

What Is Life? A Guide to Biology Student Success Guide Short-Answer Answer Key

Chapter 1

1. You are studying the effects of artificial sweetener on mice. Four groups of mice consume different amounts of sweetener in their food. How much sweetener would the control group receive? Explain your answer.

Answer: The control group is the basis for comparison with the experimental groups and should be treated in the same way as the experimental group except for the single variable being tested. In this case, the variable being tested is artificial sweetener, so we would expect that the control group would not receive any artificial sweetener.

2. You are testing treatments for cancer patients and find that 75% of patients respond very well to a particular treatment while 25% show no improvement or decline in health after taking the experimental treatment. What should you do next?

Answer: Potential answers are variable for this question. In this case it is likely that the experimental design or dosages may need to be reviewed and revised.

3. It is notoriously difficult to perform unbiased studies when human subjects are used. When governmental agencies (like the FDA) are trying to determine the validity of scientific claims, they very closely examine the method in which the experimental studies were done. Name several things that would be important in evaluating how the studies were performed.

Answer: The answers for this question are highly variable. A few potential answers include evaluating how many participants were in the study, whether the studies were controlled and double blind, the repeatability of the study, the demographics of the research subjects, etc.

4. There are many nutritional supplements on the market that allege that they can cause weight loss without dieting or exercise. Suppose you read a claim that a particular supplement causes weight loss and you are given the following information:

- People were weighed at the beginning of the study
- People were asked to take two pills per day
- People were weighed at the end of the study
- People who took the supplement for four weeks seem to have lost some weight at the end of the study
- It was concluded that the supplement is helpful for weight loss

This study has some obvious holes in it. Explain five things that could be done to this study to improve it. Do not assume any information other than what has been provided.