

## CONTENTS

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# Locally Developed Compulsory Credit Course – Grade 9 Science

### Introduction to Reading Strategies

#### Unit 1 Science in Daily Life:

Extending Vocabulary (Creating a Word Wall)	2
Extending Vocabulary (Creating a Glossary)	6
Following Instructions	10

#### Unit 2 Staying Alive:

Extending Vocabulary (Word Wall Activity)	14
Most/Least Important Idea(s) and Information	18
Sorting Ideas Using a Graphic Organizer	22

#### Unit 3 Electrical Circuits:

Extending Vocabulary (Creating a Word Wall)	26
Using Context to Find Meaning	32
Following Instructions	36
Sorting Ideas Using a Graphic Organizer	40
Reading Graphical Texts (Schematic Diagram)	44

#### Unit 4 Properties of Common Materials

Extending Vocabulary (Creating a Word Wall)	48
Reading Graphical Texts (Table)	52
Reading Informational Texts	56

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## Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)

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### LDCC Science Grade 9 (Science in Daily Life Unit)

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The Locally Developed Compulsory Credit Course Profile emphasizes word walls as a way of developing and extending science vocabulary. Students are required to learn, on average, over 2 000 words each year in various subject areas. Those who have trouble learning new words will struggle with the increasingly complex texts that they encounter in the middle and senior school years. A *word wall* is a wall, chalkboard or bulletin board listing key words that will appear often in a new unit of study, printed on card stock and taped or pinned to the wall/ board. The word wall is usually organized alphabetically. Teachers should encourage students to keep a glossary of the words from the classroom word wall.

#### Purpose

- Identify unfamiliar vocabulary and create a visible reference in the classroom for words that will appear often in a topic or unit of study.

#### Payoff

Students will:

- develop some sense of the meaning of key words before actually reading the words in context.
- improve comprehension and spelling because key words remain posted in the classroom.
- have reference support for their reading and writing.
- develop independence as they work with the words in their reading and writing.

#### Tips and Resources

- Consider posting certain words for longer periods (for example: words that occur frequently in the unit, words that are difficult to spell, and words that students should learn to recognize on sight).
- Have students refer to the word wall to support their understanding and spelling of the words.
- Make words very accessible by putting them where every student can see them, writing them in big, black letters, or using a variety of background colors.
- **Word Anticipation Guide:** A Word Anticipation Guide allows students to use prediction skills based on context when learning new vocabulary. As students are asked to predict word meanings, they are also asked to confirm their predictions by conferencing with a partner and looking the word up using another source. Consider using the Word Anticipation Guide template found in Student Resources.

*Words, Words, Words* pp. 70-71.

*When Kids Can't Read, What Teachers Can Do*, Chapter 10.

*Reaching Higher – Making Connections Across the Curriculum*, pp. 7-8.

#### Further Support

- Add a picture to the word cards (preferably a photograph from a magazine) as a support for ESL students and struggling readers.
- Provide each student with a recording sheet so that they can make their own record of the key words for further review.



**Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)**

**LDCC Science Grade 9 (Science in Daily Life Unit)**

**Notes**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Prepare the word wall. See the Teacher Resources for a list of the words and their meanings.</li> <li>• Make a copy of the Word Anticipation Guide for all students.</li> <li>• Divide students into pairs.</li> </ul>	<ul style="list-style-type: none"> <li>• Look over the words and try to determine the overall theme of the unit.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Ask students to look over the words to get a general sense of what the unit is about.</li> <li>• Ask students to tell you what they think the unit will be about.</li> <li>• Engage students in general discussion of the words. Many of the words will be familiar to the students others will not.</li> <li>• Ask students to individually complete the section entitled <i>What I Think It Means</i>.</li> <li>• In pairs the students discuss the meanings of the words and complete the <i>Think, Pair, Share</i> Section.</li> <li>• Ask each pair to look up the meaning of the words.</li> </ul>	<ul style="list-style-type: none"> <li>• Complete the section entitled <i>What I Think It Means</i> on the Word Anticipation Guide.</li> <li>• In pairs find an appropriate space where they can talk face-to-face and complete the <i>Think, Pair, Share</i> section of the <i>Word Anticipation Guide</i>.</li> <li>• Use a dictionary, glossary or textbook to find the meanings of the words and complete the section entitled <i>Actual Meaning</i>.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Lead some discussion of the words and ask students to discuss the words they had to look up in a dictionary or textbook.</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in a class discussion about the words.</li> <li>• Add the words to their glossary.</li> </ul>



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**Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)**

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**LDCC Science Grade 9 (Science in Daily Life Unit)**

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Word Anticipation Guide

Name :

Date :

<b>Word</b>	<b>What I Think It Means</b>	<b>Think, Pair, Share</b>	<b>Actual Meaning</b>



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**Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)**

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**LDCC Science Grade 9 (Science in Daily Life Unit)**

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**Key Words and Definitions**

conclusion – an interpretation of the results of an experiment as it applies to the hypothesis being tested

discrepant event – an event that occurs when something you expect to happen does not occur; the result is the opposite of what was expected, and it contradicts the belief of the individual

experiment – a controlled test, activity or investigation

fair test – an investigation carried out under strictly controlled conditions to ensure accuracy

hypothesis – educated guess; a possible explanation for a question or observation

materials – list of all equipment needed for an experiment

observations – something seen and noted; the result of an experiment that you can see and record

procedure – plan for how you will conduct an experiment; explains all of the steps of the experiment

purpose – the question you will try to answer in the experiment

testable question – a question that is answered by experimentation

variable – any factor that might influence the outcome of an experiment

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**Getting Ready to Read: Extending Vocabulary (Creating a Glossary)**

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**LDCC Science Grade 9 (Science in Daily Life Unit)**

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The Locally Developed Compulsory Credit Course Profile encourages the use of a student glossary to extend and promote vocabulary development in science. Students are required to learn, on average, over 2 000 words each year in various subject areas. Those who have trouble learning new words will struggle with the increasingly complex texts that they encounter in the middle and senior school years. A glossary is a listing of key words that will appear often in a new unit of study.

**Purpose**

- Identify unfamiliar vocabulary and create a visible reference in their notebook or portfolio for words that will appear often in a topic or unit of study.

**Payoff**

Students will:

- develop some sense of the meaning of key words before actually reading the words in context.
- improve comprehension and spelling because the key words are readily available in their notebook or portfolio.
- have a reference support for their reading, writing and lab activities.
- develop independence as they work with the words in their reading, writing and lab activities.

**Tips and Resources**

- Have students refer to their glossary to support their understanding and spelling of the words.
- The glossary should be easy to add to and very accessible.
- Consider allowing students to use their glossaries for quizzes and tests.
- Maintaining a glossary should be a daily event in science class. A good beginning is an equipment list for the first unit in Grade 9. The equipment list should include the name, picture, purpose and safe use of each piece of equipment. See Teacher Resources for a possible equipment list and a sample method of recording the equipment.

**Further Support**

- Include a picture (magazine, catalogue, drawn) for additional support.



**Getting Ready to Read: Extending Vocabulary (Creating a Glossary)**

**LDCC Science Grade 9 (Science in Daily Life Unit)**

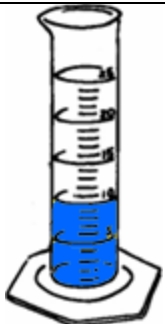
What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Collect pictures of lab equipment (magazines, equipment catalogues, textbooks).</li> <li>• Ask students to think about lab equipment they may have used in previous science classes.</li> </ul>	<ul style="list-style-type: none"> <li>• Think about any equipment they may have used in previous science classes.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Explain to students that they will be keeping a glossary of science equipment (and/or terms) for the entire semester.</li> <li>• The equipment glossary will include the name, picture, purpose, and safe use of each piece of equipment.</li> <li>• Make students aware of the safety equipment available in the room (e.g., eye wash stations, sharp item disposal). This equipment should also be included in the glossary.</li> <li>• Put the outline for the glossary on the blackboard for students to copy (see sample in Teacher Resources). Choose one piece of equipment and complete the chart together orally.</li> </ul>	<ul style="list-style-type: none"> <li>• Students note how to complete the glossary.</li> <li>• Students work individually to complete the glossary for the equipment they will be using in the first unit (e.g., graduated cylinder, beaker, balance).</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Clarify any confusing equipment.</li> <li>• Point out safety concerns.</li> <li>• Remind students to keep the glossary readily available for future classes.</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in a group discussion about the safety considerations for each piece of equipment.</li> <li>• Ensure the glossary is complete.</li> </ul>

**Notes**

## Getting Ready to Read: Extending Vocabulary (Creating a Glossary)

### LDCC Science Grade 9 (Science in Daily Life Unit)

#### Sample Equipment Glossary:

Name of Equipment/Glassware	Picture	Purpose	Safe Use
graduated cylinder		<ul style="list-style-type: none"> <li>-measuring cylinder</li> <li>-used to measure the volumes of liquids</li> <li>-small spout on the top to allow easy pouring of liquids</li> </ul>	<ul style="list-style-type: none"> <li>-ensure the cylinder is placed on a flat, even surface</li> <li>-bottom is larger to keep the cylinder from tipping</li> </ul>

#### Possible List of Laboratory Equipment:

beaker  
 beaker tongs  
 cover slip  
 crucible tongs  
 electronic balance  
 Erlenmeyer flask  
 evaporating dish  
 filter paper  
 funnel  
 graduated cylinder  
 hot plate  
 medicine dropper  
 mortar  
 overflow can  
 pestle  
 petri dish  
 retort stand  
 slide  
 spot plate

test tube  
 test-tube rack  
 test-tube holder





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## Getting Ready to Read: Following Instructions

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### LDCC Science Grade 9 (Science in Daily Life Unit)

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Students are expected to read and follow instructions in every subject area. The ability to read and follow instructions is crucial to being able to perform an experiment. This strategy asks students to examine different types of instructions, their features and elements, and how the features, language and organizational patterns can be used to help the reader understand and complete a task.

#### Purpose

- Provide students with strategies for reading, interpreting and following instructions to complete a specific task.
- Learn how instructions are organized.

#### Payoff

Students will:

- identify purposes for reading instructions.
- develop a process for reading and following instructions.

#### Tips and Resources

- Instructions give detailed step-by-step information about a process or a procedure (e.g., directions, recipes, experiments, manuals, tests). They are sometimes called procedures or how-tos. Most instructions use organizational patterns, language, and features (diagrams and illustrations, bold or italic type, headings, numbers, lists) to help the reader identify the task and the best way to complete it, however, some instructions are complicated without any features to help the reader determine the sequence of steps.
- Collect examples of recipes, manuals and procedures from various experiments.
- This activity is a good introduction and preparation for the Bouncy Balls (Activity 1.3) in the Locally Developed Compulsory Credit Course Profile.
- You may wish to remove words from the procedure or ask students to suggest changes to the procedure that will make it easier to understand (see Student Resource). Teachers may choose different titles for the flow chart (e.g., Best Guess instead of Hypothesis).

#### Further Support

- Provide students with a list of typical signal words and task prompts and suggestions/strategies for responding to them in your subject area (e.g., explain, list, summarize, give reasons for, select, choose, support).
- Provide students with flow charts and timelines to help track successful completion of oral or written instructions.
- Create a class framework for reading instructions such as:
  - Preview.
  - Highlight and annotate.
  - Think aloud and visualize.
  - Reread.
  - Go step-by-step.
  - Read the diagrams.
  - Ask questions.

**Getting Ready to Read: Following Instructions**

**LDCC Science Grade 9 (Science in Daily Life Unit)**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>Collect examples of recipes, manuals and procedures from experiments and divide students into pairs.</li> <li>Ask students to recall an important occasion when they had to follow a set of instructions (e.g., programming a VCR/DVD, fixing a bike). Discuss what was challenging and easy about following the instructions.</li> <li>Make copies of a procedure and cut the instructions into slips of paper with a step on each slip (unnumbered). Place one set of jumbled instructions in as many envelopes as there are pairs of students. Ask students to recreate the instructions and talk about the clues they used to reconstruct the instructions. You may want to begin with a simple recipe and move to an experimental procedure.</li> </ul>	<ul style="list-style-type: none"> <li>Think about a time when they were required to follow a set of instructions.</li> <li>In pairs find an appropriate space where they can talk face-to-face and complete the activity.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>Read aloud with the students noting signal words and/or draw a diagram to assist with the understanding of the steps.</li> <li>Ask students to discuss the strategies they are using to arrange the instructions.</li> </ul>	<ul style="list-style-type: none"> <li>Students note the signals.</li> <li>Students work in pairs to arrange the strips of paper in order.</li> <li>Discuss the strategies they are using aloud.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>Compare the groups' reconstructions and discuss the strategies and decisions they made.</li> <li>Clarify any confusing sections of the instructions. Use a flow chart to outline the steps, if necessary.</li> <li>Ask students to write the instructions for a simple activity (e.g., directions from home to school, how to open a combination lock) and/or have students complete the Bouncing Tennis Ball Activity (see Student Resource).</li> <li>Teachers may wish to remove words from the Procedure or challenge students to improve the instructions. For example, students may decide to add a thermometer or provide clearer instructions for getting an accurate reading of the bounce (e.g., drop the ball near a wall).</li> </ul>	<ul style="list-style-type: none"> <li>Participate in a group discussion about the strategies and difficulties they had in completing the task.</li> <li>Complete the writing activity and/or the Bouncing Tennis Ball activity.</li> <li>Suggest changes to the procedure in the tennis ball activity to improve the instructions.</li> </ul>

**Notes**



**Getting Ready to Read: Following Instructions**

**LDCC Science Grade 9 (Science in Daily Life Unit)**

**Bouncing Tennis Balls**

During a recent tennis tournament Matt noticed something odd about the amount of bounce in his tennis balls. In the morning, when it was cooler, Matt’s tennis balls didn’t seem to bounce as high as they did in the afternoon when the temperature was higher. Matt decided to do his own investigation to determine if temperature affects the bounce of a tennis ball.

**Purpose:** Does temperature effect how high a tennis ball will bounce?

**Hypothesis:** The warmer ball will bounce higher.

**Materials:**

- 3 similar tennis balls (same brand)
- Meter stick
- Refrigerator

**Procedure:**

1. Place one tennis ball in the refrigerator for 30 minutes. Make sure the bag is tightly sealed so that the ball does not get wet.
2. Place the second ball on the window ledge in direct sunlight for 30 minutes.
3. The third ball is left at room temperature for 30 minutes.
4. Choose a floor area with a hard, clean surface and drop each ball from a height of 150 cm. Watch carefully and measure the height the ball bounces. Record the results in the table.
5. Repeat step #4 three times for each ball.

**Observations:**

Temperature	Height in cm	Bounce Height Trial 1	Bounce Height Trial 2	Bounce Height Trial 3	Average of Trials
Room					
Warm					
Cold					

**Questions:**

1. Which ball bounced the highest?
2. Which ball bounced the lowest?
3. Is this what you expected? Why or why not?
4. Which variables did you have to control to make this a fair test?

**Conclusion:**

Explain your findings.



Student Resource

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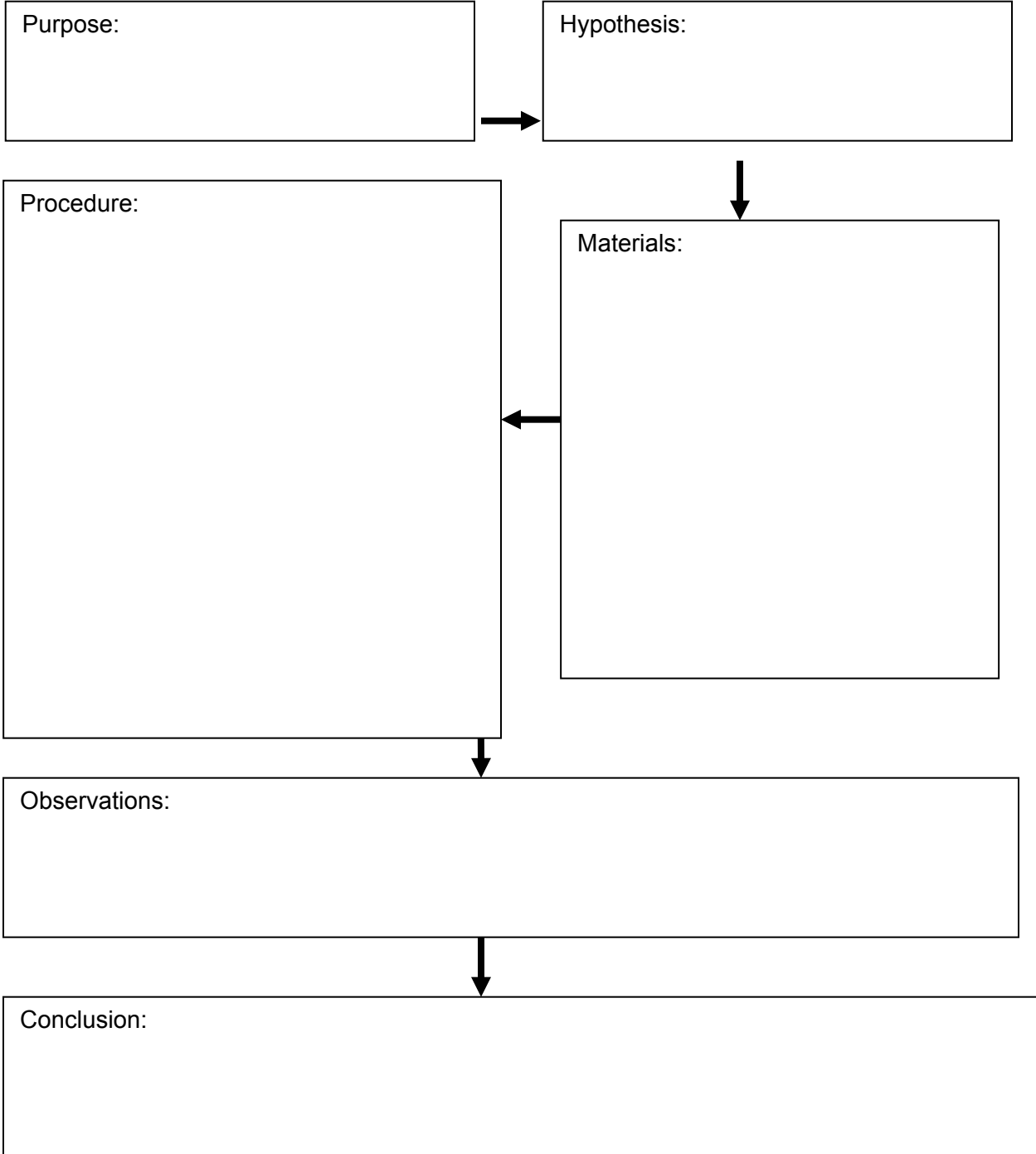
**Getting Ready to Read: Following Instructions**

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**LDCC Science Grade 9 (Science in Daily Life Unit)**

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**Flow Chart for Bouncing Tennis Balls**



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## Getting Ready to Read: Extending Vocabulary (Word Wall Activity)

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LDCC Science Grade 9 (Staying Alive Unit)

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The Locally Developed Compulsory Credit Course Profile emphasizes word walls as a way of developing and extending science vocabulary. This word wall activity is limited to key words about organs and their systems and is a good review of the frog and earthworm dissections (Activity 2.2.2). A *word wall* is a wall, chalkboard or bulletin board listing key words that will appear often in a new unit of study, printed on card stock and taped or pinned to the wall/ board. The word wall is usually organized alphabetically. Teachers should encourage students to keep a glossary of the words from the classroom word wall.

### Purpose

- Identify unfamiliar vocabulary and create a visible reference in the classroom for words that will appear often in a topic or unit of study.

### Payoff

Students will:

- develop a sense of the meaning of key words.
- improve comprehension and spelling because key words remain posted in the classroom.
- have a reference support for their reading and writing.
- develop independence as they work with the words in their reading and writing.

### Tips and Resources

- Consider posting certain words for longer periods (for example: words that occur frequently in the unit, words that are difficult to spell, and words that students should learn to recognize on sight).
- Have students refer to the word wall to support their understanding and spelling of the words.
- Make words very accessible by putting them where every student can see them, writing them in big, black letters, or using a variety of background colors.
- **Word Wall Activity for Relating to Human Systems:** Each student is given a card that has either an organ or a system (circulatory, respiratory and digestive) listed on it. Students find another student with a card that matches the organ to the system. The teacher assigns each pair an organism depending on which dissections were done in class (e.g., frog, fish grasshopper or earthworm). Students orally dialogue with their partner about the differences and similarities of the system of their organism to that of a human system. Students find another pair of students discussing the same system, with a different organism. They discuss the differences and similarities between the frog, earthworm and human systems and record their discussions of one system on a Venn diagram showing all three organisms.
- See Teacher Resource for a list of words and their meanings.

### Further Support

- Add a picture to the word cards (preferably a photograph from a magazine) as a support for ESL students and struggling readers.



**Getting Ready to Read: Extending Vocabulary (Word Wall Activity)**

**LDCC Science Grade 9 (Staying Alive Unit)**

**Notes**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Post the words on the word wall.</li> <li>• Organize the class into pairs.</li> <li>• Prepare the word cards (see Teacher Resource).</li> <li>• Review the organs and relationships between the major organ systems of a frog and earthworm.</li> <li>• Review how to draw and label a Venn diagram to compare 2 and 3 items.</li> <li>• Give each student a card that has either an organ or a system listed. Students find another student with a card that matches the organ to the system.</li> <li>• Assign each pair an organism (e.g., frog, grasshopper, fish or earthworm). Students orally dialogue with their partner about the differences and similarities of the system of their organism to that of a human system. Prepare a Venn diagram to compare the earthworm or frog to humans.</li> </ul>	<ul style="list-style-type: none"> <li>• Review dissection notes for the frog, grasshopper, fish or earthworm.</li> <li>• Review how to complete a Venn diagram.</li> <li>• Discuss similarities and differences between the organism and humans. Complete a Venn diagram to compare the two.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Students find another pair of students discussing the same system, with a different organism. They discuss the differences and similarities between the frog, earthworm and human systems and record their discussions of one system on a Venn diagram showing all three organisms.</li> </ul>	<ul style="list-style-type: none"> <li>• Find another pair of students discussing the same system.</li> <li>• Discuss the differences and similarities between the frog, earthworm and human systems and record their discussions of one system on a Venn diagram showing all three organisms.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Post the Venn diagrams in the classroom.</li> <li>• Instruct students to record the words and their definitions.</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in a class discussion about the differences and similarities between the frog, earthworm and human systems.</li> </ul>

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**Getting Ready to Read: Extending Vocabulary (Word Wall Activity)**

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**LDCC Science Grade 9 (Staying Alive Unit)**

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## Relating to Human Systems Words and Definitions

**circulatory system** – the system that moves substances such as oxygen and nutrients through the organism

heart – the muscular organ that pumps blood through an organism

blood vessels – tubes in the body that carry blood

**digestive system** – the system of an organism that breaks down food into smaller parts that can be transported by the blood to tissues and organs

mouth - the entrance to the digestive system where food is broken into pieces by the teeth and saliva begins the digestion process

esophagus – a long tube that leads from the mouth to the stomach; muscles push food through to the stomach

stomach – the organ in which digestion begins with enzymes and gastric juices breaking down food

small intestine – the organ in which most digestion takes place; nutrients are absorbed through the walls of the intestine

large intestine – an organ in which water is removed from undigested food; waste is stored here until it is eliminated by the organism

liver – a large organ that produces chemicals to help break down food in the small intestine

pancreas – a large gland near the stomach that produces enzymes to help digest food in the small intestine

**respiratory system** – the system of an organism that gets oxygen to all the cells and takes carbon dioxide away

nose - opening through which an organism can take in oxygen and expel carbon dioxide

mouth - opening through which an organism can take in oxygen and expel carbon dioxide

trachea – windpipe; a tube that carries air from the nose and mouth to the lungs

lungs – the main respiratory organ through which an organism gets oxygen





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## Engaging in Reading: Most/Least Important Idea(s) and Information

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### LDCC Science Grade 9 (Staying Alive Unit)

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Determining important ideas and information in text is central to making sense of reading and moving toward insight. (Stephanie Harvey and Anne Goudvis, 2000).

#### Purpose

- Find the main idea(s) in a text by distinguishing between the most important and least important information.

#### Payoff

Students will:

- become familiar with the text and make judgments about the content.
- work collaboratively with a partner – using reading, note taking, and oral strategies – to make sense of the text.

#### Tips and Resources

- Determining the main idea(s) in a text is not always a clear, straightforward process. Some or all of the following strategies can help the students:
  - Activate prior knowledge to help students connect to the information in the text.
  - Note the type of text and its typical audience and purpose (e.g., to persuade, to explain, to illustrate).
  - Set a clear purpose for the text so that students have common ground for finding the main idea.
- Main ideas are often found in first sentences or last sentences in a paragraph, or first and last paragraphs in a chapter.
- The reader constructs meaning, deciding on what is most important based on prior knowledge and experience. What is important to one reader may not be as important to another, unless both have a common goal or purpose.
- See *Teacher Resource, Most /Least Important Ideas and Information – Science Sample*. For a blank template that can be handed out in class, see *Student Resource, Most/Least Important Idea(s) and Information*.

#### Further Support

- After students have done a least-important/most-important “T” chart on their own or in pairs, model the process an additional time by thinking aloud through another passage. Ask students to compare their choices with yours.
- Put students in groups of four, with each group having a different passage from the same chapter of the textbook, to create their own think-aloud for that passage. Ask students to number off as they begin their work (from 1 to 4) and to remember their number. Students work together to decide most-important/least-important ideas and information and provide reasons for their choices as they prepare their think-aloud. Ask the #3s (and ask the #1s to assist them) to present their think-aloud to the rest of the class.



**Engaging in Reading: Most/Least Important Idea(s) and Information**

**LDCC Science Grade 9 (Staying Alive Unit)**

**Notes**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Copy the science sample reading passage for students or put it up on an overhead.</li> <li>• With students, set a clear purpose for reading the passage.</li> <li>• Give students time to read the passage.</li> <li>• Read the passage aloud to students, asking them to think about the most important and least important idea(s).</li> </ul>	<ul style="list-style-type: none"> <li>• Read the passage silently, thinking about the purpose for reading.</li> <li>• Listen to the passage being read, while thinking about their choices for most important and least important idea(s).</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Reread the passage aloud, while thinking about the various sentences and ideas, to make judgments about least important and most important ideas. See <i>Teacher Resource, Most/Least Important Ideas and Information – Science Sample</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Record most important and least important ideas on a “T” chart in their note books, after the teacher has done the think-aloud through the passage.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Assign students an additional passage of text, setting a clear purpose for reading.</li> <li>• Ask students to use the handout, <i>Student Resource, Most /Least Important Ideas and Information</i> to record their choices for least important and most important Ideas and information in the passage.</li> <li>• Alternatively, ask students to use two different colours of highlighters on photocopied text – one colour for the most important ideas and information and one for the least important.</li> <li>• Put students in pairs to share and justify their choices. (Provide a fresh photocopy for them to synthesize their ideas.)</li> </ul>	<ul style="list-style-type: none"> <li>• Read the assigned text, keeping in mind the purpose for reading.</li> <li>• Reread and record the most important and least important ideas and information.</li> <li>• Reflect on choices with a partner, and make any changes necessary to the chart based on this discussion.</li> </ul>



**Engaging in Reading: Most/Least Important Idea(s) and Information**

**LDCC Science Grade 9 (Staying Alive Unit)**

**Science Sample Passage**

This short passage could be used by the teacher as a script to demonstrate a *Think Aloud* for students, showing how to decide what’s important in a text, and what’s less important. It could also be used as an overhead for the same purpose.

The Circulatory System	Most/Least Important Idea(s) and Information
<p>The circulatory system is one of nine systems in the human body. The other systems are the digestive, respiratory, nervous, excretory, reproductive, endocrine, muscular and skeletal. The circulatory system moves oxygen and nutrients through the human body. The heart and the blood vessels (arteries and veins) work together to transport oxygen and nutrients to the body's cells, and carry away waste materials.</p> <p>The heart is a muscular organ about the size of a clenched fist. The heart contracts about once every second sending blood through out the body. On average, your body has about 4-5 litres of blood continually traveling through it by way of the circulatory system. If you could lay all of the blood vessels in your body end-to-end they would stretch over 160 000km.</p>	<p>Least important – gives some background information.</p> <p>Important – defines what the circulatory system does.</p> <p>Important – outlines the parts of the circulatory system.</p> <p>Least important – providing additional information about the heart.</p> <p>Least important – providing additional interesting information.</p>
<p>Key idea from this passage: The circulatory system moves oxygen and nutrients through the human body. The heart and the blood vessels (arteries and veins) work together to transport oxygen and nutrients to the body's cells, and carry away waste materials.</p>	



Student Resource

**Engaging in Reading: Most/Least Important Idea(s) and Information**

**LDCC Science Grade 9 (Staying Alive Unit)**

Read the text assigned by the teacher and record (exactly) the most important and least important ideas and information. When you have finished recording, go to the bottom section of the chart and write what you believe to be the key idea from the whole text.

Title of textbook, chapter, article or passage: \_\_\_\_\_

Pages Read: \_\_\_\_\_ Purpose for reading: \_\_\_\_\_

Most Important Ideas and Information	Least Important Ideas and Information
<p><b>Key idea from this passage:</b></p>	

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## Engaging in Reading: Sorting Ideas Using a Graphic Organizer

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### LDCC Science Grade 9 (Staying Alive Unit)

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A graphic organizer is a visual representation of information used for constructing meaning in reading, writing, and speaking.

#### Purpose

- Record ideas during reading.
- See the relationships among ideas, and distinguish between main ideas and supporting details.

#### Payoff

Students will:

- remember important details from the text.
- organize information in a memorable and accessible way.
- help students identify and remember key facts or ideas.
- support students who are highly visual in connecting ideas.

#### Tips and Resources

- Brain-based research shows that visual organizers, such as graphic organizers, can be highly effective in helping students who struggle with reading and writing.
- If possible, provide students with several samples of graphic organizers so that they get a sense of how concepts can be organized.
- Graphic organizers may or may not use colour and pictures.
- Using the HRSDC website, or the Essential Skills Profiles, students identify the safety concerns associated with a career, and the life-sustaining process(es) potentially threatened by each job hazard. Students present this information using a graphic organizer.
- Human Resources and Skills Development Canada (HRSDC) [http://www15.hrdc-drhc.gc.ca/english/general/home\\_e.asp](http://www15.hrdc-drhc.gc.ca/english/general/home_e.asp) (see Teacher Resource and Student Resource).

#### Further Support

- Pair students or put them in groups to read the text and create their graphic organizer.
- Encourage students in pairs or groups to choose one person who will read the text aloud first while a partner or group member records single words that represent main ideas or details.



**Engaging in Reading: Sorting Ideas Using a Graphic Organizer**

**LDCC Science Grade 9 (Staying Alive Unit)**

**Notes**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Arrange for computer lab. If a computer lab is not available the Painters and Coaters, Manufacturing (NOC 9496) Profile may be printed or copied to an overhead. However, students will eventually need computer access to do their own research.</li> <li>• Introduce students to the HRSDC website and discuss how the HRSDC website is organized and how to access the information (see Student/Teacher Resource).</li> <li>• Explain that the task is to do some research on safety in the workplace. They may identify a future career to research but the task is not careers, it is safety in the workplace.</li> <li>• Demonstrate how to access the information.</li> <li>• As a class, work through the information and complete the graphic organizer. A sample organizer has been included in the Teacher/Student resources but many formats could be used.</li> <li>• Discuss the strategies used to get the information (e.g., skimming, inference).</li> <li>• Students work in pairs to complete an organizer for a food handling occupation.</li> </ul>	<ul style="list-style-type: none"> <li>• Think about a career to research for safety concerns in the workplace.</li> <li>• Work through the sample career (Painters and Coaters, Manufacturing) with the teacher.</li> <li>• Complete the graphic organizer for Painters and Coaters, manufacturing.</li> <li>• Participate in a discussion about the strategies used to gather the information.</li> <li>• With a partner complete an organizer for a career in food services.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Students work individually to complete an organizer for an occupation of their choice.</li> </ul>	<ul style="list-style-type: none"> <li>• Complete an organizer for a career of your choice.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Students present completed organizers to the entire class or to a small group.</li> </ul>	<ul style="list-style-type: none"> <li>• Present completed organizers to the entire class or to a small group.</li> </ul>

**Engaging in Reading: Sorting Ideas Using a Graphic Organizer**

**LDCC Science Grade 9 (Staying Alive Unit)**

Human Resources and Skills Development Canada Website  
[http://www15.hrdc-drhc.gc.ca/english/general/home\\_e.asp](http://www15.hrdc-drhc.gc.ca/english/general/home_e.asp)



1. Click on Occupation to search by occupation or to view all of the profiles in the database.
2. Type paint in the search box to see a list of occupations with paint in the name.
3. Click on View the Entire Profile for Painters and Coaters, Manufacturing (NOC 9496).

- Understanding Essential Skills
- Essential Skills and Workplace Literacy Initiative
- Essential Skills Profiles
- Authentic Workplace Materials
- How Can I Use This Site?
- Tools and Applications
- Workplace Resources

## Essential Skills

Painters and Coaters, Manufacturing

**NOC 9496**

Introduction

Painter and coaters, manufacturing tend and operate machines or use brushes and spray equipment to apply paint, enamel, lacquer or other non-metallic protective and decorative coatings to surfaces of various production items. They are employed by manufacturing companies.

4. Read through the information and complete a graphic organizer.

Occupation	Safety Concern	Safety Procedures for Protection	Life-sustaining Process(es) Affected
Painters and Coaters, Manufacturing	hearing vision fumes skin contact	- ear plugs when using machinery - goggles for paint spray - wear a mask or work in a properly ventilated room - read the MSDS sheets -wear proper clothing and gloves	respiratory system

Source: Human Resources and Skills Development Canada.  
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**Engaging in Reading: Sorting Ideas Using a Graphic Organizer**

**LDCC Science Grade 9 (Staying Alive Unit)**

Human Resources and Skills Development Canada Website

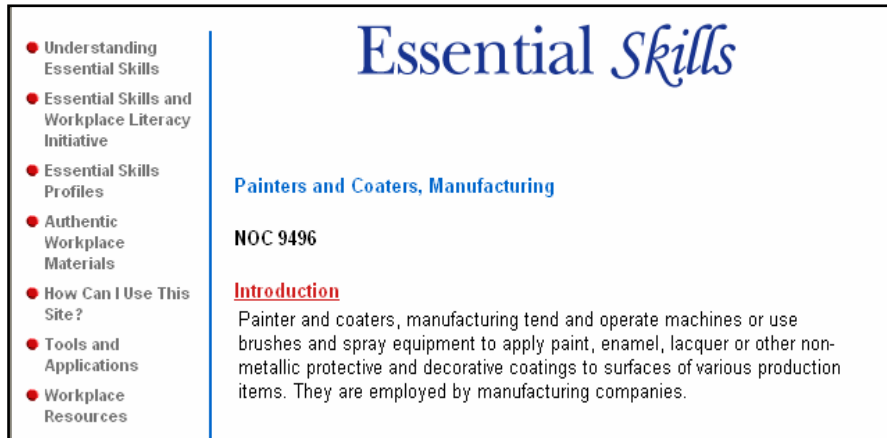
[http://www15.hrdc-drhc.gc.ca/english/general/home\\_e.asp](http://www15.hrdc-drhc.gc.ca/english/general/home_e.asp)



1. Click on Occupation to search by occupation or to view all of the profiles in the database.

2. Type paint in the search box to see a list of occupations with paint in the name.

3. Click on View the Entire Profile for Painters and Coaters, Manufacturing (NOC 9496).



4. Read through the information and complete a graphic organizer.

Occupation	Safety Concern	Safety Procedures for Protection	Life-sustaining Process(es) Affected

Source: Human Resources and Skills Development Canada.Reproduced with the permission of Her Majesty the Queen in Right of Canada 2005.

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## Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)

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### LDCC Science Grade 9 (Electrical Circuits Unit)

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The Locally Developed Compulsory Credit Course Profile emphasizes word walls as a way of developing and extending science vocabulary. Students are required to learn, on average, over 2 000 words each year in various subject areas. Those who have trouble learning new words will struggle with the increasingly complex texts that they encounter in the middle and senior school years. A *word wall* is a wall, chalkboard or bulletin board listing key words that will appear often in a new unit of study, printed on card stock and taped or pinned to the wall/ board. The word wall is usually organized alphabetically. Teachers should encourage students to keep a glossary of the words from the classroom word wall.

#### Purpose

- Identify unfamiliar vocabulary and create a visible reference in the classroom for words that will appear often in a topic or unit of study.

#### Payoff

Students will:

- develop a sense of the meaning of key words before actually reading the words in context.
- improve comprehension and spelling because key words remain posted in the classroom.
- have reference support for their reading and writing.
- develop independence as they work with the words in their reading and writing.

#### Tips and Resources

- Consider posting certain words for longer periods (for example: words that occur frequently in the unit, words that are difficult to spell, and words that students should learn to recognize on sight).
- Have students refer to the word wall to support their understanding and spelling of the words.
- Make words very accessible by putting them where every student can see them, writing them in big, black letters, or using a variety of background colors.
- The key words (and definitions) for the Electrical Circuits Unit are listed in the Teacher Resources. The word wall should be started on the first day of the unit and added to as the unit progresses. Word wall activities/games have been included as a Teacher Resource.
- Tips for skimming and scanning text may be found as a Student Resource.

*Words, Words, Words* pp. 70-71.

*When Kids Can't Read, What Teachers Can Do*, Chapter 10.

*Reaching Higher – Making Connections Across the Curriculum*, pp. 7-8.

#### Further Support

- Add a picture to the word cards (preferably a photograph from a magazine) as a support for ESL students and struggling readers.
- Provide each student with a recording sheet so that they can make their own record of the key words for further review.



**Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)**

**LDCC Science Grade 9 (Electrical Circuits Unit)**

**Notes**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Preview the reading material for key vocabulary.</li> <li>• Prepare strips of card stock (approximately 10 cm x 25 cm) for words.</li> <li>• Divide students into groups of three.</li> <li>• Provide stick-on notes, markers, and masking tape or pins for each group of students.</li> <li>• Explain to students that together the class will find key vocabulary in the assigned text, and class members will help each other to understand and spell the key vocabulary by creating a “word wall” in the classroom that they can refer to for the duration of the unit.</li> <li>• Distribute the Student Resource <i>Skimming and Scanning</i>. Read together and discuss the main points of skimming and scanning.</li> </ul>	<ul style="list-style-type: none"> <li>• With their group find an appropriate space where they can talk face-to-face and write down the words.</li> <li>• Get a copy of the assigned reading material.</li> <li>• Follow along on the handout as the teacher reviews skimming and scanning.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Ask students to skim the text to get a general sense of what’s in it and where things are.</li> <li>• Engage students in some general discussion of the topic, making a few brief notes on the board about main ideas.</li> <li>• Direct students to independently scan the reading material for unfamiliar words.</li> <li>• Students create a list of unfamiliar words.</li> <li>• Direct students to small groups and ask the groups to compare words.</li> <li>• As a class determine the key words from the reading material and post them on the word wall.</li> </ul>	<ul style="list-style-type: none"> <li>• Skim the text, looking at illustrations and subtitles to get a general idea of the topic.</li> <li>• Scan the text for words they do not know, recording them for future use.</li> <li>• In groups, compare personal lists.</li> <li>• As a class determine the key words.</li> <li>• Look up the definitions of the key words using textbooks, glossaries or dictionaries.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Direct students to look up the definitions for the words.</li> </ul>	<ul style="list-style-type: none"> <li>• Look up the definitions of the key words using textbooks, glossaries or dictionaries.</li> <li>• Record the words and their meanings.</li> </ul>

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**Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)**

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**LDCC Science Grade 9 (Electrical Circuits Unit)**

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## Keywords and Definitions

ammeter – a device used to measure current in an electric circuit

ampere (A) – the unit used for measuring electric current

circuit – a complete path that allows electrons to flow

circuit breaker - a safety device placed in an electric circuit; a switch that opens when too much current flows through it

conductor – a material that allows charge (electrons) to easily flow through it

energy – a measure of how much work can be done; it is measured in joules (J)

fuse – a safety device that will melt at a lower current than that that will melt wiring in a circuit

GFCI – Ground Fault Circuit Interrupter; a safety device that detects and shuts off unwanted current flow

insulator – a material that does not allow the passage of electrons

load – that part of an electrical circuit on which the electricity performs work; the electrical energy is converted into another form of energy

parallel circuit – a circuit arrangement in which the electrons have more than one pathway available to them

potential difference (V) – a measure of the work per unit charge between two points in a circuit

resistor – a material that is difficult for electrons to flow through

series circuit – a circuit arrangement in which electrons all have to follow the same path

surge protector– a safety device used to protect devices connected to them from sudden increases in current


voltmeter – a device used to measure potential difference in an electric circuit


volt (V) – a unit of potential difference



**Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)**

**LDCC Science Grade 9 (Electrical Circuits Unit)**

<b>Skimming</b>	
<b>What is it?</b>	When you SKIM, you read quickly to get the main idea of a paragraph, page, chapter, or article, and a few (but not all) of the details.
<b>Why do I skim?</b>	Skimming allows you to read quickly to get a general sense of a text so that you can decide whether it has useful information for you. You may also skim to get a key idea. After skimming a piece, you might decide that you want or need to read it in greater depth.
<b>How do I skim?</b>  <b>Read in this direction.</b> 	<ol style="list-style-type: none"> <li>1. Read the first few paragraphs, two or three middle paragraphs, and the final two or three paragraphs of a piece, trying to get a basic understanding of the information.</li> <li>2. Some people prefer to skim by reading the first and last sentence of each paragraph, that is, the topic sentences and concluding sentences.</li> <li>3. If there are pictures, diagrams, or charts, a quick glance at them and their captions may help you to understand the main idea or point of view in the text.</li> <li>4. Remember: You do <b>not have to read every word when you skim.</b></li> <li>5. Generally, move your eyes horizontally (and quickly) when you skim.</li> </ol>

<b>Scanning</b>	
<b>What is it?</b>	When you SCAN, you move your eyes quickly down a page or list to find one specific detail.
<b>Why do I scan?</b>	<b>Scanning allows you to locate quickly a single fact, date, name or word in a text</b> without trying to read or understand the rest of the piece. You may need that fact or word later to respond to a question or to add a specific detail to something you are writing.
<b>How do I scan?</b>  <b>Read in this direction.</b> 	<ol style="list-style-type: none"> <li>1. Knowing your text well is important. Make a prediction about where in a chapter you might find the word, name, fact, term, or date.</li> <li>2. Note how the information is arranged on a page. Will headings, diagrams, or boxed or highlighted items guide you? Is information arranged alphabetically or numerically as it might be in a telephone book or glossary?</li> <li>3. Move your eyes vertically or diagonally down the page, letting them dart quickly from side to side and keeping in mind the exact type of information that you want.</li> <li>4. Look for other closely associated words that might steer you towards the detail for which you are looking.</li> </ol> <p>Aim for 100% accuracy!</p>



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## Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)

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### LDCC Science Grade 9 (Electrical Circuits Unit)

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## Word Wall Games

**Be A Mind Reader Game:** Word Walls can be used to play motivating games. This game can be played individually or in teams. The teacher thinks of a word wall word and gives five clues to that word. Your clues could include parts of the definition, synonyms or how it is used. Students number their papers from one to five and try to “read the teacher’s mind”. By the time the teacher gives the fifth clue, everyone in the class should guess the word and have it written down on their papers.

**Word Jar Game:** Place all word wall cards in a jar. Students break into two teams. Teams alternately send members to the jar to select a word and state its definition. Award two points for each correct team definition. The opposing team can earn one point if they can correctly define the word if the original team fails to correctly define the word.

**Word Mixer Game:** Play a “mixer” game with the students. Some students will receive word wall words. The remaining half of the class receives the definitions. Students move around the room trying to find their partner. Variation: Some words may have more than one meaning, hence there may be more than two students partnering.

**Word Mimes Game :** Students are divided into two teams. Students select a word from the word wall, and attempt to act out the meaning of the word.

**Wordo Game:** Teacher determines the number of words to focus upon from the word wall. Students make a grid of eight squares (e.g., a 4 x 4 matrix, similar to a bingo card) on a blank sheet of paper. Each square must be large enough for words to be written. There are two options for filling in the grid:

Option 1 - A student begins the game by calling out a word from the word wall. Classmates respond by writing the word in any space on their grid. Some teachers have students spell them as they write them, to ensure accuracy. The student who gave the first word calls on another classmate to select a second word, which all students again write in a space on their grid. As students select words from the wall and write them in their grids, the teacher writes the same words on a piece of paper and places them in a pile. This process continues until the students have all the spaces on their grids filled. Then, the teacher begins to draw words from the pile. Students mark or stamp the words in the same way (e.g., with a checkmark) until someone marks all words in a straight or diagonal line as in bingo and calls, “Wordo”.

Option 2 - Instead of having all students add the same words to their grids, have students fill in their grids with any words from the wall, so that everyone has different words on their cards. Then, either the teacher calls words from the wall until a winner is declared, or students call out a word from their card, that is marked by other students that have included the same word on their own cards.



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**Engaging in Reading: Using Context to Find Meaning**

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**LDCC Science Grade 9 (Electrical Circuits Unit)**

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Writers use a variety of ways to convey the meaning of unfamiliar words and concepts. These include definitions, examples, descriptions, illustrations, clarifications, parenthetical notes, comparisons, elaborations, and typographical cues.

**Purpose**

- Help students to infer meaning of unfamiliar words and concepts, using clues from the text.

**Payoffs**

Students will:

- read subject area texts more independently.
- discuss important concepts related to the subject.
- understand how to find context clues and make good use of them.
- monitor their understanding while reading different texts.

**Tips and Resources**

- Context refers to the text surrounding a word or passage, or the conditions that surround something.
- Effective readers use their knowledge about words and text structures, and their prior knowledge about a subject, to help figure out unfamiliar words and concepts in new contexts.
- For tips on using context to find meaning, see *Student Resource, Clues for Using Context to Find Meaning*.
- *Learning About Electricity* is a Student/Teacher Resource for practicing the skill using context to find meaning.

**Further Support**

- At the beginning of a unit, pre-teach important concepts and unfamiliar vocabulary.
- Use graphic organizers (such as concept attainment charts, concept ladders, or concept flow charts) to help students see connections and use relevant vocabulary.
- Take five minutes at the beginning of a reading task to examine a particular paragraph or section that has an unfamiliar word or concept.
- Model for students how to use the context of the sentences and paragraphs to determine the meaning of the word or concept.





**Engaging in Reading: Using Context to Find Meaning**

**LDCC Science Grade 9 (Electrical Circuits Unit)**

**Notes**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Copy the reading passage (Learning about Electricity) for students or put it on an overhead to use with the entire class.</li> <li>• Distribute the <i>Student Resource Clues for Using Context to Find Meaning</i>.</li> <li>• Write the concept word on the board and ask students to suggest possible meanings for the word.</li> <li>• Direct students to the concept word in the text. Ask students to read the paragraph(s) and confirm or reject their suggested meanings.</li> <li>• Discuss how they were able to determine the meaning of the concept word in context. Note that writers use different ways of providing meanings for concepts and words. Record these on the chalkboard.</li> <li>• Discuss clues in the text that allow the reader to determine the meaning (e.g., definition, description).</li> <li>• Arrange students in small groups to read the passage together and highlight contextual clues.</li> </ul>	<ul style="list-style-type: none"> <li>• Recall what they already know about the topic or concept. Make connections to known words and phrases.</li> <li>• Locate the concept word in the passage, and read the text.</li> <li>• Make connections between the new learning and what they already know about the concept.</li> <li>• Note different ways a reader can use context to help figure out unfamiliar ideas, concepts and words.</li> <li>• Identify how to determine meaning and monitor understanding.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Students complete the activity (see sample in Teacher Resources).</li> <li>• Groups share and compare their findings. Discuss similarities and differences in order to establish a common understanding of the concept.</li> </ul>	<ul style="list-style-type: none"> <li>• Read the passage, identify the important concept and use context to understand the passage.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Assign further reading so that students can practice using context when reading.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe how they used context to help understand the text (e.g.: “I read ahead to look for a definition or more information.” “I looked for diagrams and side bars.” Or “I looked for signal words that pointed me to the relevant information.”).</li> <li>• Complete additional activity.</li> </ul>



Engaging in Reading: Using Context to Find Meaning

LDCC Science Grade 9 (Electrical Circuits Unit)

Clues for using Context to Find Meaning

Clue	Description	Signals
Definition	The unfamiliar word is specifically defined in the sentence, or in the preceding or following sentences.	<ul style="list-style-type: none"> <li>• “is” or “which means”</li> <li>• commas that set off a qualifying phrase</li> </ul>
Example	The unfamiliar word is illustrated by one or more examples.	<ul style="list-style-type: none"> <li>• “for example,” “including,” or “such as”</li> <li>• pictures or diagrams</li> </ul>
Description	Characteristics or features of the unfamiliar word are described.	<ul style="list-style-type: none"> <li>• descriptive words</li> <li>• sensory words</li> <li>• adjectives and adverbs</li> </ul>
Illustration	The unfamiliar word is shown in a diagram, picture or map.	<ul style="list-style-type: none"> <li>• “see figure 2.1”</li> <li>• graphic features on the page</li> </ul>
Clarification	The meaning of the unfamiliar word is restated in slightly different language, summarized, or paraphrased.	<ul style="list-style-type: none"> <li>• “in other words,” “simply,” “clearly”</li> </ul>
Parenthetical Note	The meaning of the unfamiliar word is provided in parentheses directly following the word.	<ul style="list-style-type: none"> <li>• (.....)</li> </ul>
Comparison	The meaning of the unfamiliar word is provided by contrasting or comparing it to another word, phrase or concept.	<ul style="list-style-type: none"> <li>• “such as,” “like,” “compared to,” “unlike” or “similar to”</li> <li>• synonyms, antonyms</li> <li>• charts</li> </ul>
Elaboration	Additional information about the unfamiliar word is provided in the following sentences and paragraphs. This may be a description of a related event, process or product, or a question prompt.	<ul style="list-style-type: none"> <li>• “in addition,” “another,” or “consequently”</li> </ul>
Typography and Design	Design features draw attention to important words and concepts, and to their definitions.	<ul style="list-style-type: none"> <li>• <b>bold</b>, <i>italics</i>, and other embellishments</li> </ul>



Student/Teacher Resource

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**Engaging in Reading: Using Context to Find Meaning**

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**LDCC Science Grade 9 (Electrical Circuits Unit)**

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“In Learning About Electricity”, the writer uses different ways to help the reader understand electricity and electric circuits. Context clues include definition, example, description, illustration, clarification, parenthetical, comparison, or elaboration.

Read the excerpt and see how many different context clues the writer provides for the different concepts and terms related to electricity and electric circuits. Write your annotations on the left-hand side of the excerpt. After reading, try to make a quick sketch of an electrical circuit.

Write your Annotations Here

*Definition:* Electricity is a form of energy.

*Description:* It is produced by the movement of electrons.

**3.1 Learning About Electricity**

Electricity is a form of energy. It is produced by the movement of electrons. But do you know what actually happens when you flip a switch to turn on the light, or the computer, or the television set? Why don't all the lights go out in your house when one light bulb burns out? Electricity is very useful, but if people do the wrong thing, electricity can also hurt. In some cases it can even kill. Safety is key when it comes to electricity.

**Electric Circuits**

How does electricity flow? Electricity flows through paths, or electric circuits. Electrons travel through these paths, but only if they can move around the path and get back to where they started. If the path is broken, the electrons will not move.

A closed circuit allows electrons to travel through an unbroken path and back to where they started. An open circuit has a break in the path. Electrons will not move through an open circuit.

All circuits must contain three things: connecting conductors, an energy source, and a load. A conductor is a device, such as a wire, that allows electricity to pass easily through it. An **energy source**, such as a battery, is what gives the circuit its energy. A **load** is a device or appliance that uses the energy, such as a light bulb. Figure 3.2 shows the symbols for the basic parts of a circuit.

*Science Wise 11*, (Toronto: Irwin Publishing, 2003).

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## Reading Different Text Forms: Following Instructions

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### LDCC Science Grade 9 (Electrical Circuits)

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Students are expected to read and follow instructions in all subjects. This strategy asks students to examine instructions in appliance manuals, their features and elements, and how the features, language and organizational patterns can be used to help the reader understand and complete a task.

#### Purpose

- Provide students with strategies for reading, interpreting and following instructions to complete a specific task.
- Learn how instructions are organized.

#### Payoff

Students will:

- identify purpose from reading instructions.
- develop a process for reading and following instructions.

#### Tips and Resources

- Instructions give detailed step-by-step information about a process or a procedure (e.g., directions, recipes, experiments, manuals, tests). They are sometimes called procedures or how-tos. Most instructions use organizational patterns, language, and features (diagrams and illustrations, bold or italic type, headings, numbers, lists) to help the reader identify the task and the best way to complete it; however, some instructions are complicated without any features to help the reader determine the sequence of steps.
- Collect examples of appliance manuals and troubleshooting guides.
- This activity is a good introduction to Activity 3.4 *Troubleshooting Electrical Devices* in the Grade 9 Locally Developed Compulsory Credit Course Profile.
- See *Student Resource, Tips for Reading Manuals*.

#### Further Support

- Provide students with a list of typical signal words and task prompts and suggestions/strategies for responding to them in your subject area (e.g., explain, list, summarize, give reasons for, select, choose, support).
- Provide students with flow charts and timelines to help track successful completion of oral or written instructions.
- Create a class framework for reading instructions such as:
  - Preview.
  - Highlight and annotate.
  - Think aloud and visualize.
  - Reread.
  - Go step-by-step.
  - Read the diagrams.
  - Ask questions.



**Reading Different Text Forms: Following Instructions**

**LDCC Science Grade 9 (Electrical Circuits)**

**Notes**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Collect several small appliance manuals. Divide students into pairs.</li> <li>• Provide each pair of students with a set of index cards.</li> <li>• Use the Think/Pair/Share strategy to have students recall a situation in which they had to follow a set of instructions. Create a list of elements and features of effective instructions and record them on chart paper or board.</li> <li>• What additional requirements does an appliance manual include?</li> <li>• Provide students with a copy of a manual and model how to preview the instructions. Clues can be found in the setup of the manual. Review the <i>Student/Teacher Resource Tips for Reading Manuals/Instructions</i> with students.</li> </ul>	<ul style="list-style-type: none"> <li>• Work in pairs to create a list. The list should include a title, a numbered or bulleted series of steps in sequence, clear organization and sub-headings.</li> <li>• Identify the title, read the instructions, check out the italicized or bold words for meaning and note the sequence.</li> <li>• Review Tips for Reading Manuals/Instructions.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Read the instructions aloud with the students noting the safety precautions and troubleshooting procedures.</li> <li>• Instruct students to read their manual and on an index card write a summary of the type of information the manual contains, paying attention to the headings in the manual.</li> </ul>	<ul style="list-style-type: none"> <li>• Students note the setup, highlight or underline important features and clarify what the instructions tell the reader to do.</li> <li>• Students read their manual and on an index card write a summary of the type of information the manual contains, paying attention to the headings in the manual.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• The class discusses similarities and differences between the information found in the various manuals and suggest reasons for the differences.</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in a class discussion of the similarities and differences between the information found in the various manuals and suggest reasons for the differences.</li> </ul>



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## **Reading Different Text Forms: Following Instructions**

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### **LDCC Science Grade 9 (Electrical Circuits)**

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## **Tips for Reading Manuals**

### **Before Reading**

- Know the purpose for reading the manual (e.g., troubleshooting, setup, equipment operation). If you are assembling equipment, ensure you have all of the necessary equipment (e.g., screwdriver, hammer).
- Look over the Table of Contents to understand how the manual is organized.
- Look over the Index at the back to familiarize yourself with the terminology.
- Quickly glance through the manual examining titles, headings and subheadings, and scan for words that stand out.
- Look for words and phrases that give additional clues about how the manual is organized.
- Read any overviews or summaries.
- Examine each illustration and read the titles or captions.
- Recall what you already know about the topic.
- Record some questions you might have about the topic.
- Look for safety features.

### **During Reading**

- Divide the reading into small chunks. Read a chunk, pause and think about what you read. Follow the instructions for the chunk that you have just read. Reread the steps if necessary.
- Difficult sections should be read several times. You may need to highlight or make notes.

### **After Reading**

- Read the selection again to ensure understanding.
- Make connections to what you already know about the topic.



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## Engaging in Reading: Sorting Ideas Using a Graphic Organizer

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LDCC Science Grade 9 (Electrical Circuits Unit)

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A graphic organizer is a visual representation of information used for constructing meaning in reading, writing, and speaking.

### Purpose

- Record ideas during reading.
- See the relationships among ideas, and distinguish between main ideas and supporting details.

### Payoff

Students will:

- remember important details from the text.
- organize information in a memorable and accessible way.
- help students identify and remember key facts or ideas.
- support students who are highly visual in connecting ideas.

### Tips and Resources

- Brain-based research shows that visual organizers, such as graphic organizers, can be highly effective in helping students who struggle with reading and writing.
- If possible, provide students with several samples of graphic organizers so that they get a sense of how concepts can be organized.
- Graphic organizers may or may not use colour and pictures.
- After reading the *Student Resource, Series and Parallel Circuits*, students compare series and parallel circuits using a graphic organizer (e.g., “T” Chart or a Venn Diagram).

### Further Support

- Pair students or put them in groups to read the text and create their graphic organizer.
- Encourage students in pairs or groups to choose one person who will read the text aloud first while a partner or group member records single words that represent main ideas or details.





**Engaging in Reading: Sorting Ideas Using a Concept Map**

LDCC Science Grade 9 (Electrical Circuits Unit)

**Notes**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Make an overhead of the sample text (<i>Series and Parallel Circuits</i>). Note: Do not tell students the topic of this text ahead of time.</li> <li>• Read the sample text aloud to the class, asking them to listen for and note the ideas that stand out in their minds or are of greatest interest.</li> <li>• Engage students in discussion about the ideas and key words.</li> <li>• Review how to use a graphic organizer (Venn diagram or “T” Chart) if needed.</li> <li>• Ask students to suggest what should be written under differences and similarities.</li> </ul>	<ul style="list-style-type: none"> <li>• Listen and record ideas of greatest interest as the teacher reads the text.</li>   <li>• Contribute ideas and suggestions to the class discussion.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Challenge students to create their own graphic organizer.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Complete the graphic organizer.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Put students in pairs to share and compare their graphic organizers</li> </ul>	<ul style="list-style-type: none"> <li>• Compare and discuss differences between their concept maps.</li> </ul>

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**Engaging in Reading: Sorting Ideas Using a Concept Map**

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LDCC Science Grade 9 (Electrical Circuits Unit)

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**Series and Parallel Circuits****The Series Circuit**

A series circuit applies to any electric circuit in which the parts of the circuit are wired to one another in a single path. It is set up like a running track because there is only one path for the electrons to flow. The series circuit only has one loop; therefore, you can place your finger on any part of the circuit and trace a path back to the start. If one light bulb burns out or is removed in a series circuit, then the whole circuit turns off. Another characteristic of a series circuit is that the electric current is the same in all parts of the circuit. Inexpensive mini-lights are a good example of a series circuit.

**The Parallel Circuit**

A parallel circuit is a circuit arrangement in which the electrons have more than one pathway available to them. It is set up like city streets because there are many paths for the electrons to flow. The parallel circuit has many loops because the current passes through a separate circuit to each bulb. Each separate circuit is called a branch circuit. Therefore, you can place your finger on any part of the circuit and trace a path but you will have to decide which wire to follow. If one light bulb burns out, the circuit still works. Almost all of the electric circuits in a home are connected in parallel.



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## Reading Different Text Forms: Reading Graphical Texts (Schematic Diagram)

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### LDCC Science Grade 9 (Electrical Circuits Unit)

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Graphical text forms (such as diagrams, photographs, graphs, charts, and tables) are intended to communicate information in a concise format and illustrate how one piece of information is related to another.

#### Purpose

- Become familiar with the elements and features of graphical texts.
- Explore a process for reading graphical texts, using a range of strategies for before, during and after reading.

#### Payoff

Students will:

- become more efficient at “mining” graphical texts for information and meaning.
- practice essential reading strategies and apply them to different course-related materials.

#### Tips and Resources

- Sometimes a complicated idea or concept can be communicated more easily through a chart. Many informational texts include graphics to supplement the main ideas and provide clues to the important concepts in the text. Some of the features of graphical texts include:
  - print features (such as typeface and size of type, titles, headings, subheadings, italics, labels and captions).
  - design features (such as colour, shape, line, placement, and focal point).
  - organizational patterns (such as sequential, categorical, and explanatory).
- Each graphical text uses these elements and features in different ways to effectively present information in a condensed format. For example, a chart or table may illustrate key information and show how pieces of information relate to each other. A table uses columns and rows to organize the information and may include a title that describes the main idea or subject, and a caption to explain the purpose of the table. The information in a table can be read horizontally and vertically. Tables are often used to help the reader quickly grasp key information (such as number patterns).
- Many of the strategies for reading informational and literacy texts can also be used effectively to read graphical texts.
- This activity is a good review for how to read a circuit and parallel circuits in the Grade 9 Locally Developed Compulsory Credit Course.
- See Student Resource, Tips for Reading Graphical Texts.
- See Student Resource, Can You Analyze This Circuit?
- See Teacher Resource, Questions to Guide Reading: Can you analyze this circuit? These questions can be adapted for use with a variety of diagrams, depending on the instructional focus of your lesson.
- As a follow-up to the class discussion, students are to use their own words to paraphrase the information they have learned from the diagrams. Some suggested prompts are provided in the Teacher Resource, Questions to Guide Reading: Can you analyze this circuit?

#### Further Support

Depending on the ability level, teachers may substitute this graphic for a simpler graphic (e.g., series circuit, parallel circuit).



**Reading Different Text Forms: Reading Graphical Texts  
(Schematic Diagram)**

**LDCC Science Grade 9 (Electrical Circuits Unit)**

**Notes**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Prepare handouts for students and the equipment to build the circuit for students who may need more than the diagram. Edison, an OSAPAC licensed software, may also be used to build the circuit.</li> <li>• Divide students into pairs.</li> <li>• Students brainstorm related ideas, concepts and vocabulary. Identify and pre-teach unfamiliar vocabulary.</li> <li>• Pose questions to students to help them determine a purpose for reading the graphic.</li> <li>• Model (using a think-aloud) about how to predict the content based on the features of the graphic.</li> </ul>	<ul style="list-style-type: none"> <li>• Think about any prior knowledge.</li> <li>• Determine unfamiliar vocabulary and note any symbols, numbers, captions or titles.</li> <li>• Predict the content.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Have students describe and model the different reading strategies they might use such as predicting, questioning, activating prior knowledge, inferring, reading slowly and rereading.</li> <li>• Ask students to identify all of the symbols. What do they mean? How do they relate to one another?</li> <li>• Prompt students: “Where do you start to analyze the circuit? How do you know? Where is the end of the circuit? How do you know? Is there a specific direction to be followed? How do you know?”</li> <li>• Add arrows to the diagram to indicate the flow of the electrons.</li> <li>• Ask the students what information is provided by the caption/question.</li> <li>• Ask students how the diagram assists them to understand the question being asked.</li> </ul>	<ul style="list-style-type: none"> <li>• Work with a partner and draw on prior knowledge to answer the questions.</li> <li>• Students should realize that this creates a series circuit inside a parallel circuit once they have placed the new bulb next to bulb #1. Some students may need to build the circuit because the diagram won’t have enough information to answer the question.</li> <li>• The diagram allows you to see all of the components when considering where the third light bulb will be added to the circuit.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Discuss how the altered circuit, in the question, would look different.</li> <li>• Ask the students if they see any relationships. Does the graphic help them understand?</li> </ul>	<ul style="list-style-type: none"> <li>• Students add the extra light bulb #3 to the given diagram. Some students/classes may need to build the circuit.</li> <li>• The students should see that this is a comparison between the given (which is parallel) and the altered (a series within a parallel) circuits.</li> </ul>

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**Reading Different Text Forms: Reading Graphical Texts  
(Schematic Diagram)**

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LDCC Science Grade 9 (Electrical Circuits Unit)

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## Tips for Reading Graphical Texts

### Before Reading

- Set a purpose for reading. Ask yourself why you are reading this particular text.
- Look over the text to determine what type it is and which elements are used.
- Examine the titles, headings, captions and images. Start with the title. The title tells you what the graphic is about. The captions may also use words and phrases from the text to show how the graphic is related to the information in the written text.
- Recall what you already know about the topic or subject.
- Record some questions you might have about the information presented.

### During Reading

- Read all the labels and examine how they are related to the graphic. Each label has a purpose. The most important labels may be in capital letters, bold type, or a larger font.
- Follow the arrows and lines. They may be used to show movement or direction, or connect to the things they name.
- Look for the use of colour or symbols to emphasize important words and information. Some graphical texts have a legend or a key to explain the meaning of specific symbols and colours.
- Study the image carefully. See if you recognize the details in the image. Read the text near the picture to find an explanation of the information in the graphic. Use the figure number or title and key words to find and read the related information in the written text.
- Identify the relationships among the visuals and information presented.

### After Reading

- Interpret the information conveyed in any of the graphics (e.g., diagrams, charts, graphs, maps). Ask yourself why this information might be important.
- Rephrase information orally or in writing. Imagine that you are explaining the graphic to someone who has not read it.
- Create your own graphical text (e.g., graph, map, diagram, table, flow chart) to represent the important information.

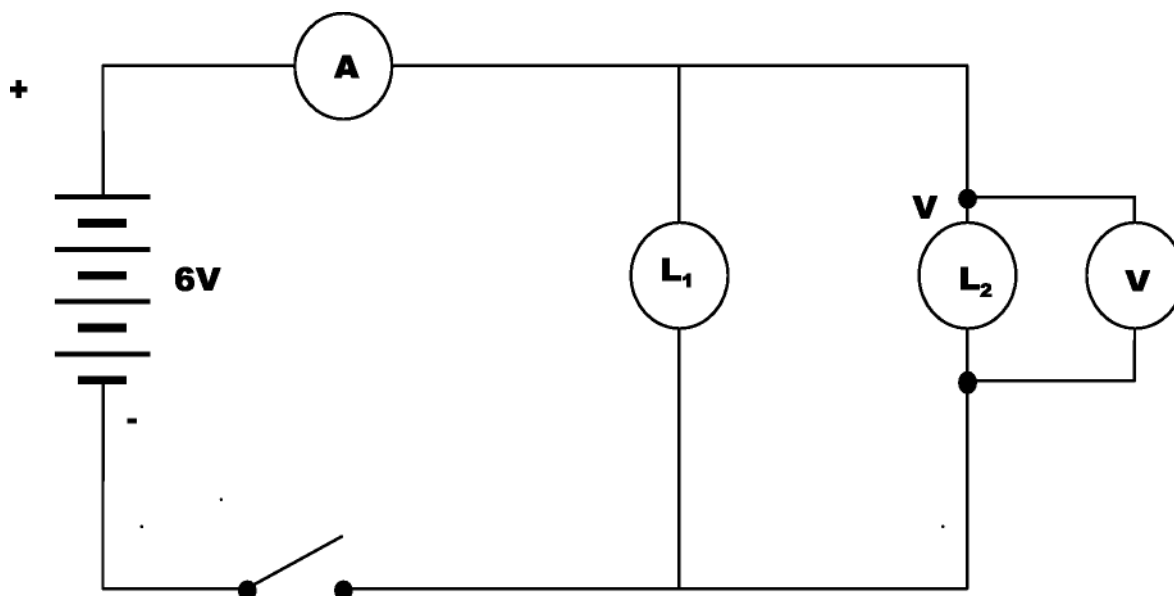
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**Reading Different Text Forms: Reading Graphical Texts  
(Schematic Diagram)**

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LDCC Science Grade 9 (Electrical Circuits Unit)

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**Can You Analyze This Circuit?**

Would the brightness of the light bulbs (#1 + #2) change if you added another light bulb (#3) next to the first one, on the same wire, in this circuit? Explain your thinking.

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## Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)

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### LDCC Science Grade 9 (Properties of Common Materials)

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The Locally Developed Compulsory Credit Course Profile emphasizes word walls as a way of developing and extending science vocabulary. Students are required to learn, on average, over 2 000 words each year in various subject areas. Those who have trouble learning new words will struggle with the increasingly complex texts that they encounter in the middle and senior school years. A *word wall* is a wall, chalkboard or bulletin board listing key words that will appear often in a new unit of study, printed on card stock and taped or pinned to the wall/ board. The word wall is usually organized alphabetically. Teachers should encourage students to keep a glossary of the words from the classroom word wall.

#### Purpose

- Identify unfamiliar vocabulary and create a visible reference in the classroom for words that will appear often in a topic or unit of study.

#### Payoff

Students will:

- develop some sense of the meaning of key words before actually reading the words in context.
- improve comprehension and spelling because key words remain posted in the classroom.
- have reference support for their reading and writing.
- develop independence as they work with the words in their reading and writing.

#### Tips and Resources

- Consider posting certain words for longer periods (for example: words that occur frequently in the unit, words that are difficult to spell, and words that students should learn to recognize on sight).
- Have students refer to the word wall to support their understanding and spelling of the words.
- Make words very accessible by putting them where every student can see them, writing them in big, black letters, or using a variety of background colours.
- **Word Development Guide:** The language of science includes special terms that are recognized as belonging primarily to specific fields, as well as words that in the context of science are used in new or distinctive ways. To facilitate learning by engaging more of the brain to enhance retention, two senses – writing and drawing images – are used. Refer to the Student Resources for a Word Development Guide template.

*Words, Words, Words* pp. 70-71.

*When Kids Can't Read, What Teachers Can Do*, Chapter 10.

*Reaching Higher – Making Connections across the Curriculum*, p. 7-8.

#### Further Support

- Pair students for this activity.





**Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)**

**LDCC Science Grade 9 (Properties of Common Materials Unit)**

**Notes**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Prepare the word wall. See the Teacher Resources for a list of the words and their meanings.</li> <li>• Collect textbooks, glossaries and dictionaries.</li> <li>• Make a copy of the <i>Word Development Guide</i> for all students.</li> <li>• Words should be added to the word wall and the Word Development Guide as they are introduced in class.</li> <li>• Divide students into pairs.</li> </ul>	
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Ask students to look over the words to get a general sense of what the words might mean.</li> <li>• Ask students to tell you what they think the words mean.</li> <li>• Engage students in general discussion of the words. Some of the words will be familiar to the students.</li> <li>• Ask students to work in pairs to complete the Guide.</li> <li>• Ask each pair to look up the meaning of the words.</li> </ul>	<ul style="list-style-type: none"> <li>• Look over the words and try to determine the meanings.</li> <li>• In pairs find an appropriate space where they can talk face-to-face and complete the Word Development Guide.</li> <li>• Use a dictionary, glossary or textbook to find the meanings of the words.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Lead some discussion of the words and ask students to discuss the words they had to look up in a dictionary or textbook.</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in a class discussion about the words.</li> <li>• Keep the <i>Word Development Guide</i> accessible because more words will be added in later classes.</li> </ul>

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**Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)**

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**LDCC Science Grade 9 (Properties of Common Materials Unit)**

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**Key Words and Definitions**

chemical property – the characteristic behaviour that occurs when one substance interacts with another to become a new substance

conductivity – the ability of a substance to allow the flow of energy or electricity

flammable – the chemical property of a substance that allows it to burn when exposed to flame and oxygen

gas – physical state of matter where a substance has no definite shape or volume

hardness – a physical property of a solid that is the measure of its resistance to being scratched or dented

heat – thermal energy transferred from one object or substance to another because of a temperature difference

HHPs – (Household Hazardous Product Symbols) symbols found on household (consumer) products that identify the type of danger associated with the product

liquid – a fluid that takes the shape and fills the volume of its container

lustre – the light reflecting properties, or shininess, of minerals

malleability – the physical property that allows the shape of a solid to be changed

mixture – a material made up of several different types of materials; in a mixture, each material retains its own properties

physical property – a characteristic or description of a substance that can be used to identify it

pure substance – matter that contains only one kind of particle

solid – one of the states or phases of matter; in the solid phase, materials keep a specific shape and size

solubility – the ability of a substance to dissolve in a solvent

state – the physical form that matter can take; there are three states of matter (solid, liquid and gas)

WHMIS – (Workplace Hazardous Material Information System) symbols found on hazardous products that identify the type of danger associated with the product and provide information on safe handling



Student Resource

**Getting Ready to Read: Extending Vocabulary (Creating a Word Wall)**

**LDCC Science Grade 9 (Properties of Common Materials Unit)**

Word Development Guide

Word	Picture or Symbol to Represent the Word	Definition	Define Using Your Own Words	Similar Word or Synonym	Put the Word in a Sentence

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**Reading Different Text Forms: Reading Graphical Texts (Table)**

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**LDCC Science Grade 9 (Properties of Common Materials Unit)**

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Graphical text forms (such as diagrams, photographs, graphs, charts, timelines, and tables) are intended to communicate information in a concise format and illustrate how one piece of information is related to another. Providing students with an approach to reading graphical text also helps them to become effective readers.

**Purpose**

- Become familiar with the elements and features of graphical texts.
- Explore a process for reading graphical texts, using a range of strategies for before, during and after reading.

**Payoff**

Students will:

- become efficient at mining graphical texts for information and meaning.
- practice essential reading strategies and apply them to different course-related materials.

**Tips and Resources**

Sometimes a complicated idea or concept can be communicated more easily through a chart, graph, diagram or illustration. Many informational texts include graphics to supplement the main ideas and provide clues to the important concepts in the text. Some of the features of graphical texts include:

- print features (such as typeface and size of type, bullets, titles, headings, subheading, italics, labels, and captions).
  - organizational features (such as tables of contents, legends, keys, pronunciation guides, labels and captions).
  - design features (such as colour, shape, line, placement, balance, and focal point). Design features can also include images.
  - organizational patterns (such as sequential, categorical, and explanatory).
- Each graphical text uses these elements and features in different ways to effectively present information in a condensed format. For example, a chart or table may illustrate key information and show how pieces of information relate to each other. A table uses columns and rows to organize the information and may include a title that describes the main idea or subject, and a caption to explain the purpose of the table. The information in a table can be read horizontally and vertically. An example of a common table format is a calendar that uses columns to show the days of the week, and rows to show the dates. Tables are often used in Mathematics, Science and Geography to help the reader quickly grasp key information (such as number patterns, pollution indexes, or city populations).
  - Many of the strategies for reading informational and literacy texts can also be used effectively to read graphical texts.
  - See Student Resources, *Tips for reading Graphical Texts* and *The Three States of Matter*.

**Further Support**

- See strategy Reading Graphical Texts, *Think Literacy: Cross Curricular Approaches, Grades 7 – 12*.



**Reading Different Text Forms: Reading Graphical Texts (Table)**

**LDCC Science Grade 9 (Properties of Common Materials Unit)**

**Notes**

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Prepare handouts for students.</li> <li>• Have students brainstorm related ideas, concepts and vocabulary. Identify and pre-teach unfamiliar vocabulary.</li> <li>• Pose questions to help students determine a purpose for reading the graphic.</li> <li>• Model (using a “think-aloud”) how to predict the content based on the features of the graphic.</li> <li>• Ask students: “What type of graphic is this? What is the purpose of the table? Why did the author choose a table?”</li> </ul>	<ul style="list-style-type: none"> <li>• Think about any prior knowledge.</li> <li>• Determine unfamiliar vocabulary and note any symbols, numbers, captions or titles.</li> <li>• Predict the content.</li>   <li>• It is a table.</li> <li>• It organizes information to help us compare the three states of matter.</li> <li>• It is a quick visual comparison of a lot of information.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Have students describe and model the different reading strategies they might use such as predicting, questioning, activating prior knowledge, inferring, reading slowly and rereading.</li> <li>• Ask the students what information is provided by the title?</li> <li>• Ask students how can you read this table?</li> <li>• Ask students how the table assists them to understand the three states of matter.</li> </ul>	<ul style="list-style-type: none"> <li>• Students draw on prior knowledge to answer the questions.</li>   <li>• The title tells us what the table summarizes.</li> <li>• The table can be read one cell at a time, across or down.</li> <li>• It is a good visual representation or summary of a lot of information.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Ask the students if they see any relationships.</li> <li>• Does the graphic help them understand?</li> <li>• Students can create a Venn diagram to further reinforce the similarities and differences between the three states of matter.</li> </ul>	<ul style="list-style-type: none"> <li>• Students should be able to quickly summarize the patterns.</li> <li>• Complete Venn diagram(s).</li> </ul>

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**Reading Different Text Forms: Reading Graphical Texts (Table)**

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**LDCC Science Grade 9 (Properties of Common Materials Unit)**

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**Tips for Reading Graphical Texts****Before Reading**

- Set a purpose for reading. Ask yourself why you are reading this particular text.
- Look over the text to determine what type it is and which elements are used.
- Examine the titles, headings, captions and images. Start with the title. The title tells you what the graphic is about. The captions may also use words and phrases from the text to show how the graphic is related to the information in the written text (e.g., “Figure 1.6”).
- Recall what you already know about the topic or subject.
- Record some questions you might have about the information presented.

**During Reading**

- Read all the labels and examine how they are related to the graphic. Each label has a purpose. The most important labels may be in capital letters, bold type, or a larger font.
- Follow the arrows and lines. They may be used to show movement or direction, or connect to the things they name.
- Look for the use of colour or symbols to emphasize important words and information. Some graphical texts have a legend or a key to explain the meaning of specific symbols and colours.
- Study the image carefully. See if you recognize the details in the image. Read the text near the picture to find an explanation of the information in the graphic. Use the figure number or title and key words to find and read the related information in the written text.
- Identify the relationships among the visuals and information presented.

**After Reading**


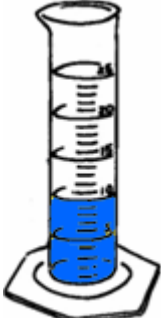

- Interpret the information conveyed in any of the graphics (e.g., diagrams, charts, graphs, maps). Ask yourself why this information might be important.
- Rephrase information orally or in writing. Imagine that you are explaining the graphic to someone who has not read it.
- Create your own graphical text (e.g., graph, map, diagram, table, flow chart) to represent the important information.



**Reading Different Text Forms: Reading Graphical Texts (Table)**

**LDCC Science Grade 9 (Properties of Common Materials Unit)**

**The Three States of Matter**

<b>State</b>	<b>Shape</b>	<b>Volume</b>	<b>Compressible</b>	<b>Flow</b>
Solid 	-retains a fixed shape	-has a set volume	-not easily compressible -little free space between particles	-does not flow easily -particles move only by vibrating in the same spot
Liquid 	-takes on the shape of its container	-has a set volume	-not easily compressible -little free space between particles	-flows easily -particles are free to move around
Gas 	-takes on the shape of its container	-assumes the volume of its container	-compressible -lots of free space between particles	-flows easily -particles are free to move around

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**Reading Different Text Forms: Reading Informational Texts**

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**LDCC Science Grade 9 (Properties of Common Materials Unit)**

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Informational text forms (such as explanations, reports, news articles, magazine articles and instructions) are written to communicate information about a specific subject, topic, event or process. These texts use vocabulary, special design elements, and organizational patterns to express ideas clearly and make them easier to read. Providing students with an approach to reading informational texts helps them to become effective readers.

**Purpose**

- Become familiar with the elements and features of informational texts used in any course.
- Explore a process for reading informational texts, using a range of strategies for before, during and after reading.

**Payoff**

Students will:

- become more efficient at mining the text for information.
- practice reading strategies using the organizational patterns to assist and consolidate understanding.

**Tips and Resources**

- Some of the features of informational texts are headings, subheadings, introductions, and diagrams. These features work together to draw readers into the text at different levels. For example, the diagram after each text section provides a visual to help students consolidate their understanding.
- Many informational texts use visual elements (such as typeface, size of type) to emphasize important words and concepts. Different texts use these features in different ways to effectively present information.
- How you read informational text will depend on your purpose for reading. If you want to find specific information in a textbook, you might examine the headings and subheadings, and then skim through the section looking for key words and phrases related to the topic. Once you have located the appropriate section, a closer reading will help you to find the information and supporting details.
- See *Student Resource, Tips for Reading Informational Text*.
- See *Student/Teacher Resource, Storing Chemicals Safely*.
- See *Teacher Resource, Questions to Guide Reading: Producers or Consumers?* These questions can be adapted for a variety of informational texts, depending on the features of the text on which you want to focus.
- See *Student Resource, Organizer for Reading: Storing Chemicals Safely 5 - 4 - 3 - 2 - 1*. Students complete the organizer, using the material they have just read. They are to find five key words from the text, four facts related to the main topic, three new words and their meanings, two facts you already know, and one question they still have after reading the passage.
  - It might be helpful to do one example for the first four to begin.
  - Record a representative sample of questions on chart paper to check later in the unit.

**Further Support**

- See strategies for before reading, such as **Previewing a Text**, and **Analyzing the Features of a Text** in *Think Literacy: Cross-Curricular Approaches, Grades 7 – 12*. Refer to these to support and reinforce the ideas described here.





Reading Different Text Forms: Reading Informational Texts

LDCC Science Grade 9 (Properties of Common Materials Unit)

Notes

What teachers do	What students do
<p><b>Before</b></p> <ul style="list-style-type: none"> <li>• Prepare handouts for students.</li> <li>• Students brainstorm related ideas, concepts and vocabulary. Identify and pre-teach unfamiliar vocabulary.</li> <li>• Pose questions to students to help them determine a purpose for reading.</li> <li>• Invite students to ask questions about the content.</li> <li>• Model (using a “think-aloud”) how to predict the content based on the features of the reading.</li> </ul>	<ul style="list-style-type: none"> <li>• Think about any prior knowledge.</li> <li>• Determine unfamiliar vocabulary and note any symbols, numbers, captions bold type or titles.</li> <li>• Predict the content.</li> </ul>
<p><b>During</b></p> <ul style="list-style-type: none"> <li>• Have students describe and model the different reading strategies they might use such as predicting, questioning, activating prior knowledge, inferring, reading slowly and rereading.</li> <li>• Model (using “think aloud”) strategies for pausing and thinking about the text. Encourage students to <b>chunk</b> the text, <b>read, pause, think,</b> and <b>ask questions</b> or <b>make notes</b> about the section of text.</li> <li>• Invite students to <b>visualize</b> the concepts as they read. Have partners share and compare the visualizations.</li> <li>• Provide students with <b>focus</b> questions, such as the following:                      “What are the main ideas?                      How has the writer organized them?                      How does the writer support the main ideas?                      What are the key words? How do you know?                      Is this a useful source of information?                      What questions do you still have?”</li> </ul>	<ul style="list-style-type: none"> <li>• Students read <i>Storing Chemicals Safely</i> in small chunks (paragraphs).</li> <li>• Participate in the class discussion about the ideas, key words, new words and any questions they may still have.</li> </ul>
<p><b>After</b></p> <ul style="list-style-type: none"> <li>• Ask students to complete the organizer for reading.</li> <li>• Discuss their answers in small groups.</li> </ul>	<ul style="list-style-type: none"> <li>• Students complete the Organizer for Reading.</li> <li>• Share their organizers in small groups.</li> </ul>

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**Reading Different Text Forms: Reading Informational Texts**

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**LDCC Science Grade 9 (Properties of Common Materials Unit)**

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**Tips for Reading Informational Text****Before Reading**

- Set a purpose for reading. Ask yourself why you are reading this particular text.
- Look over the text to see which elements appear (such as headings, subheadings, illustrations and captions, etc.).
- Examine the titles, headings, and subheadings, and scan for words that stand out.
- Look for words and phrases that might give you clues about how the information is organized.
- Read any overviews, summaries or questions. In a shorter piece, read the opening and concluding sentences or paragraphs.
- Examine each illustration and read the titles or captions.
- Recall what you already know about the topic.
- Record some questions you might have about the topic.

**During Reading**

- Divide the reading task into smaller chunks (chunking the text into paragraphs, chunking sections by subheadings, etc.). Read a chunk, pause and think about what you read, and write a brief one-sentence summary or brief point-form notes to help you remember important and interesting information.
- Read quickly, then slowly. Skim the sections you think will support your purpose for reading. When you find specific information you want, slow down and read it word by word. You may need to reread the passage several times.
- Read the selection and jot down thoughts, responses to your questions and new questions that occur to you.

**After Reading**

- Read the selection again to confirm the main idea and supporting details.
- Make connections to what you already know about the topic. How does the information you have read add to or alter what you knew about the topic?
- Record your thinking about and responses to the text. For example, write a summary, complete a graphic organizer, create a sketch, or orally retell to yourself or a friend.

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**Reading Different Text Forms: Reading Informational Texts**

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**LDCC Science Grade 9 (Properties of Common Materials Unit)**

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### Storing Chemicals Safely

Proper storage of chemicals within a laboratory is very important for everyone's safety. Chemicals must always be kept in their original containers with the **WHMIS** label attached and clearly visible. The containers should be visually inspected for cracks on a regular basis. Chemicals should be dated when they are received and opened and a record should be kept of their disposal date. A complete inventory, updated annually, should be kept in the room where the chemicals are stored. The **Material Safety Data Sheet** (MSDS) for all chemicals must also be kept.

There are two different types of storage cabinets for chemicals. An **acid cabinet** is a sealed well-ventilated cabinet for storing inorganic and organic acids with the exception of nitric acid which must be stored in a separate compartment. Bases should never be stored in the acid cabinet because they may react with acids. Flammables and solvents are kept in a sealed metal **flammable cabinet**. The flammable cabinet prevents the chemicals from coming into contact with electrical or heat sources. The cabinets should be kept in a locked room and each cabinet should also be locked.

Chemicals should always be stored by **compatibility** because it can be very dangerous to store certain chemical combinations together. Never store chemicals in alphabetical order. For example, storing Cupric sulfide and cadmium chlorate together will result in an explosion on contact. Chemicals must also be stored at an appropriate temperature and humidity level.



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**Reading Different Text Forms: Reading Informational Texts**

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**LDCC Science Grade 9 (Properties of Common Materials Unit)**

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**Organizer for Reading: Storing Chemicals Safely**

**5 - 4 - 3 - 2 - 1**

<b>5</b>	<b>Key words from the text</b> 1. 2. 3. 4. 5.
<b>4</b>	<b>Facts related to the main topic</b> 1. 2. 3. 4.
<b>3</b>	<b>New words</b> 1. 2. 3.
<b>2</b>	<b>Facts you already know</b> 1. 2.
<b>1</b>	<b>Questions you still have</b>