

ANSWER KEY	Chapter 4 Test Answer Key	BLM 4.4.1A
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Answers to **Multiple Choice** Questions

1. c
2. b
3. d
4. a
5. b
6. a
7. c
8. c
9. b
10. b
11. d
12. d
13. a
14. c
15. c
16. a
17. b
18. d
19. c
20. d

Answers to **Numerical Response** Questions

1. 4, 6, 2, 1
2. 1, 3, 4, 6
3. 1, 2, 3

Answers to **Written Response** Questions

1.
 - For speciation to occur, two populations must be prevented from interbreeding. This means that the populations must become isolated from one another through geographical or biological barriers. If the population remains isolated long enough, speciation will eventually occur; this is caused by changes accumulated in the population due to natural selection, which affects reproduction. When this happens, individuals in one population are no longer able to reproduce successfully with individuals in the other population.

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- The geographic isolation of a population does not have to be maintained forever for speciation to occur. It must be maintained long enough, however, for the population to become reproductively incompatible with the original population. Even if the populations are reunited, biological barriers (behavioural, biological) will prevent the two populations from successfully reproducing. In the case of the shrimp populations, they are fighting now rather than courting.
- Natural selection is a process that results when the characteristics of a population of organisms change because individuals with certain inherited traits survive specific local environmental conditions and, through reproduction, pass on their traits to their offspring. For natural selection to occur there must be variety or diversity within the species.

Populations change – not individuals. An abiotic environmental condition can be said to select for certain characteristics in other individuals. In this way, the environment exerts selective pressure on a population.

Natural selection does not anticipate a change in the environment (such as the formation of the land bridge). Instead, natural selection is situational. A trait that at one time seems to have no particular relevance to survival becomes the trait that later helps the population survive and reproduce in a changed environment. This trait then persists within a population, because it is inherited by the offspring of the survivors.

In this example, the land bridge resulted in changing environmental conditions. These conditions may have applied slightly different selective pressures on the two populations of snapping shrimp. As a result, each population changed to the point where members of one population are no longer capable of reproducing with members of the other. In other words, they have developed into two separate species.

Marking Guide

Score	Assessment Guidelines
5 Excellent	<p><i>The student ...</i></p> <ul style="list-style-type: none"> • constructs a diagram that clearly shows how the geographical barrier disrupts the flow of genes between the two populations • provides a detailed description of how geographic isolation can result in the formation of two species • provides a detailed explanation of why geographic isolation does not have to be permanent; includes indication that biological barriers will result in continued reproductive isolation • provides a detailed explanation of natural selection • includes a discussion of how natural selection would have formed the two species of shrimp after the land bridge formed

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4 Good	<ul style="list-style-type: none"> • constructs a diagram that shows how the geographical barrier disrupts the flow of genes between the two populations • provides a description of how geographic isolation can result in the formation of two species • provides an explanation of why geographic isolation does not have to be permanent; includes indication that biological barriers will result in continued reproductive isolation • provides an explanation of natural selection • includes a discussion of how natural selection would have formed the two species of shrimp after the land bridge formed
3 Satisfactory	<ul style="list-style-type: none"> • constructs a diagram that shows how the geographical barrier disrupts the flow of genes between the two populations • provides a limited description of how geographic isolation can result in the formation of two species • provides a brief explanation of why geographic isolation does not have to be permanent • describes natural selection but lacks detail • attempts to explain how natural selection would have formed the two species of shrimp after the land bridge formed
2 Limited	<ul style="list-style-type: none"> • makes a limited attempt at the diagram • provides a limited description of how geographic isolation can result in the formation of a new species • provides a limited description of natural selection • provides a limited attempt at explaining how natural selection works in this example
1 Poor	<ul style="list-style-type: none"> • addresses only two of the bullets at a 2 or a 3 level
0 Insufficient	<ul style="list-style-type: none"> • does not address the question or provides an answer that is too brief to assess
NR	<ul style="list-style-type: none"> • does not provide a response