

## **Reading 1.1 – Bacteria, Chimps, Peanuts, and Dolphins**

### **Getting Ready**

Would you like to observe how some of the smallest creatures on Earth get their food? Would you find it interesting to observe lions in Africa as they take care of their young? Would you like to examine the remains of an animal attacked by a wolf? Would you like to study plants and animals that live in the ocean? Or would you rather study plants in a greenhouse? If any of these sound interesting to you, you may want to think about becoming a biologist.

### **What Does a Biologist Do?**

Biology is the study of living things. Biologists, the scientists who study living things, call those things organisms. Close your eyes and think about organisms on Earth. Did you think of dogs, cats, birds, insects, plants, fish, or bacteria? Did you think of other organisms? Biologists want to learn how all of these organisms work, how they interact with each other, and how they interact with their environment. When you study biology in science class, you ask questions, make observations, and collect data just as you do in chemistry and physics. But because you are investigating living things, the way you do science will sometimes be different from what you have done before.

How do you think the way you do work in biology will be different from the way you worked in chemistry or physics?

Here are some stories about four different kinds of biologists. They all study organisms, but they do very different kinds of work.

### **Microbiologists**

Biologists pay close attention to every part of the surroundings that interact with the organisms they are studying. The surroundings and the factors in their surroundings that organisms interact with are known as the environment. Sometimes the environment is large, like a rain forest. Sometimes environments are so small that scientists need to study them through a microscope.

Microbiologists are one type of scientist. They investigate the growth, development, structure and function, and other characteristics of organisms so small that they can only be observed through a microscope.

A microbiologist named Patricia Diaz studies bacteria that live in the mouths of humans. You might be surprised to learn that about 500 different kinds of bacteria live in your mouth! Dr. Diaz focuses on the bacteria that arrive on the teeth just after they are brushed.

At first, a few species of bacteria come. Then, if teeth are not brushed properly and frequently, new species arrive. Dr. Diaz studies the first bacteria to come and how they react with each other. You can probably make some good guesses as to why someone would study bacteria on teeth. Do you see the community of bacteria on your teeth? Of course not. To see them, you need a microscope. Someone who studies them is a microbiologist.

### **Primatologists**

Other scientists look at interactions, too. An action between two or more things that have an effect on each other is called an interaction. How do you think the way you do work in biology will be different from the way you worked in chemistry or physics? In physical science, you might study how light interacts with an object, so you can see the object. In chemistry, you might study how molecules interact with each other. In life science, you might study how plants or animals and environments interact. Sometimes, biologists look at data that was collected by someone else over many years. Sometimes, they spend many years focusing on one kind of population to observe individual interactions with each other, and interactions of the whole population with its environment. A population is a group of the same kind of organism that lives together in a particular area.

Primatologists study mammals that have certain characteristics such as flexible fingers and toes and eyes that face forward and are close together. They study populations of primates. Primates include animals like chimpanzees, gorillas, and you! Yes, human beings are primates.

One famous primatologist is Jane Goodall. She is recognized as the world's best authority on chimpanzees. Goodall observed chimps stripping twigs of leaves to stick them into termite holes to pull out termites for food, the first discovery of a non-human animal using tools. Her work has expanded scientific thinking about the relationships between humans and animals. Many projects that are about paying attention to the environment have developed from her work. She made many discoveries by using observations skills like those you use in science class. She kept careful notes about her observations, just like you will be doing. Her work is an example of a biologist who makes observations over a long period of time. Jane Goodall spent over 40 years in Africa observing a population of chimpanzees. She spent many hours hardly moving, just watching and learning about chimps' behaviors.

### **Botanists**

Botanists are biologists who study plants. Here is a question for you: do you like peanut butter? If you do, you have a botanist to

thank. His name is George Washington Carver. Although the ancient Incas in South America were the first people to make a type of peanut butter, Dr. Carver rediscovered it for the modern world, along with hundreds of other uses for peanuts.

Dr. Carver did research in his laboratory at Tuskegee University in Alabama, but he also went outdoors to do some of his work. In fact, he brought his students out to work with people who were too poor to travel to the school. Dr. Carver taught farmers how to get the best crops they could by altering which ones they planted instead of planting the same crops in the same field every year. Farmers all over the world use his methods today to produce healthy crops.

### **Marine Biologists**

Marine biologists spend time on the water and in the water collecting data. They also spend time in laboratories analyzing the data they collect. Like other biologists, their work often takes years. Some kinds of data can help people understand the importance of protecting Earth's natural environment. Marine biologists help people to think about preserving ocean life.

One marine biologist is Alejandro Acevedo-Gutiérrez. He grew up in Mexico City. When he was younger like you, he enjoyed TV programs about marine life. When he grew up, he became a marine biologist who studies whales, dolphins, and seals all over the world. Dr. Acevedo-Gutiérrez was featured in a documentary called Dolphins, which showed in IMAX theaters. He studied the interesting way that some dolphins feed by herding anchovies into a tightly spinning bait ball, and then taking turns eating the fish.

He is now a professor at Western Washington University. He studies seals in their environment, and the interaction of seals and seabirds on the protected marine areas on islands off the coast of Washington. He has won many awards for his work, which all started because he pursued the interests he had as a child.

These are four short examples of the kind of work biologists can do. The field of biology has many more areas of study and ways of studying organisms. In this unit, you will be working in ways that a biologist works, and you can figure out whether biology interests you.