

TOPIC 1.1

Why is the reproduction of cells important?

Key Concepts

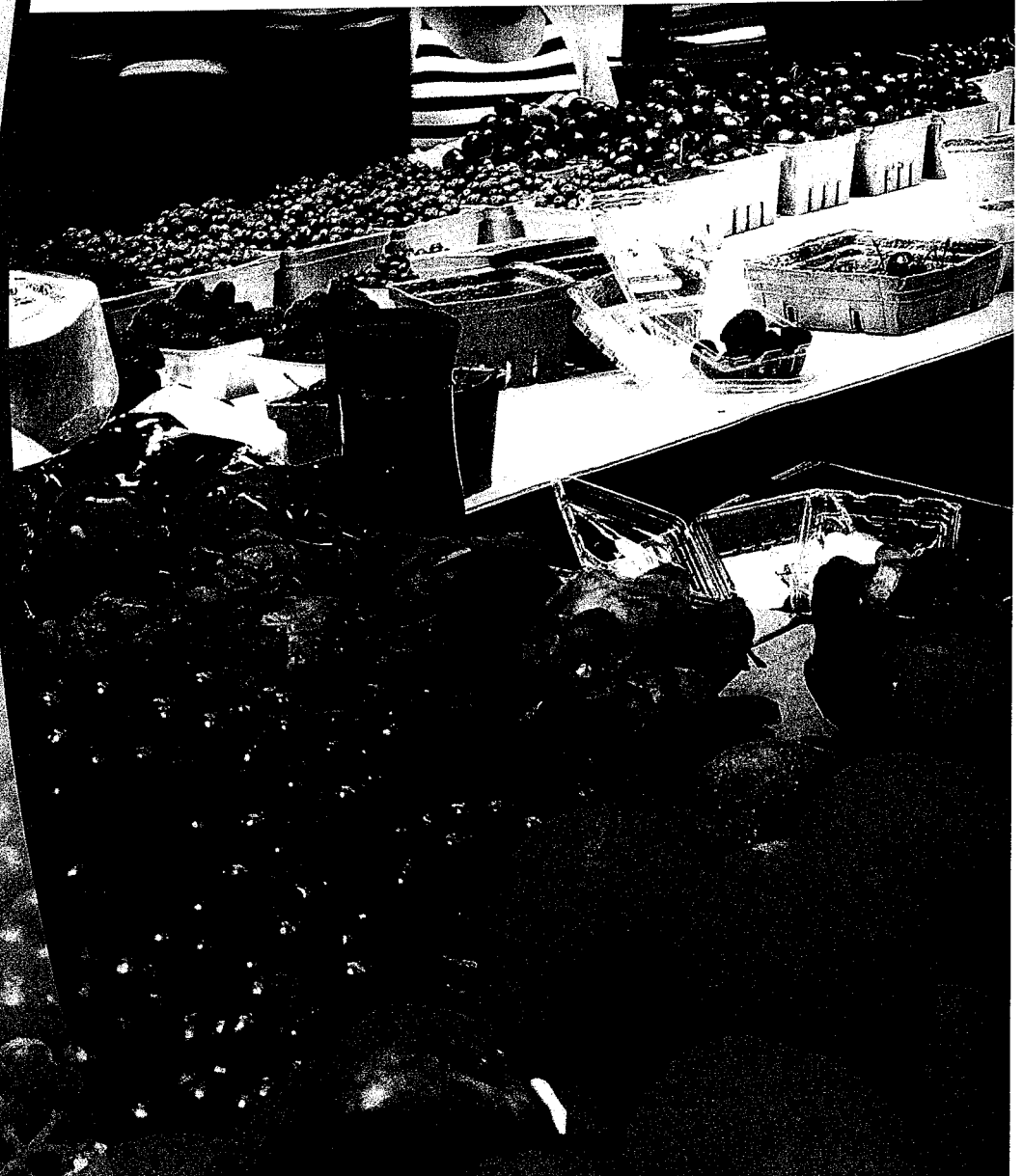
- Reproduction ensures that life exists beyond its present generation.
- Reproduction transfers genetic information from parents to offspring.

Curricular Competencies

- Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest.
- Experience and interpret the local environment.
- Ensure that safety and ethical guidelines are followed in your investigations.
- Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information.

The Granville Island market is a popular place for locals and tourists alike. As in other markets throughout the province, vendors display their wares in hopes of attracting hungry customers.

Take a moment to think about all the different kinds of fruits, vegetables, and meats that you could find at a market such as this. Reflect on how they differ in qualities such as size, colour, shape, and the number of their cells. Then consider this: Each began, at the very start of its life, as one, single cell. For that matter, so did you. And so did every other living thing on Earth.



Starting Points

Choose one, some, or all of the following to start your exploration of this Topic.

- 1. Identifying Preconceptions** What do you remember about cells from Science 8? What is the cell theory, and what are its three statements? How do prokaryotic cells differ from eukaryotic cells?
- 2. Questioning** All of us started out as a single cell. What do you think happened to the one cell you started from to make the person you are today? What do you think would happen if your body could no longer make new cells?
- 3. Applying** Think about a food such as apples, which come in so many different varieties. What makes all the apples of one variety the same but different from other varieties? How are these similarities and differences achieved?
- 4. Considering First Peoples Perspectives** Life renews itself through reproduction of cells. In what ways have humans affected this process of renewal? What are some ways that people can impact sustainability of plants and animals through their actions?



Key Terms

There are four key terms that are highlighted in bold type in this Topic:

- asexual reproduction
- sexual reproduction
- DNA
- chromosome

Flip through the pages of this Topic to find these terms. Add them to your class Word Wall along with their meanings. Add other terms that you think are important and want to remember.

CONCEPT 1

Reproduction ensures that life exists beyond its present generation.

Activity

Take a Nature Walk

According to cell theory, all living things are made up of cells, which are derived from previously existing cells. Following your teacher's instructions, go for a nature walk. Record, digitally or in writing, all the organisms that you observe.

1. What does it mean to you that all the life you observe is made up of cells?
2. Record your thoughts, curiosities, and questions about cells and life around your school, your home, and other places that you are a part of.
3. Think about interconnectedness. How are the parts of a plant connected to what you observe? How is the sky connected? How are you connected?



Figure 1.1 All First Foods ceremonies reflect the spiritual dimension of First Peoples science. They also demonstrate the interconnectedness of people and the natural world, and they reinforce respect for resources of the land.



The people of the Kwantlen First Nation stand along the river banks of Fort Langley (**Figure 1.1**). Like their ancestors before them, like other First Peoples throughout the province, they stand to mark the start of this year's salmon run. Following traditions established since time immemorial, they welcome the returning salmon, their relatives, with respect and gratitude. In this ceremony, the people and the salmon honour promises made long ago to renew and replenish the spirit and the flesh—promises that sustain generations now and in the future.

Reproduction and Sustainability

Sustainability refers to the ability of the environment and the living things it supports to endure into the future (**Figure 1.2**). Imagine for a moment that all living things on Earth are no longer able to reproduce—to make more of their own kind. Picture, for example,

the last bear eating the last berry on the last berry bush. Or catching the last trout that moments earlier snapped up the last crayfish. Imagine this same scenario for every organism on the planet. In this grim thought experiment, it would not be long before all life on Earth starved and came to an end.

Reproduction ensures that organisms have a source of nutrients and energy to sustain their life processes. The sustainability of living things depends on reproduction.

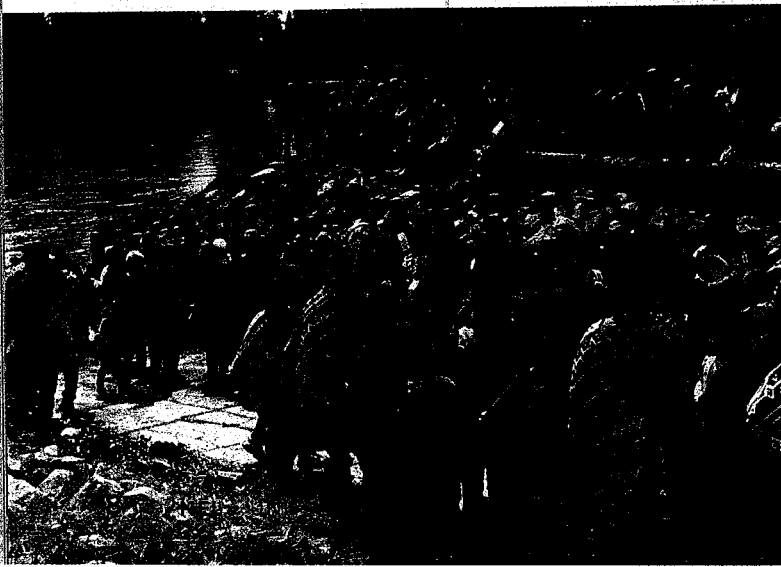




Figure 1.2 The Western Painted Turtle is B.C.'s only native freshwater turtle. It is found mainly on the southwest coast, where it is endangered, and in the southern interior, where it is of special concern. Adults live up to 30 years, but males need 8 to 10 years to reach sexual maturity and females 12 to 15 years. What questions can you think of about the Western Painted Turtle, interconnections, and the turtle's ability to endure into the future?



Reproduction and Continuity

Look back at the title for this unit on page 2. When you read the phrase “cells being derived from cells,” you might recall learning about the cell theory in Science 8. Part of the cell theory states that all cells come from pre-existing cells. What this means is that all cells are formed through the division of previously existing cells. In short, all cells are formed by reproduction.

Now look at the word at the start of the unit title: *continuity*. Biologists use this word to talk about how each species (kind) of organism continues to exist over time, from one generation to another. Individual organisms grow, develop, and die. However, a species continues to exist into the future only if its individual members produce offspring. A species continues to exist into the future only if its members reproduce.

Reproduction ensures that life exists beyond its present generation. All the life you see around you, all the life in the world beyond the places that you live, all the life that provides you and other living things with food that supplies you with energy and nutrients to grow, develop, and carry out all your daily activities—all this life depends on the ability of cells to reproduce.

Connect to Investigation
1-A on page 14

Connect to Investigation
1-B on page 16

Before you leave this page . . .

1. What does the word *continuity* mean in terms of reproduction?
2. How are these three terms related: *reproduction, sustainability, continuity*?