

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Which process used to solve problems in science involves the accumulation of facts through observation until the evidence leads to a general statement about nature? 1) _____
A) Theory B) Hypothesis
C) Inductive reasoning D) Deductive reasoning
- 2) In a double-blind experiment: 2) _____
A) the participants are unaware of whether they are in the experimental or control groups due to the use of placebos.
B) the researchers are unaware of which participants are in the experimental and control groups.
C) participants are randomly assigned to a control or experimental group.
D) All of the above
- 3) The term _____ variable describes when two variables are involved and neither variable can be isolated as having an effect in an experiment. 3) _____
A) statistical B) multiple C) confounding D) blind
- 4) A system involving at least two tissues working together to perform a function would be which of the following? 4) _____
A) Organ B) Tissue C) Molecule D) Cells
- 5) Members of the domains Bacteria and Archaea that lack a nucleus and lack organized compartments are considered which of the following? 5) _____
A) Prokaryotic B) Molds C) Eukaryotic D) Protists
- 6) Which of the following is not an organic compound? 6) _____
A) Nucleic acids
B) Protein
C) Water
D) Lipids
E) Carbohydrates
- 7) Cells that possess a nucleus and are complex due to an organized membrane system belong in which of the following groups? 7) _____
A) Eukaryotic B) Bacteria C) Virus D) Archaea
- 8) Which of the following types of organisms are not composed of eukaryotic cells? 8) _____
A) Plants B) Bacteria C) Fungi D) Animals E) Protists
- 9) During phase I clinical trials, a new drug is tested: 9) _____
A) on less than 100 human volunteers. B) on a few hundred human volunteers.
C) on thousands of human volunteers. D) in an animal model.

- 10) Which of the following is not a characteristic of all living things? 10) _____
A) They contain organic molecules such as carbohydrates, proteins, lipids, and nucleic acids.
B) They respond to stimuli.
C) They are composed of multiple cells.
D) They have adaptive traits.
- 11) Isolation of a single variable in an experiment is important in order to: 11) _____
A) assess the validity of the results. B) prevent researcher bias.
C) prevent the placebo effect. D) All of the above
- 12) Living organisms are different from inanimate objects because they: 12) _____
A) evolve.
B) maintain homeostasis.
C) respond to environmental stimuli.
D) contain DNA.
E) All of the above
- 13) You are classifying an organism and trying to determine to which domain it belongs. The organism is unicellular and was isolated from a very unusual environment. This organism probably belongs in which domain? 13) _____
A) Prokarya B) Eukarya C) Bacteria D) Archaea
- 14) A scientist discovers an unidentified organism composed of multiple cells. Of the choices listed, the most likely classification would be: 14) _____
A) Bacteria. B) Fungi.
C) Archaea. D) Any of the above
- 15) A population differs from an ecosystem because: 15) _____
A) an ecosystem and a population are identical; they are two terms for the same concept.
B) a population consists of all living organisms in an area, whereas an ecosystem consists of only one species.
C) a population consists of all living organisms in the area, whereas an ecosystem consists of all living and nonliving aspects of an area.
D) an ecosystem includes a community, whereas a population does not.
- 16) Researchers testing new drugs usually give the drug to one group of people and give placebos, "sugar pills," to another group. The group receiving the placebo: 16) _____
A) is needed so that the test will be repeated enough times.
B) constitutes the experimental group.
C) is the control group.
D) is a backup in case some of the people getting the drug drop out of the test.
- 17) "An athlete who uses dietary supplements will perform better than one who doesn't." This statement would be an example of which of the following? 17) _____
A) Theory B) Hypothesis
C) A haphazard statement D) Skeptic
- 18) Which of the following levels of organization would a single-celled organism be excluded from? 18) _____
A) Cellular B) Tissue C) Molecular D) Population

- 19) A statement such as "If human body temperature increases to a certain level, then critical proteins will be denatured" would most likely be associated with: 19) _____
A) deductive reasoning. B) conclusions.
C) a hypothesis. D) inductive reasoning.
- 20) Living organisms are members of all of the levels listed; however, rocks are components of: 20) _____
A) an organism. B) the community.
C) the ecosystem. D) the population.
- 21) The pH of soda is fairly acidic. Even after you drink several sodas, the pH of your blood will not fluctuate much. This is an example of your body's ability to: 21) _____
A) respond to stimuli.
B) perform metabolism.
C) maintain homeostasis.
D) adapt.
E) All of the above
- 22) The living organisms in this room compose a(n): 22) _____
A) biosphere. B) ecosystem. C) population. D) community.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 23) A(n) _____ group is treated like an experimental group except for the one variable being tested. 23) _____
- 24) An educated guess or a testable statement used to answer a question about observations is referred to as a(n) _____. 24) _____
- 25) _____ are traits that enable an organism to survive and reproduce in its natural environment. 25) _____
- 26) _____ reasoning involves gathering of facts that lead toward a logical generalized statement or conclusion. 26) _____
- 27) A community and its physical environment are often referred to as a(n) _____. 27) _____
- 28) A(n) _____ is all of the species in an ecosystem that can interact in a geographic area. 28) _____
- 29) All individuals of the same species in an area are called a(n) _____. 29) _____
- 30) A(n) _____ is a group of similar cells that perform the same function. 30) _____
- 31) A(n) _____ is a substance that appears to be identical to a drug being tested but has no known effect on the condition being studied. 31) _____
- 32) _____ is the ability to maintain a relatively constant internal environment. 32) _____
- 33) A(n) _____ involves drug testing on humans. 33) _____

34) The smallest functional unit of life is known as a(n) _____.

34) _____

MATCHING. Choose the item in column 2 that best matches each item in column 1.

Match each definition in the first column to the correct term in the second column.

35) A nondrug substance made to look like a real drug.

A) Critical thinking

35) _____

36) The collection of all chemical reactions that occur in a cell.

B) Epidemiologic studies

36) _____

37) A testable explanation for an observation.

C) Theory

37) _____

38) An explanation for a particular scientific phenomenon that is well supported.

D) Informed consent agreement

E) Homeostasis

38) _____

39) A document that lists all potential negative effects of participation in a study.

F) Hypothesis

G) Placebo

39) _____

40) These examine patterns within populations to find a correlation between a variable and its suspected effects.

H) Metabolism

I) Ecosystem

40) _____

41) The process of evaluating evidence and its source carefully before drawing conclusions.

J) Adaptive trait

41) _____

42) Specific areas in which certain living organisms interact with their environment.

42) _____

43) The ability to maintain a relatively constant internal environment.

43) _____

44) A genetic trait that helps an organism survive and reproduce in its environment.

44) _____

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

45) List and briefly explain the organization of life beginning at the molecular level and continuing through the biosphere.

46) How can you test the following statement using the scientific methodology? "Exam performance is increased based on the amount of sleep obtained the night before an exam."

- 47) A particular virus consists of only DNA and proteins. Viruses attach to the surface of a host cell and inject the viral DNA into the host. The host cell then copies the viral DNA and makes new viruses. Eventually, the host cell is killed, and the new viruses are released. These new viruses search for new hosts to continue the cycle. Use at least three characteristics of life to justify whether a virus is living.
- 48) The maintenance of homeostasis is critical to all living things. Pick an organism, and explain three conditions within the organisms that are regulated by homeostasis.
- 49) It is notoriously difficult to perform unbiased studies when human subjects are used. When governmental agencies such as the U.S. Food and Drug Administration are trying to determine the validity of scientific claims, they very closely examine the method in which the experimental studies were done. Name two things that would be important in evaluating how the studies were performed.
- 50) Lately, there have been many claims concerning the health benefits of green tea. Suppose you read a claim that says drinking green tea causes weight loss. The information provided states that participants were weighed at the beginning of the study, participants were asked to drink 2 cups of green tea every day for 6 weeks, and participants were weighed at the end of the study. Participants who drank the tea for 6 weeks seem to have lost some weight at the end of the study, so it was concluded that green tea is helpful for weight loss. This study has some obvious holes in it. Explain four things that could be done to this study to improve it. Do not assume any information other than what has been provided.

Answer Key

Testname: UNTITLED1

- 1) C
Skill: Level 1 – Factual Recall
- 2) D
Skill: Level 1 – Factual Recall
- 3) C
Skill: Level 1 – Factual Recall
- 4) A
Skill: Level 1 – Factual Recall
- 5) A
Skill: Level 1 – Factual Recall
- 6) C
Skill: Level 1 – Factual Recall
- 7) A
Skill: Level 1 – Factual Recall
- 8) B
Skill: Level 1 – Factual Recall
- 9) A
Skill: Level 1 – Factual Recall
- 10) C
Skill: Level 2 – Conceptual Understanding
- 11) A
Skill: Level 2 – Conceptual Understanding
- 12) E
Skill: Level 2 – Conceptual Understanding
- 13) D
Skill: Level 2 – Conceptual Understanding
- 14) B
Skill: Level 2 – Conceptual Understanding
- 15) D
Skill: Level 2 – Conceptual Understanding
- 16) C
Skill: Level 2 – Conceptual Understanding
- 17) B
Skill: Level 2 – Conceptual Understanding
- 18) B
Skill: Level 2 – Conceptual Understanding
- 19) A
Skill: Level 2 – Conceptual Understanding
- 20) C
Skill: Level 3 – Application
- 21) C
Skill: Level 3 – Application
- 22) D
Skill: Level 3 – Application
- 23) control
Skill:

Answer Key

Testname: UNTITLED1

24) hypothesis

Skill:

25) Adaptive traits

Skill:

26) Inductive

Skill:

27) ecosystem

Skill:

28) community

Skill:

29) population

Skill:

30) tissue

Skill:

31) placebo

Skill:

32) Homeostasis

Skill:

33) clinical trial

Skill:

34) cell

Skill:

35) G

Skill:

36) H

Skill:

37) F

Skill:

38) C

Skill:

39) D

Skill:

40) B

Skill:

41) A

Skill:

42) I

Skill:

43) E

Skill:

44) J

Skill:

Answer Key

Testname: UNTITLED1

- 45) Molecules exist in the cell, which is the basic unit of life, and cells can be arranged to form tissues, which in turn can form organs. Organs can be arranged into organ systems in which the organs have a particular physiological function. Cells, tissues, organs, and organ systems make up an individual. A group of individuals of the same species in a given area form a population. Many populations in an ecosystem make up a community, and all living organisms and abiotic factors that support life on Earth form the biosphere.
Skill:
- 46) The students should formulate a hypothesis, design an experiment that refutes their hypothesis, have a control group, explain how they will collect data, and explain how they will analyze their data.
Skill:
- 47) This is variable. Students may argue that a virus is not alive because it does not reproduce on its own, it is not made of cells, etc. However, a student may argue in the other direction if they tweak the characteristics of life. For example, the student might answer that viruses do reproduce by coercing their host cells to copy their contents.
Skill:
- 48) The answers will be variable, depending on the organism the student selects.
Skill:
- 49) This is variable. Considerations might be the use of control groups, placebos, double-blind studies, repeat studies, etc.
Skill:
- 50) Anything reasonable would work here. The student may suggest that a control group should be used, placebos should be used, the study could be double blind, etc.
Skill: