



Nineteenth-century explorer Charles Darwin zooms in on a giant Galápagos tortoise.



# VOYAGE OF Discovery

A historic South American cruise led to groundbreaking findings about the wild kingdom.

BY MONA CHIANG

**W**hy don't polar bears live in a steamy rain forest? Why don't pandas live in the Arctic? It may seem obvious to you that animals in different regions also have different survival **traits**. But how did they develop these **adaptations** in the first place? According to Niles Eldredge, a **paleontologist** at the American Museum of Natural History in New York, scientists didn't begin to find answers until the 19th century. That's when British **naturalist** Charles Darwin (1809-1882) came up with ideas that changed many people's thinking about the different organisms on Earth.

What were some of Darwin's ideas, and how did he come up with them? When Darwin was 22 years old, he sailed the HMS *Beagle* on an ocean voyage to explore South America. Eldredge tells *SuperScience* how the eye-opening sights on that five-year-long trip inspired Darwin's thoughts on wildlife.



**Scientist Niles Eldredge (top) learns about life in the past by studying samples he collects—just like Charles Darwin! Darwin did much of his research in the Galápagos Islands (bottom).**

## How did Darwin spend his time on the lengthy voyage?

He was so seasick that he got off the ship whenever he could to explore the land. Darwin was very curious; he collected and studied almost anything—from rocks to plants to animals. He took notes

and sent many of the samples back home to England so that he could study them later on.

## Are there any funny stories related to the samples he collected?

There are large, flightless birds in Argentina called rheas (REE-uhs). During one stop along his voyage, Darwin heard a rumor that a different species of the rhea existed. It was a species that most people had never seen. Naturally, Darwin wanted to find one.

Then, for dinner one night, Darwin was eating a smaller-than-usual rhea. In the middle of the meal, Darwin carefully looked at the bones, and noticed that they didn't look like the common rheas' bones. Oops! Darwin had eaten the mystery bird that he was looking for.

## Did anyone find another one of these mysterious rheas? Where?

Yes! It turns out that the smaller rhea that Darwin had eaten was not in its usual **habitat**.



Dome-shaped tortoises (left) live on wetter islands, where they eat grass and other plants that grow close to the ground. Saddleback tortoises (right) live on drier islands, where they feed on taller plants.



## check it out

During his voyage aboard the *Beagle*, Charles Darwin collected different plants and animals. Many of these samples can be seen in an exhibition at the American Museum of Natural History that shows Darwin's life and work. With more than 30 million objects in its collection, the Museum has been researching and celebrating the natural world for more than 135 years. Its 200 scientists travel around the world on 100 field expeditions each year, studying everything from fossils to lizards to the universe.

To learn more, ask your teacher, or go to [www.amnh.org](http://www.amnh.org).

It normally lives in a region south of where Darwin was. This got Darwin wondering why two birds that are so closely related live apart, in different environments.

### Why aren't both rhea species found all over Argentina?

You don't find elephants in the Arctic, right? Darwin observed that animals couldn't live just anywhere. They need the right environment. The smaller rhea has traits that make it better at gathering food and hiding from predators in one particular region, while the larger rhea has

traits that make it better suited to a different region.

### Darwin also sailed to the Galápagos Islands. What did he learn there?

There are giant tortoises on the islands, and they look slightly different on one island than they do on another. The governor of the Galápagos Islands told Darwin that he could tell which island a tortoise is from just by looking at the shape of its shell.

### What is so special about the shape of the tortoises' shells?

There are two main shell shapes (see photos, above), and they are related to how the tortoises eat plants. Tortoises with dome-shaped shells live on wetter islands where many food plants grow low to the ground. Their shells only allow the neck to extend forward, so their heads stay low to the ground. But saddleback tortoises live on drier islands where they must feed on taller plants. So they have shells that allow the neck to extend up-

wards. They also have longer necks to reach the food. These adaptations help the tortoises survive.

### How did the tortoises become so well-matched to their environments?

Darwin proposed that as the environment changes, a species may change its physical features over time, making the animals better adapted to their new habitats. Tortoises with traits better suited for their habitat will often produce more young, and these babies will normally inherit the same traits from their parents. Over time, all the tortoises on one island will have traits that make them better suited for their environment.

## Words to Know

**trait** — a physical characteristic

**adaptation** — trait that helps an animal survive

**paleontologist** — scientist who studies life from the past, especially through the study of plant and animal fossils

**naturalist** — person who studies wildlife

**habitat** — the natural environment of a species

# Iguana Puzzle

Can you tell where an animal lives just by looking at it?

## You'll Need

- ✿ Pencil
- ✿ Paper

**THINK:** Describe a polar bear's appearance. What is it about a polar bear that makes the animal well suited for the environment in which it lives?

**PREDICT:** Pretend you are a zookeeper who is expecting two shipments: One contains a land iguana (I-GWA-nuh) and the other contains a marine iguana. In nature, the iguanas live in different regions. To make each iguana feel at home, you have created a shelter that looks like the area in which it lives. When the two shipments arrive, you discover that neither of them is labeled. Can you determine which iguana belongs in which shelter?



## Procedure:

❑ **1.** Marine iguanas live near the ocean, where there are many rocks. To move over these rocks, this iguana needs very long claws. Land iguanas, on the other hand, live in the center of the island where there are many fruits and flowers, but not too many rocks. Therefore, land iguanas have short claws.

Look at the photos of the iguanas. Compare the lengths of the animals' claws.

❑ **2.** Take a close look at the face of iguana #2. Notice that its face is slightly lighter in color than the rest of its body. When you look closer, notice that this light coloring is really a crusty layer of salt that the iguana has ejected from its nostrils. Ask yourself: Would you find salt near the sea, or inland?

❑ **3.** The color of each iguana's skin allows it to blend in with its environment. Look at the photos. Which iguana would blend in best with flowers? Which iguana would blend in best with wet, rocky areas?

❑ **4.** A marine iguana has a shorter snout than the land iguana. A short snout allows the marine iguana to scrape a plant called algae (AL-jee) off of rocks more effectively.

## Conclusions

1. Which iguana is the marine iguana? Which is the land iguana?
2. How were you able to tell the two iguanas apart?
3. List two other animals that have characteristics that help them to survive in their environment. Explain your answer.