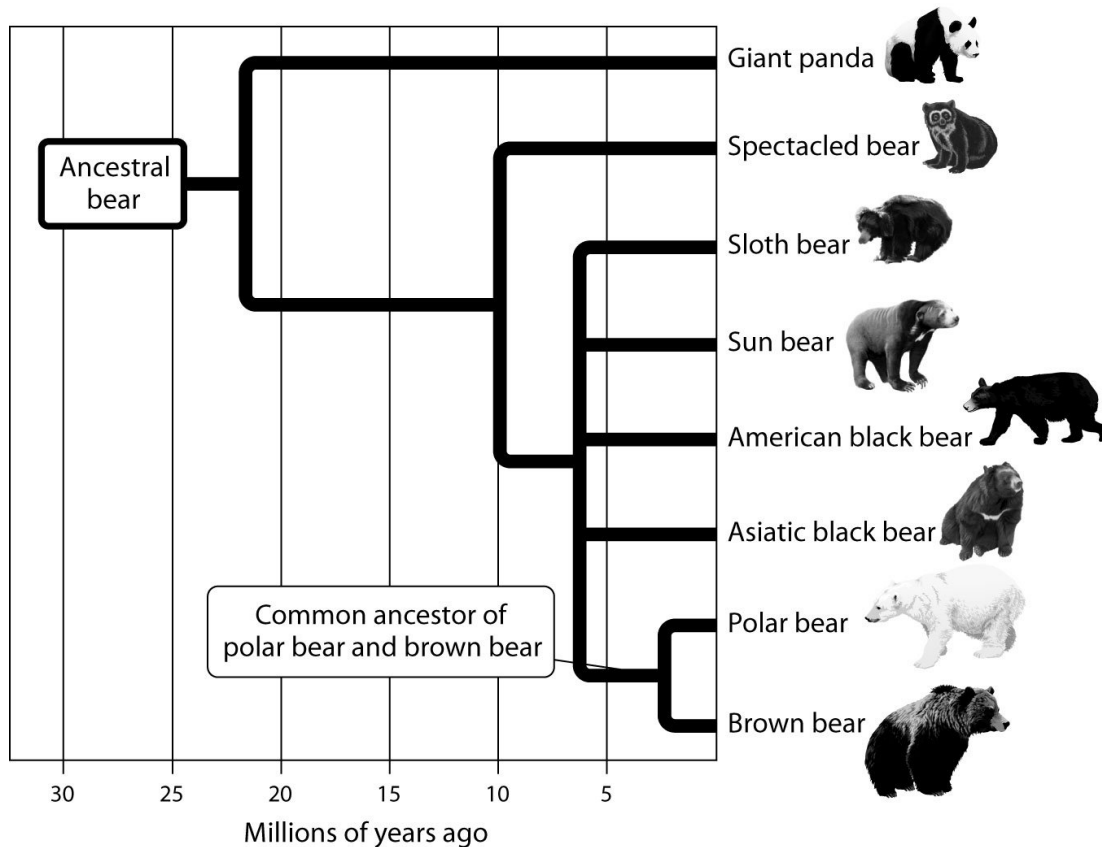


Name _____

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

- 1) 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. 1) _____



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

Answer: B

- 2) The branch of biology that explains both the diversity and the unity of life is _____. 2) _____

- A) taxonomy
- B) evolution
- C) microbiology
- D) physiology
- E) genetics

Answer: B

- 3) Which of the following structures can perform all the activities required for life? 3) _____
- A) organelles
 - B) cells
 - C) DNA molecules
 - D) A, G, C, and T
 - E) nuclei

Answer: B

- 4) Which kingdom of Eukarya consists primarily of unicellular organisms? 4) _____
- A) Animalia
 - B) Plantae
 - C) Protista
 - D) Bacteria
 - E) Fungi

Answer: C

- 5) What is biology? 5) _____
- A) the scientific study of organelles
 - B) the scientific study of life
 - C) the scientific study of DNA
 - D) the scientific study of the environment
 - E) the scientific study of ecosystems

Answer: B

- 6) What are eukaryotic genes composed of? 6) _____
- A) G
 - B) RNA
 - C) DNA
 - D) C
 - E) A

Answer: C

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).

- 7) 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? 7) _____
- 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.

Answer: A

8) Taxonomy is the _____.

8) _____

- A) study of genes
- B) study of natural selection
- C) naming and classifying of species
- D) study of organisms and their interaction with the environment
- E) study of cells

Answer: C

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).

9) Dull-colored males were part of the _____.

9) _____

- A) predicted group
- B) observation group
- C) control group
- D) experimental group
- E) hypothesized group

Answer: C

10) Which of these statements is correct?

10) _____

- A) Only discovery science can lead to important conclusions about nature.
- B) Science can be used to prove or disprove the idea that deities or spirits cause earthquakes and other natural disasters.
- C) Scientific ideas are subjected to repeated testing.
- D) In science, a hypotheses is an absolute truth.
- E) Science does not require observations that other people can confirm.

Answer: C

11) What accounts for the different breeds of domesticated dogs?

11) _____

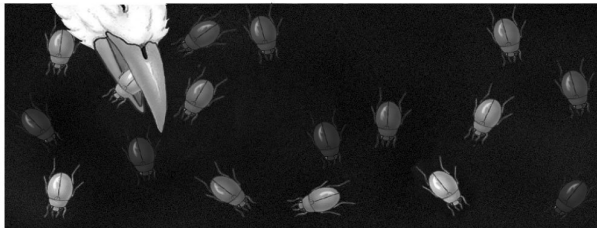
- A) natural selection
- B) variation
- C) competition
- D) artificial selection
- E) overproduction

Answer: D

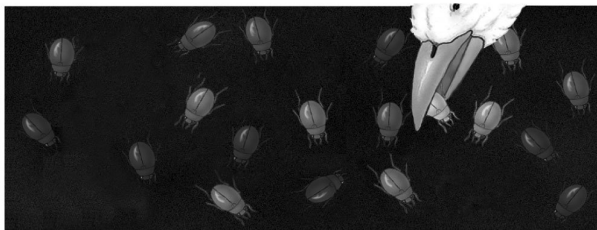
12) In the process of evolution by natural selection illustrated in the accompanying figure, which of the following is the mechanism or agent of natural selection? 12) _____



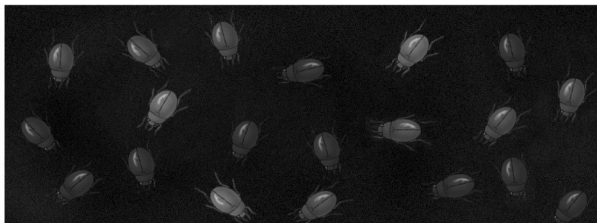
Population with varied inherited traits.



Elimination of individuals with certain traits.



Reproduction of survivors.



Increasing frequency of traits that enhance survival and reproductive success.

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

Answer: D

13) More than half of all known species are _____.

13) _____

- A) insects
- B) plants
- C) vertebrates
- D) bacteria
- E) fish

Answer: A

14) How do hypotheses differ from theories?

14) _____

- A) Theories are more comprehensive than hypotheses.
- B) Hypotheses are more generally stated than theories.
- C) Hypotheses are educated guesses, and theories are tentative explanations.
- D) Hypotheses are derived from experimentation, whereas theories are derived from observation.
- E) Theories must be testable; hypotheses do not need to be testable.

Answer: A

15) How does inductive reasoning differ from deductive reasoning?

15) _____

- A) Discovery science utilizes deductive reasoning, not inductive reasoning, to establish conclusions.
- B) Inductive reasoning involves going from the specific to the general, whereas deductive reasoning involves going from the general to the specific.
- C) Deductive reasoning involves going from the specific to the general, whereas inductive reasoning involves going from the general to the specific.
- D) Inductive reasoning is based on hypotheses, and deductive reasoning is not.
- E) Inductive reasoning is based on experimentation, and deductive reasoning is based on observation.

Answer: B

16) Which domain(s) consist(s) of prokaryotic cells?

16) _____

- A) Archaea and Eukarya
- B) Bacteria and Archaea
- C) Archaea only
- D) Eukarya only
- E) Bacteria only

Answer: B

17) You try to start your car, but it does not start. Which of these is a hypothesis?

17) _____

- A) My car is too old to function properly.
- B) My car's battery is dead.
- C) My car will not start.
- D) What is wrong with my car?
- E) If I recharge the battery, then my car will start.

Answer: B

- 18) A hypothesis is a(n) _____. 18) _____
A) guess
B) observation
C) fact
D) tentative explanation
E) theory
Answer: D
- 19) The DNA of a eukaryotic cell is found within the _____. 19) _____
A) prokaryotic cell
B) ecosystem
C) nucleus
D) insulin
E) archaea
Answer: C
- 20) The human genome consists of about _____ chemical letters. 20) _____
A) 10,000 B) 300,000 C) 1 million D) 3 billion E) 300 billion
Answer: D
- 21) Which of the following are the proper components of the scientific method? 21) _____
A) prediction, hypothesis, experiment, conclusion
B) experiment, conclusion, application
C) observation, question, hypothesis, prediction, experiment, results, conclusion
D) observation, question, opinion, conclusion, hypothesis
E) question, observation, experiment, analysis, prediction
Answer: C
- 22) Members of the kingdom Plantae differ from members of the other kingdoms of Eukarya in that 22) _____
most members of the kingdom Plantae _____.
A) obtain food by ingestion
B) are consumers
C) are unicellular
D) are decomposers
E) produce their own food
Answer: E
- 23) You try to start your car, but it does not start. Which of these is deductive testing? 23) _____
A) My car's battery is dead.
B) What is wrong with my car?
C) My car is too old to function properly.
D) My car will not start.
E) If I recharge the battery, then my car will start.
Answer: E

- 24) Humans are _____. 24) _____
A) decomposers
B) ecosystems
C) producers
D) consumers
E) cells
Answer: D
- 25) In what way(s) is the science of biology influencing and changing our culture? 25) _____
A) by reshaping our understanding of psychology and sociology
B) by revolutionizing medicine and agriculture
C) by providing new tools for solving crimes
D) by helping us evaluate environmental issues
E) all of the above
Answer: E
- 26) In a scientific experiment, the control group _____. 26) _____
A) is subjected to the factor whose effect is being tested
B) serves to increase the sample size of the experiment
C) allows for the simultaneous testing of multiple variables
D) is required for the validity of discovery science
E) serves as a basis of comparison with the experimental group
Answer: E
- 27) Humans are composed of _____ cells. 27) _____
A) archaeal
B) eukaryotic
C) bacterial
D) prokaryotic
E) plant
Answer: B
- 28) Which of these is most closely associated with Darwin? 28) _____
A) ecosystem structure
B) natural selection
C) the three domains of life
D) DNA
E) organelles
Answer: B
- 29) What is a gene? 29) _____
A) a type of eukaryotic cell
B) a type of animal cell
C) a unit of heredity
D) a type of prokaryotic cell
E) an organelle that houses DNA
Answer: C

- 30) What are the two main processes that ecosystems depend upon? 30) _____
A) photosynthesis and primary production
B) decomposition and nutrient recycling
C) nutrient cycling and energy flow
D) sunlight and photosynthesis
E) speciation and evolution
Answer: C
- 31) Unequal reproductive success _____. 31) _____
A) can lead to natural selection
B) increases variation
C) can lead to a population being less well adapted to its environment
D) always decreases the size of a population
E) does not affect the frequency of expression of traits in succeeding generations of a population
Answer: A
- 32) Which of these would be a valid hypothesis? 32) _____
A) Humans should help in the conservation of other animal species.
B) Human history is determined by a series of supernatural events.
C) Humans are controlled by forces beyond our understanding.
D) Humans and bacteria share a common genetic code.
E) Humans are responsible for the sustainable use of resources.
Answer: D
- 33) Which of the following is a producer? 33) _____
A) earthworm
B) house plant
C) dog
D) cat
E) sun
Answer: B
- 34) What is the difference between discovery science and hypothesis-driven science? 34) _____
A) Discovery science is based on deductive reasoning, whereas hypothesis-driven science is based on inductive reasoning.
B) There is no difference between them.
C) Discovery science involves predictions about outcomes, whereas hypothesis-driven science involves tentative answers to specific questions.
D) Discovery science "discovers" new knowledge, whereas hypothesis-driven science does not.
E) Discovery science is mostly about describing nature, whereas hypothesis-driven science tries to explain nature.
Answer: E
- 35) A newly discovered multicellular organism obtains food by digesting dead organisms. Such an organism is most likely a member of the kingdom _____. 35) _____
A) Eukarya B) Fungi C) Animalia D) Plantae E) Protista
Answer: B

36) Over a span of two decades, scientists measured changes in the beak size of a population of Galápagos ground finches. This _____.

36) _____

- A) is an example of artificial selection
- B) is an example of overproduction
- C) led Darwin to his theory of evolution through natural selection
- D) provided evidence of natural selection in action
- E) occurred because of selective predation

Answer: D

37) Discovery science is primarily based on _____.

37) _____

- A) experimentation
- B) observation
- C) theory
- D) deduction
- E) hypothesis testing

Answer: B

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).

38) Which of the following is the hypothesis of this case study?

38) _____

- A) Male collared lizards exhibit color variation.
- B) Dull males are less likely to be eaten by predators.
- C) Males prefer brightly colored females.
- D) A function of male coloration is to attract females.
- E) Male lizards are brightly colored.

Answer: D

39) Antibiotic resistance evolves in bacteria because _____.

39) _____

- A) the presence of antibiotics favors bacteria that already have genes for resistance
- B) doctors do not prescribe antibiotics for diseases caused by viruses
- C) the antibiotics create resistance genes in bacteria
- D) farmers do not use enough antibiotics in animal feed
- E) none of the above

Answer: A

- 40) Which of the following is not recycled but is lost from ecosystems? 40) _____
A) sodium
B) magnesium
C) carbon
D) energy
E) nitrogen
Answer: D
- 41) What does adaptation mean in a biological context? 41) _____
A) the way an individual's body adjusts to its environment
B) the ability of organisms to alter their appearance under changing environmental conditions
C) the accumulation of favorable variations in a population over time
D) the changes that occur in individuals as they grow and develop
E) all of the above
Answer: C
- 42) Science is _____. 42) _____
A) an organized set of principles for how to ethically and morally behave
B) the search for truth
C) the inquiry-based effort to describe and explain nature
D) the explanation of phenomena based on supernatural causation
E) all of the above
Answer: C
- 43) Which of these is required for natural selection to occur? 43) _____
A) individual variation
B) unequal reproductive success
C) overproduction
D) inheritance
E) all of the above
Answer: E
- 44) Relative to prokaryotic cells, eukaryotic cells are usually _____. 44) _____
A) smaller and equally complex
B) smaller and simpler
C) smaller and more complex
D) larger and more complex
E) larger and equally complex
Answer: D
- 45) Which of the following is *not* a property of life? 45) _____
A) Living things exhibit complex but ordered organization.
B) Organisms take in energy and use it to perform all of life's activities.
C) Organisms reproduce their own kind.
D) Populations of organisms are unable to change over time.
E) Organisms respond to environmental stimuli.
Answer: D

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).

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

Answer: C

47) How does taxonomy assist biologists?

47) _____

- A) by providing easily remembered scientific names for organisms
- B) by categorizing diverse items into smaller and smaller numbers of groups
- C) by reducing life to its smallest common denominator, the cell
- D) by explaining why life exists
- E) all of the above

Answer: B

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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).

- 48) "Male collared lizards show considerable color variation." This is a(n) _____. 48) _____
- A) hypothesis
 - B) conclusion
 - C) observation
 - D) result
 - E) opinion

Answer: C

- 49) What name is given to the functional compartments of a cell? 49) _____
- A) bacteria
 - B) nuclei
 - C) genes
 - D) organelles
 - E) genomes

Answer: D