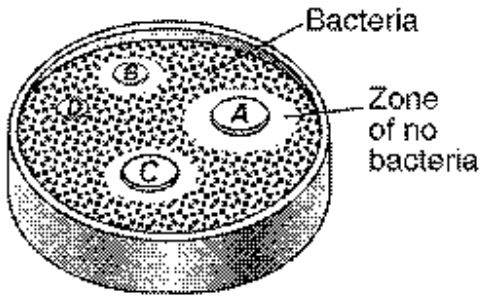
Name: _____

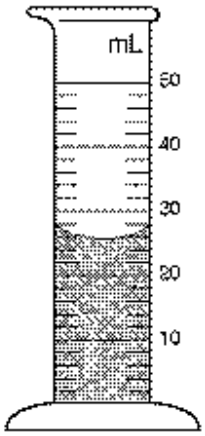
1) Which of the following statements *best* describes a controlled experiment?
   1) It eliminates the need for dependent variables.
   2) It avoids the use of variables.
   3) It tests the effect of a single independent variable.
   4) It shows the effect of a dependent variable on an independent variable.

2) An experiment was carried out to determine which mouthwash was most effective against bacteria commonly found in the mouth. Four paper discs were each dipped into a different brand of mouthwash. The discs were then placed onto the surface of a culture plate that contained food, moisture, and bacteria commonly found in the mouth. The diagram below shows the growth of bacteria on the plate after 24 hours.



Which change in procedure would have improved the experiment?
   1) using bacteria from many habitats other than the mouth
   2) using the same type of mouthwash on each disc
   3) using a smaller plate with less food and moisture
   4) using the same size paper discs for each mouthwash

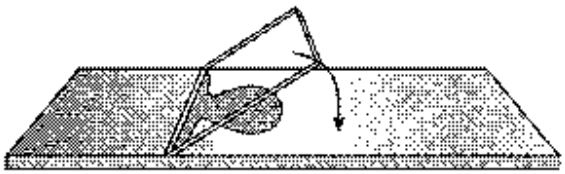
3) What is the volume of the liquid in the graduated cylinder shown below?



   1) 28 mL
   2) 23 mL
   3) 27 mL
   4) 26 mL

4) While viewing a specimen under high power of a compound light microscope, a student noticed that the specimen was out of focus. What part of the microscope should the student turn to obtain a clearer image under high power?
   1) eyepiece
   2) coarse adjustment
   3) fine adjustment
   4) nosepiece

5) The diagram below shows how a cover slip should be lowered onto some single-celled organisms during the preparation of a wet mount.

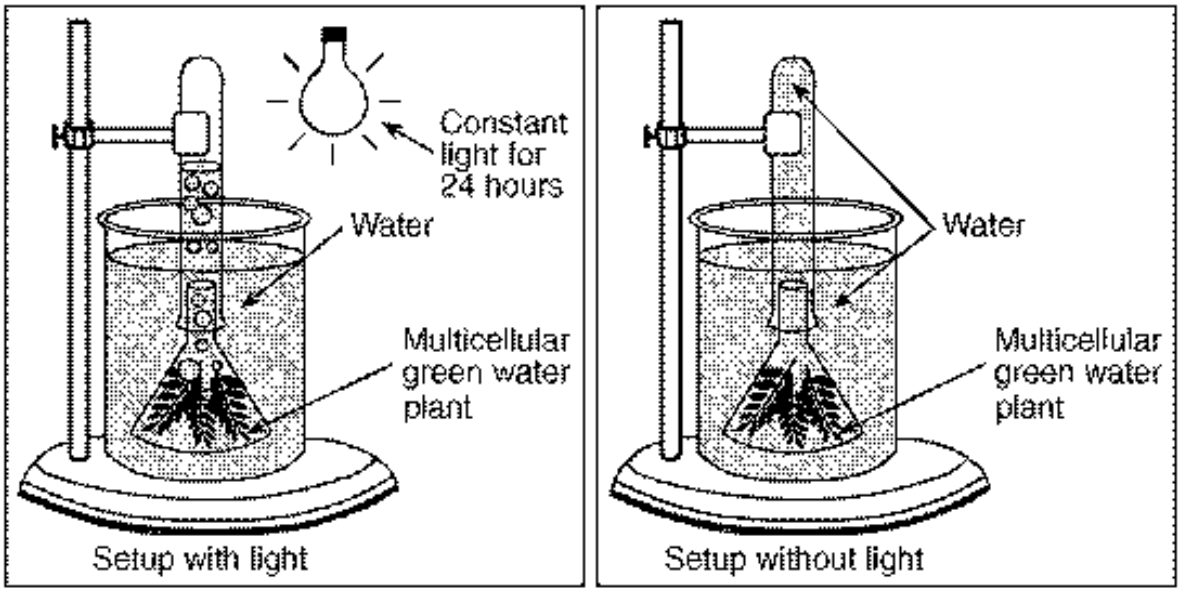


Why is this a preferred procedure?
   1) The coverslip will prevent the slide from breaking.
   2) The possibility of trapping air bubbles is reduced.
   3) The possibility of breaking the coverslip is reduced.
   4) The organisms will be more evenly distributed.

6) A certain plant has white flower petals and it usually grows in soil that is slightly basic. Sometimes the plant produces flowers with red petals. A company that sells the plant wants to know if soil pH affects the color of the petals in this plant.

Design a controlled experiment to determine if soil pH affects petal color. In your experimental design be sure to:
   (1) State the hypothesis to be tested in the experiment.
   (2) State *one* way the control group will be treated differently from the experimental group.
   (3) Identify *two* factors that must be kept the same in both the control group and the experimental group.
   (4) Identify the dependent variable in the experiment.
   (5) State *one* result of the experiment that would support the hypothesis.

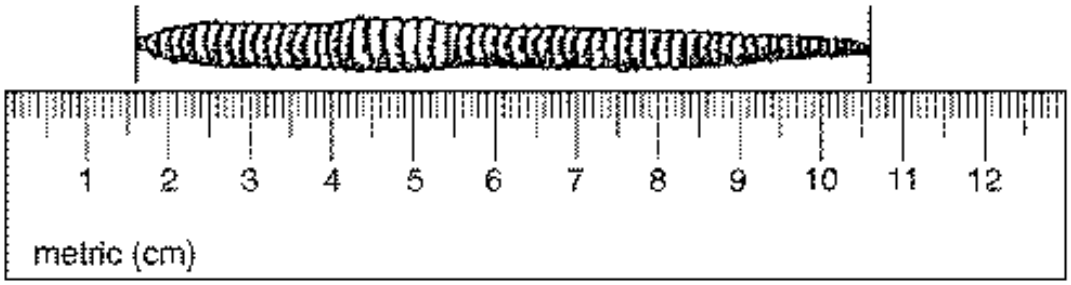
7) An experimental setup is shown in the diagram below.



Which hypothesis would most likely be tested using this setup?

1) Green water plants release a gas in the presence of light.
2) Roots of water plants absorb minerals in the absence of light.
3) Plants grow best in the absence of light.
4) Green plants need light for cell division.

8) What is the approximate length of the earthworm shown in the diagram below?



1) 10.6 cm
2) 106 cm
3) 9 mm
4) 90 mm