CIRCLE THE BEST CHOICE PROVIDED FOR QUESTIONS 1 – 11. Each worth 5 points. FOR PARTIAL CREDIT, GIVE REASON FOR CHOOSING YOUR ANSWER CHOICE.

1. A species of newt produces a toxin that can kill predators. Scientists have observed that some garter snakes can feed on the newts because they have a natural resistance to the toxin. In areas where populations of newts and garter snakes interact, which of the following predictions is best supported by evolutionary theory?
   A. The garter snakes with resistance to the toxin will successfully reproduce and pass the trait on to their offspring.
   B. The garter snakes without resistance to the toxin will acquire resistance by increasing the rate at which they feed on the newts.
   C. The newts that produce low levels of toxin will also develop camouflage adaptations that allow them to hide from the garter snakes.
   D. The newts will stop making the toxin rather than continue to use energy to make a toxin that is ineffective against the garter snakes.

2. Scientific evidence shows that modern dogs, wolves, and foxes all have a common ancestor. Further evidence shows that dogs are more closely related to wolves than to foxes. Which of the following observations provides the best evidence that dogs are more closely related to wolves than to foxes?
   A. The diets of dogs and wolves are more similar than the diets of dogs and foxes.
   B. The lifespans of dogs and wolves are more similar than the lifespans of dogs and foxes.
   C. The genetic sequences of dogs and wolves are more similar than the genetic sequences of dogs and foxes.
   D. The body sizes of dogs and wolves are more similar than the body sizes of dogs and foxes.

3. Which of the following is the best example of natural selection?
   A. The lifespan of a chimpanzee is extended to 60 years in captivity.
   B. The population size of giraffes changes over time as a result of immigration.
   C. The bone density of a human increases significantly as a result of participation in sports.
   D. The average toxin level in a poisonous frog population increases over time in response to high predation.

4. The diagram below shows many finch species that originated from a single ancestral finch species in the Galápagos Islands.

   ![Diagram of finch species]

   Which of the following statements best explains why many different finch species originated from the single ancestral species?
   A. Populations adapted to environmental pressures.
   B. Recessive traits in populations were eliminated over time.
   C. Individuals acquired unique characteristics during their lifetimes.
   D. Random mutation caused some individuals to have harmful traits.

5. Whale fins and bat wings are anatomically similar. Which of the following does this suggest about the animals?
   A. Whales and bats move in the same way.
   B. Whales and bats have a common ancestry.
C. Whales and bats have existed for the same amount of time.
D. Whales and bats were once adapted to the same environment.

6. Until recently, the myrtle warbler and the Audubon’s warbler were thought to be separate species of birds because the males have very different appearances. Which of the following observations most likely led to the reclassification of these warblers as one species?
   A. The myrtle warbler and the Audubon’s warbler have the same diet.
   B. The myrtle warbler and the Audubon’s warbler lay the same number of eggs.
   C. The myrtle warbler and the Audubon’s warbler have overlapping geographical ranges.(CONT. ON NEXT PAGE)
   D. The myrtle warbler and the Audubon’s warbler interbreed and produce fertile offspring.

7. In the deserts of the southwestern United States, rock formations made from lava flows are found scattered across the sand. The rock pocket mouse, which has dark fur, lives on the black lava rocks. The Apache pocket mouse, which has light fur, lives on the tan sand. Which of the following statements best explains how these two types of mice could have evolved from a common ancestor?
   A. Individual mice changed their fur color to escape their predators.
   B. Natural selection favored different fur colors in the different habitats.
   C. The emigration of mice changed the gene pools in the original population.
   D. The original population of mice spread out geographically to relieve overcrowding.

8. The shape and height of a tortoise’s shell influence how high the tortoise can raise its head. A tortoise with a high shell that leaves a large gap can raise its head higher than a tortoise with a lower shell and a smaller gap. In a population of herbivorous tortoises, a shift in the frequency of different shell heights is observed over time. A set of graphs representing the change in frequency of the different shell heights is shown below.

Which of the following selection pressures most likely produced the shift in frequency?
   A. lack of vegetation at ground-level
   B. dry, hot weather conditions for several years
   C. habitat changes that forced nesting sites farther inland
   D. intense competition with other species of tortoises with high shells

9. Partial amino acid sequences for a particular protein in three animal species are shown below. Each letter in the sequence stands for an amino acid. For example, Q stands for glutamine, and L stands for leucine.

<table>
<thead>
<tr>
<th>Species</th>
<th>Amino Acid Sequence</th>
</tr>
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<tbody>
<tr>
<td>Green junglefowl (bird)</td>
<td>QHEPHERKRM</td>
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Which of the following statements best explains how these sequence data are evidence for evolution?
   A. All species translate the amino acid sequences of their proteins in a similar way.
   B. The species that are most closely related have the most similar amino acid sequences.
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13. Male peafowl, called peacocks, have long, colorful tail feathers. Among peacocks there is variation in the size, brightness, and pattern of the tail. Scientists observed the mating success of two groups of peacocks. The graph below shows the scientists’ data.

![Peacock Mating Data]

- The longer the tail, the more colorful it and the more the peacock can mate.

- One disadvantage is that more females are going to want to mate with that male peacock and they’re going to have so much children that it could even tell who’s their children and who’s not. Also, they can only mate so much.

- Peacocks with shorter, less colorful tails are more disadvantage for the males.

**Peacock Group**

- A) Shorter, less colorful tails
- B) Longer, more colorful tails

a. Explain what the data show about the advantage of longer, more colorful tails for peacocks. (5 points)
b. Identify one disadvantage that longer, more colorful tails have for peacocks. (5 points)
c. Explain in detail how the longer, more colorful tails evolved in peacocks despite causing disadvantages for the males. (10 points)

14. Describe Evolution in your own words. (10 points)

15. Provide 3 pieces of evidence and explain how it supports evolution. (10 points)

16. Describe natural selection as a mechanism for evolution. (HONORS) Describe two other mechanisms for evolution. (10 points)

17. EXTRA CREDIT: Tell a story of a trait within a population and how it evolves over many generations] OR [Discuss 2 things you liked and disliked about this unit and why. What are things I’m doing well, and what are things I need to work on?] (10 points)
Based on the graph, the antibiotic that Streptococcus pneumoniae had become more resistant to by 1999 is Trimethoprim/Sulfamethoxazole.

B. What usually happens to a population of Streptococcus pneumoniae immediately after it is exposed to a new antibiotic is everyone starts getting better if they were sick but the supply of it probably becomes very low if a lot of people were exposed to Streptococcus pneumoniae. Also, the populations probably starts growing after everyone is not dying anymore and people start producing babies.

C. It could develop as a process of natural selection because people could be naturally born with pneumoniae and it would be because of natural selection.
C. Individual organisms acquire changes in their amino acid sequences over their lifetimes.

D. The organisms that evolved at the same time in geologic history have identical amino acid sequences.

10. About 70 years ago, cane toads were introduced to Australia. The toads are toxic to some species of snakes, such as Dendrelaphis punctulatus. The longer an individual snake is, the greater its chance of survival after eating a cane toad. Which of the following did scientists most likely observe in the D. punctulatus snake population as a result of the presence of the cane toads?

A. The entire population was killed by the toads.
B. The entire population became resistant to the toads.
C. The average body length in the population increased.
D. The average body length in the population decreased.

11. The Asian shore crab invaded parts of the eastern coast of the United States about 15 years ago. The Asian shore crab preys on blue mussels. In the time since the Asian shore crab arrived, the average shell thickness has increased in the blue mussel population. Which of the following is the most likely reason that this increase in shell thickness has occurred?

A. Blue mussels with thick shells attract more crabs than mussels without thick shells.
B. Blue mussels with thick shells grow in larger colonies than mussels without thick shells.
C. Blue mussels with thick shells catch more food per day than mussels without thick shells.
D. Blue mussels with thick shells survive and reproduce more successfully than mussels without thick shells.

ANSWER QUESTIONS 12 – 17 ON A SEPARATE SHEET OF PAPER.

12. One of the most important developments in modern medicine was the discovery of antibiotics. Antibiotics are used to treat infections caused by bacteria. However, strains of bacteria that are resistant to antibiotics are emerging. The rate of increase in infections caused by these antibiotic-resistant strains of bacteria is a concern for human health. The bacterium Streptococcus pneumoniae is a major cause of the respiratory disease pneumonia. The graph below shows trends in bacterial resistance to different antibiotics in pneumonia cases from 1986 to 1999.

The graph shows the changes in antibiotic resistance of Streptococcus pneumoniae over time.
For example, some mice have a bright color as skin, and some are more dark. The mice who look more like their environment will be eaten less. If over time, this might lead to a permanent change. Then, when more time has passed, this might lead to the "birth" of a new species since they differ so much from their original forms.

What I liked about this unit was the debate between evolution and creationism. What I didn't like about it was how I was put on the creationism side when I believed in evolution. I think the things you are doing well is the amount of notes we have taken and the activities we've been doing. I don't think you need to work on anything.