

Bell Work, Mar 31– Apr 3,  
2014 Mass & Change, Mass &  
Volume

# Bell Work, Monday, March 31, 2014

1. The first model of the atom was proposed by Democritus and closely resembles the model we've used throughout this unit. **List the features of the model you have learned so far.**

**a. matter is comprised of particles that have mass and take up space.**

Mass is a measure of the number of particles present.



Volume is a measure of the space the particles take up.

**b. The particles cannot be divided.**

**c. In a chemical reaction the amount of mass does not change, but the particles can rearrange and form new substances.**

c is a statement of the law of conservation of mass.



# Bell Work, Monday, March 31, 2014

## 2. What is a precipitate?

In chemistry a precipitate (ppt) is a solid that appears as the result of a chemical reaction.

## 3. When a nail rusts, does the mass of the rusty nail increase, decrease or stay the same (assume no rust fall off the nail when weighing). Why?

The mass increase because the chemical reaction with the oxygen in the air adds oxygen to the iron in the nail to form rust.

# Bell Work, Tuesday, April 1, 2014

1. What are the major divisions:

lines with numbers

2. What are minor divisions:

Marks without numbers.

3. How is the value of the minor division determined?

Subtract two adjacent numbers, divide the difference by the number of lines between the numbers.

4. Determine the value of each minor mark

$$\frac{100 - 90}{10 \text{ lines}} = 1 \text{ mL}$$

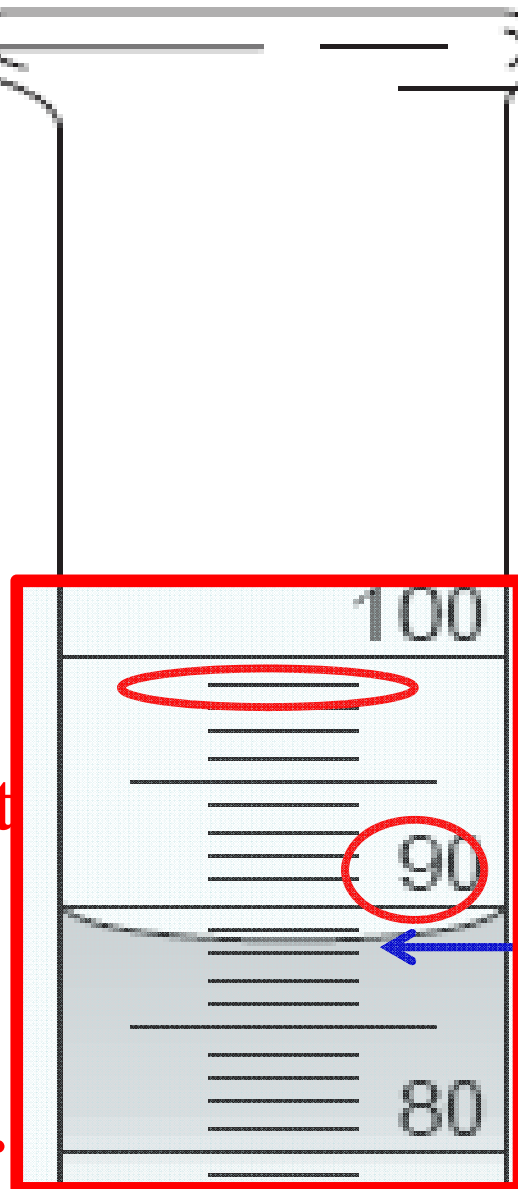
5. What is the uncertainty?

Estimation is  $\frac{1}{2}$  the minor mark, which is 1 mL

$$\frac{1 \text{ mL}}{2} = 0.5 \text{ mL}$$

6. What is the measurement shown?

88.5 mL



# Bell Work, Wednesday, April 2, 2014

*Draw the section of the cylinder in the red box:*

**1. What is the uncertainty?**

$$\frac{0.2 \text{ mL}}{2} = 0.1 \text{ mL}$$

**2. What is the measurement shown in mL?**

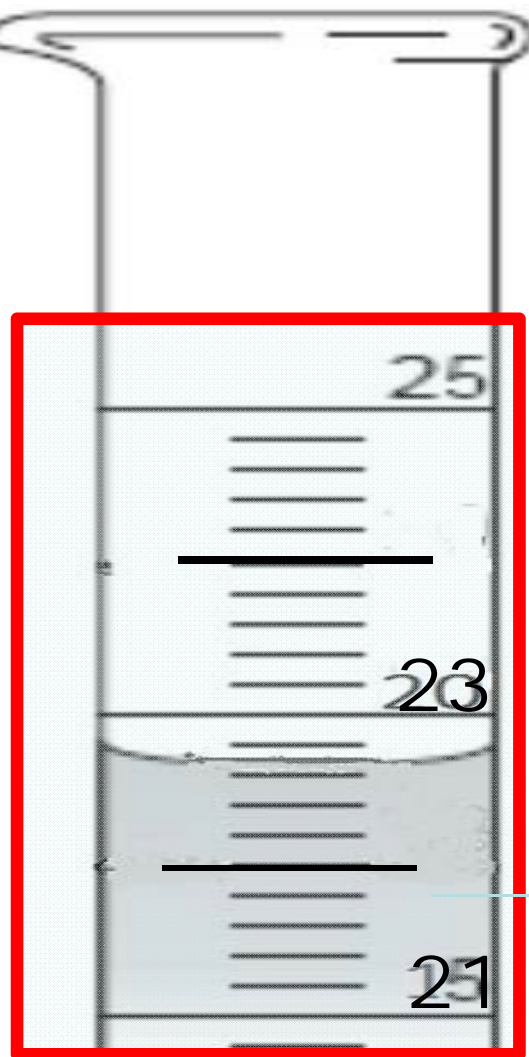
**22.7 mL**

**3. Write the measurement with the uncertainty.  $22.7 \text{ mL} \pm 0.1 \text{ mL}$**

**4. What does  $22.7 \pm 0.1 \text{ mL}$  mean?**

**The accurate measurement could be as high as  $22.7 + 0.1 = 22.8 \text{ mL}$  or as low as  $22.7 - 0.1 \text{ mL} = 22.6 \text{ mL}$  or  $22.6 - 22.8 \text{ mL}$**

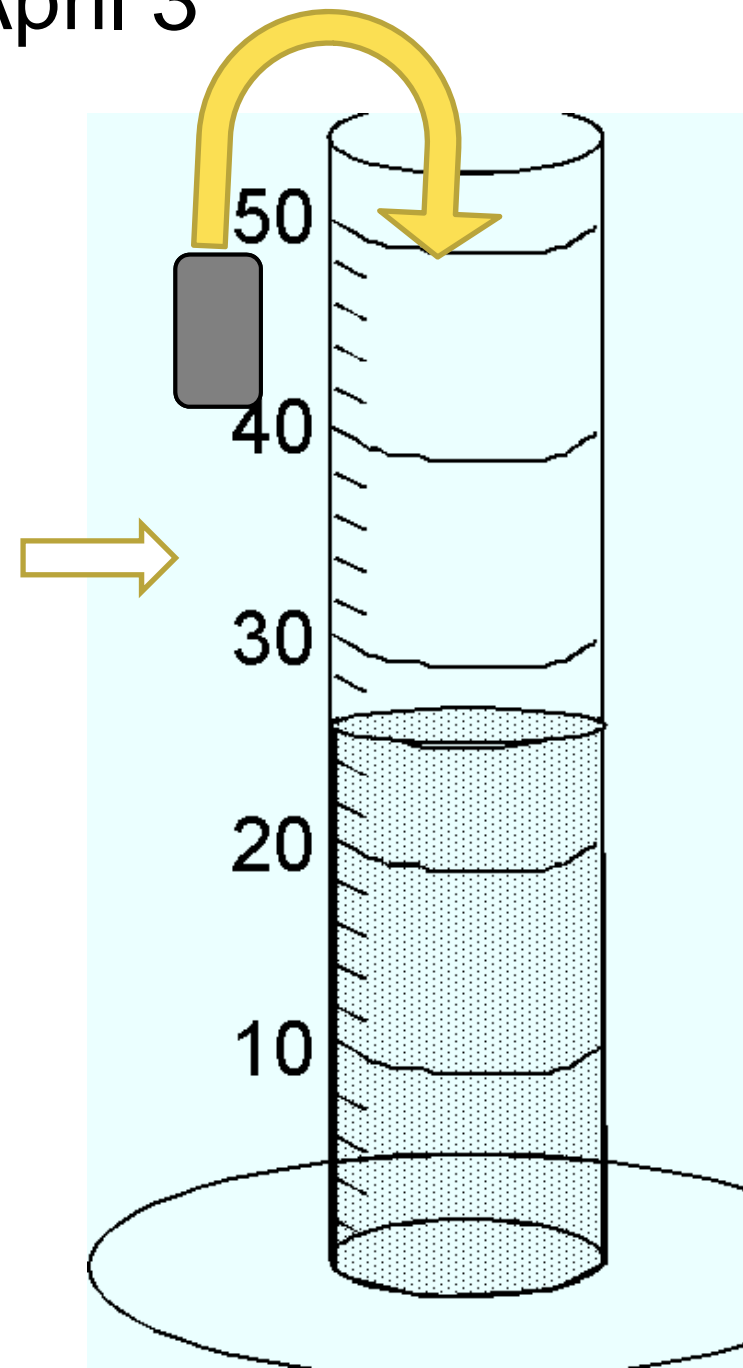
**5. What is the precision of this cylinder?**  
 **$\pm 0.1 \text{ mL}$**



## Bell Work, Thursday, April 3

1. To the right is a cylinder containing water. An object with a mass of 21g and a volume of  $15 \text{ cm}^3$  is lowered into the water.
  - a. What is the value of the minor mark?
  - b. What is the initial volume.
  - c. What is the final volume.
  - d. Sketch the object and the new water level in the cylinder on the right.

Sketch

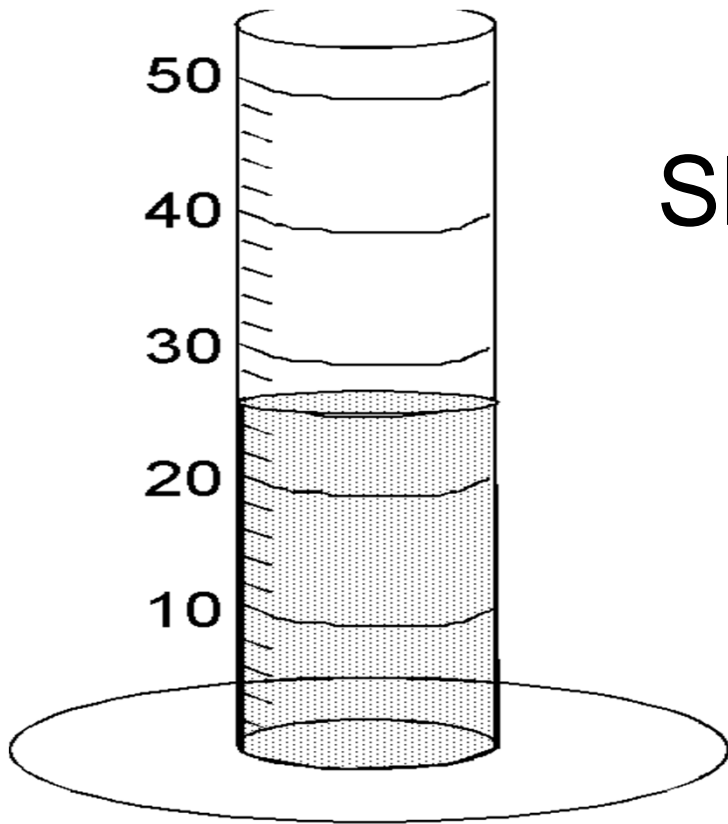


# Bell Work, Thursday, April 3

**1 a.** minor mark =  $50-40/5 = 2\text{mL}$  **d.**

**b.** initial volume =  $26.0\text{ cm}^3$

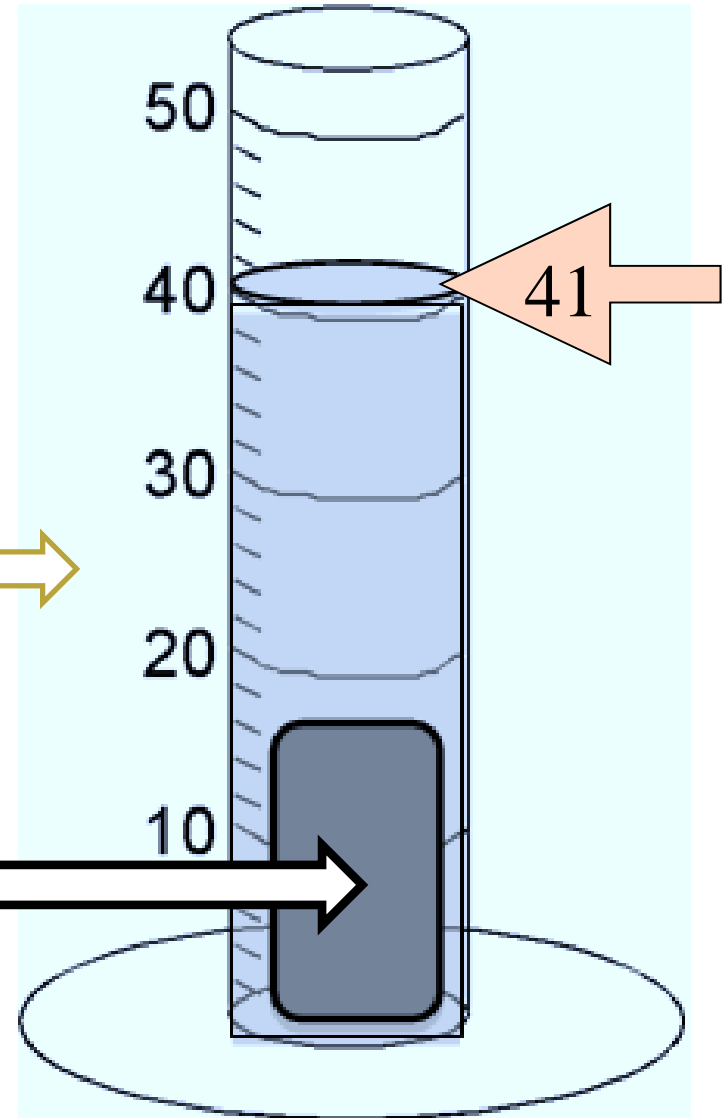
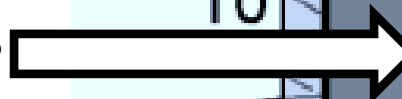
**c.** final volume =  
 $26\text{ cm}^3 + 15\text{ cm}^3 = 41\text{ mL}$



Sketch



$15\text{ cm}^3$



## Bell Work, Thursday, April 3

**2. Write the linear equation (equation of a straight line). Define the variables:**

$$y = mx + b$$

**x & y are data points you measured**

**m = the slope  $\left(\frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x}\right)$     b = the y-intercept,  $\Delta$  = change**

**3. Explain this equation:  $y = 4.75x + 0.465$**

**This is the linear equation because it has the form of  $y = mx + b$ .**

**4.75 is the slope (m)**

**0.465 is where the line crosses the y axis (the y-intercept, b)**

**y is A value for y**

**x is An value for x**