

Lab Instructor _____
 Date _____

Name _____

Period 147

Objective: To study some tools used in the biology laboratory

Use full sentences when answering all questions.

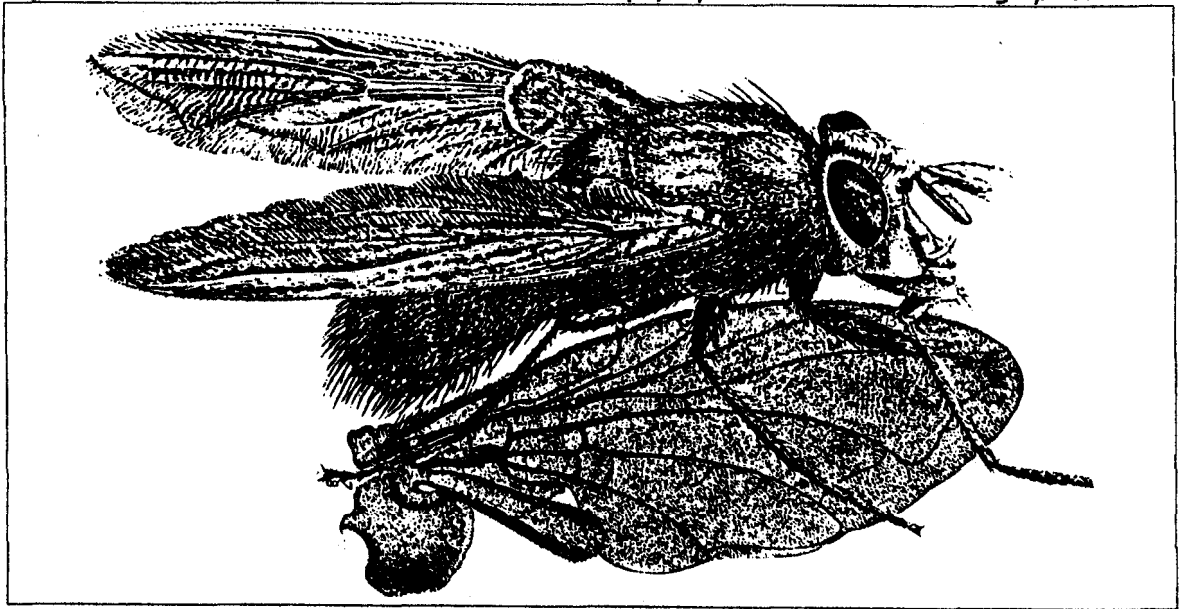
Background

Robert Hooke, pioneer of microscopy, wrote the book called *Micrographia* in 1665. He used his own microscope to observe many kinds of objects, such as living organisms and their parts. He illustrated his observations and included them in his book. Insects were one of Hooke's most detailed drawings. Hooke admired the insects and explained how their limbs helped them to jump. He was amazed by the tiny details he could examine under the microscope. The microscope is but one tool used by scientists in their studies.

Pre-Lab

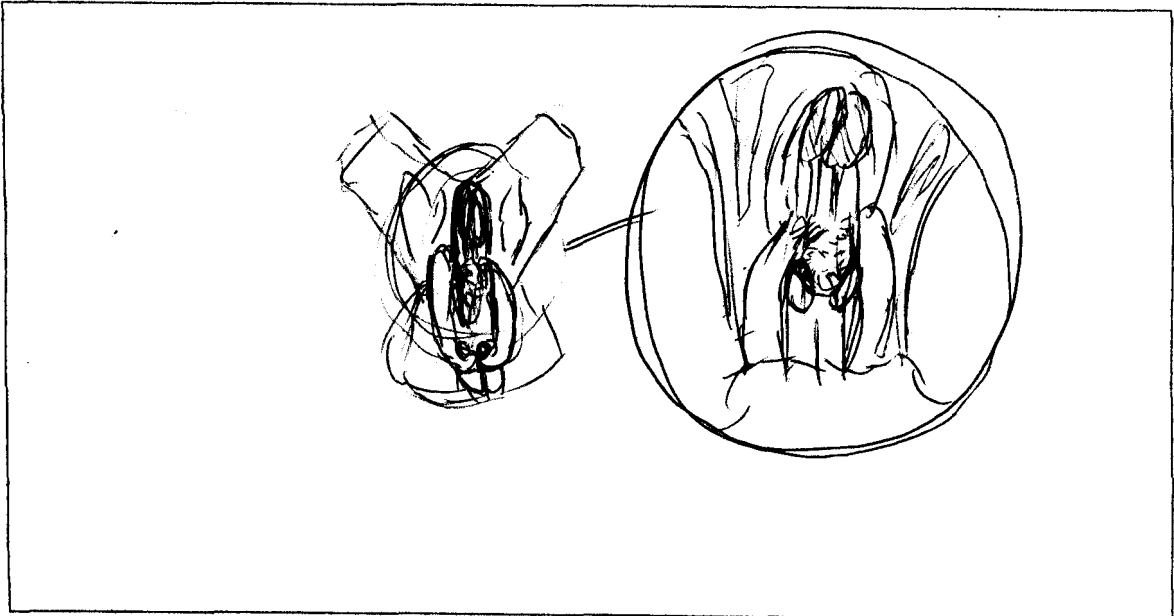
Read the entire lab description and, if needed, consult other texts to complete this section.

Figure 1. The housefly as seen under the microscope; a plate from Hooke's *Micrographia*.



In the space below follow Robert Hooke's fine detailed model above to draw and label another specimen using a hand lens or other available tool.

Figure 2.



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LAB

Materials

metric ruler, triple beam balance, stopwatch, thermometer, volumetric glassware, various samples to measure

Procedures and observations

I. Measured units

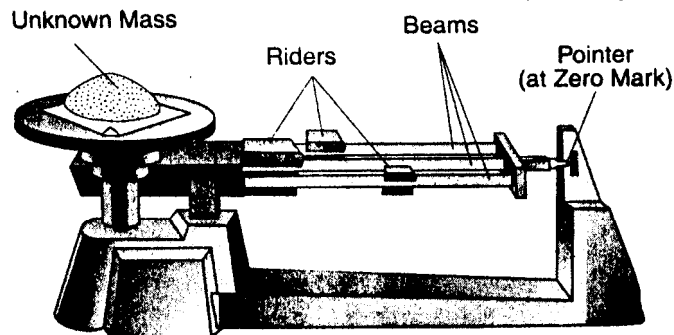
A. Length is considered a fundamental physical quantity. It is also called width, depth, or height. The SI unit of length is the meter. Since the objects we will be working with are small, our measurements will be in centimeters. One centimeter represents 1/100 (one one hundredth) of a meter.



1. How long is the earthworm in the diagram above? Be sure to include appropriate metric units.

What are the dimensions of the sample at Station 1?

B. Mass is the quantity of matter composing an object. We use a balance to determine the mass of an object. There are two basic ways of determining mass in the lab room: measuring mass directly, and determining mass by difference. The SI unit of mass is the gram.



2. Determine the mass of 100 mL water.
What is the mass of an empty 100 mL beaker?

C. Time is a quantity often measured in the biology laboratory. The SI unit of time is the second. A stopwatch can be used to determine the duration of some events.

3. How many minutes are in this class period? seconds? Show your calculations.

D. Temperature is measured in biology for many reasons. Our body temperature, as well as the surrounding temperature of the environment, is key to our well being.

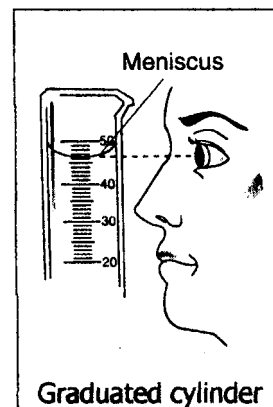
4. What is the current room temperature? _____

Temperature of ice water? _____

II. Derived units

E. Volume of a liquid is measured with a graduated cylinder. Read the volume of the liquid with your eye at the level of the liquid surface. The surface of the liquid in most cases forms a curve, or meniscus. The volume of water is read from the bottom of the meniscus.

5. What is the amount of liquid in the given graduated cylinder? _____



Show your lab instructor a measured volume of 23 mL. After obtaining instructor approval, Empty this graduated cylinder before moving to next station.

Teacher initials _____

F. Density is the amount of matter in an object for a given unit of volume. Density can be calculated by dividing the mass of a substance by its volume.

6. Why does oil float on water?

III. Miscellaneous Laboratory Equipment

Provide the names and a brief description of how the pictured equipment might be used by biologists.

