Chapter 10
Darwin's Theory of Evolution
Daily Objectives

• Explain Charles Darwin’s contribution to science.
• Explain how modern organisms have evolved over long periods of time.
• Explain Natural Selection
If you’d met young Charles Darwin, you probably wouldn’t have guessed that his ideas would change the way we look at the world.

As a boy, Darwin wasn’t a star student.

Yet Charles would one day come up with one of the most important scientific theories of all time.
Charles Darwin

- Proposed an explanation of how evolution works
- Organisms change over long periods of time by a process called natural selection
- Collected a lot of evidence to support his ideas
  - Lived from 1809-1882
  - British naturalist

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Darwin’s Epic Journey

- Invited to travel around the world on the HMS Beagle
  - From 1831-1836 (22 years old)
- Makes many observations of nature
- Main mission of the Beagle was to chart South American coastline
Observations Aboard the Beagle

• The Beagle stopped in the Galapagos Islands
• Located 500 miles off coast of Ecuador
• Recently formed volcanic islands.

• Most of animals on the Galápagos live nowhere else in the world, but they look like species living on South American mainland.
Many of Darwin’s observations made him wonder......

Darwin asked: Why were these creatures found only on the Galapagos Islands?

1. Geospiza magnirostris  
2. Geospiza fortis  
3. Geospiza parvula  
4. Cemhidea olivacea  

Finches from Galapagos Archipelago
Darwin found: 

- Evidence that organisms have changed over time
- Example:
  - Extinct armadillos & modern armadillos can be found on the same continent
- Fossils are the preserved remains or traces of ancient organisms
Several islands in the Galapagos were home to distinct forms of giant land tortoises.

• The tortoises’ shells varied in predictable ways from one island to another.

• The shape of the tortoises’ shells corresponds to different habitats.

Darwin found...

Different Shells on tortoises from different islands
Darwin found...
Different Shells on tortoises from different islands

Darwin asked:
Is there a relationship between the environment & what an animal looks like?
Darwin found many different birds on the Galapagos Islands. He thought that he had found many different types of birds.
Darwin was amazed to find out:

- All 14 species of birds were actually finches.
- But there is only one species of finch on the mainland!
Darwin Asked Himself

• If the Galapagos finches came from the mainland, why are they so different now?

• Why do you think the finches evolved into 14 different species?
Darwin’s Conclusions

- Different beaks are inherited variations
- Serve as adaptations that help birds compete for food
- These birds survive & reproduce more
- Pass on the genes for those more fit beaks
- Over time nature selected for different species with different beaks
4 Parts of Natural Selection

• Overproduction- Too many offspring, the offspring with the most desirable or favorable traits will survive, others will die.

• Inherited Variation- Every individual has its own combination of traits; unique individuals.

• Struggle to Survive- Competition for food, illness, disease, predators.

• Successful Reproduction- The individuals best adapted to their environment reproduce.
Relationship between species (beaks) & food

(b) The Galápagos finches
Review of Daily Objectives

• What was Charles Darwin’s major contribution to science?
• How have modern organisms evolved over long periods of time?
• What is Natural Selection?