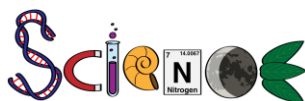


# SCIENCE PLANNER: WEEK OF 8.12.19




## OBJECTIVES FOR THE WEEK:

**Honors Biology** : What tools do we need to study biology? Students will understand metrics, conversion, graph analysis, and the scientific method.

**Honors Chemistry**: What tools do we need to study chemistry? Students will understand metrics, conversion, graph analysis, and the scientific method.

## DAILY AGENDA – (SUBJECT TO CHANGE)

DAY	Honors Biology	Honors Chemistry
<b>Mon 8/12</b> 	-Warm up and collect HW <a href="https://www.youtube.com/watch?v=AhsIF-cmoQQ">https://www.youtube.com/watch?v=AhsIF-cmoQQ</a> -QUIZ! (20 q) -Inquiry lab! Graphing  HW= finish #1-30 (ok to answer right on that paper)	-Warm up and collect HW <a href="https://www.youtube.com/watch?v=UdQreBq6MOY">https://www.youtube.com/watch?v=UdQreBq6MOY</a>  -Presentations: measurement lab -Inquiry lab! Graphing  HW= Finish #1-30 (ok to answer right on that paper), study for QUIZ!!
<b>Tues 8/13</b>	-Warm up -NOTES: The chemistry of life and water -Activity: ATOMS HW= finish Graph lab, # 1-9 on that sheet =)	-Warm up -QUIZ! -NOTES: Sig figs -Practice: sig figs and measurement HW= finish Graph lab, CK12 is due THURSDAY at 11pm!, finish all odd (or all evens) from sig figs packet!
<b>Wed 8/14</b>	-Warm up <a href="https://scaleofuniverse.com/">https://scaleofuniverse.com/</a> -finish NOTES: The chemistry of life and water	-Warm up <a href="https://scaleofuniverse.com/">https://scaleofuniverse.com/</a> -PRESENTATIONS!! Measurement ☺

	<p><b>HW=Worksheet: scale of universe (pick 10 total). As always, study notes!</b></p>	<p><b>-NOTES: complex conversions</b> <b>-Practice</b></p> <p><b>HW= finish #1-12 on Sep paper show all work and units! Work more on CK12 due Thurs at 11pm.</b></p>
<b>Thur 8/16</b>	<p><b>-Warm up and HW check</b> <b>-finish NOTES: the chemistry of life</b></p> <p><b>ATOMIC STRUCTURE LAB!!</b></p> <p><a href="http://phet.colorado.edu/en/simulation/build-an-atom">http://phet.colorado.edu/en/simulation/build-an-atom</a></p> <p><b>-HW= Test tomorrow!! pHET lab pages 1, 2, and 3 due FRI.</b></p>	<p><b>-Warm up</b> <b>-go over HW (If questions)</b> <b>-Measurement lab #2!!! DENSITY</b> <a href="https://phet.colorado.edu/en/simulation/legacy/density">https://phet.colorado.edu/en/simulation/legacy/density</a></p> <p><b>HW= Study for test and CK12 is due by 10pm tonight!!</b></p>
<b>Fri 8/16</b>	<p><b>TEST: Ch1 and Chemistry of liife</b></p> <p><b>-Activity: Culture21</b></p>	<p><b>TEST- measurement, conversion, sig figs, and density</b></p> <p><b>-Activity: Culture21</b></p>

<https://www.youtube.com/watch?v=UdQreBq6MOY>

## WARM UP ACTIVITIES

<b>MON</b>	<p><b>The three things that I found to be the most interesting about this video are:</b></p> <p><b>(see video link above for your subject)</b></p>
<b>TUES</b>	<p><b>Describe stomata, guard cell, ovum and ovule.</b></p> <p>Surrounding each <b>stomata</b> are two <b>guard cells</b>, which regulate the opening and closing of <b>stomata</b> to facilitate gas exchange and control transpiration in plants. ** <b>ovum</b> is (label) the female gamete in animals; the <b>egg</b> cell while <b>ovule</b> is (botany) the structure in a plant that develops into a seed after fertilization</p> <p><b>Explain why it is ok to multiply something by</b></p>

$$\left( \frac{10^3 \text{ g}}{1 \text{ kg}} \right)$$

**WED**

Describe 2 small and two big things as well as their diameter in  $1 \times 10^7 \text{ m}$

**THUR**

List the classification of life from biggest to smallest.  
<https://cnx.org/contents/s8Hh0oOc@15.8:-Yx1m5Xz@12/1-1-Themes-and-Concepts-of-Biology#91821> MAKE A MNEMONIC!!

DKPCOFGS

A moped can travel at 2.2 m/s. The nearest grocery store is 8.3 miles away. Bobby REALLY wants some ice cream. How long would it take him to get to the store? 88 Km= 55 mi

**FRI**

List the levels of organization of life from biggest to smallest.

1 mole of gold = 197 grams. Ms. Evans' ring has a mass of 11.52 grams. How many moles of gold does Ms. Evans have in that ring?

**FRI**

**BIO- 1) Warm up with 30 GRAPH questions**

**HAND**

**2) PhET atomic structure lab**

**IN!**

**3) Scale of universe**

**CHEM- 1) Warm up with 30 GRAPH questions**

**2) PhET density lab**

**3) HW #1-12 show work and units! (4 pts each!)**

DOMAIN Eukarya
KINGDOM Animalia
PHYLUM Chordata
CLASS Mammalia
ORDER Carnivora
FAMILY Canidae
GENUS Canis
SPECIES Canis lupus

## Levels of Organization

- **Subatomic particles** ( $p^+$ ,  $e^-$ ,  $n^0$ )
- **Atom** (O)
- **Element** (O)
- **Molecule** ( $O_2$ )
- **Macromolecules** (lipid)
- **Cell** (blood cell) **<--life begins here**
- **Tissue** (epithelial tissue)
- **Organ** (lung)
- **Organ system** (Respiratory System)
- **Organism** (*Homo sapien*)

**QUIZ! (20 q)**

<b>QUESTION #</b>	<b>Where to find in text</b>	<b>Key word(s) for the tricky ones</b>
1	1.1	Properties of life
2	1.1	Cell
3	1.1	Individual
4	1.1	
5	1.1	
6	1.1	DKPCOFGS "Homo Sapiens"
7	1.1	
8	1.1	Extreme and tough bacteria
9	1.2	Inductive vs. deductive reasoning

10	1.2	Inductive vs. deductive reasoning
11	1.2	guess
12	1.2	(the warm up today)
13	1.1	
14	1.1	
15	1.1	
16	1.1	
17	1.1	
18	1.1	You are still doing this....
19	1.1	DKPCOFGS
20	1.1	



Answer Key  
 Quiz: Chem 8.12.19

Quiz Date: Aug 12, 2019

Class: BIO1

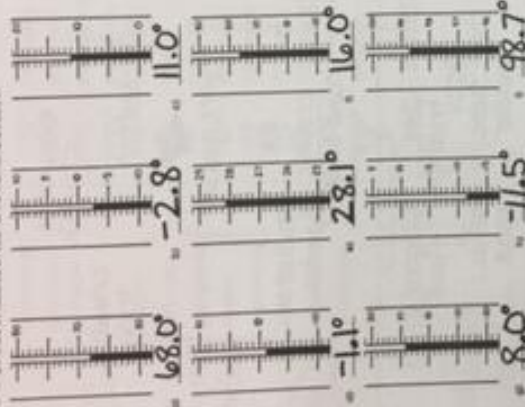
Key A

- 1 E 1
- 2 C 1
- 3 D 1
- 4 D 1
- 5 C 1
- 6 C 1
- 7 B 1
- 8 A 1
- 9 D 1
- 10 A 1
- 11 C 1
- 12 A 1
- 13 B 1
- 14 B 1
- 15 A 1
- 16 C 1
- 17 A 1
- 18 D 1
- 19 D 1
- 20 D 1

# ANSWER KEY

## READING THERMOMETERS

What temperature is indicated on each of the thermometers below?



## DIMENSIONAL ANALYSIS (FACTOR LABEL METHOD)

Using the method, it is possible to solve many problems by using the relationship of one unit to another. For example, 12 in = 1 ft and 1 ft = 1.35 in are both equal to one. When you multiply a number by the number one, you do not change its value. However, you may change its unit.

**Example 1:** Convert 12 miles to inches.  
 $12 \text{ miles} \times \frac{5,280 \text{ ft}}{1 \text{ mile}} \times \frac{12 \text{ in}}{1 \text{ ft}} = 633,600 \text{ in}$   
 (using appropriate figures)

**Example 2:** How many kilometers are in 4 days?  
 $4 \text{ days} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{1,000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ km}}{1,000 \text{ m}} = 691,200 \text{ m}$   
 (using appropriate figures)

Solve the following problems. Write the answers in appropriate figures.

- 2 kg = 2,000 g
- 500 mg = 0.5 g
- 3.5 kg = 3,500 g
- 15 yd = 135 ft
- 1.5 yr = 180 mo
- 1 mile = 1,609 m
- 2.5 x 10<sup>3</sup> molecules = 2,500 molecules
- 1 meter = 100 cm
- 100 feet = 30.5 m
- 100 miles = 160,934 m
- 5.5 x 10<sup>3</sup> molecules = 5,500 molecules
- 7.5 x 10<sup>3</sup> g = 7.5 kg

## METRICS AND MEASUREMENT

In the chemistry classroom and lab, the metric system of measurement is used as a standard to solve to convert from one unit to another.

Base Unit	Symbol	Prefix	Symbol
meter	m	kilo	k
meter	m	hecto	h
meter	m	deca	da
meter	m	deci	d
meter	m	centi	c
meter	m	milli	mm

- Write the given number in SI unit.
- Set up a conversion factor (show units to cancel one unit to another).
- Place the given unit on denominator of conversion factor.
- Place the unit you want on numerator of conversion factor.
- Cancel the number of number units needed to make "1" of the given unit.
- Cancel units. Solve the problem.

**Example 1:** 50 mm = 0.05 m

**Example 2:** 84 km = 84,000 m

**Example 3:** 100 mm = 10 cm

**Example 4:** 8 mm = 0.8 cm

The factor label method can be used to solve virtually any problem involving changes in and between units. It is especially useful in solving complex conversion dealing with concentration.

- Convert the following:
- 25 cm = 0.25 m
  - 100 g = 0.1 kg
  - 100 mm = 10 cm
  - 100 m = 0.1 km
  - 100 s = 1.67 min
  - 100 min = 1.67 hr
  - 100 hr = 4.17 days
  - 100 days = 3.03 months
  - 100 months = 8.33 years
  - 100 years = 100 centuries

## SCIENTIFIC NOTATION

Numbers very often show up with very small and very large numbers. Which can lead to a lot of confusion when working with them. One has learned to express these numbers in powers of 10.

Scientific notation takes the form of  $M \times 10^N$  where  $M$  is a number between 1 and 10 and  $N$  represents the number of decimal places to be moved. Positive  $N$  indicates the decimal has to be moved to the right and negative  $N$  indicates the decimal has to be moved to the left.

**Example 1:** Convert 1,000,000 to scientific notation.  
 $1,000,000 = 1 \times 10^6$

**Example 2:** Convert 0.00005 to scientific notation.  
 $0.00005 = 5 \times 10^{-5}$

**Example 3:** Convert 1.5 to scientific notation.  
 $1.5 = 1.5 \times 10^0$

- Convert the following to scientific notation:
- 0.05 =  $5 \times 10^{-2}$
  - 100 =  $1 \times 10^2$
  - 1000 =  $1 \times 10^3$
  - 10000 =  $1 \times 10^4$
  - 100000 =  $1 \times 10^5$
  - 0.01 =  $1 \times 10^{-2}$
  - 0.001 =  $1 \times 10^{-3}$
  - 0.0001 =  $1 \times 10^{-4}$
  - 0.00001 =  $1 \times 10^{-5}$
  - 0.000001 =  $1 \times 10^{-6}$

Convert the following to standard notation:

- $1.5 \times 10^2 =$  150
- $1.5 \times 10^3 =$  1,500
- $1.5 \times 10^4 =$  15,000
- $1.5 \times 10^5 =$  150,000
- $1.5 \times 10^6 =$  1,500,000
- $1.5 \times 10^{-2} =$  0.015
- $1.5 \times 10^{-3} =$  0.0015
- $1.5 \times 10^{-4} =$  0.00015
- $1.5 \times 10^{-5} =$  0.000015
- $1.5 \times 10^{-6} =$  0.0000015

# ANSWER KEY

**SIGNIFICANT FIGURES**

A student can only be as accurate and precise as the instrument that produces a value. That is, the accuracy of a number and the number of significant figures in it are determined by the accuracy of the instrument. The number of significant figures in a number is the number of digits that are known to be reliable.

- All digits are significant.
- Zeros between significant digits are significant.
- Leading zeros in a number are not significant.
- Zeros to the right of a number are significant only if the number contains a decimal point.
- Zeros to the right of a number are significant only if there is a decimal point.
- Zeros between significant digits are significant.
- Zeros to the right of a number are significant only if there is a decimal point.

Determine the number of significant figures in the following values.

- 1.000 4
- 0.009 1
- 90 2
- 901.0 4
- 1.000 4
- 1000 1
1000. 4
- 1000.0 6
- 1000.00 6
- 1000.000 7

Determine the location of the last significant figure value by placing a dot over the digit.

- 1.000 0
- 1.000 0
- 1.000 0
- 1.000 0
- 1.000 0
- 1.000 0
- 1.000 0
- 1.000 0
- 1.000 0
- 1.000 0

**CALCULATIONS USING SIGNIFICANT FIGURES**

When multiplying and dividing, first find the number of significant figures in any of the factors.

Example 1:  $12.25 \text{ cm} \times 4.02 \text{ cm} = 49.25 \text{ cm}^2$   
The answer is expressed as  $49.3 \text{ cm}^2$  since 4.02 has only two significant figures.

Example 2:  $12.25 \text{ cm} \times 4.02 \text{ cm} \times 1.0 \text{ cm} = 49.25 \text{ cm}^3$   
The answer is expressed as  $49 \text{ cm}^3$  since 1.0 has only two significant figures.

When adding and subtracting, first find the number of decimal places in any of the addends and subtractands. The answer is expressed to the same number of decimal places as the least precise measurement.

Example 3:  $12.25 \text{ cm} + 4.02 \text{ cm} = 16.27 \text{ cm}$   
The answer is expressed as  $16.3 \text{ cm}$  since 4.02 has only two decimal places.

Example 4:  $12.25 \text{ cm} + 4.02 \text{ cm} + 1.0 \text{ cm} = 17.27 \text{ cm}$   
The answer is expressed as  $17.3 \text{ cm}$  since 1.0 has only one decimal place.

Perform the following operations expressing the answer in the correct number of significant figures.

- $1.25 \text{ m} + 2.47 \text{ m} = 3.72 \text{ m}$
- $1.000 \text{ mL} - 42 \text{ mL} = 41 \text{ mL}$
- $12.25 \text{ mL} + 82 \text{ mL} + 4 \text{ mL} = 98 \text{ mL}$
- $25.46 \text{ g} - 2.1 \text{ g} = 23.4 \text{ g}$
- $20 \text{ cm} + 3.2 \text{ cm} + 10.1 \text{ cm} = 33.3 \text{ cm}$
- $5.18 \text{ cm} + 1.8 \text{ cm} + 3.001 \text{ cm} = 9.98 \text{ cm}$
- $100 \text{ L} \times 4 \text{ L} = 400 \text{ L}^2$
- $88 \text{ kg} - 40.25 \text{ kg} = 48 \text{ kg}$
- $1.200 \text{ m} \times 0.100 \text{ m} \times 0.010 \text{ m} = 0.0012 \text{ m}^3$
- $1.20 \text{ m} \times 10 \text{ m} = 12 \text{ m}^2$
- $1.000 \text{ m} \times 10 \text{ m} = 10 \text{ m}^2$
- $1.000 \text{ m} \times 10 \text{ m} = 10 \text{ m}^2$
- $1.000 \text{ m} \times 10 \text{ m} = 10 \text{ m}^2$
- $1.000 \text{ m} \times 10 \text{ m} = 10 \text{ m}^2$
- $1.000 \text{ m} \times 10 \text{ m} = 10 \text{ m}^2$

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**PERCENTAGE ERROR**

Percentage error is a way for scientists to express how far off a laboratory value is from the accepted value.

$$\% \text{ error} = \frac{|\text{Accepted Value} - \text{Laboratory Value}|}{\text{Accepted Value}} \times 100$$

Determine the percentage error in the following problems.

- Laboratory value = 1.30 g  
Accepted value = 1.32 g  
**4.62%**
- Laboratory value =  $1.24 \times 10^3 \text{ g}$   
Accepted value =  $9.98 \times 10^3 \text{ g}$   
**24.2%**
- Laboratory value = 202 mL  
Accepted value = 200 mL  
**12.0%**
- Laboratory value = 22.1 L  
Accepted value = 22.4 L  
**0.893%**
- Laboratory value = 100.2 mg  
Accepted value = 100.0 mg  
**0.3%**

**TEMPERATURE AND ITS MEASUREMENT**

Temperature is a measure of the average kinetic energy of the particles in a substance. It is measured using the Celsius scale, Fahrenheit scale, and Kelvin scale. The Celsius scale is the most commonly used scale. Each degree on the Celsius scale is equal to one degree on the Fahrenheit scale. Each degree on the Kelvin scale is equal to one degree on the Celsius scale.

$$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$$

$$^{\circ}\text{F} = \frac{9}{5} (^{\circ}\text{C}) + 32$$

$$\text{K} = ^{\circ}\text{C} + 273.15$$

$0^{\circ}\text{C}$	$273 \text{ K}$	$32^{\circ}\text{F}$
$100^{\circ}\text{C}$	$373 \text{ K}$	$212^{\circ}\text{F}$
$177^{\circ}\text{C}$	$450 \text{ K}$	$351^{\circ}\text{F}$
$37.0^{\circ}\text{C}$	$310 \text{ K}$	$98.6^{\circ}\text{F}$
$-273^{\circ}\text{C}$	$0 \text{ K}$	$-459^{\circ}\text{F}$
$21^{\circ}\text{C}$	$294 \text{ K}$	$70^{\circ}\text{F}$
$25^{\circ}\text{C}$	$298 \text{ K}$	$77^{\circ}\text{F}$
$-48^{\circ}\text{C}$	$225 \text{ K}$	$-54^{\circ}\text{F}$
$-40^{\circ}\text{C}$	$233 \text{ K}$	$-40^{\circ}\text{F}$

Complete the following chart. All measurements are good to  $1^{\circ}\text{C}$  or better.

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## WED 8/14 PRESENTATIONS- CHEM

### NAMES AT TOP! THUMB RULE!!!!

- Explain what you did, how you did it (board A)
- Provide all measured data and units (BOARD A)
- Show all conversions with units and how they cancel (BOARD B) PUT FINAL ANSWER IN popsicle sticks!!
- Calculate % error (BOARD B)

23.5m (short) 26.91m (long)

**-Did you find their name ok?**

**-Could you replicate the experiment?**

**-Any place where you couldn't tell what the units were?**

**-Any numbers show up that you couldn't tell where they came from?**

**-Was the % error less than 20%**

**ACTUAL=58.73 x 45.72 cm= 26.85m**

**51.1 x 45.72 cm= 23.36 m**





Answer Key  
Quiz: Bio Test 8.16

Quiz Date: Aug 16, 2019

Class: BIO1

Key A

1	E	1
2	C	1
3	D	1
4	D	1
5	B	1
6	C	1
7	C	1
8	D	1
9	A	1
10	A	1
11	A	1
12	D	1
13	C	1
14	C	1
15	B	1
16	A	1
17	D	1
18	A	1
19	B	1
20	B	1
21	C	1
22	A	1
23	D	1
24	D	1
25	D	1
26	C	1
27	D	1
28	B	1
29	A	1
30	B	1
31	A	1
32	D	1
33	C	1

