Script of Video Narration

Extracted from: "Understanding Cells" - AGC/UNITED LEARNING

LESSON ONE: LIFE AND CELLS

The world in which we live can be divided into two very basic parts: things that are alive, such as these microorganisms, and things that are not, such as this rock.

Among living things, there are unbelievable variations. But, as strange as it seems, this sea anemone, this elephant, these tiny rod–shaped bacteria, this crab, and both this butterfly and flowering plant all share certain traits that clearly distinguish them from non–living things.

Scientists call these shared traits the "Characteristics of Life."

The first characteristic of life is that **living things can reproduce.** This means that, like these giraffes, they can produce new life that is very similar to themselves.

The second characteristic of life is that, like these young fish, all living things can **grow and develop**, forming mature organisms that are capable of reproduction.

The third characteristic of living things is that they can **respond to the outside world**. For example, these striped fish are responding to the much larger white fish by getting out of its way. And this bee has sensed the pollen in this flower and is responding by gathering it to make honey.

Being able to respond to things in the outside world is very useful because it helps living things find food, protect themselves from harm, find mates and perform many other important activities.

The fourth characteristic of life is that **living things need to use energy** to stay alive. For example, plants, such as these grasses, can trap the energy of sunlight and this energy not only keeps the grasses alive, some of it is chemically stored in their leaves and stems, so that when animals like these cattle graze, they are able to get the energy they need to power their life processes.

The fifth characteristic of life is that living things can **change as their environments change**, and it is because life has been able to change and adapt over millions of years to meet some very extreme conditions that living things can now be found in almost every imaginable place on earth, such as the algae that live in the boiling water of this hot springs pool, or the dry lichen that cover the surfaces of these rocks, or the bacteria that thrive in the human mouth and digestive tract.

The sixth characteristic of life is that **living things can move.** This characteristic is obvious when movement is fairly rapid. But it is harder to see when it is slow, such as the movements made by plants as they turn their leaves toward the sun.

When it comes to life some creatures are very complicated, while others are quite simple.

But no matter how simple or how complicated they may be, **living things are always very highly organized** in the way they are are put together.

In fact, it is because they are so highly organized that scientists usually refer to living things as **organisms**.

If we look closely at **how** living things are organized, one fact stands out–they are all **made up of cells**. For example, the tips of these tiny onion roots, when stained and viewed under a microscope, look like this–a collection of tiny compartments called cells.

Cells are defined as the **simplest structures that can carry out all of the activities characteristic of life**, that is, can reproduce, grow and develop, use energy, and so on. And because life cannot exist without them, scientists call cells **the basic units of life**.

The tiny microscopic organisms seen here have only one cell; they are called **single celled** or **unicellular organisms** and are examples of some of the simplest living things.

But as we saw in the case of the onion, as living things get bigger, they will always have more cells. In fact, some organisms have hundreds of trillions of cells of many different types. Creatures made up of more than one cell are called **multicellular organisms.**

Within the bodies of multicellular organisms, cells have become **specialized** to carry out specific tasks. For example these **red blood cells** are specialized to carry oxygen to other cells all over the body, while this **white blood cell**, stained with purple dye, is specialized to kill the harmful bacteria that cause certain diseases.