Name _____ Due Date _____

# Introduction Review Packet

## *Life Functions and Scientific Method*

### A. Laboratory Safety

*List 5 general safety rules in the biology lab*

1. _____
2. _____
3. _____
4. _____
5. _____

### B. Scientific Method

1. What is the scientific method? _____

   _____

2. List the steps of the scientific method
   1) _____
   2) _____
   3) _____
   4) _____
   5) _____

3. List **Five** characteristics of a valid experiment
   - _____
   - _____
   - _____
   - _____
   - _____

4. Define a hypothesis _____

   _____

5. In what form should your hypothesis be written _____

6. What is a control group and why is it necessary in an experiment

   _____

   _____

7. Why is it best to have a large sample size when conducting an experiment

   _____

8. When can results be reported as valid?

   _____

   _____

9. Does your hypothesis need to be proven in order to conduct a successful experiment? Why or why not

   _____

   _____

## Characteristics of life

1. _____ is the study of life
2. Another word for a living thing is an _____
3. Organisms are able to maintain a stable internal environment even though the external environment is constantly changing, this is called _____
4. Describe an example of homeostasis

   _____

   _____

5. Define metabolism _____

   _____

## B. Life Functions

*Briefly describe the following*

1. Nutrition _____

   _____

2. Transport _____

   _____

3. Respiration _____

   _____

4. Excretion _____

   _____

5. Synthesis _____

   _____

6. Growth _____

   _____

7. Regulation _____

   _____

8. Reproduction _____

   _____

*Fill in the following:*

9. Oxygen moving into cells and carbon dioxide leaving the cells is an example of _____
10. Cells carrying out _____ when they convert the stored energy in glucose to make ATP
11. Humans release carbon dioxide (metabolic waste) from the lungs. This is an example of _____
12. The human brain maintains a constant pH in the blood, this is an example of the life function of _____
13. _____ is the combination of small molecules into large complex molecules.

14. Pick **Three** life functions and explain how they work together to maintain homeostasis

_____

_____

_____

_____

15. Reproduction is not necessary to sustain life of the individual organism, explain why it is then considered to be a life function.

_____

_____

## C. Tools of the biologist

1. What is the total magnification of a compound light microscope that has a 10x eye piece and a 43x objective _____
2. How did you arrive at that answer?

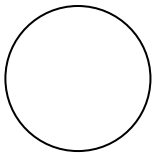
   _____

3. When observing a cell under the microscope a biologist will add a _____ to reveal details that would otherwise not be seen.
4. How many micrometers are equal to 1 millimeter _____
5. Which has a larger field of view, low or high power? _____
6. When viewing a specimen a student should always start with _____ lens and focus using the _____ adjustment
7. You should only have to adjust the _____ adjustment when under high power.
8. As you increase magnification you must _____ the amount of light
9. What could happen if you used the coarse adjustment on high power?

   _____

   _____

10. In the circle below draw the letter "d" as it would appear if views through a microscope



11. The _____ is the most powerful microscope

12. What is the proper procedure for focusing an object under High power starting with placing the slide on the stage.

_____

_____

_____

_____

_____

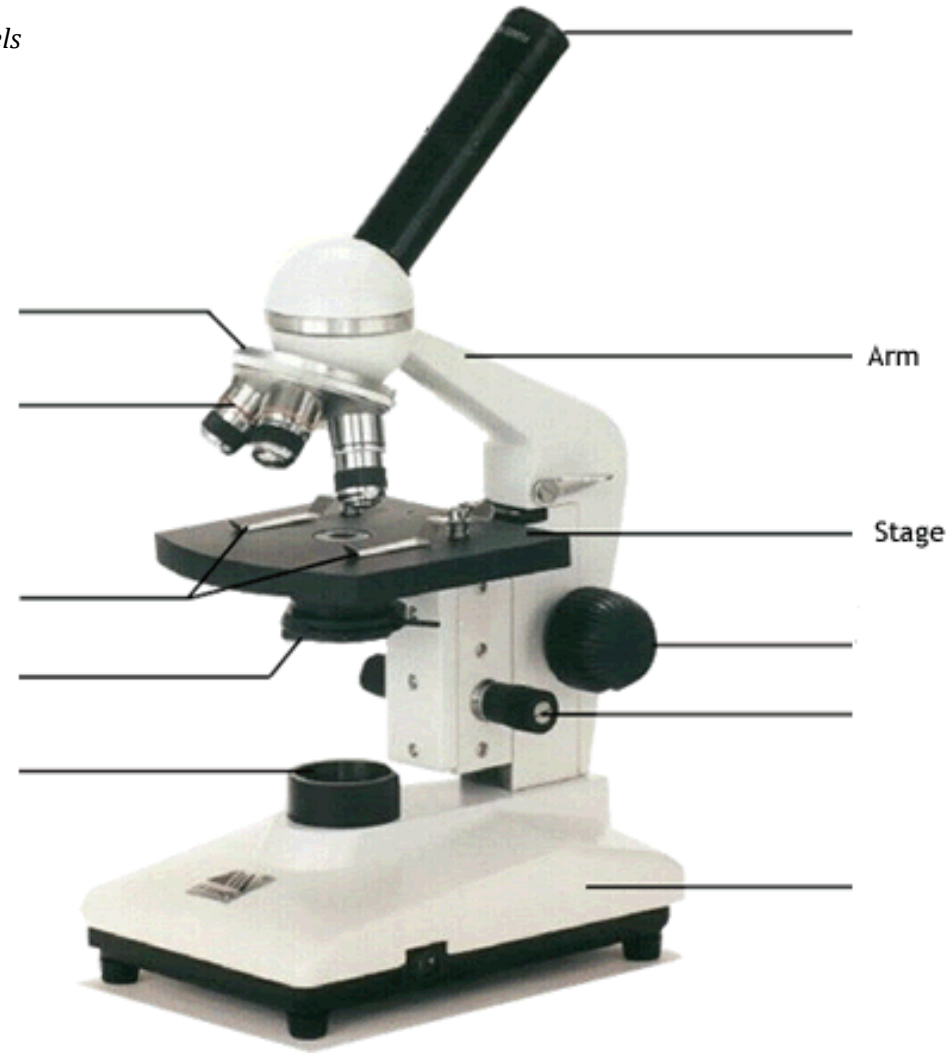
13. What would you use a centrifuge for?

_____

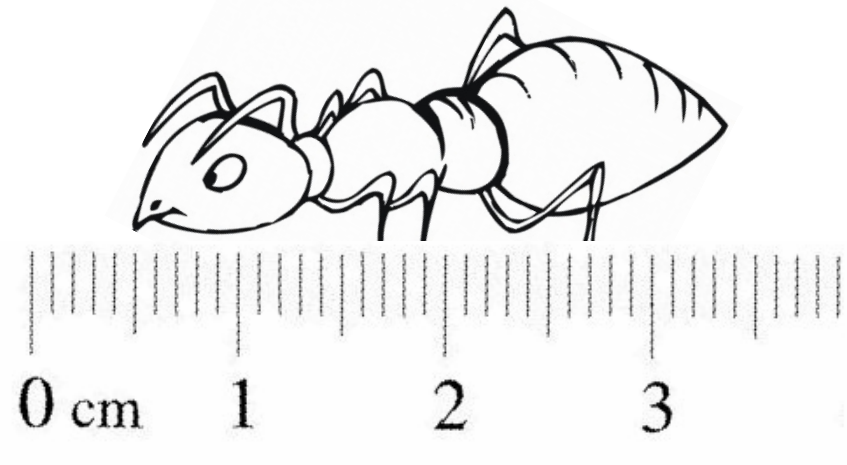
14. Gel electrophoresis separates _____and _____ fragments by size
15. What is chromatography used for?

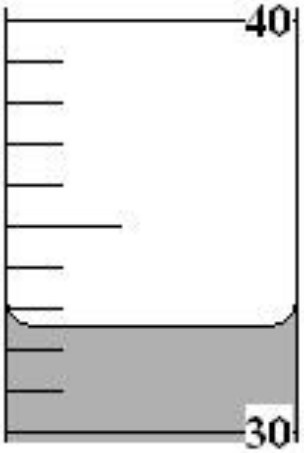
_____

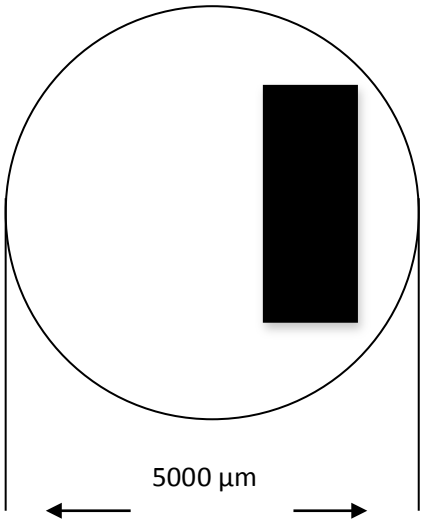
*Fill in the missing labels*



## E. Measuring




1) How long is the ant? _____ mm

2) What is the reading in the graduated cylinder? _____ ml

3) How big is the Black box _____ µm

4) How many grams are in a kg _____

5) When measuring a liquid you read at the bottom of the _____

## D. Conversions

1. .23 Km = _____cm
2. 122 um = _____ mm
3. 32 g = _____ kg
4. 78 cm = _____ mm
5. 45 cm = _____ m
6. 41 mm= _____ um
7. 2 L = _____mL
8. 15mg = _____kg

Based on her field experiments a scientist observed that a certain species of insects require a specific range of air temperatures in order to live. She tested her hypothesis by exposing larval stages of this species to varying air temperatures. The data from her experiments is shown below. Use the data to answer the following questions.

| Temperature (°C) | Survival rate (%) |
|---|---|
| 15 | 0 |
| 16 | 20 |
| 17 | 60 |
| 18 | 80 |
| 19 | 90 |
| 20 | 100 |
| 21 | 100 |
| 22 | 80 |
| 23 | 73 |
| 24 | 30 |
| 25 | 0 |

1) What is the independent variable in this experiment

_____

2) What is the dependent variable

_____

3) What type of graph would you use to display this experiment and why

_____

_____

4) Draw the type of graph described above. Be sure to label the axis.