil? _____

Mass of a notebook? _____

Amount of water in a cup? _____

Mass of a car? _____

Volume of water in a swimming pool? _____

Exit Ticket

If you're going to take the mass of your DESK, what would be the most appropriate unit?

Wait for answer choices to be posted

Mix & Match Mass

Name _____

Choose items from the container on your table that will be closest to the targeted mass. You may use a single item or mix and match items to reach the targeted mass.

Have your teacher check your estimates before you find the actual mass!

Targeted Mass	Item(s)	Actual Mass
1 gram		
5 grams		
10 grams		
20 grams		
50 grams		
100 grams		
200 grams		
400 grams		

Circle the BEST metric unit for each.

(1) Your mass: mg g kg

(2) Amount of spices in a batch of cookies: mg g kg

(3) Mass of 10 pennies: mg g kg

Mass Challenge: Use the equipment provided and your knowledge of the metric system to answer the question. Be sure to explain your procedure - how you found your answer!

What is the mass of 100 milliliters of water? _____

Procedure:

Day 4 - Thursday

Kickoff:

What volume of liquid is shown?

A. 20 ml

B.24 ml

C. 23 ml

D. 25 ml

Pencils down! Wait for Mad Minute

Mad Minute

What instrument is used to measure mass?

What instrument is used to measure volume?

What instrument is used to measure length?

How many milliliters are there in a liter?

What base unit is used to measure volume?

Grade and graph your Mad Minute!!!

Metric Mania

Name _____

Lesson 3: Volume

1. Which is longer? Circle your choice for each one.

   1 liter or 1 gallon 1 liter or 1 quart 1 milliliter or 1 fluid ounce

2. Complete each statement.

   1 gallon = _____ liters 1 fl oz = _____ ml 1 quart = _____ liters

3. _____ is the amount of space an object takes up.

4. The base unit of volume in the metric system in the _____ and is represented by ___ or ___.

5. 1 liter is equal to one cubic _____

6. Complete each statement.

   1 L = _____ mL 1 mL = _____ cm3 (or cc) = _____ gram*

7. Which is larger? Circle your choice for each one.

   A. 1 liter or 1500 milliliters B. 200 milliliters or 1.2 liters C. 12 cm^3 or 1.2 milliliters*

8. What instrument will we use to find liquid volume? _____

9. What is the name of the curve you see at the top of a liquid in a cylinder? _____

10. What is the volume of liquid in each cylinder?

    A. _____ B. _____ C. _____

11. What formula do we use to find the volume of regular objects?

    Volume = _____ X _____ X _____

12. What is the volume of the cube? _____ X _____ X _____ = _____

13. How do we find the volume of an irregular object using a graduated cylinder? _____

_____

_____

14. What is the volume of the rock? _____ - _____ = _____

Volume Lab

Name _____

Part A: Count your drops!

Take a guess - How many drops of water will it take to equal 1 milliliter? _____ drops

Follow the directions to find the number of drops in 1 milliliter of water, then answer the questions. You will need a small graduated cylinder (25 ml), a beaker of water, and an eyedropper for this section.
(1) Fill a small graduated cylinder with 10 ml of water.
(2) Count the number of drops it takes to raise the water to 11 ml. Record the number in the chart.
(3) Leave the water in the graduated cylinder and count the number of drops it takes to raise the water to 12 ml. Record the number in the chart.
(4) Leave the water in the graduated cylinder and count the number of drops it takes to raise the water to 13 ml. Record the number in the chart.
(5) Calculate your average and round to the nearest tenth.

# of drops to 11 ml	# of drops to 12 ml	# of drops to 13 ml	Average

Based on your average, how close were you to your guess? _____

Based on your average, how many drops would it take to make 1 liter? _____

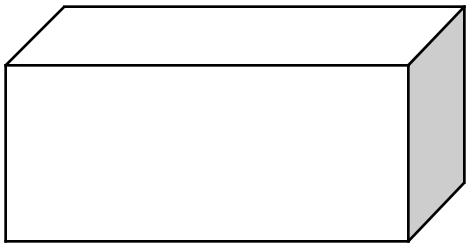
Part B: Water Displacement

Follow the directions to find the volume of three marbles using water displacement.
(1) Add 20 ml of water to a 100 ml graduated cylinder. Record this amount in the chart.
(2) Add three marbles to the cylinder and measure the volume. Record this amount in the chart.
(3) Find the difference between the two measurements and record in the chart. The difference between the two measurements will be the volume of the three marbles.

Volume of water before adding marbles	Volume of water after adding marbles	Difference in volume	Volume of 3 marbles

Part C: Volume by Formula

Use the formula to find the volume of the box. Measure to the nearest centimeter (no decimals) before calculating your answer.



Volume = length x width x height

_____ x _____ x _____ =

Part D: Color Challenge

1. Obtain the following items from your teacher:

   3 beakers with colored water- 25 ml of each color (red, blue, and yellow)
   1 graduated cylinder (25 ml - 50 ml)
   1 eyedropper
   6 test tubes labeled A, B, C, D, E, and F

2. Perform each step outlined below using accurate measurements.

   (1) Measure 17 ml of RED water from the beaker and pour into test tube A.
   (2) Measure 21 ml of YELLOW water from the beaker and pour into test tube C.
   (3) Measure 22 ml of BLUE water from the beaker and pour into test tube E.
   (4) Measure 5 ml of water from test tube A and pour it into test tube B.
   (5) Measure 6 ml of water from test tube C and pour it into test tube D.
   (6) Measure 8 ml of water from test tube E and pour it into test tube F.
   (7) Measure 5 ml of water from test tube C and pour it into test tube B.
   (8) Measure 2 ml of water from test tube A and pour it into test tube F.
   (9) Measure 4 ml of water from test tube E and pour it into test tube D.

3. Complete the chart.

Test Tube	Color	Final Amount (ml)
A		
B		
C		
D		
E		
F		

Questions /Examples/ Workspace:

Guided Practice

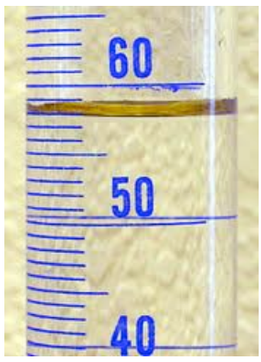
- Volume Lab: Part I

Independent Practice

Once you have finished your Guided Practice work, move on to the Independent Worksheet at the end of this packet.

- Volume Lab: Part I

Exit Ticket



What volume of liquid is shown above?

DAY 5 - Friday

Kickoff:

Review Kickoffs from the Week and make sure they are correct.

Pencils down! Wait for Mad Minute

Mad Minute

Calculate your MM average for the week