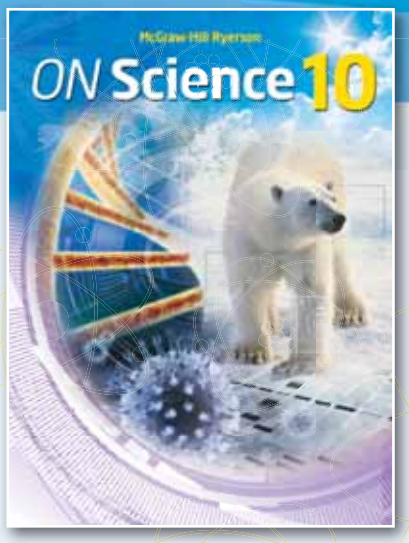
Exploring *ON Science 10*



Solve a Puzzle, Find a Quote

Use the puzzle clues on these two pages to begin your journey through *ON Science 10*. (Do not write in this textbook.) When you are finished, the circled and numbered letters will help you discover a powerful quote by Marie Curie.

Marie Curie's pioneering work in the field of radioactivity included directing the world's first studies into the treatment of cancers using radioactivity. She was the first person ever to win two Nobel Prizes.

What idea inspired Marie Curie to attain such accomplishments?

Nothing in life is to be feared.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

—Marie Curie

What does this quote tell you about Marie Curie's approach to science?

How can you apply this approach to your studies in science?

Engage—Learning Science

What are the four units you will study in *ON Science 10*?

Unit 1: _____, (21) _____, and _____ (19) of _____ _____

Unit 2: _____ (17) _____

Unit 3: _____ (16) _____

Unit 4: _____ and _____ (2) _____ (5) _____

The first Big Idea for Unit 2 is:

BIG IDEAS

Chemical (12) _____ may have a negative impact on the environment, but they can also be used to address _____ (10) _____ challenges.

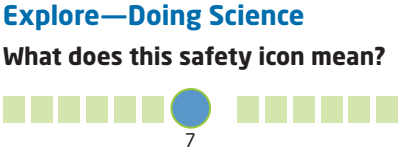
Features in the margins throughout each chapter help you understand science through fascinating facts and figures. Three of these "Sense of" features are shown below. Which one is missing?

Sense of Value **Sense of scale** **Sense of place**

Sense of (3) _____

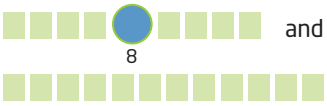
Explore—Doing Science

What does this safety icon mean?



The Activities and Investigations in your textbook will help you explore and investigate questions about your world using the skills of scientific inquiry. **Which is the missing skill in the Skill Check below?**

Skill Check
- ✓Initiating and Planning
- ✓Performing and Recording
- ✓Communicating



Where would you look in this textbook to find out how to draw a pie graph?

Explain—Understanding Science

National Geographic features help you understand science through images. **What is the title of the National Geographic feature in Unit 2?**

Learning how to understand and use science vocabulary is an important communication skill. **What is the second key term in Chapter 1?**

Suppose you are looking for places in the book where a particular name or term is mentioned. **What part of this textbook can help you?**

Extend—Applying Science

Every chapter has a Case Study feature that explores a specific real-world scientific topic or issue that relates to that chapter. Questions at the end of each Case Study challenge you to find out more about the topic. **What is the name of the Case Study in Chapter 4?**

In the Making a Difference feature, you will have the opportunity to read about young Canadians, most of them high school students, who have used the tools of scientific inquiry to positively influence their community, the environment, or some other facet of their lives. **Who is profiled in the Making a Difference feature in Chapter 1?**

Which prominent Canadian is profiled in the Science at Work feature at the end of Unit 3?

Evaluate—Studying Science

What Study Toolkit strategy helps you alter your reading speed based on your purpose for reading?

What chapter feature models the way you might solve a certain kind of problem?

If you wanted to check an answer to a Practice Problem, where would you look?

Safety in your Science Classroom

Become familiar with the following safety rules and procedures. It is up to you to use them and your teacher's instructions to make your activities and investigations in *ON Science 10* safe and enjoyable. Your teacher will give you specific information about any other special safety rules that need to be used in your school.

1. Working with your teacher …

- Listen carefully to any instructions your teacher gives you.
- Inform your teacher if you have any allergies, medical conditions, or other physical problems that could affect your work in the science classroom. Tell your teacher if you wear contact lenses or a hearing aid.
- Obtain your teacher's approval before beginning any activity you have designed for yourself.
- Know the location and proper use of the nearest fire extinguisher, fire blanket, first-aid kit, and fire alarm.

2. Starting an activity or investigation …

- Before starting an activity or investigation, read all of it. If you do not understand how to do a step, ask your teacher for help.
- Be sure you have checked the safety icons and have read and understood the safety precautions.
- Begin an activity or investigation only after your teacher tells you to start.

3. Wearing protective clothing …

- When you are directed to do so, wear protective clothing, such as a lab apron and safety goggles. Always wear protective clothing when you are using materials that could pose a safety problem, such as unidentified substances, or when you are heating anything.
- Tie back long hair, and avoid wearing scarves, ties, or long necklaces.

4. Acting responsibly …

- Work carefully with a partner and make sure your work area is clear.
- Handle equipment and materials carefully.
- Make sure stools and chairs are resting securely on the floor.
- If other students are doing something that you consider dangerous, report it to your teacher.

5. Handling edible substances …

- Do not chew gum, eat, or drink in your science classroom.
- Do not taste any substances or draw any material into a tube with your mouth.

6. Working in a science classroom …

- Make sure you understand all safety labels on school materials or those you bring from home. Familiarize yourself, as well, with the WHMIS symbols and the special safety symbols used in this book, found on page xvii.
- When carrying equipment for an activity or investigation, hold it carefully. Carry only one object or container at a time.
- Be aware of others during activities and investigations. Make room for students who may be carrying equipment to their work stations.

7. Working with sharp objects …

- Always cut away from yourself and others when using a knife or razor blade.
- Always keep the pointed end of scissors or any pointed object facing away from yourself and others if you have to walk with such objects.
- If you notice sharp or jagged edges on any equipment, take special care with it and report it to your teacher.
- Dispose of broken glass as your teacher directs.

8. Working with electrical equipment …

- Make sure your hands are dry when touching electrical cords, plugs, or sockets.
- Pull the plug, not the cord, when unplugging electrical equipment.
- Report damaged equipment or frayed cords to your teacher.
- Place electrical cords where people will not trip over them.

9. Working with heat …

- When heating an item, wear safety goggles and any other safety equipment that the text or your teacher advises.
- Always use heatproof containers.
- Point the open end of a container that is being heated away from yourself and others.
- Do not allow a container to boil dry.
- Handle hot objects carefully. Be especially careful with a hot plate that looks as though it has cooled down.
- If you use a Bunsen burner, make sure you understand fully how to light and use it safely.
- If you do receive a burn, inform your teacher, and apply cold water to the burned area immediately.

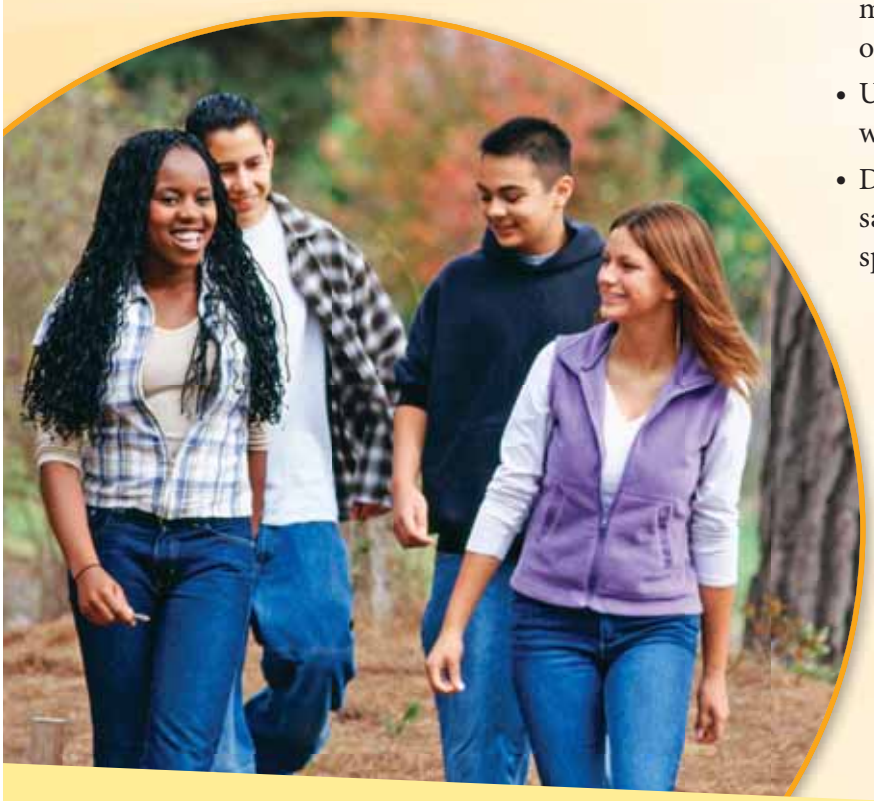
10. Working with various chemicals …

- If any part of your body comes in contact with a substance, wash the area immediately and thoroughly with water. If you get anything in your eyes, do not touch them. Wash them immediately and continuously for 15 min, and inform your teacher.
- Always handle substances carefully. If you are asked to smell a substance, never smell it directly. Hold the container slightly in front of and beneath your nose, and waft the fumes toward your nostrils.
- Hold containers away from your face when pouring liquids.

11. Working with living things …

On a field trip:

- Try not to disturb the area any more than is absolutely necessary.
- If you move something, do it carefully, and always replace it carefully.
- If you are asked to remove plant material, remove it gently, and take as little as possible.



In the classroom:

- Make sure that living creatures receive humane treatment while they are in your care.
- If possible, return living creatures to their natural environment when your work is complete.

12. Cleaning up in the science classroom …

- Clean up any spills, according to your teacher's instructions.
- Clean equipment before you put it away.
- Wash your hands thoroughly after doing an activity or an investigation.
- Dispose of materials as directed by your teacher. Never discard materials in the sink unless your teacher requests it.

13. Designing and building …

- Use tools safely to cut, join, and shape objects.
- Handle modelling clay correctly. Wash your hands after using modelling clay.
- Follow proper procedures when using mechanical systems and studying their operations.
- Use special care when observing and working with objects in motion.
- Do not use power equipment such as drills, sanders, saws, and lathes unless you have specialized training in handling such tools.

Safety Symbols

ON Science 10 Safety Symbols

The following safety symbols are used in *ON Science 10* to alert you to possible dangers. Be sure you understand each symbol used in an activity or investigation before you begin.

Disposal Alert
This symbol appears when care must be taken to dispose of materials properly.

Thermal Safety
This symbol appears as a reminder to use caution when handling hot objects.

Sharp Object Safety
This symbol appears when a danger of cuts or punctures caused by the use of sharp objects exists.

Electrical Safety
This symbol appears when care should be taken when using electrical equipment.

Skin Protection Safety
This symbol appears when use of caustic chemicals might irritate the skin or when contact with micro-organisms might transmit infection.

Clothing Protection Safety
A lab apron should be worn when this symbol appears.

Fire Safety
This symbol appears when care should be taken around open flames.

Eye Safety
This symbol appears when a danger to the eyes exists. Safety goggles should be worn when this symbol appears.

Instant Practice—Safety Symbols

Find four of the *ON Science 10* safety symbols in activities or investigations in this textbook. For each symbol, identify the possible dangers in the activity or investigation that the symbol refers to.

WHMIS Symbols

Look carefully at the WHMIS (Workplace Hazardous Materials Information System) safety symbols shown here. The WHMIS symbols are used throughout Canada to identify dangerous materials. Make certain you understand what these symbols mean. When you see these symbols on containers, use safety precautions.

Compressed Gas

Flammable and Combustible Material

Oxidizing Material

Corrosive Material

Poisonous and Infectious Material Causing Immediate and Serious Toxic Effects

Poisonous and Infectious Material Causing Other Toxic Effects

Biohazardous Infectious Material

Dangerously Reactive Material

Instant Practice—Safety Symbols

Hydrochloric acid is stored in containers. This solution is corrosive.

1. What symbol would you expect to see on a label for hydrochloric acid?
2. Describe the following.
   - **a.** the risks illustrated by the symbol
   - **b.** precautions someone would need to take when working with the solution
   - **c.** where it could be safely stored
   - **d.** first aid or emergency treatment
3. If you did not know the answer to part d., where would you find this information?