ABC's of Science Lecture Day 2 & 3: Temperature, Volume, Mass 3pts extra credit



Volume

Have you ever heard someone say "this shampoo gives my hair a lot of volume!!!" What does that mean? Volume means to ______. Or, volume is the amount of space occupied by an object. So if someone's hair has a lot of volume that means it is full. It takes

up a lot of space. Volume of Solid Rectangular Objects: For solid rectangular objects, the volume is the length x width x height. ______. A cubic meter (m^3) is a unit of volume. A cubic meter is a very large unit - it contains 1,000,000 cubic centimeters.



You try it! 4. What is the You try it! 5. What is the volume volume of this solid? of this solid? $V = L \times W \times H$ $2 \, \mathrm{cm}$ $V = L \times W \times H$ 3 cm 1 cm

Measuring Volume of Liquid Objects

For liquid objects, we use to measure the volume. In cooking, we may also use measuring cups, teaspoons or tablespoons. The level of a liquid in a graduated cylinder shows the volume of the liquid. A _____ (L) is a unit that is usually used to express volume. A soft drink bottle is a 2-liter bottle. For smaller volume measurements, we also use: milliliter (ml), cubic centimeter (cm³). 1 liter contains 1000 milliliters or 1000 cubic centimeters.

Accuracy is Everything To read the volume of the liquid, note the level at the of the curve. We call this the



You try it! What is the volume in ml?



You try it! What is the volume in ml?



Volume of Liquids

Do these graduated cylinder have the same volume of liquid in them? YES! How can that be??? One is a 100-mL cylinder & the other is a 50-mL cylinder.

Which one is better to use to measure this liquid?

The smaller one!!! Why? Better Accuracy! The smaller the cylinder, the smaller the increments on the cylinder, which means a more accurate result.



Volume of Liquids- But look at this! Both of these cylinders have exactly 50 ml of water





Measuring Volume of Solid Irregular Objects

So, how would I measure the volume of an irregular object such as a piece of clay? I can't measure the sides and I can't use a measuring cup. But I CAN still use a graduated cylinder. Simply submerge the object in the graduated cylinder and record the difference in water level. We call this measuring volume by You will practice it during our lab this week.

cubic meter (m3)

liter (L)

milliliter (mL)

cubic centimeter (cm3)



Mass Review:

Volume

Mass is the amount of in an object.Balance Parts to Know Be careful!!It's measured on a (also called a triple beam balance).RidersMass is measured in grams or kilograms. A science book is about 1.3 kilograms.Alarge paperclip is about 1 gram.						v: Pointer put		Reading the balance- You try it!					Reading the balance- You try it!				3	Reading the balance- You try it!								
	D 125 cubic cm	C 25 cubic cm	B 15 cubic cm	A 5 cubic cm	5 One side of a cube is 5 cm long. What is the cube's volume?		0		A	4 If you wanted to measure an irregular object's volume,	D Milliliter	C Quart	B Gram	A Centimeter	3 Which of the following units is rarely, if ever, used in science labs?	D Weight depends on gravity and mass is constant	C Mass depends on gravity and weight is constant	B Weight depends on gravity and mass depends on volume	A Weight depends on density and mass depends on gravity	2 What is the difference between weight and mass?	D It has a low density	C It is made out of rock or metal	B It will float on water	A It's very dense	1 If a substance has a large mass and a small volume, what can you conclude about it?	POP MEA
Ð	c	B	A	5	Ð	C	B	A	9	D	C	B	A	œ		C	B	A	7	Ð	c	B	A	0	•	US
40 g/cubic cm	60 g/cubic cm	5 g/cubic cm	500 g/cubic cm	If an object's mass is 50 g, ar what is its density?	They are both unrelated to an	They are both dependent on a	Cubic centimeters measure le	They are equivalent	What is the relationship betwo milliliters?	10 grams per cubic cm	10 newtons	10 kilograms	10 centimeters	Which of the following is a me weight?	It cannot be accurately measu	It has a high density	It has a large volume	It contains a lot of matter	What is always true of an obje	Quantity	Virtue	Attribute	Possession	"property"?		RING MATTER

 $1 \text{ cm}^3 = 0.000001 \text{ m}^3$

 $1 L = 1 dm^3 = 0.001 m^3$

 $1 \text{ mL} = 0.001 \text{ L} = 1 \text{ cm}^3$

- In the context of the movie, what is the best synonym for "property"?

- Possession
- Attribute

- C Virtue
- Quantity

What is always true of an object with a lot of mass?

- It contains a lot of matter
- It has a large volume
- It has a high density
- It cannot be accurately measured

Which of the following is a measurement of an object's weight?

- 10 centimeters
- 10 kilograms
- 10 newtons

- 10 grams per cubic cm

9 What is the relationship between cubic centimeters and milliliters?

- They are equivalent
- Cubic centimeters measure length; milliliters measure volume
- They are both dependent on an object's mass

- They are both unrelated to an object's density

5 If an object's mass is 50 g, and its volume is 10 cubic cm, what is its density?

- 500 g/cubic cm
- 5 g/cubic cm
- 60 g/cubic cm
- 40 g/cubic cm

Now it's YOUR TURN!! Metric Measurement

answers below. Now it's your turn to practice measuring with a metric ruler. In each box below, write the length from the zero edge to each arrow in both centimeters and millimeters. Check your



You Try It!

 The following pictures show water in different graduated cylinders. What would be the correct measurement (in milliliters) for each picture? Record your answer in the space provided below each picture. Check your answers below after writing the four measurements.





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Note: If additional precision is desired, you can estimate an additional digit between the marks. For example, the bottom of the meniscus of cylinder (d) is a little less than halfway between 3.4 and 3.5. So, the next digit could be estimated and added to the reading, about 3.43 mL.



Determine the volume of the liquids in the following cylinders:

Ruler:



F



B

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F

Finding Temperature



Now you try it!

Around the room you will find multiple stations. In table groups, go to the stations and determine the mass, volume and temperatures. Write down your answers here:

Station 1: Mass Determine the mass of the objects on the balances	Station 2: Graduated Cylinders Determine the volume of the 5 different liquids in graduated cylinders
Ball: paper clip:	Cylinder 1: Cylinder 2:
Eraser: large washer:	Cylinder 3: Cylinder 4:
Small washer: marble:	Cylinder 5: Cylinder 6:
Station 3: Displacement Method Determine the volume of the object by using the displacement method	Station 4: Measuring for Volume Determine the volume of the objects using your rulers
rock: paper clip:	Box 1: Box 2:
Small washer: marble:	Box 3: Box 4:
Video Not	tes lecture 2:
Video 3:	
Video 4:	
Video 5:	
Video 6:	
Video 7:	
Video 8:	