

You are about to begin a scientific exploration using *Investigating Science 9*. To assist you in your journey, this book has been designed with the following features to help you.

1. Unit Overview — what you will learn

The book is divided into four units. Each unit opens with a large photograph that captures one of the ideas that will be covered in the unit.

UNIT A Sustainable Ecosystems

Contents

- 1 Ecosystems are complex, self-regulating systems of organisms and their abiotic environments.**
 - 1.1 Ecosystems
 - 1.2 Nutrient Cycles and Energy Flow
 - 1.3 Interactions in Ecosystems
- 2 Human activity affects the sustainability of ecosystems.**
 - 2.1 Human Use of Ecosystems
 - 2.2 Assessing the Impact of Human Activities on Ecosystems
- 3 Governments, groups, and individuals work to promote sustainable ecosystems.**
 - 3.1 Government Action to Protect Canada's Ecosystems
 - 3.2 Environmental Stewardship

Unit Task

You will be part of a team that is designing a highly sustainable community to be built in your area. You will ask the following questions as you plan, design, and research your community to ensure the impact on your local ecosystem.

Essential Question

How do human activities, both positive and negative, affect the sustainability of ecosystems?

The unit **Contents** lists the Chapters, Key Ideas, and sections in the unit. The orange DI box indicates essential lessons that have additional differentiated instruction support in the Teacher's Resource.

An introduction to the **Unit Task** is provided below the unit Contents. This task is revisited at the end of each chapter, providing you with an opportunity to review key ideas covered in the chapter that will be required to successfully complete the Unit Task.

2. Exploring — adds interest

This spread is an introduction. It has an interesting real-world example to introduce the unit.

Exploring

Cootes Paradise

What caused the plant populations to decrease?

The lush green of Cootes Paradise hangs up against the hard edge of the city of Hamilton. Cootes Paradise is a wetland located beside the city of Hamilton. A wetland is an area in which the soil is saturated with water for at least part of the year. Wetlands provide a home for many different species of fish, plants, insects, and birds. Many people also use wetlands for camping, fishing, and wildlife viewing.

Pollution and urban development have affected Cootes Paradise, but another factor has taken its toll on the wetland—cayuga. These fish feed in the shallow waters by pulling up the roots of water plants, damaging the plants and making the waters as they go. This makes it difficult for water plants and other fish species to survive. Almost 85 percent of the water plants in the marsh have disappeared. This was never supposed to happen.

Take Action

In 1983, the municipal government of Hamilton and the local community joined together to take on the challenge of restoring Cootes Paradise. One of the major things they did was to install a fallowway at the entrance to Cootes Paradise. It allows small fish to enter the wetland but prevents large fish from entering. The large fish are then captured and inspected. Wetland fish species are returned to Cootes Paradise, but adult carp are not. The fallowway project has been a tremendous success and wetland plant and fish species are recovering.

A1 Science, Technology, Society and the Environment

Pesticide Use Across the Country

Province/Territory	Pesticide Use (kg/ha)
Alberta	10
British Columbia	15
Manitoba	20
Ontario	25
Quebec	30
Saskatchewan	35
Atlantic Provinces	40

1. Why does pesticide use vary across the country?

2. How has pesticide use changed over time?

3. How can we reduce pesticide use?

This activity connects the themes of Science, Technology, Society, and the Environment to what you are learning.

7. Unit Task — lets you demonstrate learned skills

A task at the end of each unit presents an opportunity for you to demonstrate what you've learned. You'll work in a group or individually. The task requires you to apply some of the skills and knowledge that you have acquired during the unit.

UNIT A Task
Building a Sustainable Community

Getting Started
You will work in groups to design a sustainable community as part of a team designing a new village. You will submit a specific plan for the village, such as:

- a budget
- a floor plan
- a water management plan
- a waste management plan
- a transportation plan

Criteria for Success
You will receive feedback on your design from your peers and your teacher. Your design should include:

- a budget
- a floor plan
- a water management plan
- a waste management plan
- a transportation plan

What You Need
• Research on sustainable design
• Research on sustainable design
• Research on sustainable design

What You Need to Know
• You will need to know how to design a sustainable community.

Assessing Your Work
• You will be assessed on your design and presentation.

8. Unit Review — connects what you have learned

The Unit Review is an opportunity to review the concepts, skills, and ideas you have learned in the unit.

UNIT A Review
Key Terms Review
Key Concept Review
Connect Your Understanding
Skills Practice
Revisit the Big Ideas and Fundamental Concepts

Key Terms Review
This is a chance to review the important terms in the unit.

Key Concept Review
Questions designed to review your basic understanding of the key concepts in each chapter of the unit.

Connect Your Understanding
Questions that require you to use the ideas in more than one chapter in your answers.

Skills Practice
Questions related to specific skills you have learned in the unit.

Revisit the Big Ideas and Fundamental Concepts
Questions that revisit the Big Ideas and Fundamental Concepts covered in the unit.

Science, Technology, Society, and the Environment
Opportunities to express your thoughts about ideas related to Science, Technology, Society, and the Environment issues discussed in the unit.

Reflection
Opportunities to express your thoughts about ideas you have discovered in the unit.

9. Other Features — bring science to life

Here are other features you will find in each unit. Each one has a different purpose and is designed to help you learn about the ideas in the unit.

Investigating Careers in Science
Here you will find profiles of great Canadians in science as well as careers in science based on the different types of science studied in each unit.



Science Everywhere
This feature presents interesting information about concepts covered in the unit.



Cool Ideas
This feature is written by Discovery Channel *Daily Planet* host Jay Ingram to connect concepts covered in the unit to findings coming from current research.

10. Skills Reference — provides skills information and practice

These pages provide references to lab safety and other basic scientific skills that will help you as you do the activities. Remember to check the Skills Reference when you need a reminder about these skills.



Now it's time to start. We hope you will enjoy your scientific exploration using *Investigating Science 9!*