Task_____

Name_____ Period_____Date_____

Lab: What is Life?

Introduction: How can you determine whether something is alive, dead, or inanimate? Whenever we speak of life, we must think in terms of cells. Even though we cannot see cells without a microscope, they are the basic unit of life and they exhibit all of the characteristics of living organisms. They can exist individually, as do bacteria, or they may work together, taking on specialized tasks to create a more complex organism. However, all living organisms share certain characteristics, which are discussed below.

Characteristics of Living Organisms

1. Living organisms are made of cells.
2. Living organisms are organized. Organization is present at both the molecular and cellular levels. In multicellular organisms cells are organized into tissues, tissues are organized into organs, and organs are organized into organ systems.
3. All organisms use energy for growth and maintenance.
4. All organisms respond to the environment. A response is a reaction to a stimulus. Responses may be simple or complex.
5. All living things grow. Growth occurs through cell division and cell enlargement.
6. All organisms have the ability to reproduce. Reproduction is not essential for the survival of an individual, but it is essential for the continuity of life.
7. Organisms have adaptations. These adaptations are traits that give an organism an advantage in an environment. Variations of adaptations are essential for the continuity of life since they confer an advantage on some members of a species in a changing environment.
8. Living organisms have a lifespan. Development does not stop when an organism reaches its adult for. Repair, rebuilding, and replacement go on continuously throughout an organism's lifespan. No organism can keep renewing itself forever. As a result, the organism deteriorates and eventually dies.

9.

Prelab Preparation

Think about the characteristics that are common to all living things.

1. List ~~10~~ 6 processes that occur while an organism is alive but ceases when it is dead.

1._____2._____3._____

4._____5._____6._____

2. Name one way that plants differ from animals in their life activities.

_____

3. How does the growth of an icicle differ from the growth of a cell?

_____

Procedure

There are 10 numbered specimens at different stations in the room. Notice that they are not identified. You will visit each station with your group in turn. Follow the numbers sequentially from your starting point. For example, if you start with number 4, your next station will be number 5. First look at the specimen without touching it and examine its size, color, smell (if possible), and shape. Try to use several of your senses to examine the specimens. Touch, smell, and hearing can sometimes be more valuable than sight. **DO NOT TASTE THE SPECIMENS.** It is never advisable to taste and unknown. Give particular attention to any characteristic that does not seem to belong with the characteristics of life. Ask yourself if this specimen has all, some, or none of the characteristics of life.

Work with your team to compile a list of what you know about each.

RECORD ON YOU DATA TABLE ALL THE CHARACTERISTICS YOUR TEAM OBSERVED THAT WOULD CLASSIFY EACH SPECIMEN AS LIVING OR AS NONLIVING. LIST EACH CHARACTERISTIC BY NIMBER IN THE APPROPRIATE COLUMN.

UNDER DESCRIPTION, CATEGORIZE EACH SPECIMEN WITH THE CATEGORIES GIVEN AT THE BOTTOM OF YOUR CHART. THESE INCLUDE: 1) Alive 2) Alive, but dormant 3) Dead, once alive 4) Product of a living organism 5) Never alive.

ENTER YOU ANSWERS ON YOUR DATA TABLE.

Postlab Analysis

1. Which specimens (by number) are alive or contain living organisms?

_____

2. Which specimens are dead? _____

3. Which specimens were once part of, or made by, a living organism?

_____

4. List one characteristic that the nonliving materials have in common.

_____

5. In which specimens did you observe all the characteristics of living organisms?

_____

6. List two characteristics of life that you were not able to observe.

A._____ B._____

7. How could you obtain the information for question 6?

_____

Name_____ Task#_____

OBSERVATION CHART

(Look for color, shape, size, texture, amount of something. List at least 2 per specimen.)

	NAME OF SPECIMEN	SUMMARY OF OBSERVATIONS
Station 1		
Station 2		
Station 3		
Station 4		
Station 5		
Station 6		
Station 7		
Station 8		
Station 9		
Station 10		

Specimen	✓ If Living Characteristics	✓ If Non-living Characteristics	Description (Use numbers at the bottom of chart)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Metric Measurement:

Length
1)

MASS
2)

Volume
3)

Convert Answers:

C into M:_____

g to kg:_____

l to L:_____

Life Categories: 1. Alive
4. Temperature
2. Alive but dormant
3. Dead (once alive)

Boiling:_____ 4. Product of a living organism

Freezing:_____ 5. Never alive

Name_____ Task_____

Section Assessment

1. Which parts of the earth are included in the biosphere?

2. What is the definition of species?

3. Is the rate at which species are now disappearing greater or less than 300 years ago?

4. Many people feel that the world would be better off without any mosquitoes. Do you agree? Why?

5. Compare and contrast growth and development.

6. Which characteristics of life are not exhibited by the following items: copy machine, automobile, fire?

Name _____ Section TA Sec 11 Date _____

1 The Study of Life

Objectives Study Guide

Chapter Objectives

As you study this chapter, you should be able to do the following:

1. Give several examples of the diversity of living things. *1.1*

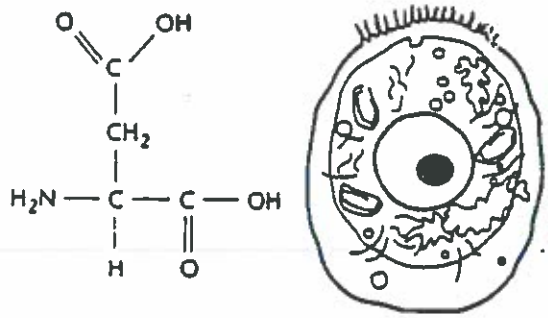
2. Explain how the parts of the biosphere interact to maintain life. *1.1*

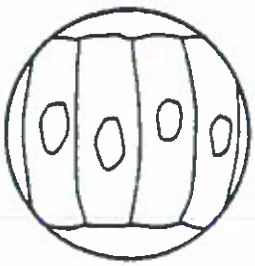
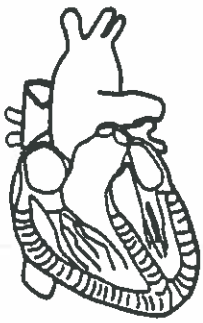
3. Describe how biology affects five areas of human life: food, clothing, shelter, health, fuel. *1.2*

4. Summarize the characteristics that are common to all organisms. *1.3*

5. a. Summarize the levels of organization in living systems from the simplest to the most complex.

b. Label each of the levels of organization shown in the diagram.




A. _____ B. _____ C. _____ D. _____ E. _____

6. a. List some of the areas of study within biology. *1.4*

b. Briefly describe the subjects of five of these areas of study.

Lab Safety Poster Task #____
Laptop Activity

- Select a safety rule from the safety sheet
- Make a poster about the rule
- The poster must have the rule# and rule
- Write a statement on poster on how this could apply to your home
- The poster must also include your name, block number,
task number, rule and rule number
- Save your document as *Your Name* Safety Poster
- "Copy" your document
- Go to My Computer, Global drive (G),
_Student_Submissions,
Charles.Pierce

TASK:

Name: _____

Secret Weapons Video Guide

1. How did the black beetle at the beginning of the film advertise its presence to the ants?

2. What seemingly trivial observation led Eisner to investigate hemispherota?

3. How was Eisner able to discount suction by the body as a method for the beetle to remain attached to a leaf?

4. What hypothesis was tested using the glass slide?

5. How did hemispherota's defense as a beetle larva save energy?

6. Explain how one female moth in the film helped to insure that her offspring were more likely to survive.

7. From what you have seen, do males attract females most of the time, or is the reverse true for most animal species? Explain why.

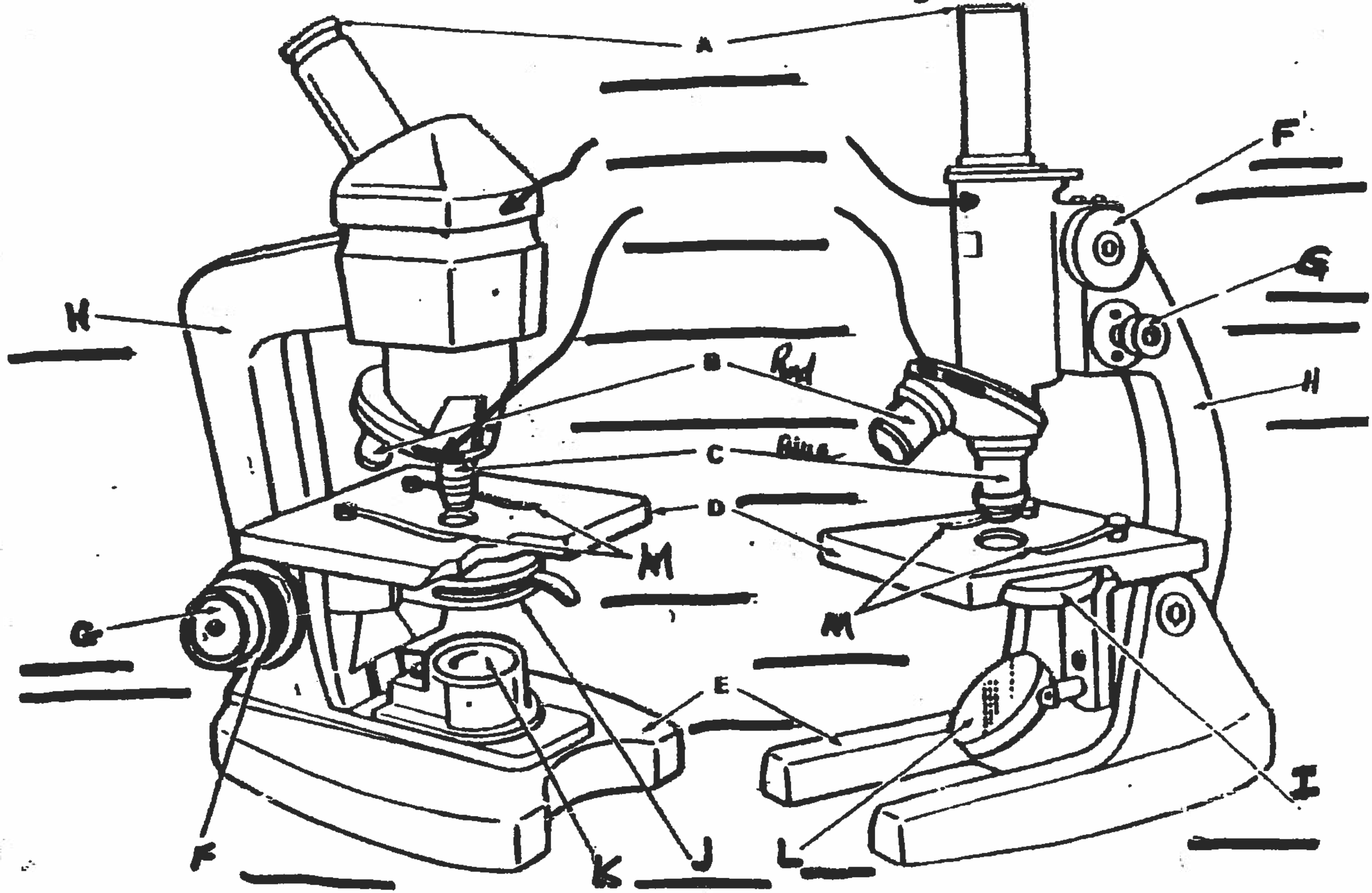
8. Why do you suppose Monarch butterflies feed almost exclusively on milkweed even though it contains large amounts of toxins?

9. How did Eisner determine the beetle's ability to aim the hydroquinones?

10. What was the purpose of the enzymes in the beetles glands? Why does the beetle produce the "explosives" in pulses?

Task # 6

Parts of the Microscope



Chapter 1
Teaching Master 1-1

CARE AND USE OF THE COMPOUND MICROSCOPE

I. **Microscope parts and their functions**

Eyepiece or ocular lens – contains lens for magnification
Arm – supports body tube
Body tube – maintains a set distance between eyepiece and objective lens
Coarse focus – moves body tube up and down quickly
Fine focus – sharpens the image, used to focus
Nosepiece – contains high and low power objective lenses
Stage – supports the slide being viewed
Stage clips - holds the slide in place on the stage
Diaphragm – regulates light from the mirror or light source
Mirror / lamp – provides a source of light
Base – supports microscope

II. **Magnification**

Eyepiece lens power **X** objective lens power = total magnification

III. **Use of the microscope**

A. **ALWAYS** begin with low (10X) objective. **RAISE** the stage all the way up. To focus slowly lower the stage until the specimen comes into focus using the coarse adjustment (focus). Use fine adjustment for greater clarity.

B. To view specimen under higher power:
   1. Center the specimen in the field of view on low power.
   2. Change to high power objective while looking at the microscope from the side. (Listen for the click.)
   3. **CAREFULLY** adjust fine focus **ONLY**. Never move coarse focus while on high power.

C. Preparation of a wet mount:
   1. Place specimen on microscope slide.
   2. Add a drop of water to the specimen on the slide.
   3. Using forceps carefully lower the coverslip onto the slide
   4. If bubbles are present, gently tap the coverslip directly over the bubbles with the eraser of a pencil.

D. Always carry the microscope to and from the storage area by placing one hand beneath the base and firmly grasping the arm of the microscope with the other hand. Carry the microscope close to your body.

E. At the end of a microscope lab, the following procedure **MUST** be taken.
   1. Remove the slide and the coverslip from the stage, wash them in slightly soapy water, rinse and replace both in the boxes provided.
   2. Turn the revolving nosepiece to the lowest power. Run the tube down, or the stage up as far as it will go. Place the stage slips in proper position
   3. Cover the microscope and return it to the storage cabinet.

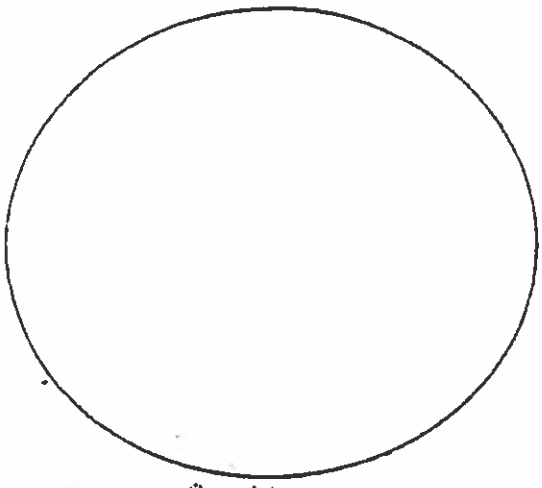
TASK #

Name: _____ Class: _____ _____ Date: _____

Laboratory Notebook Viewing the Hidden World

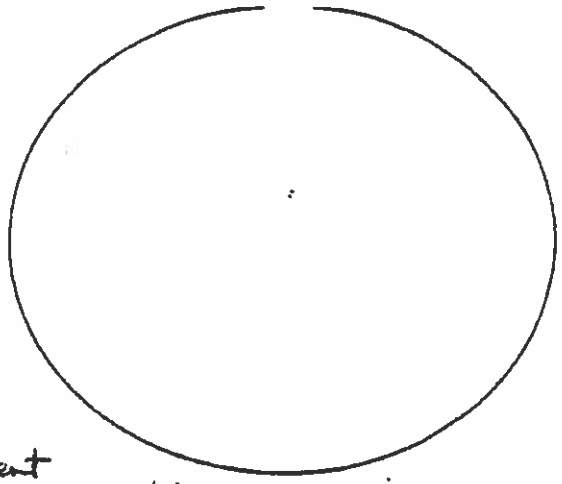
Data Record

Magnification of objective lenses	_____	_____	_____
Magnification of ocular lens	_____		
Maximum magnification of microscope	_____		
Eye relief (millimeters)	_____		



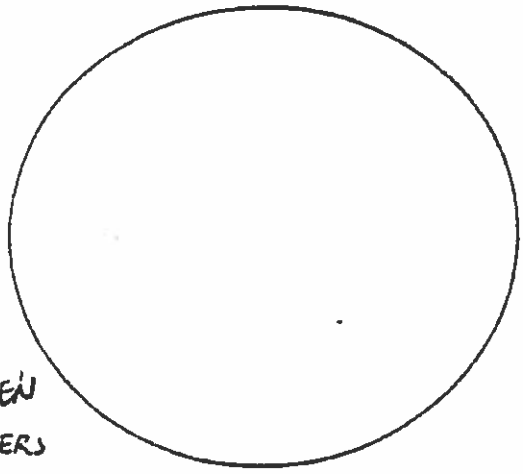
Letter "e"

Slide Magnification = _____



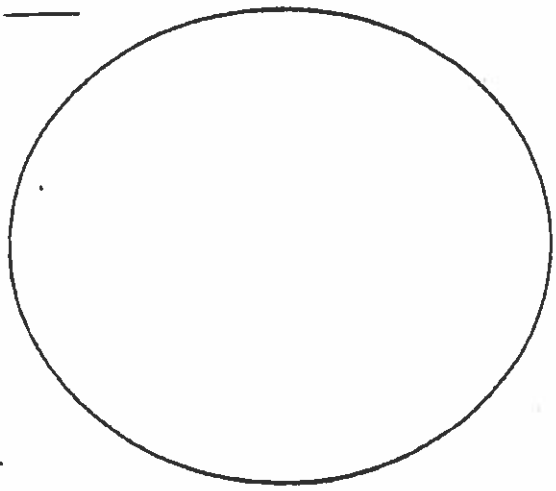
HAIR Segment

Slide Mag. _____



LINEN FIBERS

Slide Mag. _____



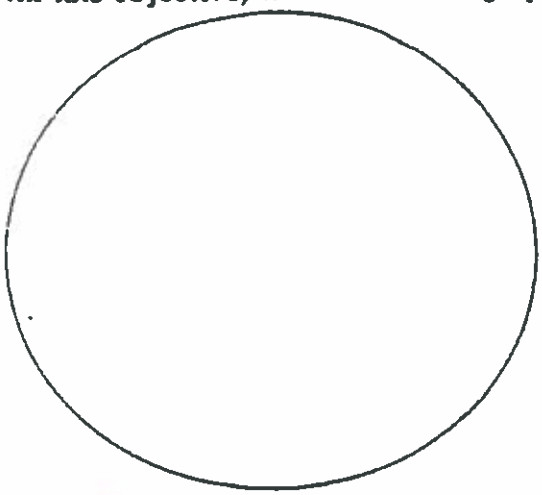
Colored PAPER

Slide Mag _____

Microscope Observations

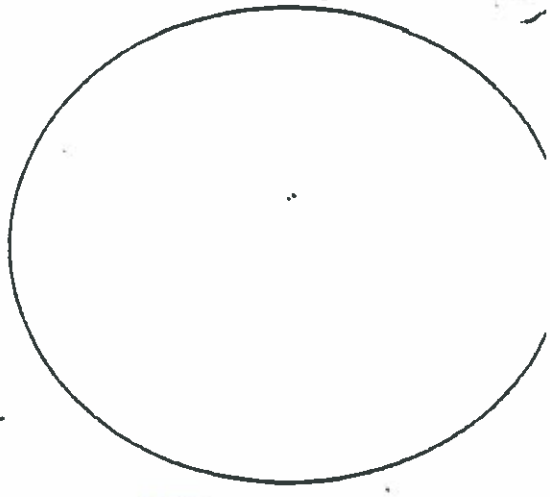
Make observations of five microscope slides. View the slide on low power (use the coarse with this objective) then switch to high power (use the fine focus with this objective).

Foam Parts



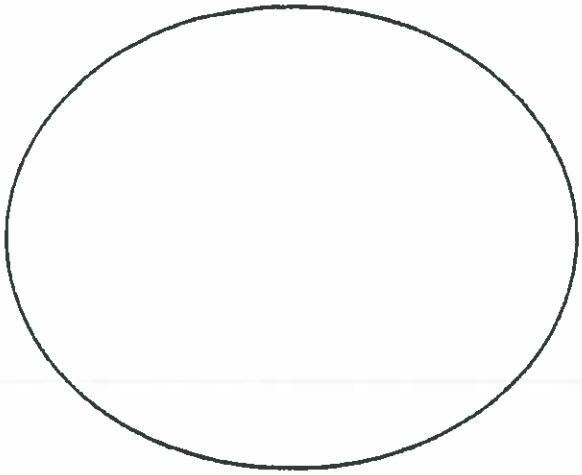
Slide Magnification

Insect Parts



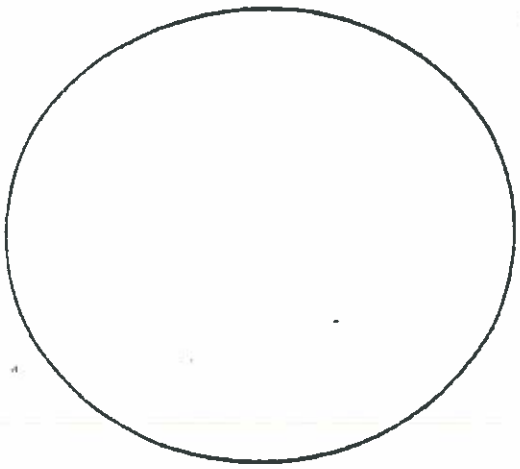
Slide Mag.

Microorganisms →



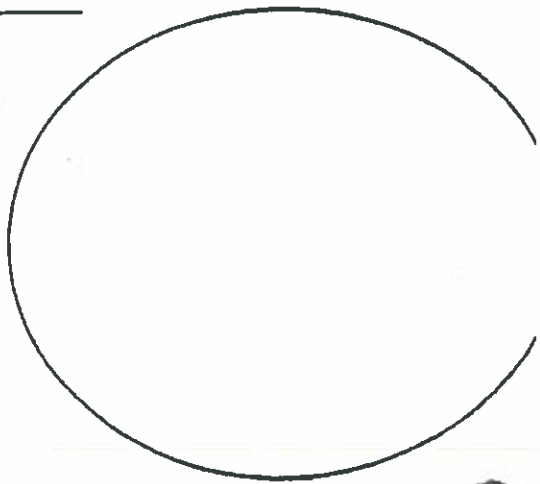
Slide Mag.

Pond H_2O



Slide Mag

Pond H_2O



Slide Mag.

Pond H_2O

Analyses and Conclusions

1. CALCULATE the total magnification of the microscope at low power. (Multiply the objective power by the ocular power.)

2. STATE the general relationship between the actual movement of a specimen on the stage of a microscope and movement seen through the microscope.

3. When you switched from low power to high power while viewing the hairs, did they remain in fairly good focus? Is your microscope parfocal?

4. EXPLAIN how you were able to tell which hair was on top using the fine adjustment knob.

A Step Further

On the stage of a microscope, place a transparent ruler marked in millimeters. Focusing on the markings under low power, determine the width you can see through the microscope. This measurement is the diameter of the field of view. Express this number in micrometers. (Note that 1 millimeter equals 1000 micrometers.) Next, calculate the approximate diameter of the field under high power. To do so, first divide the value of the high-power objective by that of the low-power objective (for example, 40X/10X = 4). Then divide the resulting number into the diameter of the low-power field you measured using the ruler. Use this knowledge of the diameters of the two fields of view to estimate the sizes of objects and details seen through the microscope.

→ Find 3 Different Micro organisms in The Pond H_2O - Make Drawings of observations.

Task #
Power Point

THE SCIENTIFIC METHOD

What do you do with an observation?

1. _____ _____ is the process of generalizing from specific observations.

   Ex.

2. Deductive reasoning starts with a _____, reason from it and arrive at a specific conclusion.

   ex.

3. STEPS TO THE SCIENTIFIC METHOD

4. In science, there are no _____ _____. An idea is correct within the framework of observations and tests which it is derived.

5. A _____ is a set of ideas that form a general frame of reference for further study. Explanations have a _____ of being valid.

6. A _____ is evidence so overwhelming that the explanation is further elevated, becoming fundamental _____ on which other concepts are based objecuvity.

7 A hypothesis is a _____ explanation. To be scientific it must be _____ constructed to provide framework for stating of an experiment. It must be more _____ than the problem.

8. In testing a hypothesis, must have three variables:

a. _____ _____ is the condition or event under study.

b. _____ _____ are variables that can possibly change because of the presence of or change in the independent variable. (what is actually measured)

c. _____ _____ conditions that could affect the outcome of an experiment but do not because they are held constant.

RANDOM SAMPLING

9. Subjects are randomly assorted into either experimental group or control group. (Must ensure both groups are representative samples of the _____ population.

10. _____ _____ is the type of error that occurs in the same direction each time and is always too low or too high.

11. _____ _____ occurs when the test group is not equivalent to a nature population.

ORGANIZING TEST RESULTS

12. Statistical tests determine if differences between experimental and control data are _____ or likely due to chance.

Generalizing from test results

13. _____ is accepted or rejected based on conclusions drawn

14. Statements are written about new _____ gained

Apparent trends are noted

Further problems and hypotheses posed

Video Questions

Task #_____

"Lions and Hyenas: Eternal Enemies"

1. What group produced the "Lions and Hyenas" video?

2. What type of study was performed in the video? What was the main biological tool used?

3. Name at least four (4) different populations that were seen on the video.

4. What is the definition of a population? Is a population always a high number?

5. What are the limiting factors that controlled the size of the lion population and the hyena population? Limiting factors are any condition of the environment that controls the size of a population.

6. In every environment you have interspecific relationships and intraspecific relationships. Give an example of each using the lions and hyenas.

7. Competition is a big part of survival for all species. List the resources that lions competed for within their own species. List the resources for which the lions competed against the hyenas.

8. Would competition be more severe between members of different species or members of same species and why?

9. The hyenas moved from one den to another because of a parasite. What is the definition of parasite, and what was the parasite?

10. What is a host? Who are the examples of "hosts" in the video.

Task #_____

Video Questions - "Lions and Hyenas: Eternal Enemies"
Page Two

11. What main limiting factor caused the bees to irritate the lions and hyenas?

12. There were some predator-prey relationships mentioned on the video. Name some.

13. There are scavengers and hunters. Can they both be in the same species? What would t vulture be (seen early in the video)?

14. There are first-level consumers and second-level consumers seen throughout the vid Name at least three (3) for each.

15. What do you call a population of hyenas, lions and zebras?

16. What sex was the most dominant among the lions?...and among the hyenas?

Name: _____ Class: _____ Date: _____

Laboratory Notebook A Predator and Its Prey

Hypothesis: _____

_____

_____

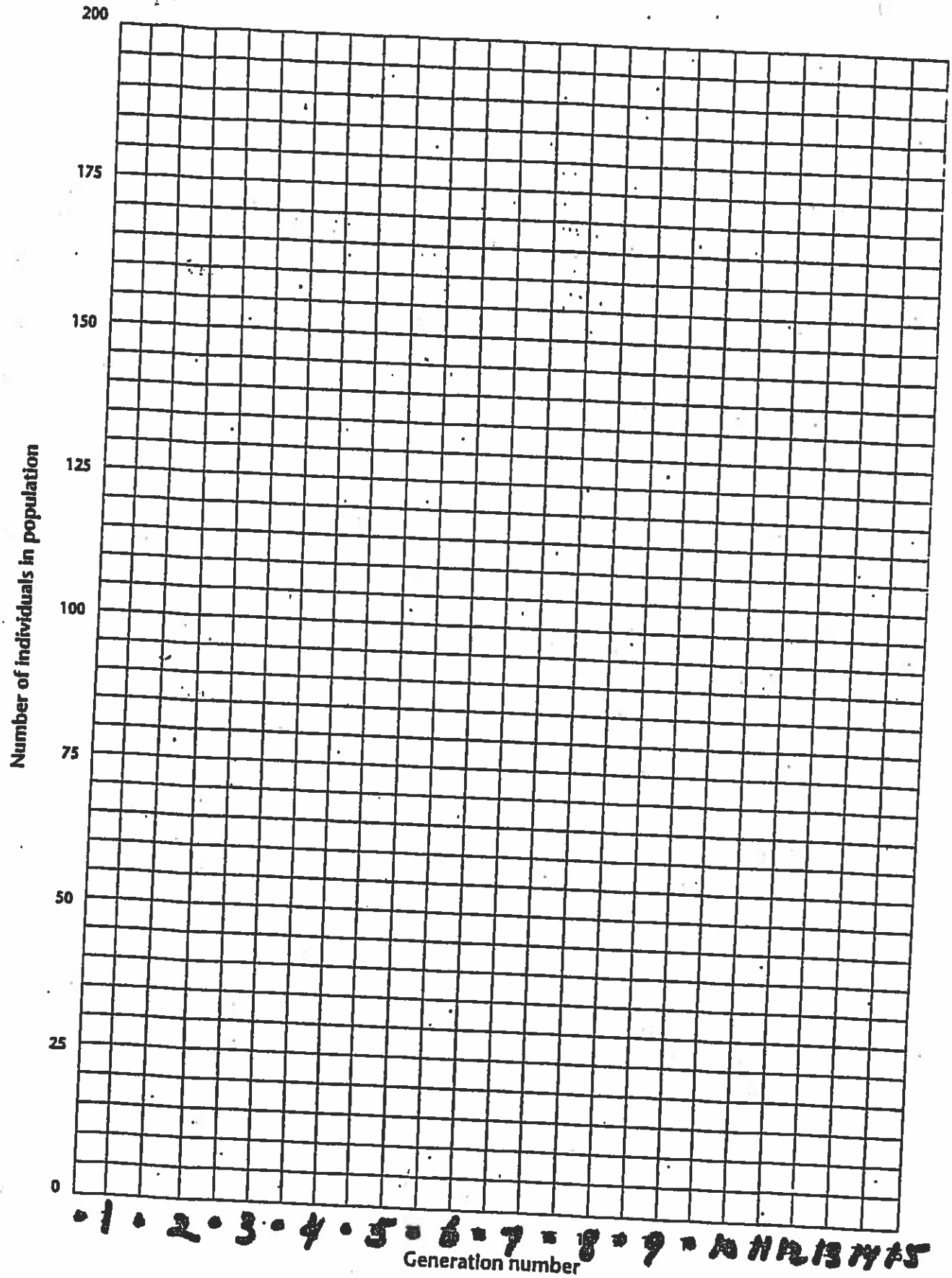
Data Record

Mouse and Owl Populations

Generation	Number of mice at start of generation	Number of owls at start of generation	Number of mice caught	Number of owls starved	Number of surviving mice and offspring	Number of surviving owls and offspring
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

Name: _____ Class: _____ Date: _____

Population Graph



Analyses and Conclusions

1. COMPARE the population changes by INTERPRETING the data that you collected and graphed.

2. Suppose the owl and mice populations were not labeled on a graph. How could you INFER which curve represented the predator and which the prey?

3. COMPARE your simulation with what might occur in a real ecosystem that included owls and mice.

4. Suppose the habitat of the owl was reduced by lumbering activity, as is the case for the spotted owl in the forests of the Pacific Northwest. PREDICT what would occur in both the owl and the mouse populations.

A Step Further

1. Locate data for other predator-prey populations, such as the lynx and the snowshoe hare in Canada. How is a graph of these data similar to or different from your results?
2. Hypothesize as to how changes in abiotic (nonliving) factors in a habitat might affect predator-prey relationships.
3. What would happen to your simulation if you introduced another prey species? Design an extension to the simulation and try it.

Name: _____

Pd: _____

Directions: Write the function of the equipment shown below.

1. Beaker / Flask

Functions:

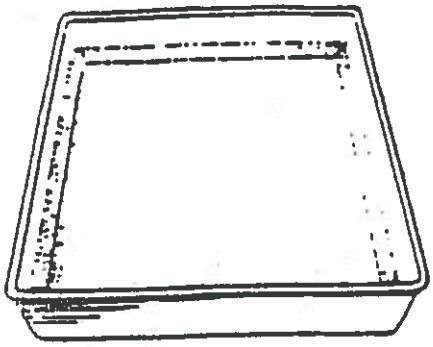
2. Bunsen Burner

3. Coverslip

4. Glass Slide

Functions

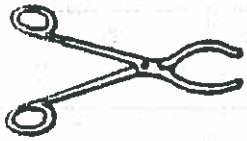
5. Dissecting Tray



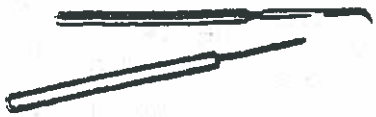
6. Dissecting Pins

7. Dissecting Scissors

8. Forceps / Tweezers

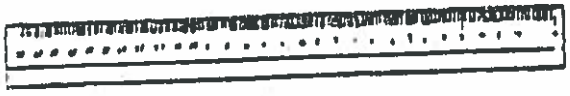


9. Probe



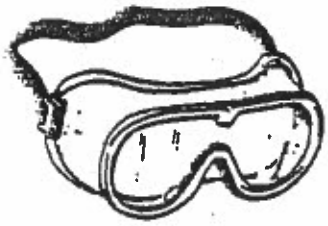
10. Scalpel

11. Metric Ruler



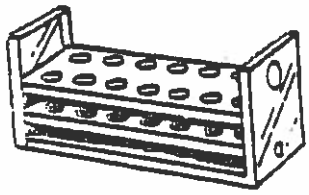
12. Hand Lens

13. Safety Goggles

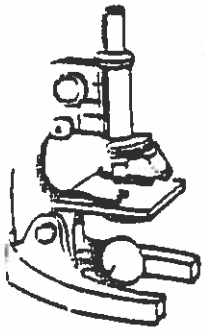


14. Test Tube

15. Test tube rack



16. Microscope

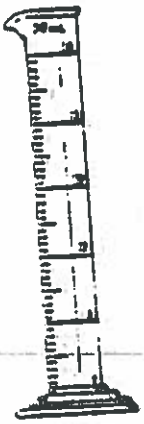


1. Petri Dish

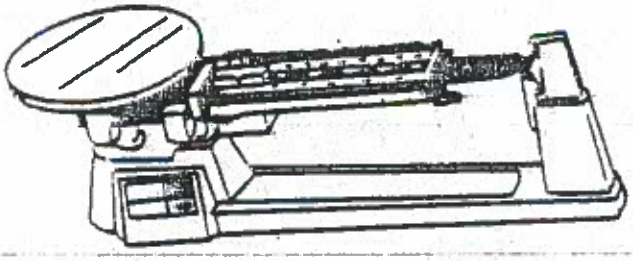
Functions

Functions

18. Graduated Cylinder



19. Triple-beam Balance



20. Test Tube Holder

21. Medicine Dropper
or
Pipette

22. Thermometer

Definition Bank

You may use the following definitions to fill in the function section.

– measures the length of objects

–picks up small objects

– holds bacteria cultures or to hold specimens

– holds specimens down in dissections

–allows you to see objects magnified up to 400X

–holds liquids for experiments and transferring

– measure liquids

– allows you to measure small amounts by suction

–usually filled with tar – it holds specimens for dissection

– finds the mass of objects

– holds a specimen for microscope observation

–heats samples in experiments

– covers specimens for the microscope

– cuts specimens during dissection

– holds test tubes during experimentation and carrying

–measures large amounts of liquid and holds them as well

– moves objects in dissection

– magnifies objects too big for microscopes

– trims or cuts objects or specimens

– transfers liquids into smaller containers without spilling

– protects the eyes from chemicals or objects

–transfers small amounts of liquid using suction

– measures the temperature of samples