

# Study Guide

## CHAPTER 15

### Section 1: Darwin's Theory of Evolution by Natural Selection

In your textbook, read about developing the theory of natural selection.

For each statement below, write true or false.

- \_\_\_\_\_ 1. Charles Darwin served as naturalist on the HMS *Beagle*.
- \_\_\_\_\_ 2. The environments that Darwin studied exhibited little biological diversity.
- \_\_\_\_\_ 3. While in the Galápagos Islands, Darwin noticed slight differences in the animals from one island to the next.
- \_\_\_\_\_ 4. Darwin discovered that the Galápagos mockingbirds were different species.
- \_\_\_\_\_ 5. Darwin named the process by which evolution proceeds *artificial selection*.

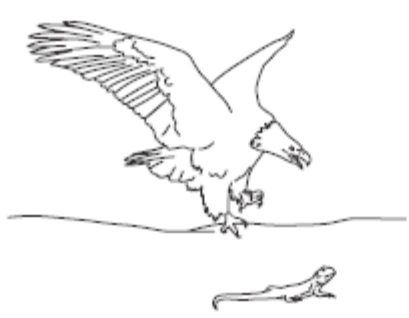

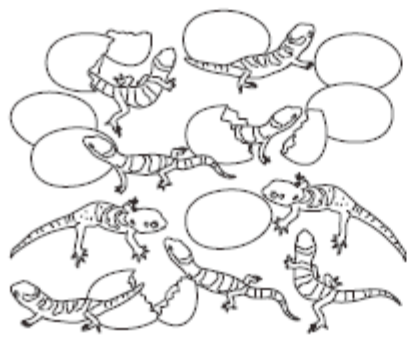
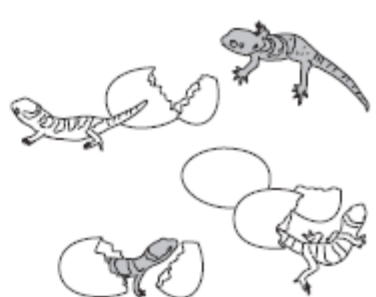
Match the point from Darwin's theory of evolution to the appropriate diagram.

A. There is a struggle to survive.

C. There is variation among offspring.

B. Living things overproduce.

D. Natural selection is always taking place.

<p>_____ 6.</p> 	<p>_____ 8.</p> 
<p>_____ 7.</p> 	<p>_____ 9.</p> 

Section 1 Darwin's Theory of Evolution by Natural Selection (continued)

Main Idea \_\_\_\_\_

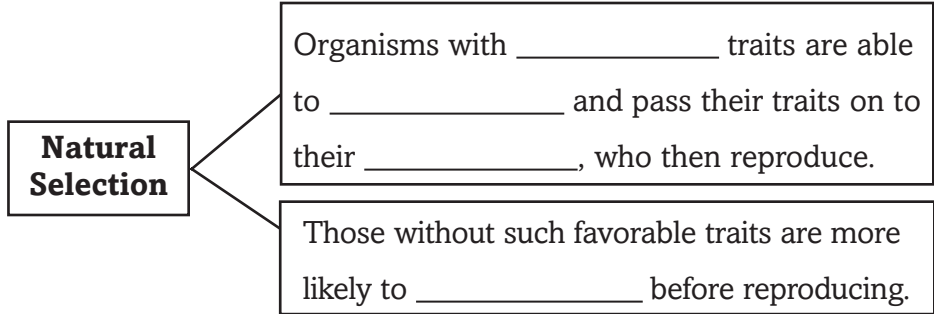
I found this information on page \_\_\_\_\_.

Details \_\_\_\_\_

Identify the four principles of natural selection.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

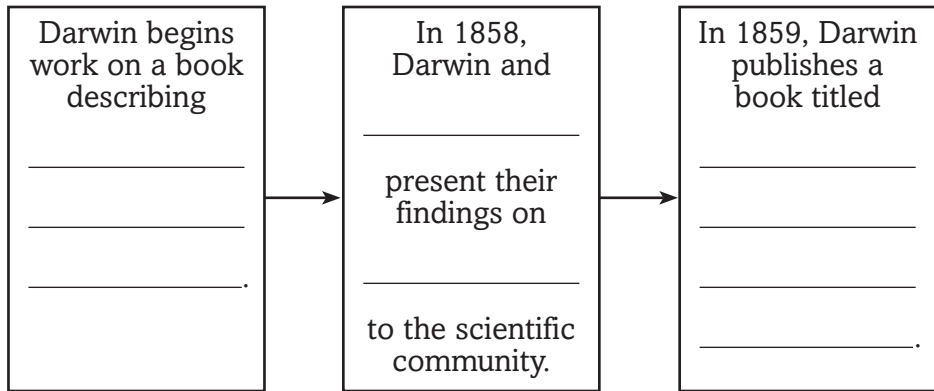
Summarize natural selection by completing the sentences below.



The Origin of Species

I found this information on page \_\_\_\_\_.

Sequence the events that led to the publication of Darwin's ideas.



**SUMMARIZE**

Discuss Darwin's different observations that led him to propose the theory of natural selection.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**CHAPTER 15**

***Study Guide***

**Section 2: Evidence of Evolution**

**In your textbook, read about the fossil record.**

*Match the description in Column A with the term in Column B.*

**Column A**

- \_\_\_\_\_ 1. show that the species present on Earth have changed over time
- \_\_\_\_\_ 2. thought to be the ancestor of birds
- \_\_\_\_\_ 3. are newly evolved features such as feathers
- \_\_\_\_\_ 4. are traits shared by species with a common ancestor
- \_\_\_\_\_ 5. thought to be the ancestor of armadillos

**Column B**

- A.** glyptodont
- B.** ancestral traits
- C.** fossils
- D.** derived traits
- E.** dinosaur

**In your textbook, read about comparative anatomy and comparative biochemistry.**

*Complete the table by checking the correct column(s) for each description.*

<b>Description</b>	<b>Homologous Structure</b>	<b>Analogous Structure</b>	<b>Vestigial Structure</b>	<b>Comparative Biochemistry</b>
<b>6.</b> Modified structure seen among different groups of descendants				
<b>7.</b> Eyes in a species of blind fish				
<b>8.</b> DNA and RNA comparisons that might indicate evolutionary relationships				
<b>9.</b> Bird wings and butterfly wings that have the same function but different structures				
<b>10.</b> A body structure that is no longer used for its original function but that might have been used in an ancestor				

## Study Guide, Section 2: Evidence of Evolution continued

In your textbook, read about geographic distribution and types of adaptation.

If the statement is true, write true. If the statement is false, replace the italicized term or phrase to make it true.

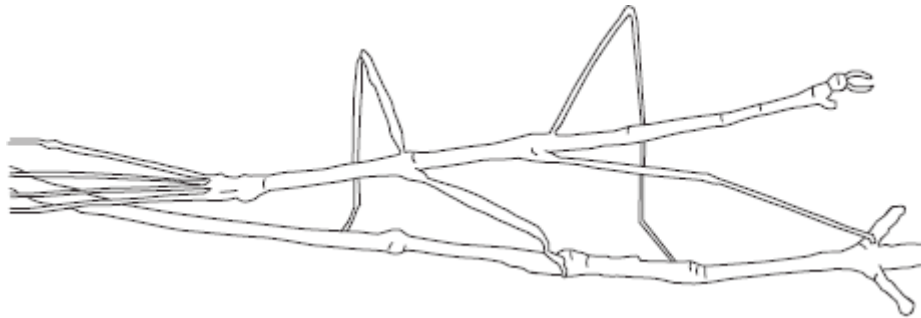
11. Evolutionary theory predicts that species respond to similar *environments* in similar ways.
- 

12. *Geographic distribution* is the study of the distribution of plants and animals on Earth.
- 

13. Similar environments can lead to the *evolution* of similar animals, even if they are not close relatives.
- 

14. Traits that enable individuals to survive or reproduce better than individuals without those traits are called *reproduction*.
- 

15. Mimicry involves a harmless species that has evolved to closely resemble a *beneficial* one.
- 



16. The type of morphological adaptation shown in the picture above is *camouflage*.
- 

17. Mimicry and camouflage are morphological adaptations that increase a species' *fitness*.
- 

18. *Antibiotic resistance* is a form of adaptation that causes some diseases to come back in more harmful forms.
-

**Section 2 Evidence of Evolution** (continued)

**Main Idea** \_\_\_\_\_

**Details** \_\_\_\_\_

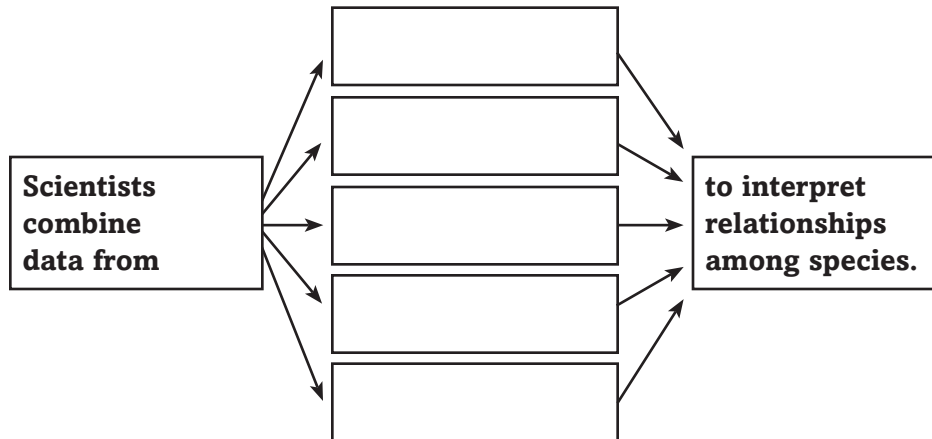
**Support for Evolution**

*I found this information on page \_\_\_\_\_.*

**Summarize** the role that anatomy plays in teaching us about evolution by completing the table below.

Structure	What is it?	Example
Homologous structure		
Analogous structure		
Vestigial structure		
Embryo		

**Identify** ways scientists interpret relationships among species by completing the organizer below.



**CHAPTER 15**

*Study Guide*

**Section 3: Shaping Evolutionary Theory**

**In your textbook, read about the mechanisms of evolution, speciation, and patterns of evolution.**

*Write the term or phrase that best completes each statement. Use these choices:*

- |                              |                              |                              |                             |
|------------------------------|------------------------------|------------------------------|-----------------------------|
| <b>adaptive radiation</b>    | <b>allopatric speciation</b> | <b>directional selection</b> | <b>disruptive selection</b> |
| <b>founder effect</b>        | <b>genetic drift</b>         | <b>gradualism</b>            | <b>sexual selection</b>     |
| <b>stabilizing selection</b> | <b>sympatric speciation</b>  |                              |                             |

- \_\_\_\_\_ is a change in allelic frequencies in a population that is due to chance.
- \_\_\_\_\_ removes individuals with average trait values, creating two populations with extreme traits.
- The most common form of selection, \_\_\_\_\_, removes organisms with extreme expressions of a trait.
- When a small sample of the main population settles in a location separated from the main population, the \_\_\_\_\_ can occur.
- In \_\_\_\_\_, a species evolves into a new species without any barriers that separate the populations.
- \_\_\_\_\_ will shift populations toward a beneficial but extreme trait value.
- In \_\_\_\_\_, a population is divided by a barrier, each population evolves separately, and eventually the two populations cannot successfully interbreed.
- \_\_\_\_\_ is a change in the size or frequency of a trait based on competition for mates.
- One species will sometimes diversify in a relatively short time into a number of different species in a pattern called \_\_\_\_\_.
- The idea that evolution occurred in small steps over millions of years in a speciation model is currently known as \_\_\_\_\_.

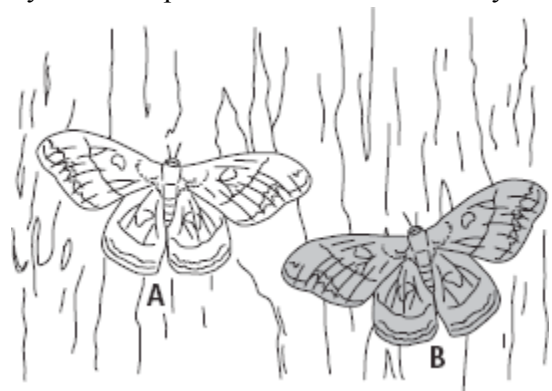
*Refer to the figure. Respond to each statement.*

**11. Specify** which moth would survive if pollution increases.

\_\_\_\_\_

**12. State** the name of the phenomenon illustrated.

\_\_\_\_\_



**Section 3 Shaping Evolutionary Theory** (continued)

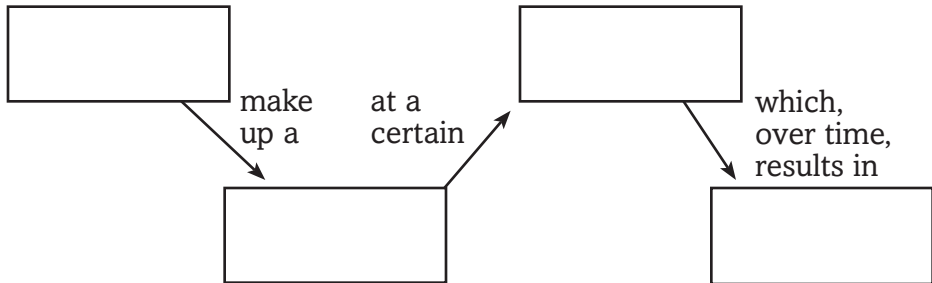
**Main Idea** \_\_\_\_\_

**Details** \_\_\_\_\_

**Mechanisms of Evolution**

*I found this information on page \_\_\_\_\_.*

**Sequence** *the steps associated with genetic equilibrium by completing the graphic organizer below.*



**Identify** *three ways that genetic equilibrium can be disrupted.*

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

**Reproductive Isolation**

*I found this information on page \_\_\_\_\_.*

**Contrast** *geographic isolation and reproductive isolation.*

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Compare** *natural selection and sexual selection by completing the table.*

	<b>Species Changes Based on</b>	<b>Increases Fitness?</b>
Natural selection		
Sexual selection		