

# Chapter 4 Cells

## Lesson 1

### If We Resemble Apes Does That Mean We Evolved from Apes?



I WOULDN'T HAVE SEEN IT, IF I HADN'T BELIEVED IT...

Evolutionist Richard Leakey approached the National Geographic Society to get funding to *look for ape ancestors of man*. He did not ask for funding to investigate *if man evolved from apes*. When they gave him the funds, they warned him to not come begging again unless he found something. Isn't it interesting that he discovered 40 specimens of the "human ancestor" *Australopithecus*.

"The opportune appearance of mutations permitting animals and plants to meet their needs seems hard to believe. Yet the Darwinian theory is even more demanding: a single plant, a single animal would require thousands and thousands of lucky, appropriate events. Thus miracles would become the rule: events with an infinitesimal probability could not fail to occur."

—Dr. Pierre-Paul Grasse

# Chapter 4 Cells

## Lesson 1

## Vocabulary

**Endoplasmic reticulum**—a network of folded membranes that serves as the cell's transportation system

**Organelle**—any structure that performs specific functions within a cell

**Chromosome**—coiled structure in a cell nucleus that carries information controlling the cell's activities

**Ribosome**—a structure on the endoplasmic reticulum that begins the process of making proteins

**Mitochondrion**—organelle in cell that converts chemical energy of food into a form that the cell can use

**Diffusion**—the movement of a substance from an area of higher concentration to an area of lower concentration

**Osmosis**—the diffusion of water across the cell membrane

**Semipermeability**—when a barrier allows only certain things to pass through it

# Chapter 4 Cells

## Lesson 1

## Vocabulary Matching Answer Key

Letter	Definition	Word
F	1. the movement of a substance from an area of higher concentration to an area of lower concentration	A. endoplasmic reticulum
A	2. a network of folded membranes that serves as the cell's transportation system	B. organelle
B	3. any structure that performs specific functions within a cell	C. chromosome
D	4. a structure on the endoplasmic reticulum that begins the process of making proteins	D. ribosome
C	5. coiled structure in a cell nucleus that carries information controlling the cell's activities	E. mitochondrion
E	6. organelle in the cell that converts chemical energy or food into a form that the cell can use	F. diffusion
G	7. the diffusion of water across the cell membrane	G. osmosis

# Chapter 4 Cells

## Lesson 3

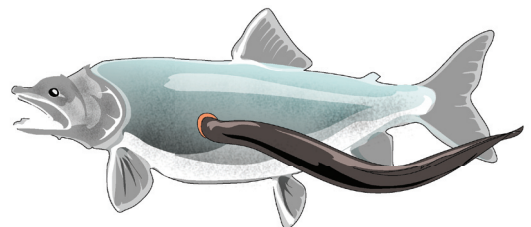
## Was My Great-Granddaddy A Fish?

Example of  
Evolutionary Tree of Life



### A LAMPREY IS NOT A FISH

A lamprey is a jawless marine animal with a toothed, funnel-like sucking mouth, with which most species bore into the flesh of other fishes to suck their blood.





# Chapter 4 Cells

## Lesson 3

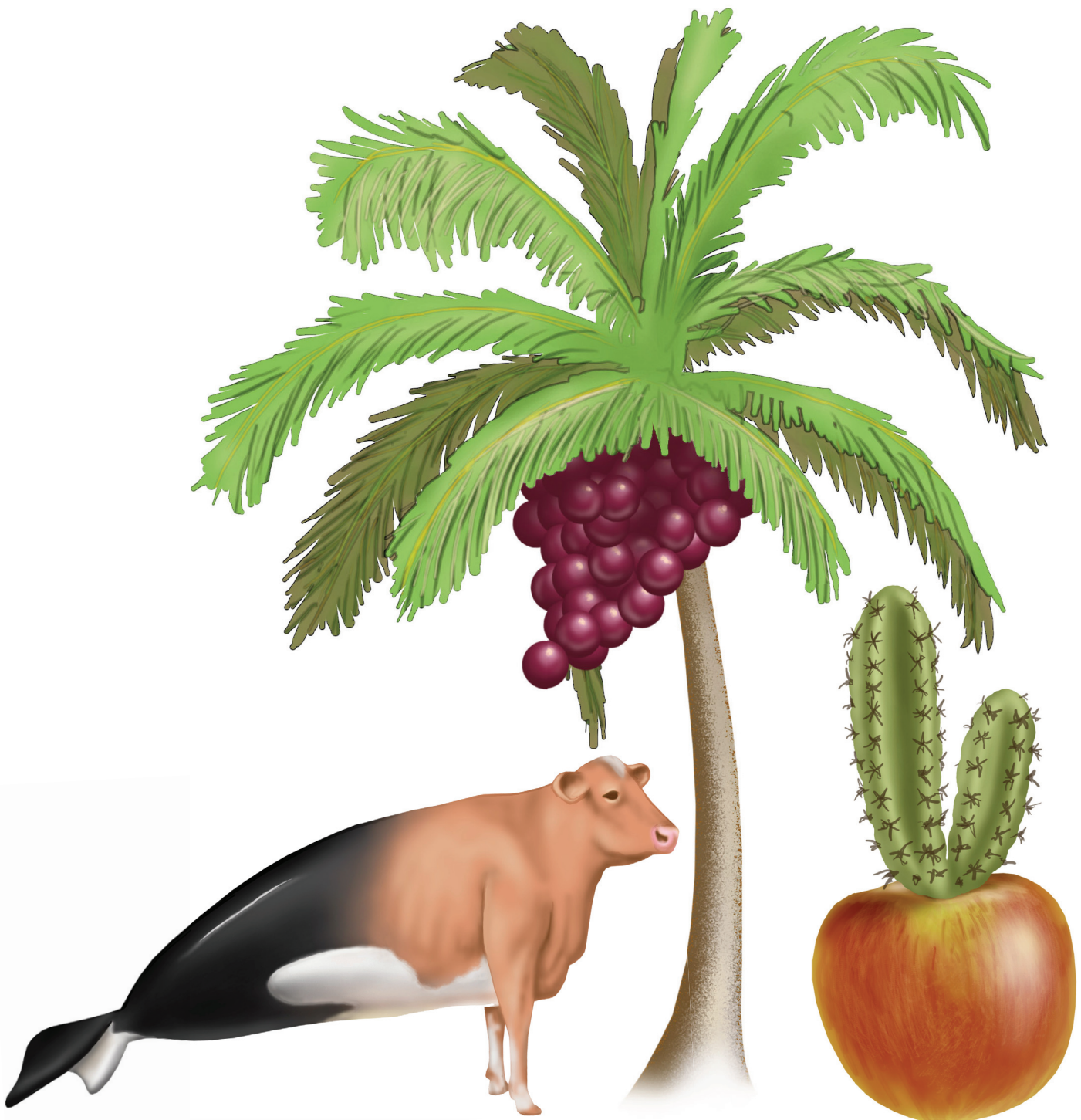
## Common Ancestor or Common Designer?



# Chapter 4 Cells

## Lesson 3

## Did You Ever See These "Transitional Kinds"?





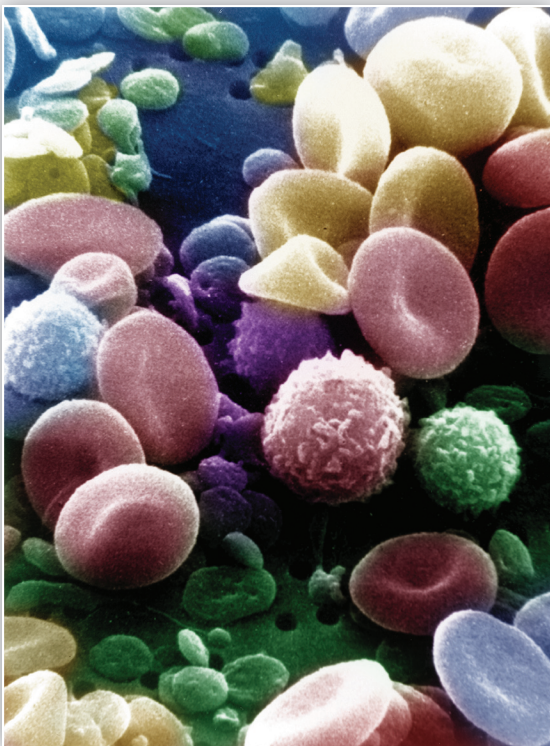
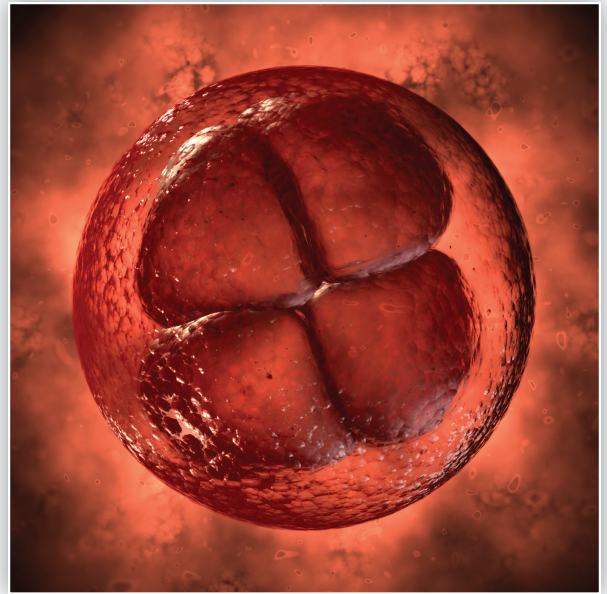
# Chapter 4 Cells

## Lesson 3

## A Look at Cells

A cell is the basic building block of living things and will demonstrate all seven of life's processes:

- respiration
- taking in of nutrients
- growth and repair of wounds
- response to change in surroundings
- getting rid of waste
- movement of parts inside the cell
- division to make new cells



Single-cell organisms are made up of one cell that performs all the necessary functions for life. Multi-cellular organisms may be made up of trillions of cells that have specialized functions.

The invention of the microscope in the 1600s led to the discovery of cells.

The cell theory states:

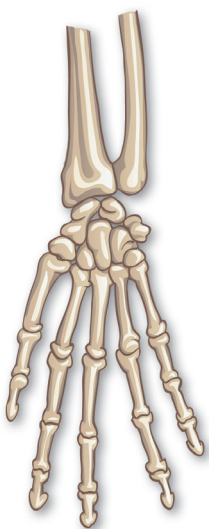
1. All living things are made of cells
2. Cells are the basic units of living things
3. All cells come from existing cells

# Chapter 4 Cells

## Lesson 4

## Similarities Between Organisms

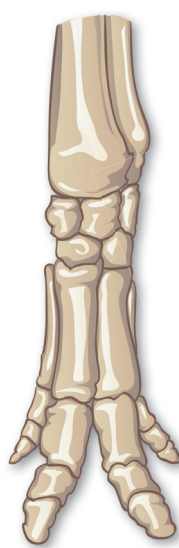
- The limb bones from different mammals do show resemblances. Evolutionists believe this is irrefutable evidence that man evolved from animals.
- Evolutionary scientists are now examining the similarities found in the building blocks of the cell: molecules like protein, RNA, and DNA. There are many genes that are common between humans and bacteria (bacteria are the little germs that make you sick). Genes are made of DNA, the instruction set for forming organisms. Genes are in the chromosomes, which are found in the nucleus of nearly every cell in your body. Since there are common genes, evolutionary scientists conclude that humans and bacteria shared a common ancestor millions of years ago. They believe humans and chimpanzees share a common ancestor from 6 million years ago, and that its ancestor evolved from a fish some 375 million years ago. Therefore, according to evolutionary thinking, the relationship between humans and bacteria would have been more distant.
- Creationists believe that the similarities between humans and bacteria, or humans and fish, is evidence that supports creation by a common Designer not evolution from a common ancestor.



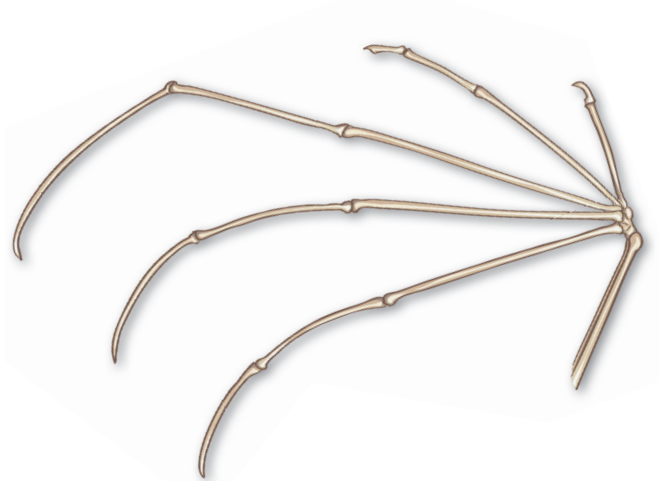
Human



Cat



Pig



Bat

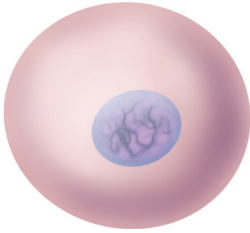


# Chapter 4 Cells

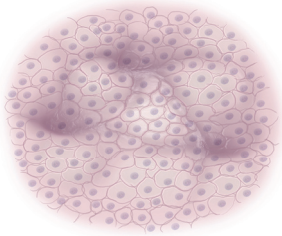
## Lesson 4

## Cells to Systems—1

cell



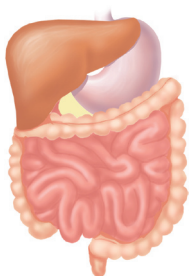
tissue



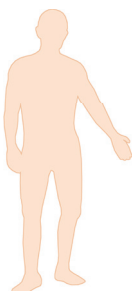
organ



organ system



organism

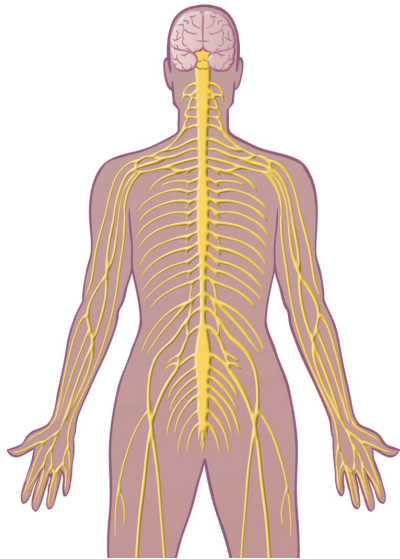


- Cells have specialized shapes and structures that help them perform specialized functions. Your body has about 200 different kinds of cells.
- Cells work together to form tissues. Muscles, bones, and nerves are all specific tissues.
- Tissues can work together to form an organ, which performs a main job for the body. For example, the heart is the organ of the body that pumps life-giving blood.
- Organs work together as organ systems to perform major life processes. The heart is the main member of the circulatory system. The circulatory system contains veins that run throughout the body delivering the oxygen rich blood to every tissue and picking up the cellular waste on the way back to the heart.
- Organ systems work together in many ways to make a complex organism. Each one of life's processes are accomplished by a system of organs that work together to keep the organs alive.
- In humans, the Respiratory System provides oxygen during the process of breathing. The Digestive System breaks down food to provide the nutrients for the circulatory system to deliver. The Nervous System provides stimulation and response to the human's environment. The Skeletal and Muscular Systems provide movement. The Urinary System provides a method to excrete waste.

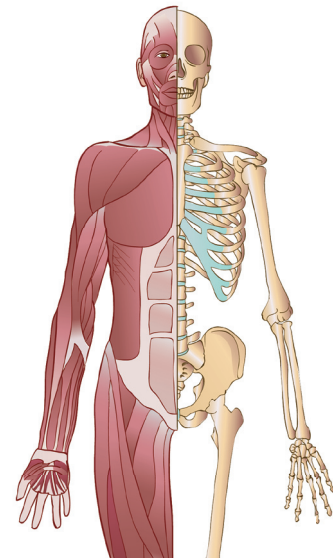
# Chapter 4 Cells

## Lesson 4

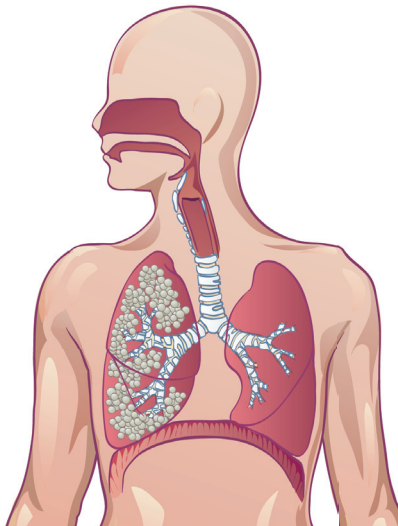
## Cells to Systems—2



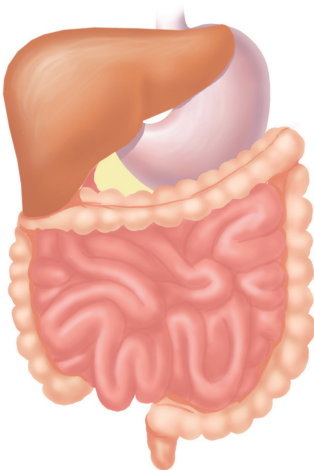
*The nervous system provides stimulation and response to the human's environment.*



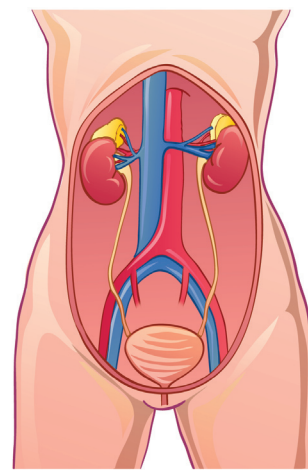
*The skeletal and muscular systems provide movement.*



*In humans, the respiratory system provides oxygen during the process of breathing.*



*The digestive system breaks down food to provide the nutrients for the circulatory system to deliver.*



*The urinary system provides a method to excrete wastes.*

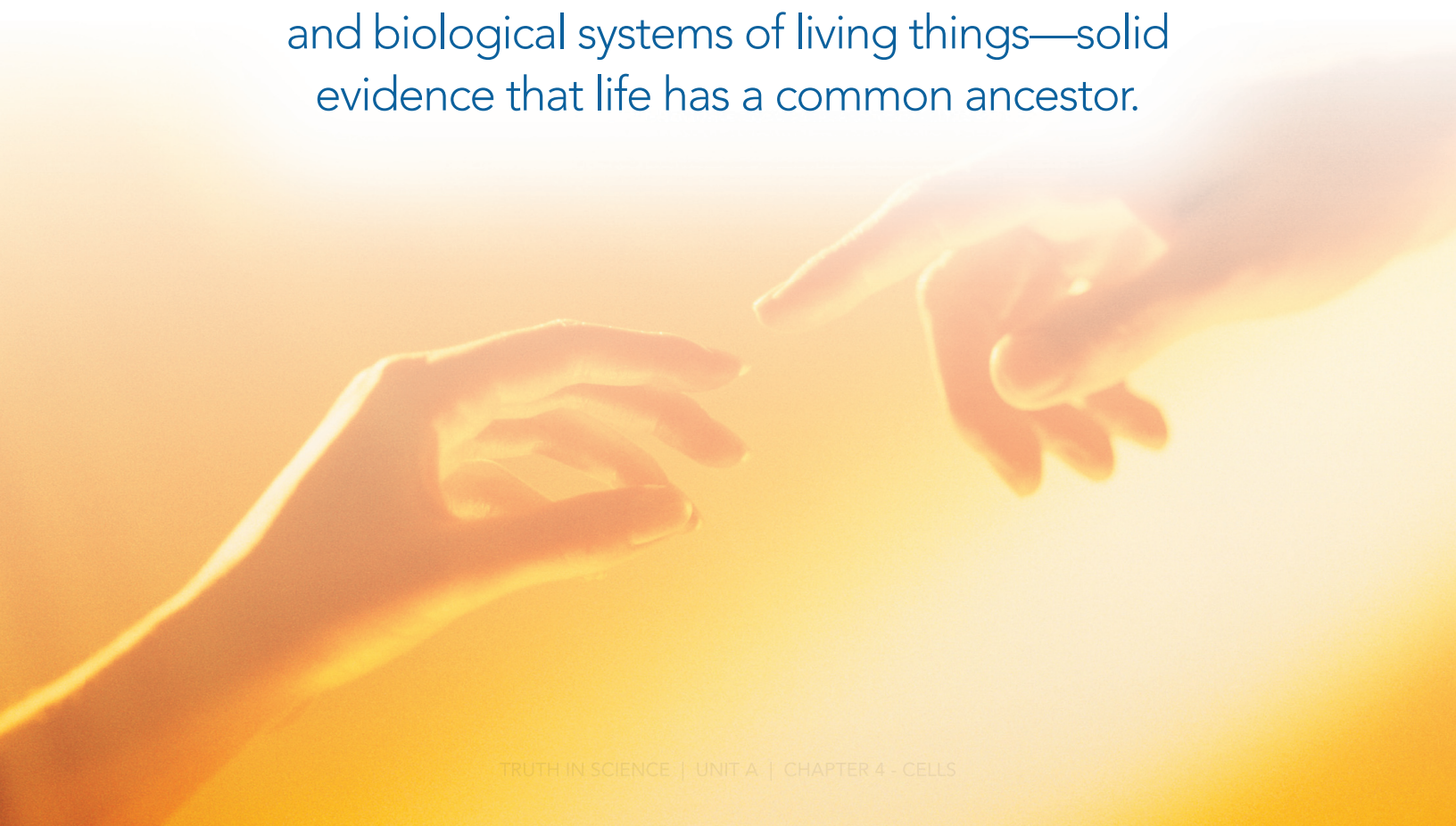
## Lesson 5

### It's All About Viewpoint

All living things, including bacteria, have basically the same type of molecules that appear to be essential for life itself and share a common genetic code mechanism for their reproduction. This is solid evidence to support the idea that life had a common designer.



Studies have found amazing similarities in DNA and biological systems of living things—solid evidence that life has a common ancestor.

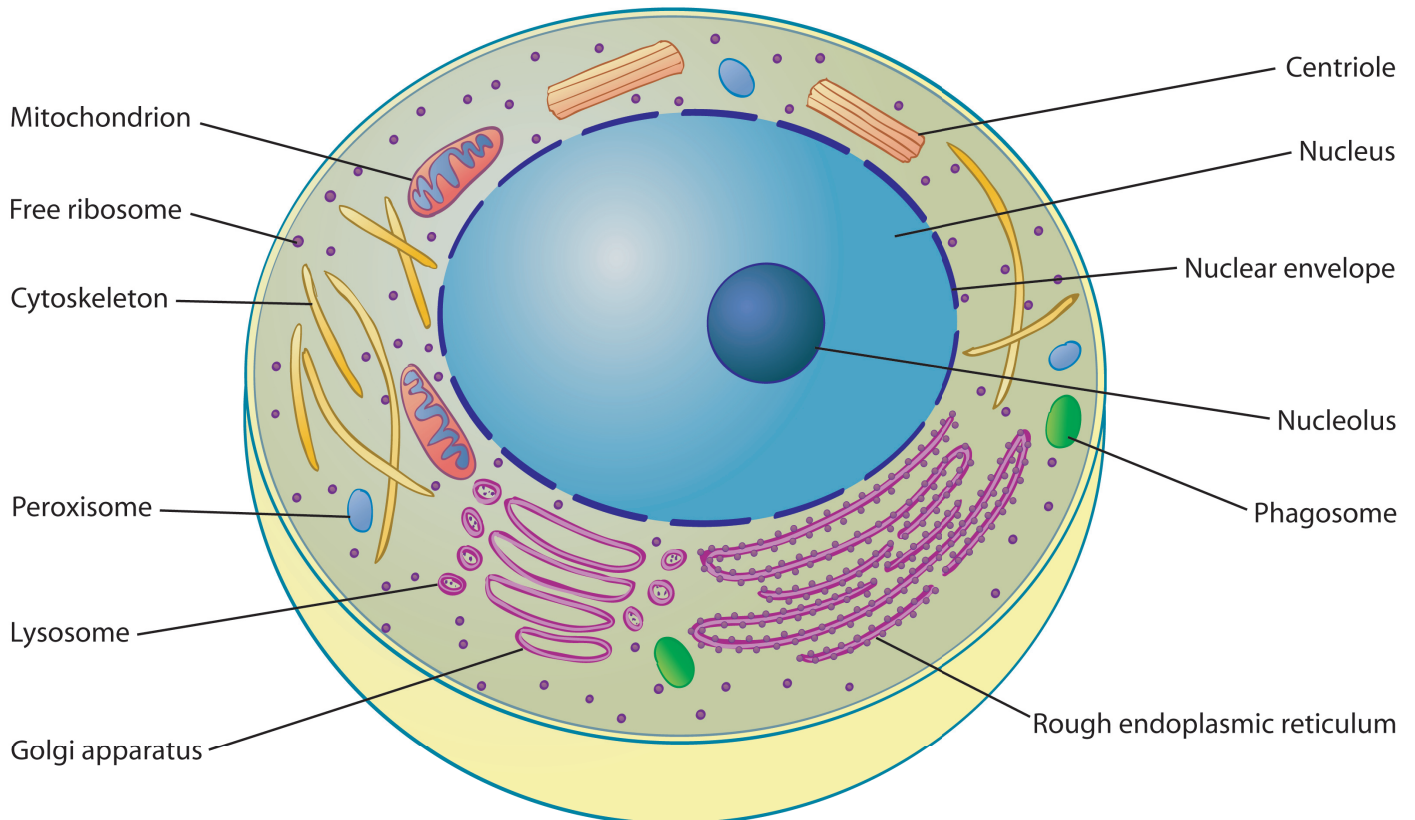




# Chapter 4 Cells

## Lesson 5

## Functions of Organelles



- For a cell to survive, it must get, store and release energy that living things need to stay alive.
- Organelles are structures within cells that perform specific tasks.
- Some common organelles in plants and animals include the nucleus, mitochondria, cell membrane, vacuole, and cytoplasm. Plants cells have two additional organelles: chloroplasts and cell wall.
- Cells depend on the diffusion of water, or osmosis, in order to be two-thirds water.
- Cells need certain substances to function.
- Cells regulate the transport of materials across the cell membranes.



## Lesson 6

## Darwin's Theory of Evolution Based on Natural Selection

- Organisms usually produce more offspring than can survive.
- Competition exists among organisms. Those organisms that survive the competition are the only ones to reproduce and pass on their traits to offspring.



- Organisms best adapted to their environment are the ones most likely to survive long enough to reproduce.
- Parent organisms pass traits on to their offspring. Offspring mostly look like their parents, but variations occur.
- Natural selection is nature's tendency to select certain traits over others to be survivors.

## Lesson 6

## Examples of Rapid Speciation



Researchers on the Caribbean island of Trinidad wanted to see if evolution could be visible in fish by changing their environment. Using guppies (a type of fish), they moved them from a pond with many predators to a pond with a predator that only ate the small guppies. The guppies

found their new home to be very nice. They grew bigger and began to mature slower than before, and produced larger and fewer offspring. This change only took 4 short years: a rate that is 10,000 to 10 million times faster than predicted by the Model of Evolution.

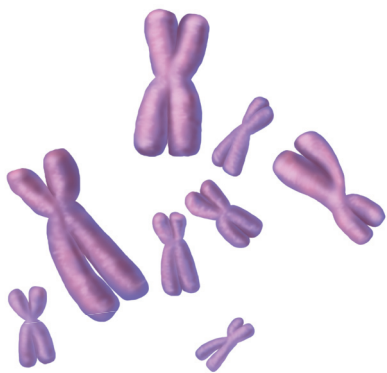
Another example of observed changes that did not take millions of years involved anole lizards. Scientists in the Bahamas took anole lizards from an island with large trees to an island without any lizards and small vegetation. As the original lizards reproduced, the newer generations of lizards displayed immediate body changes. Their back legs became shorter very quickly because the long legs didn't give the lizards any advantages over the other lizards. For example, long legs were no longer needed to climb the broad surface of the trees. This attribute changed very quickly. It happened much faster than the model of evolution says it should happen.



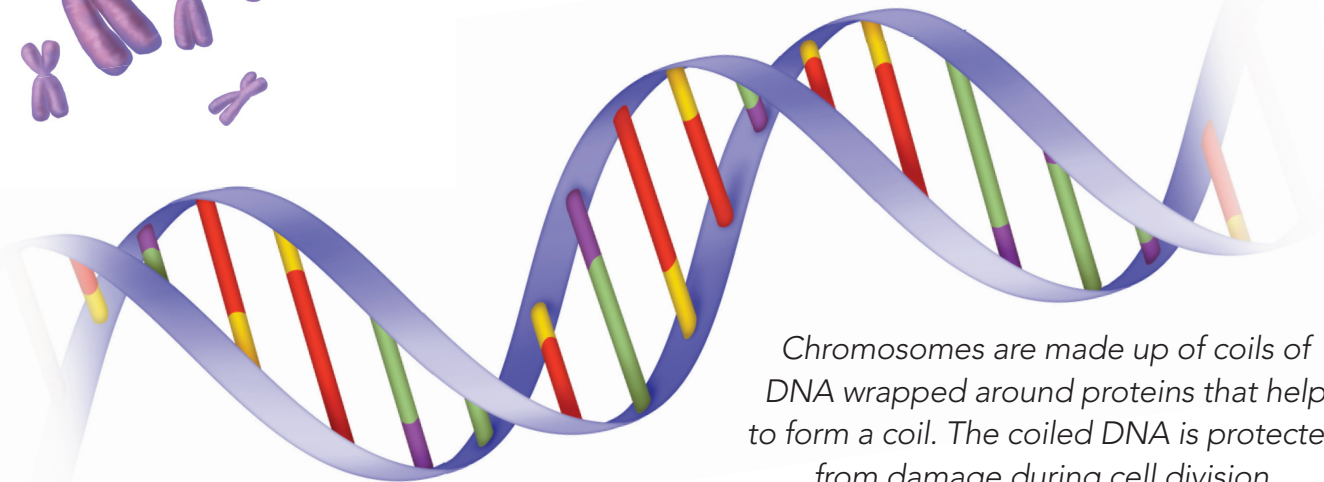
## Lesson 6

### Cells Grow and Divide—1

- As a cell grows, it gets larger, it uses more food, and generates more waste. The distance that the food and waste must travel through the cell gets longer.
- Eventually, cells get so large that they divide into new cells. The new cells take the place of the old cells that are damaged or worn out.
- The cell's nucleus contains DNA, which is the cell's instruction set that defines the function of the cell and how the organism will grow and develop.
- Usually invisible, when mitosis begins the DNA can be seen under a microscope coiling tightly to form bodies called chromosomes.
- To operate properly, each cell must have a full set of chromosomes.



*A cell's chromosomes contain the instructions to build all of the cell's proteins.*

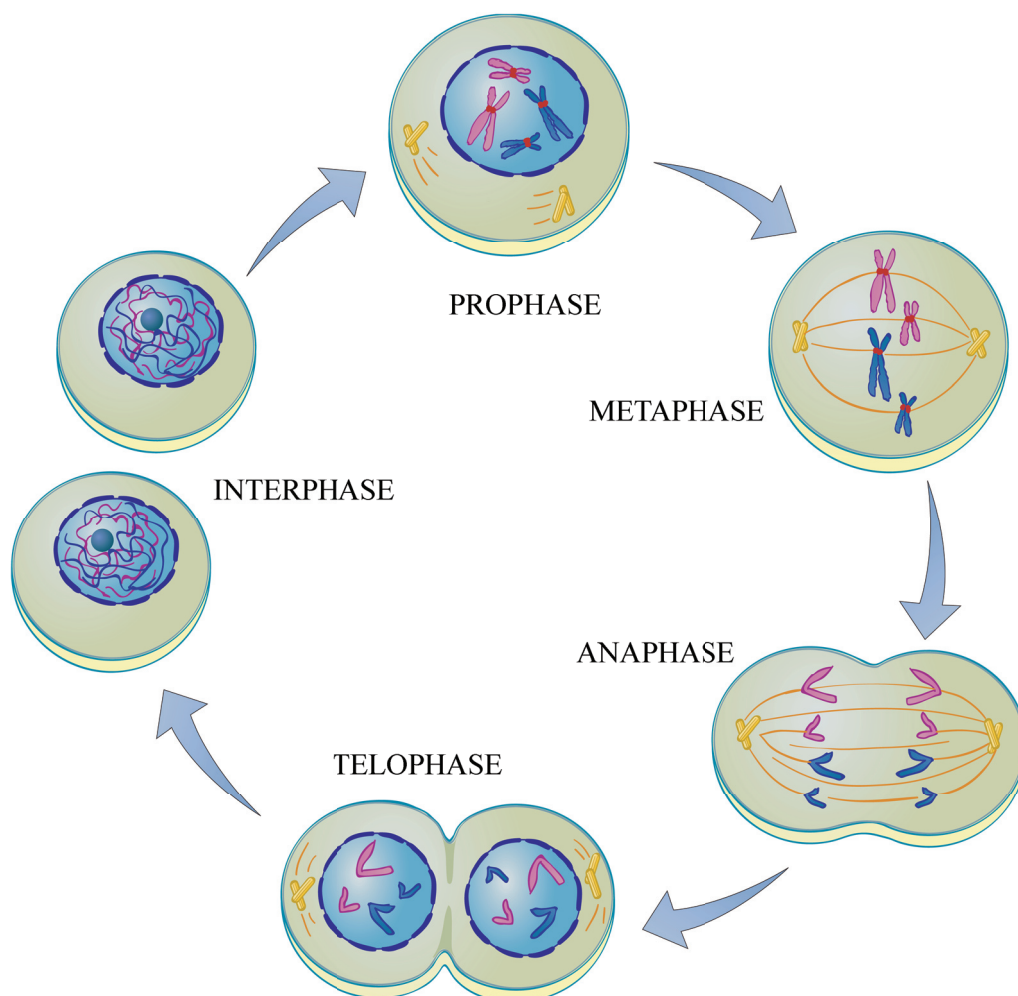


*Chromosomes are made up of coils of DNA wrapped around proteins that help to form a coil. The coiled DNA is protected from damage during cell division.*

## Lesson 6

## Cells Grow and Divide—2

- Cell division begins with mitosis, which is the division of the cell's nucleus.
- To operate properly, each cell must have a full set of chromosomes.
- The process of mitosis assures that new cells that are resulting from division have the proper number of chromosome pairs.





# Chapter 4 Cells

## Lesson 9

## Concept Map

