

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

- 1) In what way(s) is the science of biology influencing and changing our culture? 1) _____
A) by revolutionizing medicine and agriculture
B) by helping us evaluate environmental issues
C) by reshaping our understanding of psychology and sociology
D) by providing new tools for solving crimes
E) all of the above
- 2) What is biology? 2) _____
A) the scientific study of the environment
B) the scientific study of DNA
C) the scientific study of life
D) the scientific study of ecosystems
E) the scientific study of organelles
- 3) Which of the following is *not* a property of life? 3) _____
A) Organisms reproduce their own kind.
B) Populations of organisms are unable to change over time.
C) Living things exhibit complex but ordered organization.
D) Organisms take in energy and use it to perform all of life's activities.
E) Organisms respond to environmental stimuli.
- 4) What are the two main processes that ecosystems depend upon? 4) _____
A) sunlight and photosynthesis
B) nutrient cycling and energy flow
C) photosynthesis and primary production
D) decomposition and nutrient recycling
E) speciation and evolution
- 5) Which of the following is not recycled but is lost from ecosystems? 5) _____
A) sodium
B) magnesium
C) carbon
D) energy
E) nitrogen
- 6) Which of the following is a producer? 6) _____
A) dog
B) cat
C) earthworm
D) house plant
E) sun

- 7) Humans are _____. 7) _____
A) consumers
B) decomposers
C) ecosystems
D) producers
E) cells
- 8) Which of the following structures can perform all the activities required for life? 8) _____
A) DNA molecules
B) organelles
C) A, G, C, and T
D) nuclei
E) cells
- 9) Relative to prokaryotic cells, eukaryotic cells are usually _____. 9) _____
A) smaller and simpler
B) larger and equally complex
C) smaller and equally complex
D) smaller and more complex
E) larger and more complex
- 10) Humans are composed of _____ cells. 10) _____
A) eukaryotic
B) plant
C) archaeal
D) bacterial
E) prokaryotic
- 11) What name is given to the functional compartments of a cell? 11) _____
A) bacteria B) organelles C) genomes D) nuclei E) genes
- 12) The DNA of a eukaryotic cell is found within the _____. 12) _____
A) nucleus
B) prokaryotic cell
C) insulin
D) ecosystem
E) archaea
- 13) What are eukaryotic genes composed of? 13) _____
A) RNA B) DNA C) G D) A E) C
- 14) What is a gene? 14) _____
A) a type of animal cell
B) a unit of heredity
C) a type of prokaryotic cell
D) an organelle that houses DNA
E) a type of eukaryotic cell
- 15) The human genome consists of about _____ chemical letters. 15) _____
A) 10,000 B) 300,000 C) 1 million D) 3 billion E) 300 billion

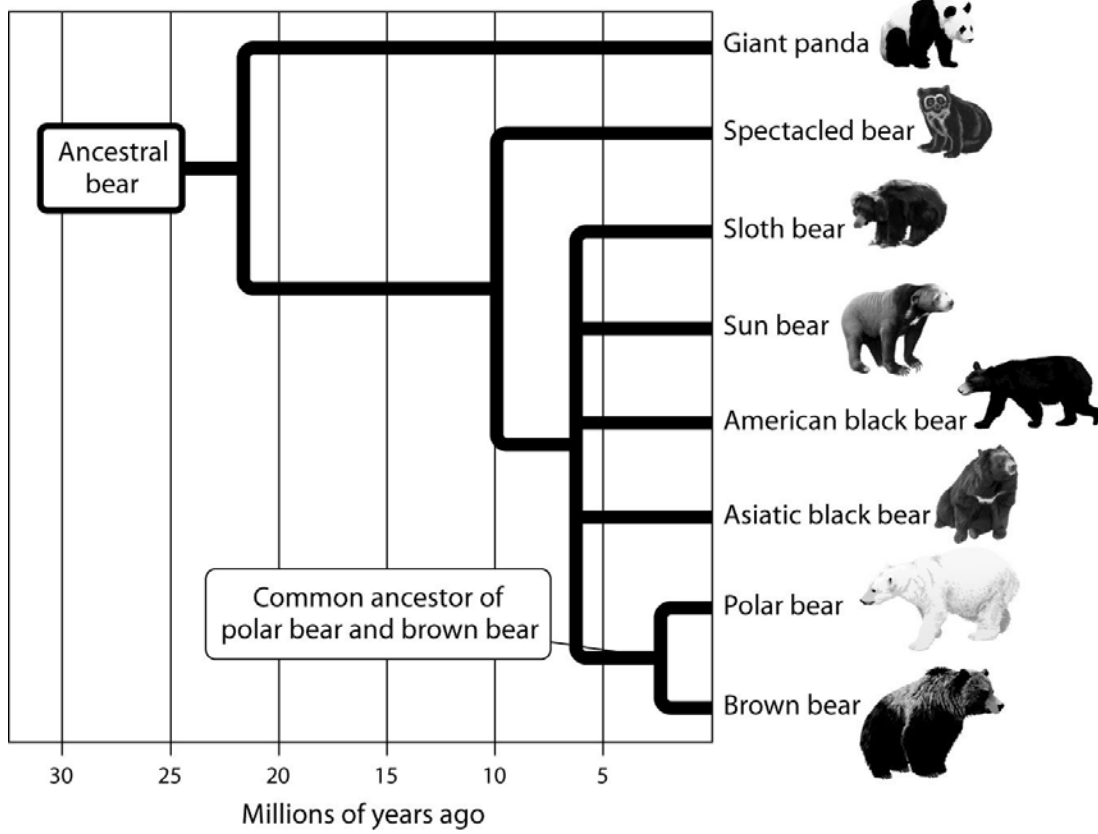
- 16) More than half of all known species are _____. 16) _____
A) plants
B) insects
C) vertebrates
D) fish
E) bacteria
- 17) Taxonomy is the _____. 17) _____
A) study of natural selection
B) study of cells
C) study of genes
D) naming and classifying of species
E) study of organisms and their interaction with the environment
- 18) How does taxonomy assist biologists? 18) _____
A) by reducing life to its smallest common denominator, the cell
B) by explaining why life exists
C) by providing easily remembered scientific names for organisms
D) by categorizing diverse items into smaller and smaller numbers of groups
E) all of the above
- 19) Which domain(s) consist(s) of prokaryotic cells? 19) _____
A) Bacteria only
B) Bacteria and Archaea
C) Archaea only
D) Eukarya only
E) Archaea and Eukarya
- 20) Which kingdom of Eukarya consists primarily of unicellular organisms? 20) _____
A) Bacteria B) Animalia C) Protista D) Fungi E) Plantae
- 21) A newly discovered multicellular organism obtains food by digesting dead organisms. Such an organism is most likely a member of the kingdom _____. 21) _____
A) Protista B) Plantae C) Animalia D) Eukarya E) Fungi
- 22) Members of the kingdom Plantae differ from members of the other kingdoms of Eukarya in that most members of the kingdom Plantae _____. 22) _____
A) are unicellular
B) obtain food by ingestion
C) are decomposers
D) produce their own food
E) are consumers
- 23) The branch of biology that explains both the diversity and the unity of life is _____. 23) _____
A) evolution
B) genetics
C) physiology
D) taxonomy
E) microbiology

- 24) Which of these is most closely associated with Darwin? 24) _____
A) ecosystem structure
B) the three domains of life
C) organelles
D) DNA
E) natural selection
- 25) Which of these is required for natural selection to occur? 25) _____
A) individual variation
B) unequal reproductive success
C) overproduction
D) inheritance
E) all of the above
- 26) Unequal reproductive success _____. 26) _____
A) increases variation
B) can lead to a population being less well adapted to its environment
C) always decreases the size of a population
D) can lead to natural selection
E) does not affect the frequency of expression of traits in succeeding generations of a population
- 27) What does adaptation mean in a biological context? 27) _____
A) the changes that occur in individuals as they grow and develop
B) the accumulation of favorable variations in a population over time
C) the way an individual's body adjusts to its environment
D) the ability of organisms to alter their appearance under changing environmental conditions
E) all of the above
- 28) What accounts for the different breeds of domesticated dogs? 28) _____
A) artificial selection
B) variation
C) overproduction
D) competition
E) natural selection
- 29) Over a span of two decades, scientists measured changes in the beak size of a population of Galápagos ground finches. This _____. 29) _____
A) is an example of overproduction
B) led Darwin to his theory of evolution through natural selection
C) occurred because of selective predation
D) is an example of artificial selection
E) provided evidence of natural selection in action
- 30) Science is _____. 30) _____
A) the explanation of phenomena based on supernatural causation
B) an organized set of principles for how to ethically and morally behave
C) the inquiry-based effort to describe and explain nature
D) the search for truth
E) all of the above

- 31) What is the difference between discovery science and hypothesis-driven science? 31) _____
- A) There is no difference between them.
 - B) Discovery science "discovers" new knowledge, whereas hypothesis-driven science does not.
 - C) Discovery science is mostly about describing nature, whereas hypothesis-driven science tries to explain nature.
 - D) Discovery science involves predictions about outcomes, whereas hypothesis-driven science involves tentative answers to specific questions.
 - E) Discovery science is based on deductive reasoning, whereas hypothesis-driven science is based on inductive reasoning.
- 32) Which of these statements is correct? 32) _____
- A) Science can be used to prove or disprove the idea that deities or spirits cause earthquakes and other natural disasters.
 - B) Science does not require observations that other people can confirm.
 - C) In science, a hypotheses is an absolute truth.
 - D) Only discovery science can lead to important conclusions about nature.
 - E) Scientific ideas are subjected to repeated testing.
- 33) Discovery science is primarily based on _____. 33) _____
- A) hypothesis testing
 - B) observation
 - C) theory
 - D) deduction
 - E) experimentation
- 34) How does inductive reasoning differ from deductive reasoning? 34) _____
- A) Inductive reasoning involves going from the specific to the general, whereas deductive reasoning involves going from the general to the specific.
 - B) Deductive reasoning involves going from the specific to the general, whereas inductive reasoning involves going from the general to the specific.
 - C) Inductive reasoning is based on experimentation, and deductive reasoning is based on observation.
 - D) Discovery science utilizes deductive reasoning, not inductive reasoning, to establish conclusions.
 - E) Inductive reasoning is based on hypotheses, and deductive reasoning is not.
- 35) Which of these would be a valid hypothesis? 35) _____
- A) Humans are responsible for the sustainable use of resources.
 - B) Human history is determined by a series of supernatural events.
 - C) Humans and bacteria share a common genetic code.
 - D) Humans should help in the conservation of other animal species.
 - E) Humans are controlled by forces beyond our understanding.
- 36) A hypothesis is a(n) _____. 36) _____
- A) fact
 - B) tentative explanation
 - C) theory
 - D) guess
 - E) observation

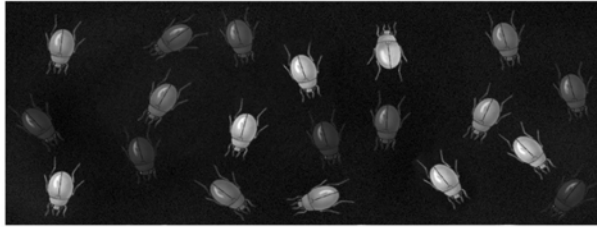
- 37) You try to start your car, but it does not start. Which of these is a hypothesis? 37) _____
- A) My car is too old to function properly.
 - B) My car will not start.
 - C) What is wrong with my car?
 - D) My car's battery is dead.
 - E) If I recharge the battery, then my car will start.
- 38) You try to start your car, but it does not start. Which of these is deductive testing? 38) _____
- A) My car is too old to function properly.
 - B) My car's battery is dead.
 - C) What is wrong with my car?
 - D) My car will not start.
 - E) If I recharge the battery, then my car will start.
- 39) Which of the following are the proper components of the scientific method? 39) _____
- A) observation, question, hypothesis, prediction, experiment, results, conclusion
 - B) observation, question, opinion, conclusion, hypothesis
 - C) question, observation, experiment, analysis, prediction
 - D) experiment, conclusion, application
 - E) prediction, hypothesis, experiment, conclusion
- 40) In a scientific experiment, the control group _____. 40) _____
- A) is subjected to the factor whose effect is being tested
 - B) is required for the validity of discovery science
 - C) serves to increase the sample size of the experiment
 - D) serves as a basis of comparison with the experimental group
 - E) allows for the simultaneous testing of multiple variables
- 41) How do hypotheses differ from theories? 41) _____
- A) Theories are more comprehensive than hypotheses.
 - B) Theories must be testable; hypotheses do not need to be testable.
 - C) Hypotheses are derived from experimentation, whereas theories are derived from observation.
 - D) Hypotheses are more generally stated than theories.
 - E) Hypotheses are educated guesses, and theories are tentative explanations.
- 42) Antibiotic resistance evolves in bacteria because _____. 42) _____
- A) doctors do not prescribe antibiotics for diseases caused by viruses
 - B) farmers do not use enough antibiotics in animal feed
 - C) the antibiotics create resistance genes in bacteria
 - D) the presence of antibiotics favors bacteria that already have genes for resistance
 - E) none of the above

43) Using the branching tree of life for bears depicted in the accompanying figure, choose from among the following bear species the one that is most distantly related to the sun bear. 43) _____

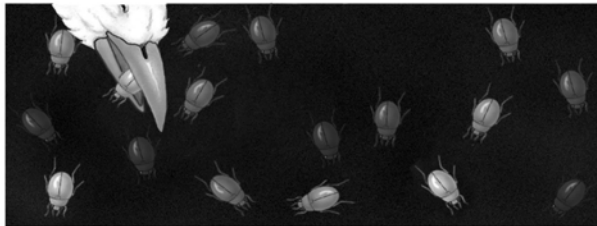


- A) sloth bear
- B) brown bear
- C) spectacled bear
- D) Asiatic black bear
- E) giant panda

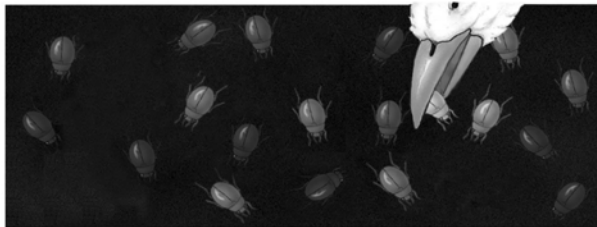
44) In the process of evolution by natural selection illustrated in the accompanying figure, which of the following is the mechanism or agent of natural selection? 44) _____



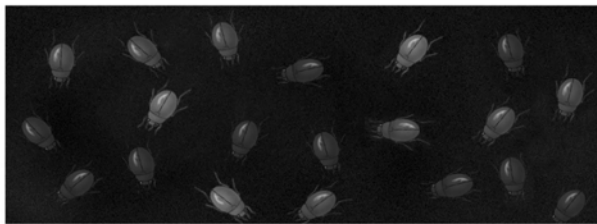
Population with varied inherited traits.



Elimination of individuals with certain traits.



Reproduction of survivors.



Increasing frequency of traits that enhance survival and reproductive success.

- A) selective breeding
- B) artificial selection
- C) selective trees
- D) selective beetles
- E) selective predation

Please use the following information to answer the following question(s).

The collared lizard is a species found in the Desert Southwest. Male collared lizards show considerable color variation, ranging from brightly colored to a very dull pattern. Your goal is to determine the function, if any, of male color patterns in collared lizards, using the scientific method. Your tentative explanation is that male color plays a role in attracting females for mating purposes. You predict that females will preferentially choose brightly colored males over dull-colored ones. To test this prediction, you observed the interactions of female collared lizards with their male counterparts. You selected males that were the same age and size, and that differed only in their coloration pattern. You placed equal numbers of the two types of male lizards, bright and dull, in aquariums, along with one female lizard per aquarium. Out of 350 aquariums observed, the female chose to mate with the brightly colored male 277 times, and the dull-colored male 70 times. In 3 instances, the females did not mate with either type.

Create a bar graph of your data, plotting the type of male (dull or brightly colored) on the x -axis. On the y -axis, plot the frequency with which each type of male was chosen by females. Using this graph, answer the following question(s).

- 45) Is it reasonable to conclude (i.e., is it supported by the data) that female collared lizards prefer more brightly colored male lizards over dull-colored males? 45) _____
- A) Yes, this conclusion is supported by the data.
 - B) No, this conclusion is not supported by the data.
 - C) The data do not clearly indicate a preference one way or the other.
 - D) There is no way to conclude anything from this data.
 - E) None of the above choices are correct.
- 46) Identify the experimental group of this case study. 46) _____
- A) brightly colored female lizards
 - B) dull-colored female lizards
 - C) brightly colored male lizards
 - D) dull-colored male lizards
 - E) all of the above
- 47) Dull-colored males were part of the _____. 47) _____
- A) observation group
 - B) predicted group
 - C) control group
 - D) hypothesized group
 - E) experimental group
- 48) Which of the following is the hypothesis of this case study? 48) _____
- A) Dull males are less likely to be eaten by predators.
 - B) A function of male coloration is to attract females.
 - C) Males prefer brightly colored females.
 - D) Male lizards are brightly colored.
 - E) Male collared lizards exhibit color variation.
- 49) "Male collared lizards show considerable color variation." This is a(n) _____. 49) _____
- A) result
 - B) hypothesis
 - C) observation
 - D) opinion
 - E) conclusion

Answer Key

Testname: UNTITLED1

- 1) E
Skill: Knowledge/Comprehension
- 2) C
Skill: Knowledge/Comprehension
- 3) B
Skill: Knowledge/Comprehension
- 4) B
Skill: Knowledge/Comprehension
- 5) D
Skill: Knowledge/Comprehension
- 6) D
Skill: Knowledge/Comprehension
- 7) A
Skill: Knowledge/Comprehension
- 8) E
Skill: Knowledge/Comprehension
- 9) E
Skill: Knowledge/Comprehension
- 10) A
Skill: Knowledge/Comprehension
- 11) B
Skill: Knowledge/Comprehension
- 12) A
Skill: Knowledge/Comprehension
- 13) B
Skill: Knowledge/Comprehension
- 14) B
Skill: Knowledge/Comprehension
- 15) D
Skill: Knowledge/Comprehension
- 16) B
Skill: Knowledge/Comprehension
- 17) D
Skill: Knowledge/Comprehension
- 18) D
Skill: Knowledge/Comprehension
- 19) B
Skill: Knowledge/Comprehension
- 20) C
Skill: Knowledge/Comprehension
- 21) E
Skill: Application/Analysis
- 22) D
Skill: Knowledge/Comprehension
- 23) A
Skill: Application/Analysis

Answer Key

Testname: UNTITLED1

- 24) E
Skill: Knowledge/Comprehension
- 25) E
Skill: Knowledge/Comprehension
- 26) D
Skill: Knowledge/Comprehension
- 27) B
Skill: Knowledge/Comprehension
- 28) A
Skill: Knowledge/Comprehension
- 29) E
Skill: Knowledge/Comprehension
- 30) C
Skill: Knowledge/Comprehension
- 31) C
Skill: Knowledge/Comprehension
- 32) E
Skill: Knowledge/Comprehension
- 33) B
Skill: Knowledge/Comprehension
- 34) A
Skill: Knowledge/Comprehension
- 35) C
Skill: Knowledge/Comprehension
- 36) B
Skill: Knowledge/Comprehension
- 37) D
Skill: Application/Analysis
- 38) E
Skill: Application/Analysis
- 39) A
Skill: Knowledge/Comprehension
- 40) D
Skill: Knowledge/Comprehension
- 41) A
Skill: Knowledge/Comprehension
- 42) D
Skill: Knowledge/Comprehension
- 43) E
Skill: Application/Analysis
- 44) E
Skill: Application/Analysis
- 45) A
Skill: Application/Analysis
- 46) C
Skill: Application/Analysis

Answer Key

Testname: UNTITLED1

47) C

Skill: Application/Analysis

48) B

Skill: Application/Analysis

49) C

Skill: Application/Analysis