

The Science of Biology and Science Methods

Objectives - Chapters 1 pp. 2-31

1. Describe at least six characteristics that are common to all living things. (pages 17-19)

2. Use various science methods in solving biological problems (pages 6-9).
 - a. making observations
 - b. sampling/collecting data
 - c. measuring
 - d. questioning
 - e. hypothesizing
 - f. predicting
 - g. experimenting
 - h. quantifying
 - i. graphing
 - data
 - j. analyzing
 - k. making inferences
 - l. classifying

3. Given a “scientific” statement, determine whether it is:
 - a. science or superstition
 - b. evidence (facts) or inference
 - c. a hypothesis or theory(pages 4-5, 10-15)

4. Given a biological problem or question:
 - a. Write a hypothesis that is clearly stated, testable, measurable and includes an independent and dependent variable.
 - b. Design a controlled experiment that will adequately test a hypothesis, has one independent variable, a measurable dependent variable and controls other variables.
 - c. Run a controlled experiment of your design, collect and organize the data into tables and graphs, analyze the results, draw conclusions supported by your data and state whether the results support or do not support your original hypothesis. (pages 6-9)

5. Given a light microscope, point out the following parts and describe their functions.
 - a. base
 - b. arm
 - c. plug and cord
 - d. power switch
 - e. stage
 - f. stage clips
 - g. light source
 - h. diaphragm
 - i. objective lenses
 - j. nose piece
 - k. body tube
 - l. eyepiece
 - m. coarse adjustment knob
 - n. fine adjustment knob

6. Demonstrate the use of the microscope by completing a lab assignment requiring the following skills:
 - a. slide preparation – Prepare a wet mount using a microslide, sample material and cover slip.

- b. focusing – Use the course and fine adjustment knobs in the correct order, centering the object to be studied on low power before moving to higher power lenses.
- c. light adjustment – correctly adjust the diaphragm between lenses to get the best lighting possible of the object to be studied. (pages 26, 190-192).