Name Date

Topic 1.2 Summary

Where do living things come from?

Use with textbook pages 14–21.

Reading Check

1. What is the cell theory?

2. Why do scientists think viruses might be living things?

In Your Own Words

Highlight the three main ideas of the cell theory. Put each idea in your own words.

Check For Understanding

As you read about viruses, highlight the parts that help you understand what a virus is.

The Cell Theory

The invention of the microscope let scientists discover cells. Over a period of about 200 years, scientists studied cells in great detail. These studies helped scientists develop the *cell theory*. The *cell theory* is a set of three statements that explain what living things are made up of and where they come from.

- *Statement 1:* All living things are made up of one or more cells. This is one of the characteristics of living things. (Refer to page 8 in your textbook.)
- *Statement 2:* All new cells come from pre-existing cells. This is a different way of saying that living things reproduce—another characteristic of living things. (Refer to page 11 in your textbook.)
- *Statement 3:* The cell is the basic unit of life. This means that the cell is the most simple thing that has all the characteristics of living things. If a thing is missing even just one of those characteristics, it is not a cell.

Viruses—Living, Non-living, or Something Else?

A virus is a strand of genetic material encased in a protective coating of protein—a protein coat. A virus has just one of the characteristics of living things: It can reproduce. But, a virus cannot reproduce on its own. It must enter and take over a living cell so that it can reproduce.

Most scientists used to think that viruses are not living things. This view may be changing. The table outlines why.

Why Scientists' View of Viruses May Be Changing

What Scientists Have Learned Recently About Viruses	Comments
New, very large viruses are discovered.	These viruses have more genetic material than other known viruses. Some of it has never been seen before in viruses..
The new viruses and genetic material are studied and compared with known viruses.	Studies suggest that viruses might have been more like living cells long ago in Earth's ancient past. As time passed, viruses might have evolved to become the kinds of things they are today.

Cell Theory

Use with textbook pages 16–17.

1. Explain what the three parts of the **cell theory** mean.

a) The cell is the basic unit of life.

b) Cells come from pre-existing cells.

c) All living things are made up of one or more cells.

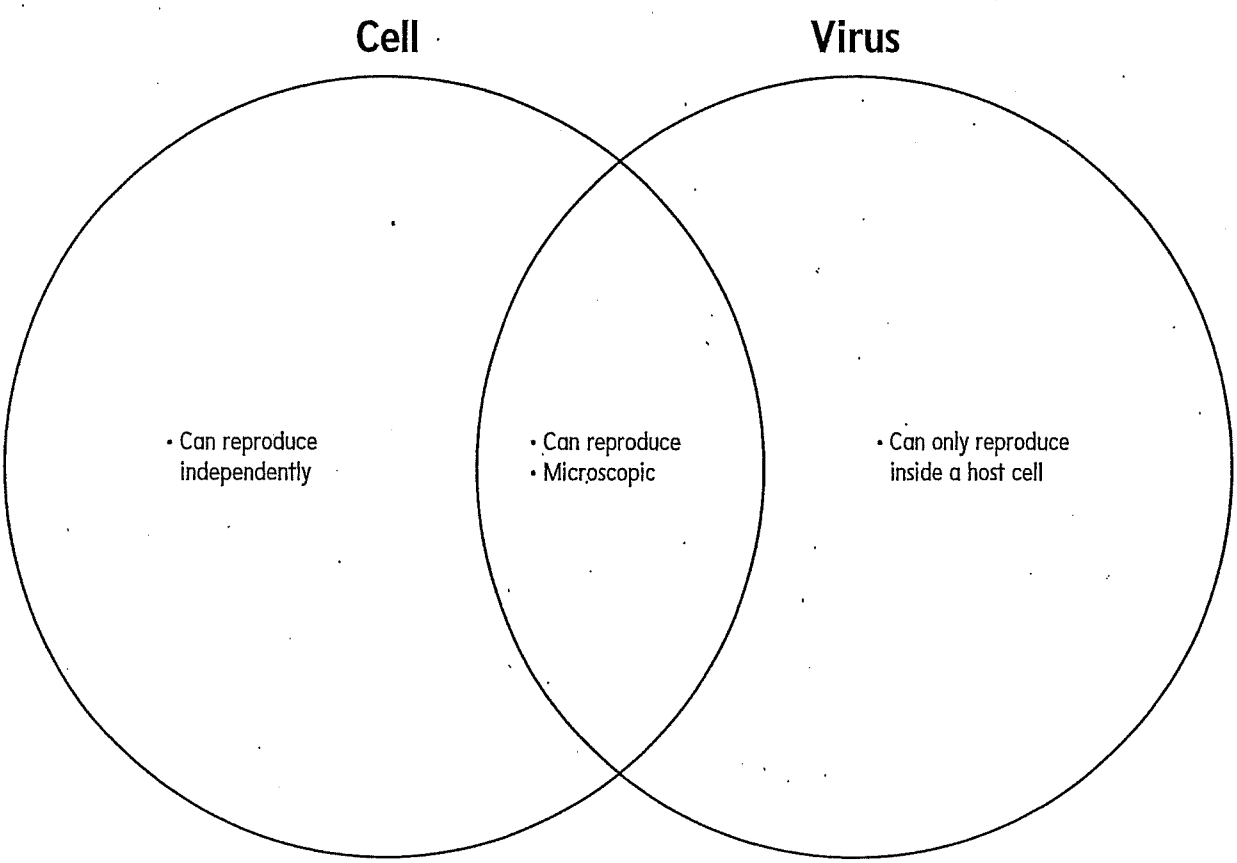
2. Identify the part of the **cell theory** that explains each of the following statements. The table has been partially completed for you.

	Statement	Part of the Cell Theory
a)	A nerve cell by itself is alive.	The cell is the basic unit of life.
b)	An orca is a multicellular organism.	All living things are made up of one or more cells.
c)	A bacterium splits into two new daughter cells.	Cells come from pre-existing cells.
d)	New skin cells are produced through cell division.	
e)	*Paramecium* is a single-celled organism.	
f)	Diatoms are unicellular algae found in the ocean.	
g)	A fairy ring mushroom is composed of many cells.	
h)	A plant cell takes in carbon dioxide and releases oxygen.	
i)	A white blood cell engulfs a bacterium and then digests it.	
j)	Cells are often referred to as the building blocks of life.	
k)	A cell is the structural unit of life that can perform different life functions.	
l)	A bud grows off the yeast cell and eventually separates to form a new cell.	

Comparing a Cell to a Virus

Use with textbook pages 18–19.

1. Complete the Venn diagram to compare and contrast a cell with a virus. Part of the Venn diagram has been completed for you.



Are Viruses Alive?

Use with textbook pages 18–19.

1. Identify which of the following statements provide evidence that viruses are living things and which support that they are non-living particles.

	Statement	Living or Non-living?
a)	Viruses do not use energy.	
b)	A virus can evolve or change over time.	
c)	Viruses do not produce any waste products.	
d)	Viruses can exist in an inactive or dormant state.	
e)	A virus can reproduce only by infecting a host cell.	
f)	Many viruses have the same 400 protein folds as living cells.	
g)	A virus is a particle with genetic material surrounded by a protein coat.	
h)	A virus is dependent on a host cell's structures and processes to produce more viral particles.	
i)	Viruses have the ability to pass on their genetic information to future generations.	
j)	Viruses do not have the internal structures needed to produce more viruses on their own.	
k)	Viruses cannot take in nutrients like consumers or produce their own food like producers.	
l)	Viruses cannot carry out many life processes like digestion, respiration, and circulation.	
m)	There are no internal activities that occur inside a virus when it is not in contact with a host cell.	
n)	Some viruses, like the Mimivirus and the Megavirus, may have evolved from a common ancestor that was able to produce its own proteins.	