**Ch. 1 Notes – The Science of Biology**

**Questions:**

(at least 3 per pg.)

**Black Death**

* Killed 1/3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* People in the 13th century thought it was caused by

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Goals of Science**

* to \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_ nature
* to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in nature
* to use those explanations to make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Methods of Scientists**

* \_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_information (\_\_\_\_\_\_\_) in a careful, orderly manner
* look for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* propose\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Observation**

* Based on five senses: sight, hearing, taste, smell, touch
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – numerical
  + Ex- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_– descriptive
  + Ex – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Hypothesis**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ explanation for a set of observations or a possible answer to a scientific question
* Arise from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Testing Hypotheses**

* Can be done through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Usually done through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* A hypothesis \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ still adds to the body of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Scientific Method**

* There is a\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ way of thinking found in all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_a problem
  + \_\_\_\_\_\_\_\_\_\_\_\_a question
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_ a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_experiment
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ data
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_results

**Questions:**

**Spontaneous Genereation?**

* In the past, people thought \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_matter
* Ex – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Redi’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* 1668 – proposed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_that the maggots came from flies
* Tested hypothesis by placing meat in jars and covering some of the jars
* Everything was **controlled** (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) except the variable (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

**Types of Variables**

* Independent: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Redi controlled the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Dependent: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + The presence of maggots in Redi’s experiment

**Spallanzani’s Experiment**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Pasteur’s Experiment**

* What was \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?
  + Microorganisms \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Independent variable?
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Dependent variable?
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**A Theory in Science**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* When a hypothesis has been \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ many times by different scientists, it becomes a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Redi’s, Spallanzani’s, and Pasteur’s experiments led to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Theories explain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Characteristics of Life**

* Made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Reproduction – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Contain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – universal genetic code
* Growth (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (changing, ex: puberty)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – metabolism is the sum of all chemical reactions in body
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Maintain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – stable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (change) over time

**Summary:** (at least 3 sentences)

**Questions:**

**Tools and Procedures**

* SI = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The international, metric standard for reporting units
* Necessary to ensure \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can be interpreted by \_\_\_\_\_\_\_\_ scientists everywhere
* Easy to use because it is based in \_\_\_\_\_\_
* To convert between units, you only have to move decimals ☺

**Metric Units**

|  |  |  |  |
| --- | --- | --- | --- |
| Length |  | m |  |
| Mass | gram |  |  |
| Volume |  | L |  |
| Temperature |  |  | Measurement of heat energy |
| Time |  |  |  |

**Tools of the Trade**

* Metric ruler-Measures in meters, centimeters, millimeters
  + Longer lines mark \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Shorter lines mark \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-Measures liquid volume in Liters and milliliters
  + Measurement is made at the “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,” the curve of the liquid line that occurs when a liquid is added
* Thermometer-Measures in degrees \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Metric Scale-Measures in grams or kilograms
  + Can be manual or electric

**Metric Prefixes**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| kilo |  | deka | Base  (m, g, L) |  | centi |  |
|  | 100 |  | 1 | 0.1 |  | m  0.001 |

**Lets Practice!**

1. 1 m = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cm
2. 1 kg = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_g
3. 1 mL = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_L
4. 286 g = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mg
5. 48.7 mm = \_\_\_\_\_\_\_\_\_\_\_\_\_m
6. 147.965 kg = \_\_\_\_\_\_\_\_\_\_\_hg
7. 280,000 mg = \_\_\_\_\_\_\_\_\_\_\_kg
8. 23 cc = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ml