Pre-assessment [Edit]

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Pre-assessment

Due: 11:59pm on Thursday, September 8, 2016

You will receive no credit for items you complete after the assignment is due. Grading Policy

Chapter 22 Pre-Test Question 2

Description: (a) An adaptation is _____.

Part A

An adaptation is _____.

Hint 1.

What did Darwin observe in the Galapagos Islands?

ANSWER:

- an individual's attempt to conform to its environment
- a trait that gives an organism a reproductive advantage in the current environment
- a trait that gives rise to a new species
- the cause of natural selection
- all of the above

Evolutionary adaptations are inherited characteristics that enhance an organism's ability to survive and reproduce in a particular environment.

Chapter 23 Question 4

Description: [[Bloom's Taxonomy: Application/Analysis]] (a) Which statement about variation is true?

Part A

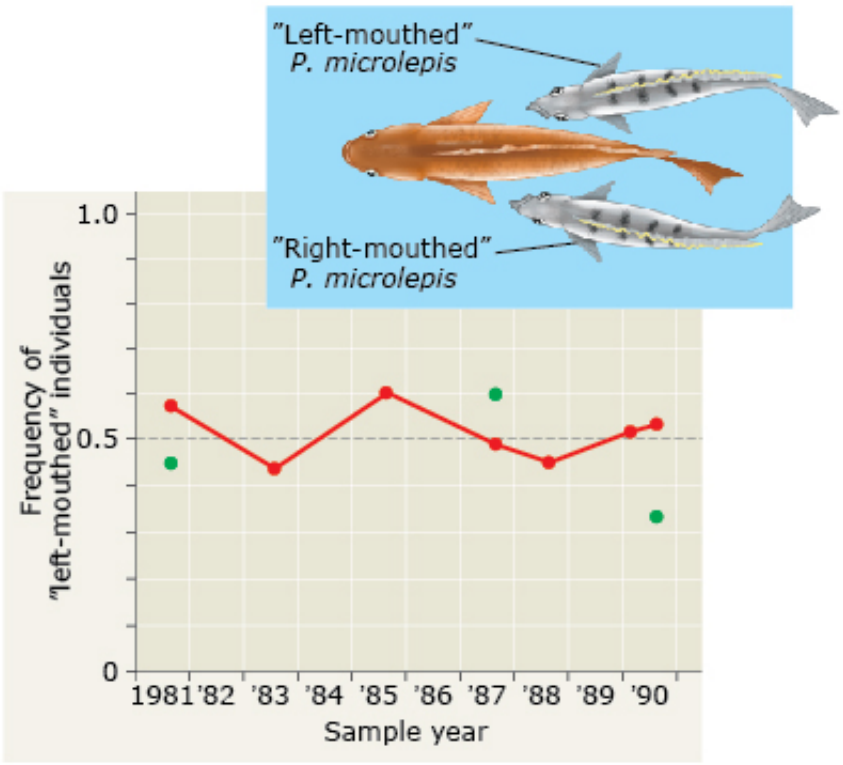
Which statement about variation is true?

ANSWER:

- All nucleotide variability results in neutral variation.
- All phenotypic variation is the result of genotypic variation.
- All genetic variation produces phenotypic variation.
- All new alleles are the result of nucleotide variability.

Interpret the Data: Frequency-dependent Selection

Description: (a) ... (b) ...



In a population of the scale-eating fish *Perissodus microlepis*, the frequency of left-mouthed individuals (red data points) rises and falls in a regular manner. The frequency of left-mouthed adults that reproduced was also recorded in three sample years (green data points).

Part A

For 1981, 1987, and 1990, how does the frequency of left-mouthed breeding adults compare to the frequency of left-mouthed individuals in the entire population?

ANSWER:

- Most of the breeding adults had the *same* phenotype as that which was most common in the population.
- There is no relationship between the frequency of left-mouthed breeding adults and the frequency of left-mouthed individuals in the entire population.
- Most of the breeding adults had the *opposite* phenotype of that which was most common in the population.
- Most of the breeding adults were left-mouthed.

When the frequency of left-mouthed individuals (red data points) was *higher* than 50%, the frequency of left-mouthed breeding adults (green data points) was *lower* than 50%. The opposite was also true--when the frequency of left-mouthed individuals was *lower* than 50%, the frequency of left-mouthed breeding adults was *higher* than 50%.

Part B

What do these comparisons suggest about when natural selection favored left-mouthed individuals over right-mouthed individuals?

ANSWER:

- Left-mouthed individuals were always selected for.
- Left-mouthed individuals were selected for when there were more left-mouthed individuals in the population.
- Left-mouthed individuals were selected for when right-mouthed individuals were more common, and vice versa.
- Left-mouthed individuals were always selected against.

When left-mouthed individuals were more common, they decreased in frequency (were selected against), and when they were less common, they increased in frequency (were favored by natural selection). This is an example of frequency-dependent selection.

Chapter 24 Question 54

Description: [[Bloom's Taxonomy: Synthesis/Evaluation]] (a) Suppose that a group of male pied flycatchers migrated from a region where there were no collared flycatchers to a region where both species were present. Assuming events like this are very rare,...

Part A

Suppose that a group of male pied flycatchers migrated from a region where there were no collared flycatchers to a region where both species were present. Assuming events like this are very rare, which of the following scenarios is LEAST likely?

ANSWER:

- (•) The frequency of hybrid offspring would decrease.
- ( ) Pied females would rarely mate with collared males.
- ( ) Migrant pied males would produce fewer offspring than would resident pied males.
- ( ) Migrant males would mate with collared females more often than with pied females.

Chapter 25 Question 7

Description: [[Bloom's Taxonomy: Application/Analysis]] (a) A swim bladder is a gas-filled sac that helps fish maintain buoyancy. The evolution of the swim bladder from lungs of an ancestral fish is an example of...

Part A

A swim bladder is a gas-filled sac that helps fish maintain buoyancy. The evolution of the swim bladder from lungs of an ancestral fish is an example of

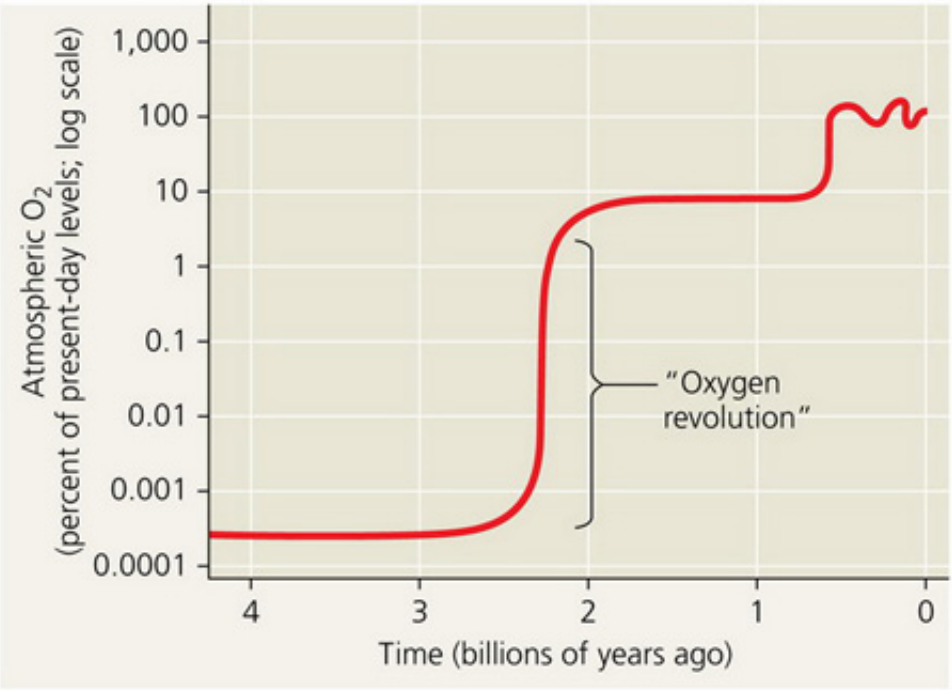
ANSWER:

- (•) exaptation.
- ( ) adaptive radiation.
- ( ) paedomorphosis.
- ( ) an evolutionary trend.
- ( ) changes in *Hox* gene expression.

Misconception Question 124

Description: (a) What was the “oxygen revolution,” which took place 2.3 billion years ago?

Part A



What was the “oxygen revolution,” which took place 2.3 billion years ago?

ANSWER:

- The “oxygen revolution” was the rapid increase in atmospheric oxygen that took place 2.3 billion years ago, dooming many prokaryotic groups.
- The “oxygen revolution” was the rapid increase in atmospheric oxygen that took place 2.3 billion years ago, with the origin of plants.
- The “oxygen revolution” was the rapid increase in atmospheric oxygen that took place 2.3 billion years ago, immediately preceding the origin of animals.

Read about photosynthesis and the oxygen revolution.

Chapter 28 Question 55

Description: [[Bloom's Taxonomy: Application/Analysis]] (a) Use the following information to answer the question(s) below. Healthy individuals of Paramecium bursaria contain photosynthetic algal endosymbionts of the genus Chlorella. When within their hosts, ...

Part A

Use the following information to answer the question(s) below.

Healthy individuals of *Paramecium bursaria* contain photosynthetic algal endosymbionts of the genus *Chlorella*. When within their hosts, the algae are referred to as zoochlorellae. In aquaria with light coming from only one side, *P. bursaria* gather at the well-lit side, whereas other species of *Paramecium* gather at the opposite side. The zoochlorellae provide their hosts with glucose and oxygen, and *P. bursaria* provides its zoochlorellae with protection

and motility. *P. bursaria* can lose its zoochlorellae in two ways: (1) if kept in darkness, the algae will die; and (2) if prey items (mostly bacteria) are absent from its habitat, *P. bursaria* will digest its zoochlorellae.

Which term most accurately describes the nutritional mode of healthy *P. bursaria*?

ANSWER:

- photoautotroph
- photoheterotroph
- chemoautotroph
- mixotroph

Chapter 1 Question 31

Description: [[Bloom's Taxonomy: Knowledge/Comprehension]] (a) A controlled experiment _____.

Part A

A controlled experiment _____.

ANSWER:

- includes at least two groups, one of which does not receive the experimental treatment
- includes at least two groups, one differing from the other by two or more variables
- includes one group for which the scientist controls all variables
- is repeated many times to ensure that the results are accurate

Chapter 30 Question 4

Description: [[Bloom's Taxonomy: Application/Analysis]] (a) Which of the following is not a characteristic that distinguishes gymnosperms and angiosperms from other plants?

Part A

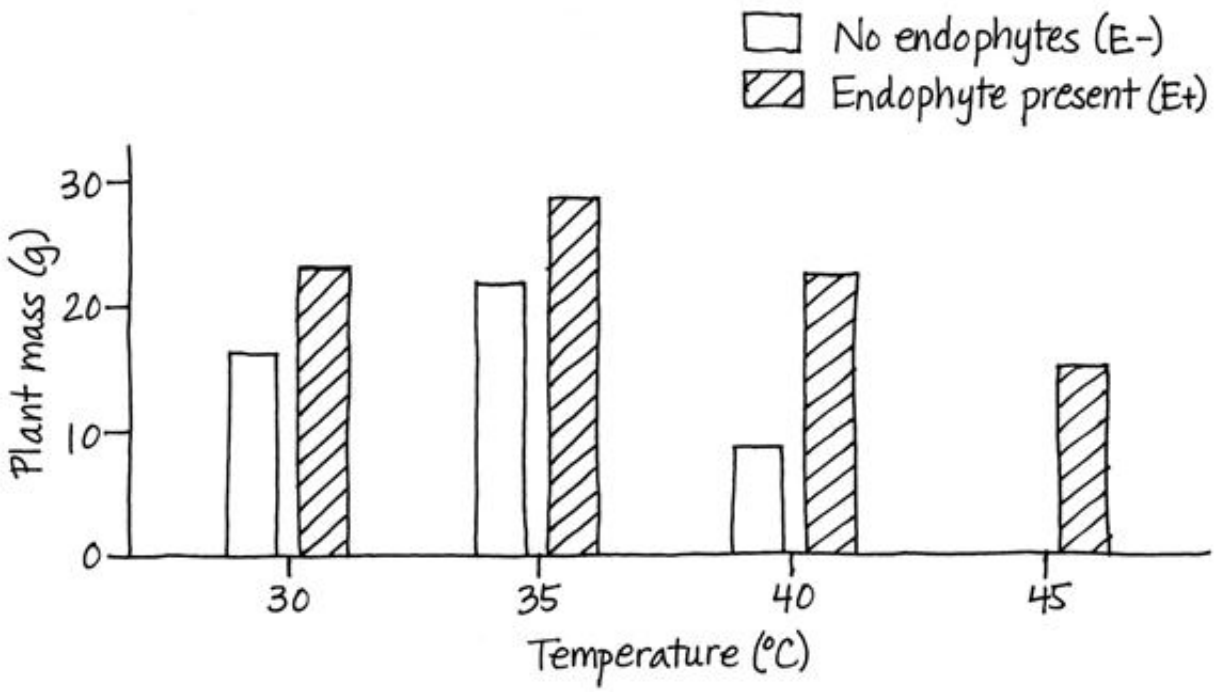
Which of the following is *not* a characteristic that distinguishes gymnosperms and angiosperms from other plants?

ANSWER:

- ovules
- pollen
- integuments
- alternation of generations
- dependent gametophytes

Interpret the Data: Endophytic Fungi and Heat Tolerance in Grass

Description: (a) ...



The grass *Dichanthelium languinosum* lives in hot soils and houses fungi of the genus *Curvularia* as endophytes. Researchers tested the impact of *Curvularia* on the heat tolerance of this grass. They grew plants without (E–) and with (E+) *Curvularia* endophytes at different temperatures and measured plant mass and the number of new shoots the plants produced. The table shows their data, and the bar graph illustrates the plant mass data.

Soil temp.	*Curvularia* presence	Plant mass (g)	Number of new shoots
30° C	E–	16.2	32
	E+	22.8	60
35° C	E–	21.7	43
	E+	28.4	60
40° C	E–	8.8	10
	E+	22.2	37
45° C	E–	0	0

	E+	15.1	24

Source: R. S. Redman et al., Thermotolerance generated by plant/fungal symbiosis, *Science* 298:1581 (2002).

Part A

What conclusion can you draw from the data?

ANSWER:

- E– grass plants grew better than E+ grass plants, with the most pronounced positive effect at lower temperatures.
- E+ grass plants grew better than E– grass plants, with the most pronounced positive effect at higher temperatures.
- E+ grass plants and E– grass plants grew equally well at all temperatures measured.
- E+ grass plants grew better than E– grass plants, but only at lower temperatures.

As indicated by the raw data and bar graph, grass plants with endophytes (E+) produced more new shoots and had greater biomass than did grass plants that lacked endophytes (E–). These differences were especially pronounced at the highest soil temperature, where E– grass plants produced no new shoots and had a biomass of zero (indicating they were dead).

Chapter 32 Question 2

Description: [[Bloom's Taxonomy: Knowledge/Comprehension]] (a) Which of the following is (are) unique to animals?

Part A

Which of the following is (are) unique to animals?

ANSWER:

- the structural carbohydrate, chitin
- heterotrophy
- flagellated gametes
- nervous system signal conduction and muscular movement

Chapter 33 Question 8

Description: [[Bloom's Taxonomy: Application/Analysis]] (a) Healthy corals are brightly colored because they _____.

Part A

Healthy corals are brightly colored because they _____.

ANSWER:

- secrete colorful pigments to protect themselves from ultraviolet light
- build their skeletons from colorful minerals
- host symbionts with colorful photosynthetic pigments
- secrete colorful pigments to attract mates

Chapter 33 Question 60

Description: [[Bloom's Taxonomy: Application/Analysis]] (a) Use the following information to answer the question(s) below. An elementary school science teacher decided to liven up the classroom with a saltwater aquarium. Knowing that saltwater aquaria can...

Part A

Use the following information to answer the question(s) below.

An elementary school science teacher decided to liven up the classroom with a saltwater aquarium. Knowing that saltwater aquaria can be quite a hassle, the teacher proceeded stepwise. First, the teacher conditioned the water. Next, the teacher decided to stock the tank with various marine invertebrates, including a polychaete, a siliceous sponge, several bivalves, a shrimp, several sea anemones of different types, a colonial hydra, a few coral species, an ectoproct, a sea star, and several herbivorous gastropod varieties. Lastly, she added some vertebrates–a parrotfish and a clownfish. She arranged for daily feedings of copepods and feeder fish.

The bivalves started to die one by one; only the undamaged shells remained. To keep the remaining bivalves alive, the teacher would most likely need to remove the _____.

ANSWER:

- ectoprocts
- sea star
- sea anemones
- gastropods

Chapter 34 Question 25

Description: [[Bloom's Taxonomy: Application/Analysis]] (a) Use the following description to answer the question(s) below. While on an intersession course in tropical ecology, Kris pulls a large, snakelike organism from a burrow (the class was granted a...

Part A

Use the following description to answer the question(s) below.

While on an intersession course in tropical ecology, Kris pulls a large, snakelike organism from a burrow (the class was granted a collecting permit). The 1-meter-long organism has smooth skin, which appears to be segmented. It has two tiny eyes that are hard to see because they seem to be covered by skin. Kris brings it back to the lab at the field station, where it is a source of puzzlement to the class. Kris says that it is a giant oligochaete worm; Shaun suggests it is a legless amphibian; Kelly proposes it belongs to a snake species that is purely fossorial (lives in a burrow).

The class decided to humanely euthanize the organism and subsequently dissect it. Having decided that it was probably not a reptile, two of their original hypotheses regarding its identity remained. Which of the following, if observed, should help them arrive at a conclusive answer?

ANSWER:

- presence of moist, highly vascularized skin
- presence of a digestive system with two openings
- presence of a nerve cord
- presence of lungs

Chapter 35 Question 5

Description: [[Bloom's Taxonomy: Synthesis/Evaluation]] (a) Leaf thickness represents a trade-off between _____.

Part A

Leaf thickness represents a trade-off between _____.

ANSWER:

- water retention and oxygen absorption
- light collection and oxygen absorption
- water retention and carbon dioxide absorption
- light collection and carbon dioxide absorption

Chapter 52 Question 5

Description: [[Bloom's Taxonomy: Application/Analysis]] (a) Why is the climate drier on the leeward (downwind) side of mountain ranges that are subjected to prevailing winds?

Part A

Why is the climate drier on the leeward (downwind) side of mountain ranges that are subjected to prevailing winds?

ANSWER:

- Air masses pushed by the prevailing winds are stopped by mountain ranges and the moisture is used up in the stagnant air masses on the leeward side.
- The sun illuminates the leeward side of mountain ranges at a more direct angle, converting to heat energy, which evaporates most of the water present.
- Pushed by the prevailing winds on the windward side, air is forced to rise, cool, condense, and drop its precipitation, leaving drier air to descend the leeward side.
- Deserts create dry conditions on the leeward side of mountain ranges.

BIOL 197 Student perception questions

Description: Student perception of assessment questions

Part A

I feel confident discussing the biology of plants, animals, and other biota with other people.

ANSWER:

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

Also accepted: Agree, Neither Agree or Disagree, Disagree, Strongly Disagree, Strongly Agree

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Part B

I feel confident in my lab skills including dissection and examining specimens with microscopes.

ANSWER:

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

Also accepted: Strongly Agree, Agree, Neither Agree or Disagree, Disagree, Strongly Disagree

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Part C

I feel confident in my ability to conduct library research and summarize and present my information.

ANSWER:

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

Also accepted: Strongly Agree, Agree, Neither Agree or Disagree, Disagree, Strongly Disagree

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