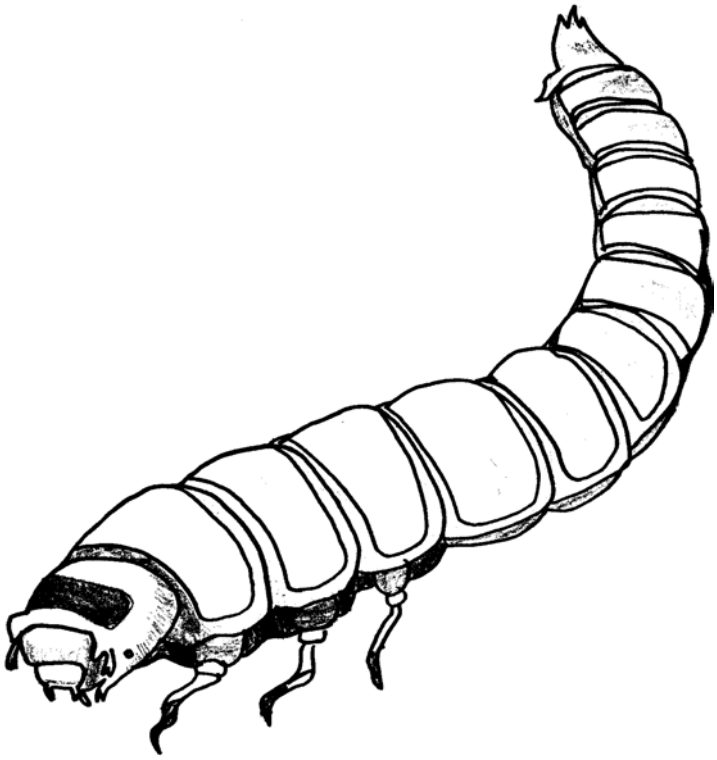
ELEMENTARY SCIENCE PROGRAM
MATH, SCIENCE & TECHNOLOGY EDUCATION

A Collection of Learning Experiences

MEET THE CREATURES

Meet the Creatures Student Activity Book



Name_____

This learning experience activity book is yours to keep. Please put your name on it now. This activity book should contain your observations of and results from your experiments.

When performing experiments, ask your teacher for any additional materials you may need.

TABLE OF CONTENTS

Activity Sheet for L.E. #1 - Care of Mealworms 2

Activity Sheet for L.E. #2 - “Meet the Creatures” 3-4

Activity Sheet for L.E. #3 - Life Cycle of a Grain Beetle 5-7

Activity Sheet for L.E. #4 - Mazes & Mealworms 8-9

Activity Sheet for L.E. #5 - Writing Experiments 10-11

Activity Sheet for L.E. #6 - Mealworm Color Preference 12-14

Activity Sheet for L.E. #7 - Backing Up 15-17

Activity Sheet for L.E. #8 - Procedure 18

Activity Sheet for L.E. #9 - Writing Your Own Experiment 19-21

Meet the Creatures Student Assessment 22-24

Student Self Assessment 25

Glossary 26-27

Activity Sheet for Learning Experience #1 **Name**_____

CARE OF MEALWORMS

Certificate of Adoption

Name(s) of mealworms: _____

_____

_____I will remember my mealworm as a living thing.

_____I agree to treat my mealworm(s) in a humane way.

_____I will not harm my mealworm(s) in any way.

_____I will handle my mealworm(s) carefully.

_____
Student Signature

Activity Sheet for Learning Experience #2 **Name_____**

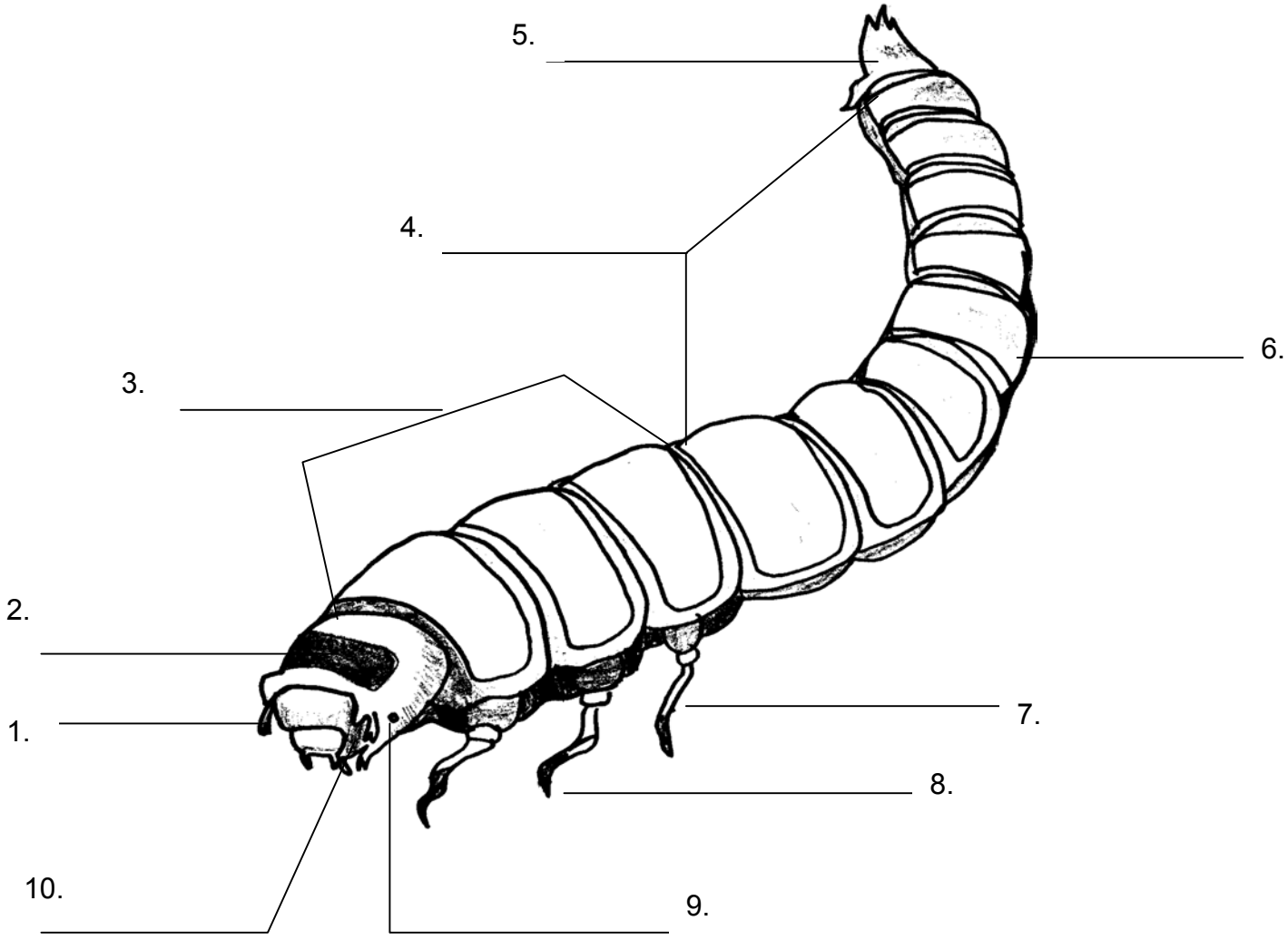
"MEET THE CREATURES"

Observe your mealworm carefully. Look at all the parts of the mealworm listed on the chart below. Then use a double lens magnifier to find those same parts. Make any notes about the mealworm in the last column of the chart.

	Naked Eye			Magnifying Glass			Notes
	Yes	No	Unknown	Yes	No	Unknown	
1. Head							
2. Tail							
3. Legs							
4. Eyes							
5. Body segments							
6. Hair							
7. Antennea							
8. Feet							
9. Mouth							
10. Skeleton							
11. Sense of smell							
12. Sense of feel							
13. Sense of taste							
14. Sense of sight							
15. Sense of hearing							

"MEET THE CREATURES"

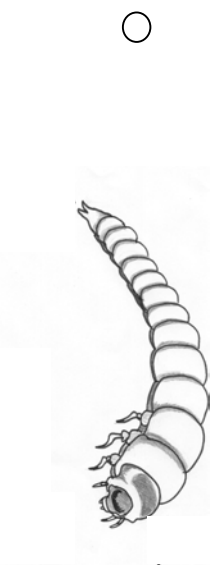
Use this information from your observations and label as many parts of the mealworm that you can. Discuss with your classmates and your teacher the names of any parts that are still left unlabeled.



Activity Sheet for Learning Experience #3 **Name**_____

LIFE CYCLE OF A GRAIN BEETLE

Name each stage of the life cycle of a grain beetle and identify the importance of each stage.



Stage _____

_____

_____

Stage _____

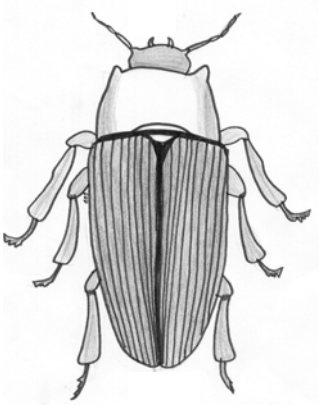
_____

_____

Stage _____

_____

_____



Stage _____

_____

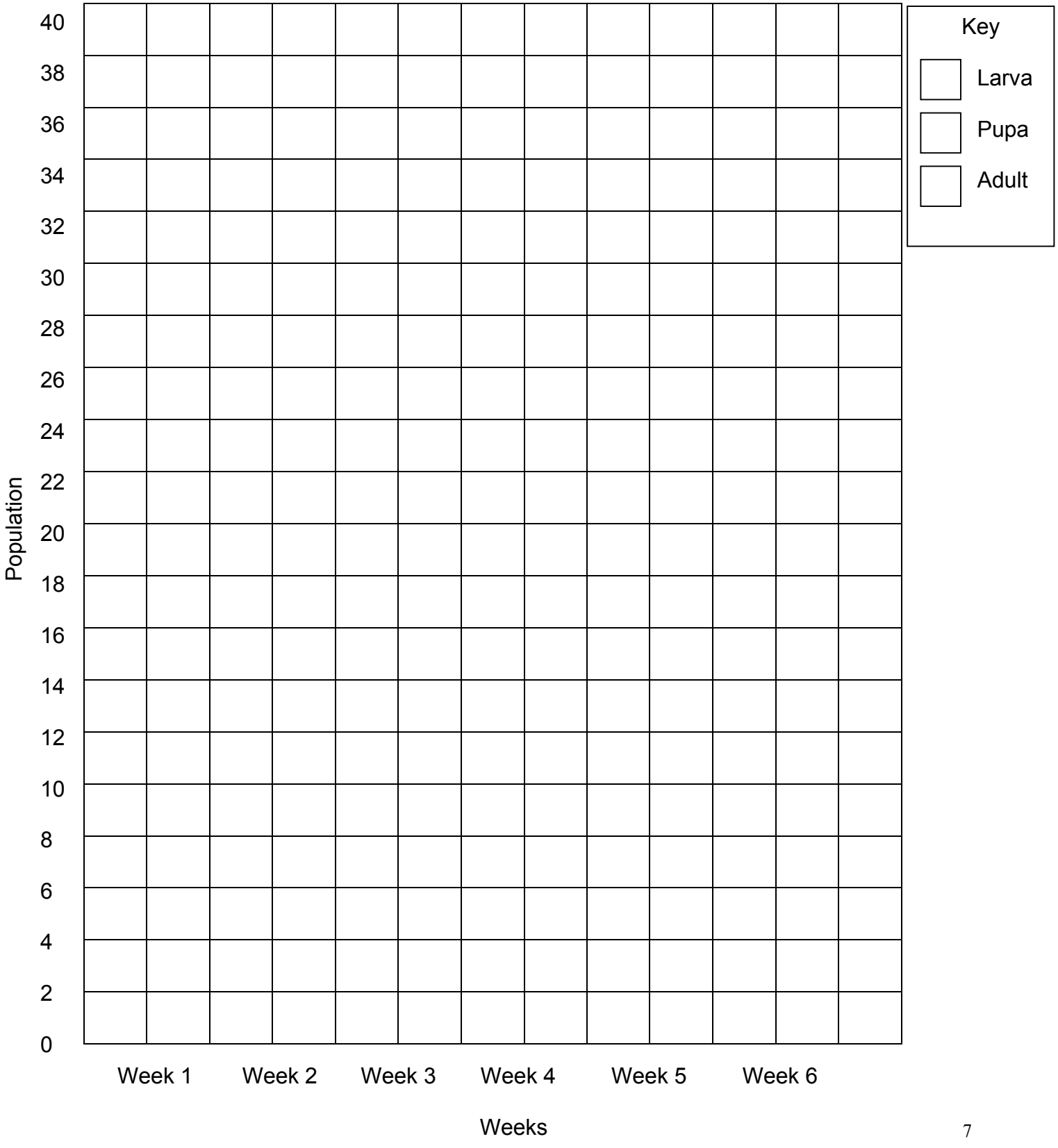
_____

Record your class's mealworm population each week.

Week	Larva	Pupae	Adult
1			
2			
3			
4			
5			
6			

Complete the color key for the graph. Create a line graph for the population of each stage of the life cycle in the classroom for each week.

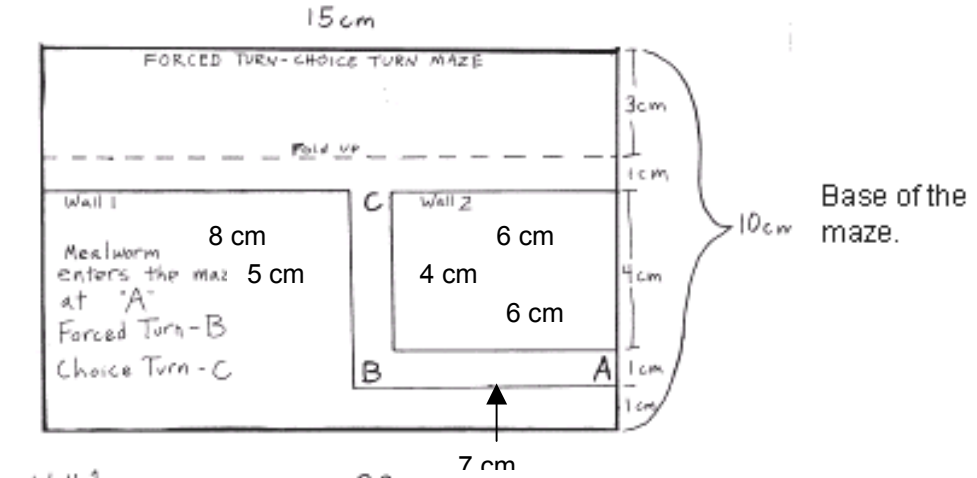
Title:_____

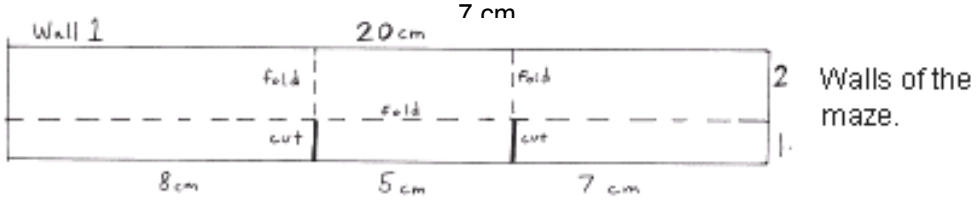


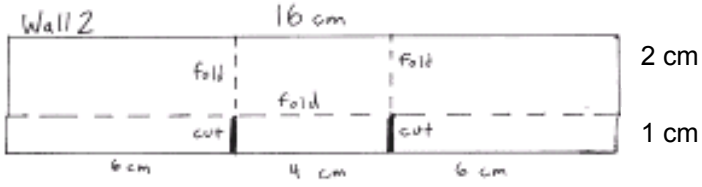
Activity Sheet for Learning Experience #4 **Name**_____

MAZES AND MEALWORMS

Use the pictures below and a metric ruler to accurately draw the maze and its walls on white construction paper. Make note of the measurements below. Tape the walls to the base of the maze.







Place your mealworm in the maze at point A and observe. Write your observations below. Sample questions to ask yourself as you are observing your mealworm:

How did the mealworm react at first when it was placed in the maze?
What path does it follow?
What happens when the mealworm comes to a corner?
What body part does the mealworm seem to use to find its way along the wall?
Do different mealworms act differently in the maze?
What did the mealworm do at point C of the maze?
What do you think caused it to move in that direction?

Can you influence the direction of a mealworm's turn? If so, how?

_____

_____

_____

_____

_____

From your observations, make a hypothesis as to how you think a mealworm senses its way through a maze. Why did you make this prediction?

_____

_____

_____

_____

Activity Sheet for Learning Experience #5 **Name**_____

WRITING EXPERIMENTS

Read each scenerio below and identify the independent variable and dependent variable for each.

Scenerio 1

Jennifer wanted to find out if the color of food would affect whether kindergarten students would select it for lunch. She put food coloring in four identical bowls of mashed potatoes. The colors were red, green, yellow, and blue. Each of the 100 students chose a scoop of potatoes of the color of their choice. She recorded the number of students that chose each color.

Independent Variable _____

_____

Dependent Variable _____

_____

Constants _____

_____

Scenerio 2

Ten of the same seeds were planted in each of five pots and set on the same shelf in her house. The plants were given the following amounts of water each day for 40 days. Pot one, 50 mL; Pot two, 100 mL; Pot three, 150 mL; Pot four, 200 mL; Pot five, 250 mL. The height of the plant was measured at the end of the experiment.

Independent Variable _____

_____

Dependent Variable _____

_____

Constants _____

_____

Scenerio 3

Jeff was interested in seeing if different brands of oil would increase the amount of kernals that popped when he was making popcorn. He tried making popcorn with oil brands x, y, and z. He then counted the number of unpopped kernals after five minutes of popping.

Independent Variable _____

_____

Dependent Variable _____

_____

Constants _____

_____

Activity Sheet for Learning Experience #6 **Name**_____

MEALWORM COLOR PREFERENCE

Identify the variables and constants for this experiment.

Independent Variable _____

_____

Dependent Variable _____

_____

Constants _____

_____

Write the title for this experiment:

Title: The Effect of _____
Independent Variable

_____

on the _____
Dependent Variable

_____

Make a hypothesis based upon your previous observations of the mealworm.

Hypothesis: If _____
Independent Variable

then _____
Dependent Variable

To begin your experiment, place the mealworm in the center of the white square and observe for _____ minutes (decide with your class). Tally the mealworms choices below.

Color Choice	Tally of Trials
White	
Red	
Yellow	
Blue	
Black	

Create a bar graph of the results.

Title_____

30					
28					
26					
24					
22					
20					
18					
16					
14					
12					
11					
10					
8					
6					
4					
2					
0					
	White	Red	Yellow	Blue	Black

Tally of Trials

Color Choices

Conclusions:

What were the major findings (see data chart and graph)?

_____

_____

What possible explanations can you give for the findings?

_____

_____

How could this experiment be improved?

_____

_____

_____

Activity Sheet for Learning Experience #7 **Name**_____

BACKING UP

Identify the variables, constants, and control for this experiment.

Independent Variable _____

_____

Dependent Variable _____

_____

Constants _____

_____

Control _____

_____

Write the title for this experiment:

Title: The Effect of _____
Independent Variable

_____

on the _____
Dependent Variable

_____

Make a hypothesis based upon your previous observations of the mealworm.

Hypothesis: If _____
Independent Variable

then _____
Dependent Variable

To begin your experiment, place the mealworm on the first "X" and place the Q-tip with water on it across from the mealworm 1 centimeter away. Count how many steps the mealworm takes backwards. Record results. Repeat two more trials and find the average for all the trials. Complete with all four Q-tips. Tally the mealworms choices below.

LIQUIDS	**Number of steps backwards**			
	Trial 1	Trial 2	Trial 3	Avg. number of steps backwards
Water				
Alcohol				
Vinegar				
Ammonia				

Create a bar graph of the average results for each liquid.

Title_____

15				
14				
13				
12				
11				
10				
9				
8				
7				
6				
5				
4				
3				
2				
1				
0				
	Water	Alcohol	Vinegar	Ammonia

Average Number of Steps Backwards

Liquids on Q-tips

Conclusions:

What were the major findings (see data chart and graph)?

_____

_____

What possible explanations can you give for the findings?

_____

_____

How could this experiment be improved?

_____

_____

_____

Activity Sheet for Learning Experience #8 **Name**_____

PROCEDURE

With a partner, write the procedure you completed for the experiment in Learning Experience #7 – Backing Up". (You may or may not use all the lines provided).

Materials: _____

_____

Step 1: _____

Step 2: _____

Step 3: _____

Step 4: _____

Step 5: _____

Step 6: _____

Step 7: _____

Step 8: _____

Step 9: _____

Step 10: _____

Read over your procedure and discuss with your partner these four questions.

1. Did I include all the steps?
2. Did I include a list of materials/equipment?
3. Did I indicate the number of repeated trials?
4. Could someone else read this procedure and complete this experiment?

Activity Sheet for Learning Experience #9 **Name**_____

WRITING YOUR OWN EXPERIMENT

Independent Variable _____

_____

Dependent Variable _____

_____

Constants _____

_____

Control _____

_____

Title of Experiment_____

_____

Hypothesis_____

_____

Procedure_____

_____

_____

_____

_____

_____

_____

_____

_____

Independent Variable	Dependent Variable			Average
	Trials			
	1	2	3	

Graph Title: _____

Conclusions:

What were the major findings (see data chart and graph)?

_____

_____

What possible explanations can you give for the findings?

_____

_____

How could this experiment be improved?

_____

_____

_____

Name: _____ Date: _____

Meet the Creatures Student Assessment

Directions: Read the question carefully and answer based on your knowledge about meet the creatures. Circle the correct answer.

1. Four stages in an insects life cycle would suggest the insect would go through:
   a. partial metamorphosis
   b. incomplete metamorphosis
   c. complete metamorphosis
   d. direct metamorphosis

2. The final stage in any metamorphosis is the
   a. egg
   b. pupa
   c. larva
   d. adult

3. The factor that is changed in an experiment is the
   a. hypothesis
   b. variable
   c. control
   d. constant

4. A prediction about the relationship between an independent and a dependant variable is also known as the
   a. hypothesis
   b. conclusion
   c. title
   d. procedure

5. The standard to which you compare the results of your experiment is called the
   a. hypothesis
   b. variable
   c. control
   d. conclusion

6. The variable in an experiment that you purposely change is called the
   a. constant variable
   b. independent variable
   c. dependant variable
   d. static variable

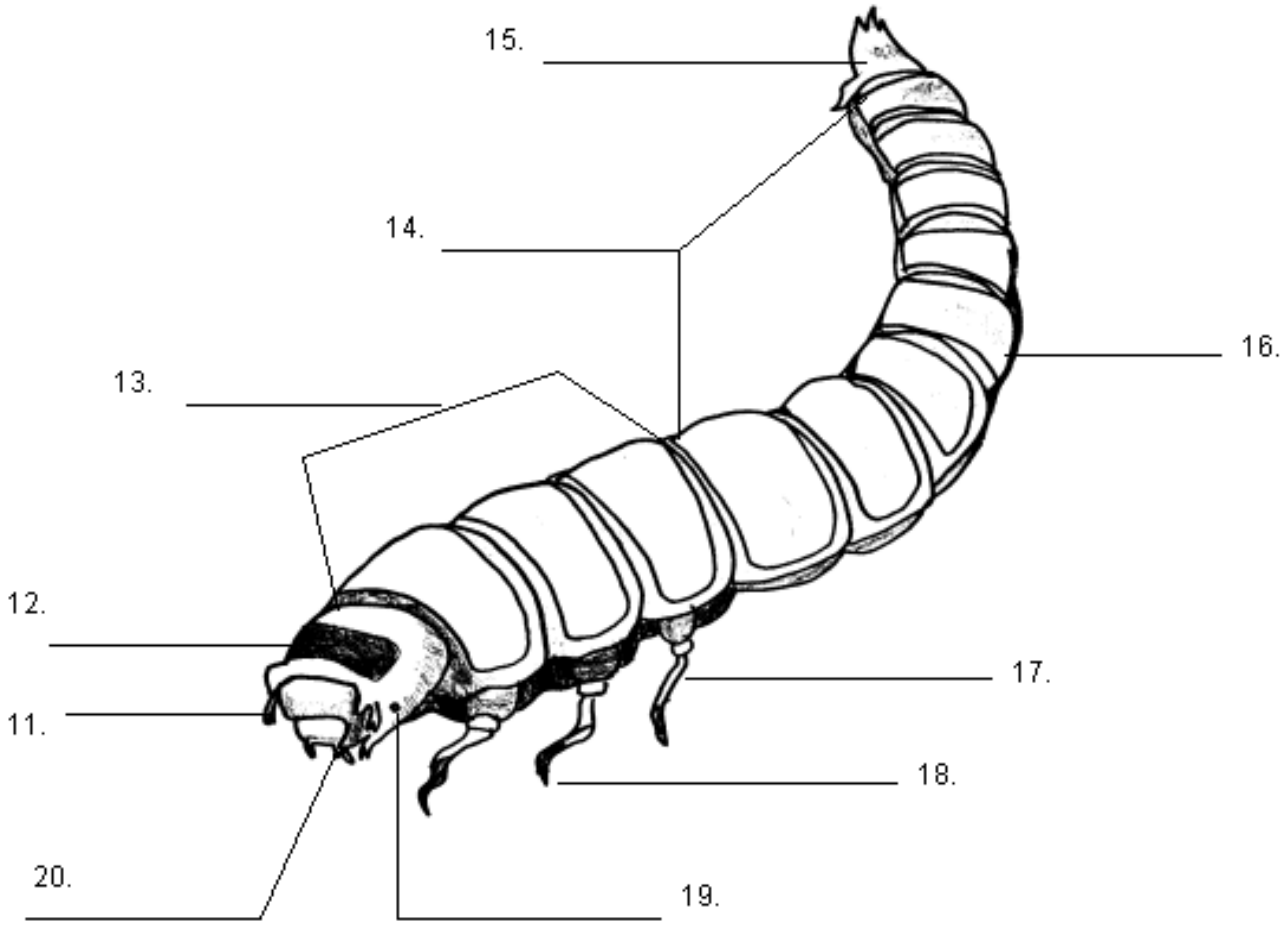
7. The variable that responds when you change something in an experiment is called the
   a. constant variable
   b. independent variable
   c. dependant variable
   d. static variable

8. All the factors that remain the same in an experiment are called the
   a. hypothesis
   b. variable
   c. control
   d. constants

9. The step-by-step set of instructions that tell how the experiment was conducted is the
   a. hypothesis
   b. conclusion
   c. title
   d. procedure

10. In an experiment, the major findings and results are summarized with an explanation of the findings in the
    a. hypothesis
    b. conclusion
    c. title
    d. procedure

Label the diagram of the mealworm with the appropriate body parts.



21. Why is it important to have only one independent variable in an experiment?

_____
_____
_____

22. What if we have two independent variables?

_____
_____
_____

23. Why is it important to have constants in an experiment?

_____
_____
_____

MEET THE CREATURES
STUDENT SELF-ASSESSMENT

Name:_____

Date:_____

1. What do you now know about the life cycle of insects that you didn't know before?

_____

_____

_____

2. What do you know about writing experiments that your did not know before?

_____

_____

_____

3. How do you think you and your partner(s) worked together? Give some examples.

_____

_____

4. What learning experiences did you enjoy? Explain why did you liked them.

_____

_____

5. Were there any learning experiences in the unit you didn't understand or that confused you? Explain your answer.

_____

_____

6. Take another look at your activity sheets and science notebook. Describe how well you think you recorded your observations and ideas.

_____

_____

GLOSSARY

Abdomen:	the lower portion of an insect's body, below the thorax.
Accurate:	correct, exact, or precise.
Adopt:	to take as one's own.
Ammonia:	a strong smelling liquid used in the manufacturing of chemicals.
Antennea:	moveable sense organ on the head of insects.
Care:	protecting or to watch over
Centimeters:	one hundredth of a meter.
Conclusion:	a statement based upon the results of data.
Constant:	the factors that remain the same in the experiment.
Data:	facts or information collected for analysis.
Dependent variable:	the variable that responds to the change of the independent variable.
Fair test:	a scientific test where there are specific items that remain constant.
Handle:	to touch, pick up, or handle with the hands.
Humane:	characterized compassion and sympathy for human beings and animals.
Hypothesis:	an educated guess which the researcher tells how he/she thinks the independent variable will affect the dependent variable.
Independent variable:	the variable that is purposely changed in an experiment.
Larva (Larvae):	the worm-like stage of most insects following the egg and before the pupa stage.
Magnify:	to increase the size of an object as with a lens.
Maze:	a confusing network of paths or passages.

Metamorphosis:	a change in body structure from egg to adult.
Observe:	to become aware of an object or event by using any of the senses to identify properties.
Population:	the number of people or animals living in one place.
Prediction:	an educated guess.
Procedure:	a step by step course of action in an experiment.
Pupa (Pupae):	the stage between the larva and adult stages characterized by long period of rest.
Repeated trials:	to complete an experiment over and over again to increase the confidence in the conclusion and reduce effects of human error.
Results:	the outcome or effect of an experiment.
Segment:	one of the parts of something naturally divided.
Skeleton:	the bony framework of an animal's body.
Thorax:	the portion of an insect's body between the head and abdomen.
Variables:	changes in an experiment that are either purposely changed or a response to a change.