

UNIT 1

Life processes are performed at the cellular level

TOPIC 1.2

Where do living things come from?

**TOPIC 1.2** Where do living things come from?**Topic 1.2: Where do living things come from?**

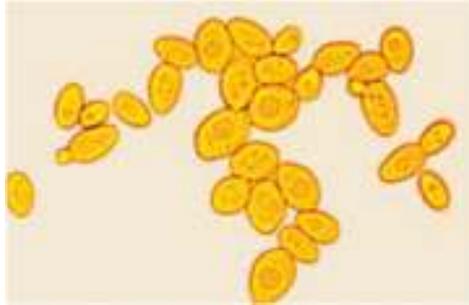
- Where do living things come from?
 - For thousands of years, people observed that maggots (fly larvae) seemed to appear in rotting meat
 - They thought that life could spontaneously generate from lifeless things



TOPIC 1.2 Where do living things come from?

Concept 1: Living things come only from other living things.

- Development of microscopes helped people understand that living things come only from other living things



How does this photo support the idea that life only comes from pre-existing life?

BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

Microscopes and Living Things

- **1660s:** Robert Hooke
 - Created a microscope to observe tree bark
 - Called the structures he saw “cells”
- Microscopes helped scientists observe and view different types of cells



Figure 1.6: Tree bark cells

BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

Microscopes and Living Things

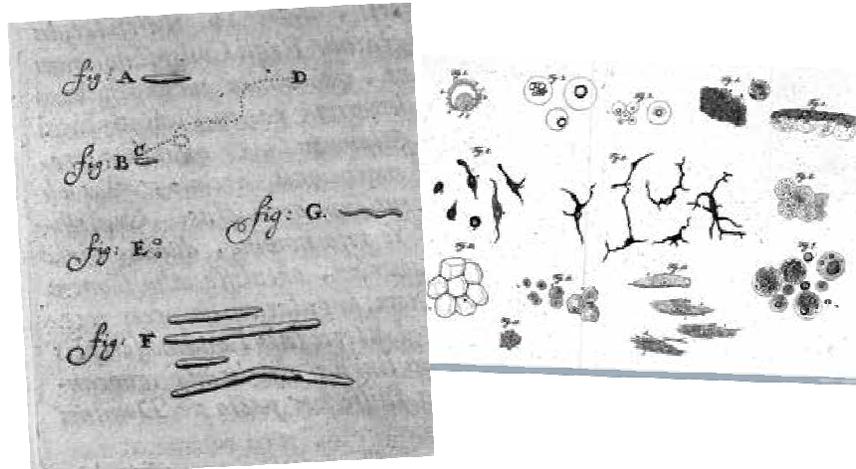


Figure 1.7: Early drawings of different organisms seen under a microscope

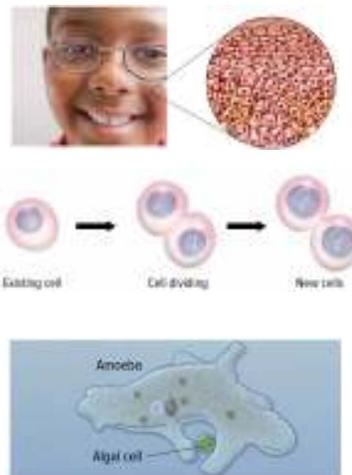
BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

The Cell Theory

- **1800s:** Based on observations of cells using microscopes, scientists agreed on three statements about cells (cell theory)

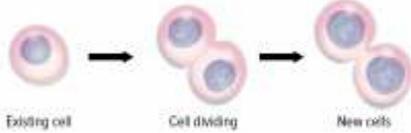
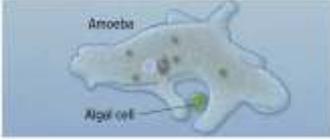
- **Cell theory:** Explains the structure and source of all living things



BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

The Cell Theory

Statement	Example
All living things are made up of one or more cells.	
All new cells come from pre-existing cells.	 Existing cell Cell dividing New cells
The cell is the basic unit of life.	<p>This unicellular amoeba is surrounding an algal cell to get food and energy.</p> 

BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

Discussion Questions

- Identify the statements that make up the cell theory. Give an example that supports each statement.
- What processes of scientific inquiry do you think scientists used to establish the cell theory?



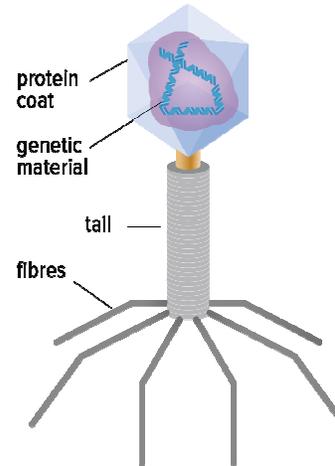
BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

Concept 2: Scientists debate about whether viruses are living things or not.

- **Virus:**
 - Strand of genetic material surrounded by a protein layer (coat)
 - Can infect and reproduce in a host cell

Figure 1.6: A bacteriophage virus infects bacteria.

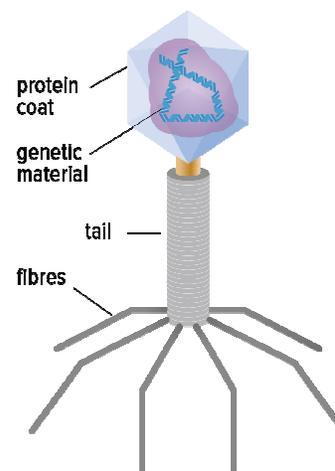


BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

How Viruses Work

- Viruses do not contain cell parts
 - Cannot take in nutrients, use energy, produce waste, or reproduce on their own
 - Need to be inside a cell of another organism (host) to reproduce

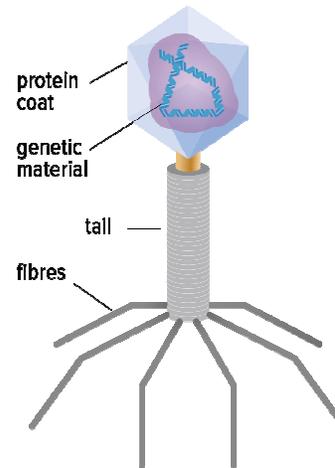


BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

How Viruses Work

- Viruses are dormant (inactive) before they enter a host
 - Can stay dormant for hours, days, or months
 - Flu viruses can stay dormant for 24 hours on a hard surface
 - Once viruses reach a host, they will use the host's cells to reproduce



BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

How Recent Evidence Has Changed How Scientists View Viruses

- Are viruses living things?
 - Many scientists do not consider viruses to be alive
 - Recent discoveries have supported the idea that viruses could be considered living things



Mimivirus (top) and Megavirus (bottom)

BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

How Recent Evidence Has Changed How Scientists View Viruses

Year	Discovery	Significance
1992-2008 	Mimivirus • Has more genetic material than other viruses	• Some of the genetic material had never been seen in viruses
2011 	Megavirus • Has more genetic material than Mimivirus	• Megavirus and Mimivirus may have evolved from a common ancestor that could make its own proteins
2015 	Protein folds that are shared between viruses and cells from other organisms	• Viruses may have once had the same properties of cells and could have been alive

BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

Discussion Questions

- Why do many scientists consider viruses to be non-living?
- What new evidence is most convincing to you that viruses should be considered living things?



BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

Discussion Questions

- A number of fish farms raise salmon on the east and west coasts.
 - A deadly flu virus that infects farm-raised salmon in the east is of concern in B.C.
 - How could such a virus affect people and B.C. culturally and economically?



Sockeye salmon

BC Science Connections 8, Copyright © McGraw-Hill Education

TOPIC 1.2 Where do living things come from?

Summary: Where do living things come from?

- Living things come only from other living things.
- The cell theory explains the structure and source of all living things.
- Scientists debate about whether viruses are living things or not.



BC Science Connections 8, Copyright © McGraw-Hill Education