

Doing Our Part for Planet Earth
Integrated English Language Arts 7 and Science 7
Cooperative Content Enhancement Unit Plan

(Training in the following Content Enhancement Routines is a Requirement to use this unit: The Unit Organizer Routine, The Framing Routine, and The Concept Comparison Routine)
Cary Pepper-Martens, Tracy Woodward, Debbie Bidulka

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Integrated ELA 7 & SC 7 Cooperative Content Enhancement Unit
(Training in the following Content Enhancement Routines is a
Requirement to use this unit: The Unit Organizer Routine,
The Framing Routine, and The Concept Comparison Routine)

Date: April 2007

Number of Students: 41

Subject: English Language Arts
and Science

Grade: Seven

Curriculum Guide Reference:

- English Language Arts: A Curriculum Guide for the Middle Level
(Grades 6-9) Thematic Unit “Doing Our Part for Planet Earth”
- Science: A Curriculum Guide for the Middle Level: Unit–Renewable Resources

Classroom Teacher: C. Pepper-Martens

Teacher Librarian: T. Woodward

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If you are interested in Content Enhancement Training, please contact Debbie Bidulka
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School Division: Prairie Spirit School Division No. 206

School: Delisle Composite School

Time Allotment: 29-41 Classes
(Dependent upon which activities you choose)

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Overview:

Through a variety of genres, media, and resources, this unit will focus on helping students **understand our environment is an intricate ecosystem, our actions can be damaging, and we must do our part to care for the earth.**

The unit is divided into the following sub-topics: Dependence on Our Environment, Resources in Our Environment (Saskatchewan), Harming the Earth (Technology, Energy Use), **The Challenge** - Things We/You Can Do to Show Respect and Care for The Environment.

Foundational and Learning Objectives:

Students will extend their abilities to:

(Adapted and copied from English Language Arts: A Curriculum Guide for the Middle Level (Grades 6 -9) and Science: A Curriculum Guide for the Middle Level documents)

Foundational and learning objectives for Science

1. Recognize the renewable resources of Saskatchewan

- 1-1. Distinguish between renewable and nonrenewable resources (E)
- 1-2. Identify those resources in Saskatchewan that are renewable (D, F)
- 1-3. Appreciate the impact that human activity has on renewable land and water resources (I)
- 1-4. Introduce the concept of sustainable use of renewable land and water resources (L)

2. Compare renewable and nonrenewable sources of energy

- 2-1. Describe how energy is used in Saskatchewan (D)
- 2-2. Recognize how energy sources are transported to where they will be consumed (C)
- 2-3. Consider some of the effects of production, transportation, and use of energy on the environment (J)
- 2-4. List sources of renewable energy (F)
- 2-5. Discuss why each source identified is classified as renewable (F)
- *2-6. Investigate the extent of current use of each source

3. Investigate critical attributes of renewable sources of energy

- 3-1. Describe how renewable energy sources could be substituted for nonrenewable energy sources (M)
- 3-2. Create a list of benefits, disadvantages, and interesting points about each of the resources (G)
- 3-3. Reach a class consensus on the desirability, possibility, and implications of increasing the use of renewable forms of energy (K)

4. Develop "strong sense" critical and creative thinkers (CCT)

- 4-1. Understand human needs in relation to the needs of other living organisms (B)
- 4-2. Explore the implications or consequences of human actions (I)
- 4-3. Distinguish between needs and wants (B)
- *4-4. Clarify their motives and develop insight into the motives of others with respect to energy use

5. Develop an understanding that technology both shapes society and is shaped by society (TL)

- 5-1. Explore the reciprocal relationships between the natural and constructed worlds (H)
- *5-2. Investigate how human wants and needs shape the direction and development of technological innovations regarding energy use and environmental concerns
- *5-3. Examine how the development of technology effects change in the physical world and in society

English Language Arts Objectives for Grade 7

Content Objectives:

Understand our environment is an intricate ecosystem and we are an important part of that system

Understand the various ways in which we depend on the environment

Recognize some problems facing the environment

Recognize possible changes to the environment within a lifetime

Create and describe practices which show respect and care for the environment

An asterisk in parentheses () following a learning objective indicates that this is a new objective for this grade level*

Focus for Grade 7 Language Study: Communicating With Clarity and Correctness

Grade 7 students will understand that:

1. Pragmatic Cues and Conventions

1-1 Identifying audience, role, purpose, and situation are important when considering the appropriate and correct language to use and in order to understand what is heard, read, or viewed

3-2 A cover page, a list of references, and the appropriate layout and spacing enhance a report or presentation

2. Textual Cues and Conventions

2-1 Ideas within texts can be organized in different ways (e.g., chronological, problem/solution, cause/effect, compare/contrast)

3. Other Cues and Conventions

3-1 Communication can be enhanced with illustrations, models, graphic organizers, charts, timelines, maps, sound

Listening (Grade 7)

4. Students will extend abilities to listen effectively in a variety of situations for a variety of purposes

4-1 Listen for a variety of purposes including: to gather information, to follow directions, to participate in a discussion, to form an opinion, to understand information, and to enjoy and appreciate

4-2 Select and use the appropriate strategies and the language cueing systems and conventions to construct meaning **before, during, and after listening** to grade appropriate texts

Before

Prepare to listen

Draw on prior knowledge and experience by considering what they know and need to know about the topic

Formulate questions before listening

Set purpose(s) for listening in a variety of situations

During

Concentrate on the message of the speaker and respond with interest (*)

Anticipate and predict the speaker's message and meaning

Separate own ideas and opinions from speaker's ideas and opinions (*)

Make connections to prior knowledge and experiences (i.e., relate text to self, text to other text, and text to world)

Recognize the main ideas and supporting details (*)

Recognize the presenter's organizational structure and follow the sequence of ideas expressed (*)

Note how examples, illustrations, and visual aids support or take away from the key message (*)

Determine literal and implied meaning of message (*)

Make jot notes to assist recall of the main idea(s) expressed by the speaker

Create visual images

Make inferences based on text and prior knowledge

Draw conclusions based on evidence in presentation

Recognize speaker's use of language (formal, informal, slang)

Determine whether fact or opinion is expressed in speaker's viewpoint

Use pragmatic (e.g., speaker's purpose and point of view), textual (e.g., speaker's organization of ideas), syntactic (e.g., main and subordinate ideas), semantic/lexical/morphological (e.g., specific word meanings by context and reason for particular word choices, common affixes), graphophonic (e.g., word patterns), and other cues (e.g., the speaker's nonverbal cues) to construct and confirm meaning (*)

After

Recall and summarize main points and supporting detail

Relate what was heard to personal experiences or needs

Analyze and evaluate what was heard

Draw conclusions based on evidence presented and

Draw conclusions about speaker's values

Consider and respect ideas from speaker's point of view (*)

Seek additional information from other sources as needed or desired

Extend abilities to assess strengths in listening and set goals for future growth

Set goals to improve listening strategies (*)

Appraise own and others' work for clarity and correctness (*)

Speaking (Grade 7)

5. Students will extend abilities to speak fluently in a variety of situations for a variety of purposes and audiences

5-1 Speak to explain, report, and inform (e.g., give multi-step instructions, give short report)

5-2 Select and use the appropriate strategies and the language cueing systems and conventions **before, during, and after** speaking to promote understanding of ideas

Before

Identify purpose for speaking

Access information and ideas from a variety of sources

Generate ideas and consider appropriate ideas and information to include in presentation

Choose appropriate format (e.g., a report)

Support key points with evidence and examples (*)

During

Present ideas clearly and at a rate that enables others to follow

Summarize personal viewpoint in clear and meaningful ways (*)

Use volume appropriate to the purpose, audience, and situation and modulate voice for effect (*)

Use level of language and vocabulary appropriate to audience and purpose

Use gestures, facial expressions, and visual aids to enhance meaning of talk

Respond to questions and comments concisely, clearly, and appropriately (*)

Acknowledge sources

After

Review feedback and questions asked by audience

Consider ways to enhance clarity and impact of presentation

Summarize ideas discussed and state own view in light of discussion (*)

Extend abilities to assess strengths in speaking and set goals for future growth

Set goals to improve speaking strategies (*)

Appraise own and others' work for clarity and correctness (*)

Reading (Grade 7)

6. Students will extend abilities to read effectively in a variety of situations for a variety of purposes

6-1 Read for a variety of purposes including: to gather information, to follow directions, to give a response, to form an opinion, to understand information, and to enjoy and appreciate

6-2 Select and use the appropriate strategies and the language cueing systems and conventions to construct meaning **before, during, and after reading** to grade appropriate texts

Before

Set a purpose for reading

Activate prior knowledge about the author's background, writing style, and bias

Formulate questions before reading

During

Make jot notes to assist recall of the main idea(s) expressed by the author

Make inferences based on text and prior knowledge

Recognize author's point of view and reasons for choosing it (*)

Determine whether fact or opinion is being portrayed

Show understanding that the author's experience, background, and culture influence the treatment of theme

After

Reread to clarify understanding when necessary

Recall and relate in own words major ideas and their supporting details

Summarize major ideas (*)

Reflect on and support personal and critical responses with reference to text (*)

Writing (Grade 7)**7. Students will extend abilities to write fluently in a variety of situations for a variety of purposes and audiences**

7-1 Write to explain, to report, to persuade, and to inform (e.g., a news story, factual account, explanation, business letter)

7-2 Select and use the appropriate strategies and the language cueing systems and conventions **before, during, and after writing** to ensure communication of ideas

Before

Identify purpose and audience for writing

Generate ideas and consider appropriate ideas and information to include in writing by brainstorming, clustering, discussing, dramatizing, reading/listening/viewing, experiencing, and representing

Use inquiry or research processes to gather additional ideas and information for specific purpose

Identify, evaluate, select, and acknowledge relevant ideas and information from two or three sources

Choose appropriate format (e.g., news story) for purpose and audience

Plan (e.g., using chart or outline) and organize ideas to fit format (e.g., chronological, problem/solution, cause/effect, comparison/contrast) (*)

During

Enhance compositions with illustrations, charts, and other graphics when appropriate (*)

Acknowledge sources

After

Revise final drafts for clarity of meaning and appropriate detail by adding, rearranging, or deleting ideas

Revise final drafts to ensure that each paragraph has a topic sentence, a body, and a concluding sentence

Revise final drafts to ensure language is appropriate for audience and purpose

Proofread final drafts for language conventions

Viewing (Grade 7)**8. Students will extend abilities to view effectively in a variety of situations for a variety of purposes**

8-1 View for a variety of purposes including to understand and to gather information, to form an opinion, and to enjoy and appreciate

8-2 Select and use the appropriate strategies and the language cueing systems and conventions to construct meaning **before, during, and after viewing** grade appropriate texts

Before

Prepare to view

Draw on prior knowledge and experience by considering what they know and need to know about the topic

Formulate questions before viewing

Set purpose(s) for each type of viewing situation

During

Make connections to prior knowledge and experiences (i.e., relate text to self, text to other texts, and text to world)

Make notes to assist recall of the main idea(s) expressed

Make inferences based on visual presentation and prior knowledge

After

Recall and summarize main points, important details, and techniques employed

Reflect and re-view in light of purpose (*)

Relate what was seen to personal experiences or needs

Express and support personal reactions to and opinions of the visual

Representing (Grade 7)**9. Students will extend abilities to represent in a variety of situations for a variety of purposes and audiences**

9-1 Integrate a variety of media (e.g., music, mime, computer graphic, graph, picture) into oral and written representations to enhance the message

9-2 Select and use the appropriate strategies and the language cueing systems and conventions **before, during, and after representing** to promote understanding of ideas

Before

Identify purpose for representing

Generate ideas and consider appropriate ideas and information to include in representation using strategies such as brainstorming, questioning, storyboarding, clustering, drawing, and reflecting

Access information and ideas from a variety of sources

Determine key ideas, messages, or information to be expressed (*)

Choose appropriate media and format for purpose, audience, and situation (*)

Organize ideas in appropriate format (layout) in preparation for sharing or presenting

Recognize and use the strategies in the representing process including planning and focusing, scripting and layout, and revising (*)

Rehearse, field test, and consider ways to enhance clarity of representation

Consider appropriate technology to communicate and to enhance representation

During

Present ideas clearly and at a rate that enables others to follow

Use volume and presentation techniques appropriate to the purpose, audience, and situation

Use level of language and vocabulary appropriate to audience and purpose

Use visuals and other techniques to portray key understandings

Acknowledge sources

After

Review feedback and questions asked by audience

Consider ways to enhance clarity and impact of representation

Extend abilities to assess strengths in representing and set goals for future growth

Set goals to improve listening strategies (*)

Appraise own and others' work for clarity and correctness (*)

Responsibilities of the Planning/Teaching Partners:

The team met initially to brainstorm and develop a plan for the unit. Resources and handouts were also discussed and selected. Various duties were delegated and the team met on four other occasions to compile the unit.

Instructional Strategies and Methods:

A variety of instructional strategies and methods are used in this unit of study. Strategies include: direct and indirect instruction using explicit teaching, demonstrations, guides for reading, viewing, listening, and representing, videos, guest speakers, problem-solving, building schema through questions, reading and making connections (text to self, text to text, and text to world), guided visualizations, and Content Enhancement Routines (Unit Organizer, The Concept Comparison Routine, The Framing Routine); experiential learning using fieldtrips, simulations, dramatic presentations, focused imaging, and model-building; independent study using resource-based learning research projects, assigned questions, and independent learning projects; and finally, interactive instruction using reading (literature) circles, jig-saw activities, literature appreciation activities (utilizing before, during, and after strategies), debates, brainstorming, class discussions, interviewing, and cooperative learning.

Adaptive Dimension:

Throughout this unit, adaptations will be made to the content, instructional practices, learning environment, and evaluation as warranted. This unit of study enables the teacher to incorporate the Adaptive Dimension by:

- Utilizing Content Enhancement Routines to ensure all students understand the concepts being presented
- Completing interactively with the students a “Unit Organizer” which is continually referred to throughout the unit so that students see the “big picture” and how all the independent activities fit together
- Utilizing reading circles to assist those who have reading difficulties.
- Encouraging a variety of responses and sharing through open-ended questions in discussions and group work
- Scanning documents or handouts into the WYNN for students with reading and writing challenges
- Using rubrics in order to provide students with detailed and clear criteria for judging, evaluating, and giving feedback on their performance and/or products

Unit Organizer (filling in and tracking Unit)
Exit Slip – Text to Self Connections
Creating a Page “If You’re Not From _____” (Rubric)
Exit Slip – Ecosystems
Ecosystem Poster (Rubric)
Ecological Footprint Quiz (optional – teachers may do this
as a group activity)
Ecolog (Rubric)
Resources – (Jot Note Worksheet)
Where and how energy is consumed in Saskatchewan? (Frame)
Flap-Book (Rubric)
Comparing Renewable and Non-Renewable Resources
(Comparison Table)
Exit Slip - Renewable and Non-Renewable Resources
Persuasive Poem (Mastery Chart and/or Presentation Rubric)
Reciprocal Relationships between Natural and Constructed
Worlds (Frame)
Debate “How have humans helped to create or destroy positive
and sustainable reciprocal relationships with nature?” (Rubric
optional extended activity)
Exit Slip – Human Activity
Newspaper Advertisement (Rubric)
“Effects of Pollution on A City” (Viewing Guide - 3 Sources/3 Effects)
Literature Circle Role Sheets
“Inconvenient Truth” Viewing Guide
Speaker or Simulation Activity “Sustainable Use of the Land and
Water Resources”
Questions - Substituting renewable energy sources for
nonrenewable energy sources, energy conservation, and
alternate forms of energy
Project – Alternate Forms of Energy (Optional)
Action Plans

Content Enhancement Unit Organizer:

The Unit Organizer on the following two pages is an instructional tool developed and researched at the University of Kansas Center for Research on Learning (B. Keith Lenz, Janis A. Bulgren, Jean B. Schumaker, and Donald D. Deshler, Daniel A. Boudah, 1994). It is one of a number of teaching devices designed for teachers to use as they teach content information to classes containing diverse student populations. It is a data-based teaching instrument that has been found effective when used with a planning routine as well as a teaching routine that combines cues about the instruction, specialized delivery of the content, involvement of the students in the cognitive processes, and a review of the learning process and content material (Bulgren, Lenz, Deshler & Schumaker, 1995). It has not been shown to be an effective tool if it is simply distributed to students.

Teacher - Unit Organizer Page 1

The Unit Organizer		④ BIGGER PICTURE		NAME _____ Mrs. Pepper-Martens
		Gr. 7 ELA and Science		DATE _____ April
② LAST UNIT/Experience		① CURRENT UNIT Doing Our Part for Planet Earth		③ NEXT UNIT/Experience
⑧ UNIT SCHEDULE		⑤ UNIT MAP		
1 Unit Organizer				
2 Reading Book Creation				
3 Ecosystem Activity				
2 Eco Footprint/ Pie Chart Log				
1-2 Energy Sources Research				
1 Compare Renew/Non-Renew				
3-4 Persuasive Poem Presentation				
2-3 Jigsaw & Reciprocal Relationships				
1-2 Human Impact Newspaper Ad				
4-5 Posters & Mini Lit. Circles				
2-3 Video "Inconvenient Truth"				
1-2 Speaker or Simulation				
2-5 Questions & Projects 4-6 classes Stories/Fieldtrip/Action Plans				
⑦ UNIT SELF-TEST QUESTIONS		1. How do we depend on the environment? 2. Compare renewable and nonrenewable resources in Saskatchewan. 3. What are some problems facing the environment? 4. What do you think will happen to the environment in your lifetime? 5. Of all the ways we may do harm to the earth, which concerns you most? 6. Why should people care about the environment? 7. What are some things you and your peers can do to show respect and care for the environment?		⑥ UNIT RELATIONSHIPS
		Describe		UNIT RELATIONSHIPS
		Compare/Contrast		
		Fact/Opinion/Bias		
		Cause/Effect		
		Analyze		
		Problem/Solution		

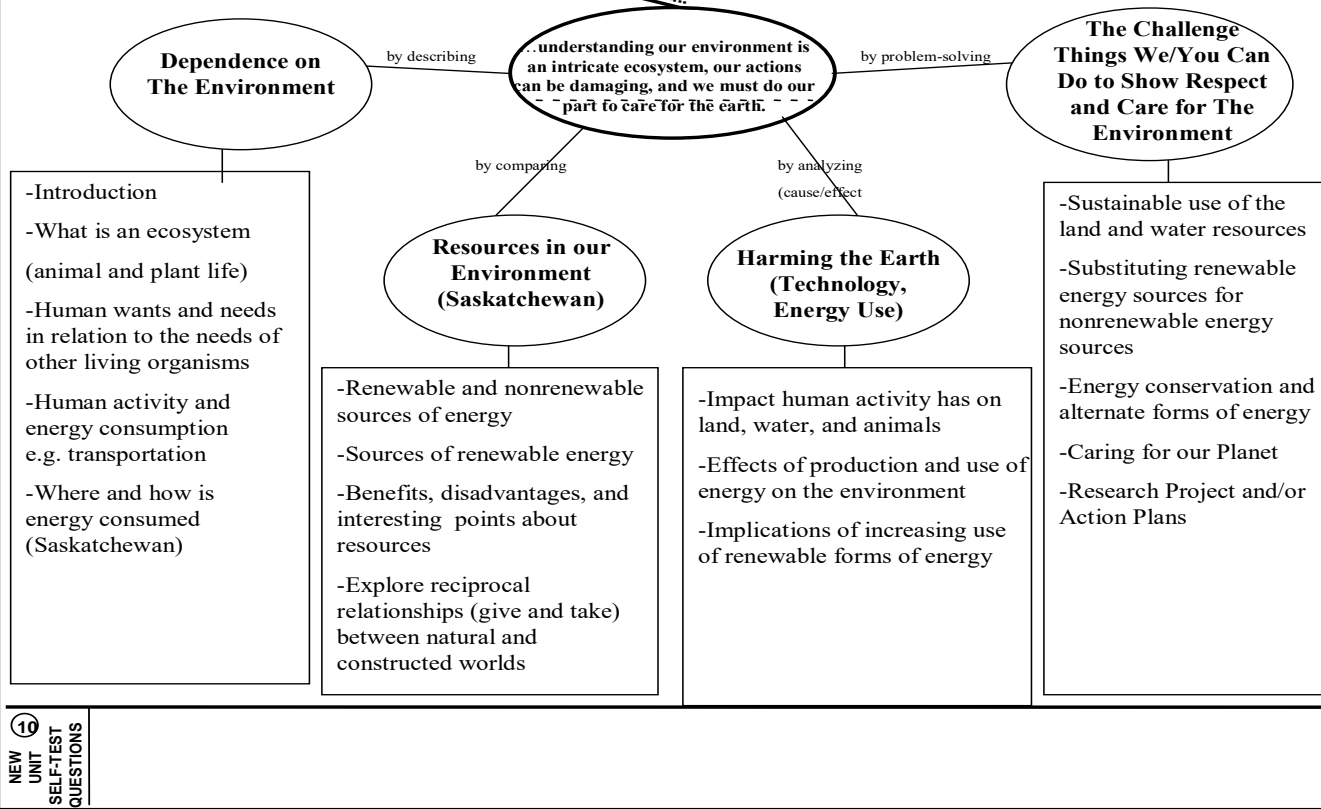
Teacher - Unit Organizer Page 2

The Unit Organizer

Doing Our Part for Planet Earth

NAME Mrs. Pepper-Martens
DATE April

⑨ Expanded Unit Map



Teacher Copy – Notes Page 3

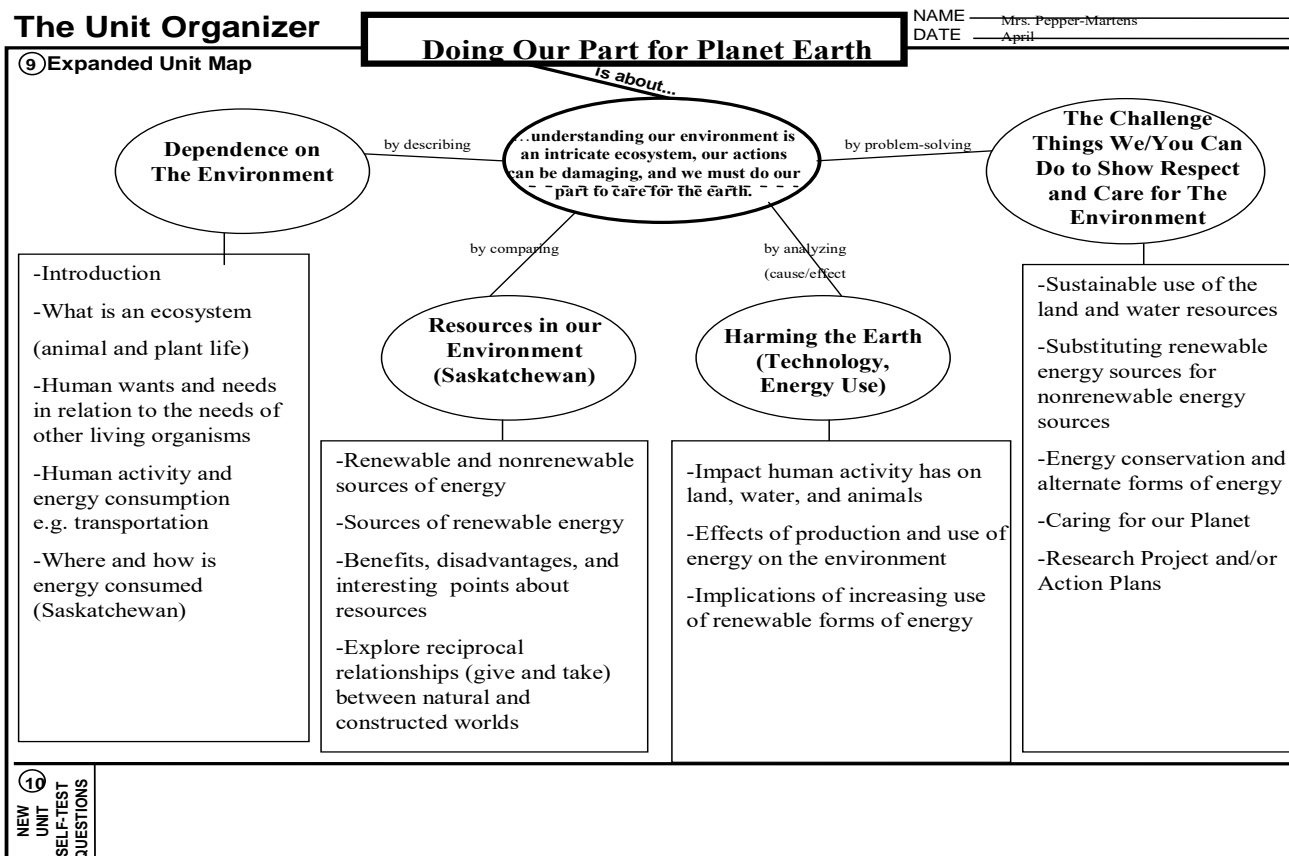
Assignments and Evaluation

Possible Assignments	Mark Allocations To Be Determined By Teacher
• Unit Organizer (filling in and tracking Unit)	
• Exit Slip – Text to Self Connections	
• Creating a Page “If You’re Not From _____ “ (Rubric)	
• Exit Slip – Ecosystems	
• Ecosystem Poster (Rubric)	
• Ecological Footprint Quiz (optional – teachers may do this as a group activity)	
• Ecology (Rubric)	
• Resources – (Jot Note Worksheet)	
• Where and how energy is consumed in Saskatchewan? (Frame)	
• Flap-Book (Rubric)	
• Comparing Renewable and Non-Renewable Resources (Comparison Table)	
• Exit Slip - Renewable and Non-Renewable Resources	
• Persuasive Poem (Mastery Chart and/or Presentation Rubric)	
• Reciprocal Relationships between Natural and Constructed Worlds (Frame)	
• Debate “How have humans helped to create or destroy positive and sustainable reciprocal relationships with nature?” (Rubric optional extended activity)	
• Exit Slip – Human Activity	
• Newspaper Advertisement (Rubric)	
• “Effects of Pollution on A City” (Viewing Guide - 3 Sources/3 Effects)	
• Literature Circle Role Sheets	
• “Inconvenient Truth” Viewing Guide	
• Speaker or Simulation Activity “Sustainable Use of the Land and Water Resources”	
• Questions - Substituting renewable energy sources for nonrenewable energy sources, energy conservation and alternate forms of energy	
• Project – Alternate Forms of Energy (Optional)	
• Action Plans	

Student – Unit Organizer – Page 1

The Unit Organizer		Gr. 7 ELA and Science		NAME <u>Mrs. Pepper-Martens</u>	
				DATE <u>April</u>	
(2) LAST UNIT/Experience (8) UNIT SCHEDULE 1 Unit Organizer 2 Reading Book Creation 3 Ecosystem Activity 2 Eco Footprint/ Pie Chart Log 1-2 Energy Sources Research 1 Compare Renew/Non-Renew 3-4 Persuasive Poem Presentation 2-3 Jigsaw & Reciprocal Relationships 1-2 Human Impact Newspaper Ad 4-5 Posters & Mini Lit. Circles 2-3 Video "Inconvenient Truth" 1-2 Speaker or Simulation 2-5 Questions & Projects 4-6 classes Stories/ Fieldtrip/Action Plans (7) UNIT SELF-TEST QUESTIONS		(4) BIGGER PICTURE		(3) NEXT UNIT/Experience	
		(1) CURRENT UNIT Doing Our Part for Planet Earth		(6) UNIT RELATIONSHIPS	
(5) UNIT MAP 					

Student Unit Organizer – Page 2



Student Copy - Notes Page 3

Assignments and Evaluation

<u>Possible Assignments</u>	<u>Mark Allocations To Be Determined By Teacher</u>
• Unit Organizer (filling in and tracking Unit)	
• Exit Slip – Text to Self Connections	
• Creating a Page “If You’re Not From _____ “ (Rubric)	
• Exit Slip – Ecosystems	
• Ecosystem Poster (Rubric)	
• Ecological Footprint Quiz (optional – teachers may do this as a group activity)	
• Ecology (Rubric)	
• Resources – (Jot Note Worksheet)	
• Where and how energy is consumed in Saskatchewan? (Frame)	
• Flap-Book (Rubric)	
• Comparing Renewable and Non-Renewable Resources (Comparison Table)	
• Exit Slip - Renewable and Non-Renewable Resources	
• Persuasive Poem (Mastery Chart and/or Presentation Rubric)	
• Reciprocal Relationships between Natural and Constructed Worlds (Frame)	
• Debate “How have humans helped to create or destroy positive and sustainable reciprocal relationships with nature?” (Rubric optional extended activity)	
• Exit Slip – Human Activity	
• Newspaper Advertisement (Rubric)	
• “Effects of Pollution on A City” (Viewing Guid3 - 3 Sources/3 Effects)	
• Literature Circle Role Sheets	
• “Inconvenient Truth” Viewing Guide	
• Speaker or Simulation Activity “Sustainable Use of the Land and Water Resources”	
• Questions - Substituting renewable energy sources for nonrenewable energy sources, energy conservation and alternate forms of energy	
• Project – Alternate Forms of Energy (Optional)	
• Action Plans	

Lesson/Sequence/Materials/Description of Activities: (note adaptations will be made as necessary)

Lesson One – The Overall Plan of the Unit – the Unit Organizers and the Motivational Set

Topic: Overall Map of the Unit (Unit Organizer Routine) and Motivational Set

Time: 2 -3 classes

Learning Objectives:

General:

Students will become familiar with the Unit Organizer, a device used to map out the unit (the big ideas, the concepts covered, unit self- test questions - what they will need to know at the end of the unit, the unit relationships, the unit schedule and the assessment procedures).

ELA 7:

4-2 Listening

- Draw on prior knowledge and experience by considering what they know and need to know about the topic
- Set purpose(s) for listening in a variety of situations

7-2 Writing

- Identify purpose and audience for writing
- Communication can be enhanced with illustrations, and graphic organizers.

9-2 Representing

- Generate ideas and consider appropriate ideas and information to include in representation using strategies such as brainstorming, questioning, storyboarding, clustering, drawing, and reflecting

Materials:

Overhead, overhead marker, teacher copy of completed Unit Organizer, overhead transparency of student Unit Organizer, and student handout of the Unit Organizer
 Picture Book: If You're Not From the Prairies by David Bouchard
 Exit Slip – Text to Self Connections
 Creative Writing Project Rubric

Activity:

Introduce the Unit Organizer by having the Student Unit Organizer on an overhead transparency. Using the teacher prepared Unit Organizer, work through all the sections with the students having them fill in the missing parts. Explain to the students the Unit Organizer is a map of how the unit will progress, and it will be referred to throughout the unit. Add evaluation procedures to the third page of the organizer under “Notes.”
 Discuss evaluation tools and procedures with the students. Teachers should always share

with students the method or evaluation tool (rubrics, checklists, exit slip, etc.) that will be used prior to students working on the assignment in order to provide clear and explicit understanding of the activity and the expectations.

The Unit Organizer will be referred to at the beginning of each lesson to identify to students how the unit is progressing within the context of the big picture.

Motivational Set:

Instructional Strategy: Think Aloud

(Before) Prior to listening to the book entitled If You're Not From the Prairies by David Bouchard, chart students' background knowledge of life on the prairies. The teacher will lead this discussion through the "think aloud" comprehension strategy to demonstrate how good readers/listeners make connections to the story in order to enhance their comprehension. (The chart can remain up for the entirety of this activity.)

(During) While students are listening, the teacher will explicitly lead them to make text to self connections. (Suggestion: This is a short story; therefore, read the entire story through once before going through it and making the connections. The teachers may choose to use sticky notes to mark pages on which they have made the connections. This will be a visual reminder for students regarding the number of connections the teacher has made.)

Assessment: To assess students' ability to make text to self connections, the teacher may want to use an exit slip. An exit slip is a short student written note from which the teacher can determine comprehension of the lesson.

Sample Exit Slip

<div style="border: 1px solid black; padding: 10px;"> <p>Name: _____</p> <p style="text-align: center;">Exit Pass</p> <p>The parts of the story that remind me of my life on the prairies are:</p> <p>1. _____</p> <p>_____</p> <p>2. _____</p> <p>_____</p> <p>3. _____</p> <p>_____</p> <p>_____</p> </div>

Creative Writing Activity

Each student will create a page of his or her own “If You’re Not From (substitute name of town here).” The pages should be made to emulate those found in Bouchard’s picture book. Students will create the pages based on the information from the categories and/or their own ideas. The pages will be compiled, laminated, and bound. The finished product can be placed in the school’s library or kept for display in the classroom. Another option is to make a book for each student to take home.

Assessment/Evaluation:

A rubric (teacher made or student and teacher created) may be used to either assess (e.g. to provide feedback on a first draft) or evaluate this creative writing project.

Sample rubric categories with the highest score added:

	Budding Writer 1	Novice Author 2	Established Author 3	World Famous Author 4
1. Writer’s Word Choice				The message conveyed has been expertly written. You’ve used many powerful and interesting nouns, verbs, adjectives, and adverbs.
2. Writer’s Graphic Selection				Masterful illustrations, background, and borders. They catch the eye and stir up the imagination.
3. Overall Formatting				Expert layout and placement of the words and graphics. Intense thought and planning went into this.
4. COPS				Wow! You are an expert writer/editor. You have no COPS errors!

Lesson Two

Topic: What is an ecosystem?

Time: 3 classes (2 consecutive classes, 1 follow-up class)

Learning Objectives:

Science 7:

4-1 Understand human wants needs in relation to the needs of other living organisms.

Science Content Learning Objective: Students will be able to define the term “ecosystem,” identify the five major ecosystems of Saskatchewan, and identify the biotic (living) and abiotic (never living) factors that exist in an ecosystem near the school.

ELA 7:

Understand our environment is an intricate ecosystem and we are an important part of that system.

4-2 Listening

- Listen for a variety of purposes including gathering information, following directions, participating in a discussion, forming an opinion, understanding information, enjoying and appreciating.

- Listening (During): Concentrate on the message of the speaker and respond with interest (*)

Materials:

Overhead, overhead transparency of completed Unit Organizer

Suitable outdoor clothing for walking through local terrain, agar plates, swabs to collect specimens, microscopes

Exit Slip - Ecosystems

Poster Rubric

Activity:

Prior to every lesson, the Unit Organizer is placed on the overhead to identify for students how the unit is progressing within the context of the big picture (review what they have covered and where they are going). The teacher and students check off activities and topics they have completed.

Senior Outdoor Education students (or Biology 20, 30 classes) will talk to the class about ecosystems in Saskatchewan. The presentation will focus on location, climate, landforms, soil, vegetation, and wildlife in the various Ecoregions (Taiga Shield, Boreal Shield, Boreal Plain, and Prairie). This will be followed up with an outdoor excursion around the community.

Students will be organized into groups of four to streak agar plates that will grow bacteria. The following day the students will spend a class together examining some of the specimens through microscopes and talking about diversity in ecosystems.

Approximately two weeks later, the students from both classes will get together to examine the changes in the agar plates. Students will be asked to compare and contrast the local ecosystems with the other ecoregions in Saskatchewan. Groups will create a poster to display the content of their learning.

Assessment:

Use an exit slip (sample provided) to assess whether the students know any or all of the benchmarks found in the objectives or chart below. This chart may be kept by the teacher, placed in a student portfolio, or placed in a student's notebook depending on the method of record keeping.

Name:			
Date:	Mastered Content	Beginning to Comprehend	Requires Reteaching of Content
I can define the term ecosystem.			
I can identify the five major ecosystems of Saskatchewan.			
I can identify biotic (living) factors that exist near my school.			
I can identify abiotic (never living) factors that exist near my school.			

Exit Slip:

<p>Name: _____ Exit Slip</p> <p>These were the key concepts from today's class!</p> <ol style="list-style-type: none"> 1. Define ecosystem. 2. What are the five major ecosystems of Saskatchewan? 3. Identify one biotic and one abiotic factor that exist near our school.

Evaluation:

Poster Rubric (teacher or student and teacher made) – sample follows

Making A Poster : A New Product

Student Name: _____

CATEGORY	4	3	2	1
Attractiveness	The poster is exceptionally attractive in terms of design, layout, and neatness.	The poster is attractive in terms of design, layout and neatness.	The poster is acceptably attractive though it may be a bit messy.	The poster is distractingly messy or very poorly designed. It is not attractive.
Title	Title can be read from 6 ft. away and is quite creative.	Title can be read from 6 ft. away and describes content well.	Title can be read from 4 ft. away and describes the content well.	The title is too small and/or does not describe the content of the poster well.
Graphics - Relevance	All graphics are related to the topic and make it easier to understand. All borrowed graphics have a source citation.	All graphics are related to the topic and most make it easier to understand. All borrowed graphics have a source citation.	All graphics relate to the topic. Most borrowed graphics have a source citation.	Graphics do not relate to the topic OR several borrowed graphics do not have a source citation.
Graphics - Originality	Several of the graphics used on the poster reflect an exceptional degree of student creativity in their creation and/or display.	One or two of the graphics used on the poster reflect student creativity in their creation and/or display.	The graphics are made by the student, but are based on the designs or ideas of others.	No graphics made by the student are included.
Graphics -Clarity	Graphics are all in focus and the content easily viewed and identified from 6 ft. away.	Most graphics are in focus and the content easily viewed and identified from 6 ft. away.	Most graphics are in focus and the content is easily viewed and identified from 4 ft. away.	Many graphics are not clear or are too small.
Mechanics	Capitalization and punctuation are correct throughout the poster.	There is 1 error in capitalization or punctuation.	There are 2 errors in capitalization or punctuation.	There are more than 2 errors in capitalization or punctuation.

Grammar	There are no grammatical mistakes on the poster.	There is 1 grammatical mistake on the poster.	There are 2 grammatical mistakes on the poster.	There are more than 2 grammatical mistakes on the poster.
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Rubric created at <http://rubistar.4teachers.org/index.php>

Lesson Three

Topic: Human Wants and Needs

Human Activity and Energy Consumption e.g. transportation

Time: 2 classes

Learning Objectives:

Science 7:

4-1 Human wants and needs in relation to the needs of other living organisms

4-3 Distinguish between needs and wants

4-2 Understand that the actions we, our families, and our communities take have a profound affect on the natural environment

1-3 Appreciate the impact that human activity has on renewable land and water resources

ELA 7:

4-2 Listening

- Formulate questions before listening

4-2 Listening

- Set purpose(s) for listening in a variety of situations

9-2 Representing

- Use visuals and other techniques that portray key understandings

Materials:

Overhead, overhead transparency of completed Unit Organizer

Poem entitled “Sarah Cynthia Sylvia Stout Would Not Take the Garbage Out” Touch the Earth, p. 68 (overhead copy)

Ecological Footprints Quiz – <http://www.earthday.net/footprint/index.asp>

Computer and Computer Projector

Pie Chart - statistics of land use in Saskatchewan

Ecolog Rubric

Activity Prior to Motivational Set:

Prior to every lesson, the Unit Organizer is placed on the overhead to identify for students how the unit is progressing within the context of the big picture (review what they have covered and where they are going). The teacher and students check off activities and topics they have completed.

Motivational Set:

Read the poem entitled “Sarah Cynthia Sylvia Stout Would Not Take The Garbage Out” on page 68 in Touch the Earth to set the tone and explicitly show students that daily human activity harms the earth.

After the poem, brainstorm the different things in life that students use every day (energy consumption). Encourage students to think about their whole lives (e.g. pre-made food, recycling, skating – no ice, and electricity). Students should consider energy consuming practices and/or products that they could live without for a weekend.

Activity:

Option 1 (Based on availability of computer room) Have students go online and complete the “Ecological Footprint Quiz.” <http://www.earthday.net/footprint/index.asp> Prior to this lesson, the teacher should go through the quiz to anticipate areas and vocabulary that would be unfamiliar to students.

Option 2 The teacher can hook up a projector to his or her classroom computer if computer access is limited. This way the teacher can do the quiz while discussing it with the class and project it for everyone to see.

This quiz estimates how much productive land and water is needed to support what you use and what you discard. Students will be explicitly aided in answering 15 questions (the teacher will need to guide this process as students will have difficulty relating to some of the questions). Students will be able to compare their ecological footprint to what other people use and to what is available on this planet.

It will be beneficial to students if the teacher provides them with the information necessary to create a visual (pie chart or graph) showing how much land is needed in Saskatchewan to sustain our lifestyles and to determine how much land in Saskatchewan is really available. Examine the fact that Saskatchewan/Canada is made up of water, ice, mines, etc.. There is a perception the province is wide-open space with an abundance of undeveloped land. In fact, this is a misconception; only 3% of Saskatchewan is natural, untouched grassland. **See Appendix for statistics.** The students should transfer this information onto a pie chart or graph.

Option: Have students keep an EcoLog for one weekend.

Evaluation:

Pie Chart or Graph

Ecolog Rubric

Ecolog – Rubric

Student Name: _____

1=Weak 2=Somewhat Weak 3=Average 4= Strong 5=Very Strong

1. The entries meet the requirements of the assignment.

1 2 3 4 5

2. The entries cover various aspects of your life and show how you consume energy.

1 2 3 4 5

3. The organization of the journal entries is clear and easy to follow. (date, time of day)

1 2 3 4 5

4. The spelling, grammar, and punctuation are accurate.

1 2 3 4 5

5. The entries are neatly typed or handwritten.

1 2 3 4 5

Additional Comments:

Adapted from: http://www.saskschools.ca/~aboriginal_res/evaluation/jnlrub.htm

Lesson Four

Topic: Where and how is energy consumed (Saskatchewan)?

Time: 1-2 classes

Learning Objectives:

Science 7:

2-1 Describe how energy is used in Saskatchewan

2-2 Recognize how energy sources are transported to where they will be consumed

2-3 Consider some of the effects of production, transportation, and use of energy on the environment

ELA 7:

6-2 Reading

- Read to gather information
- Make jot notes to assist recall of the main idea(s) expressed by the author

7-1 Writing

- Write to explain, to report, to persuade, and to inform (e.g., a news story, factual account, explanation, business letter)
- Identify purpose and audience for writing
- Generate ideas and consider appropriate ideas and information to include in writing by brainstorming, clustering, discussing, dramatizing, reading/listening/viewing, experiencing, and representing
- Use inquiry or research processes to gather additional ideas and information for specific purpose
- Identify, evaluate, select, and acknowledge relevant ideas and information from two or three sources
- Choose appropriate format (e.g., news story) for purpose and audience
- Plan (e.g., using chart or outline) and organize ideas to fit format (e.g., chronological, problem/solution, cause/effect, compare/contrast) (*)

During

- Enhance compositions with illustrations, charts, and other graphics when appropriate
- Acknowledge sources

After

- Revise final drafts for clarity of meaning and appropriate detail by adding, rearranging, or deleting ideas
- Proofread final drafts for language conventions including

Materials:

Overhead, overhead transparency of completed Unit Organizer

Teacher Librarian to compile library resources on Saskatchewan

Jon Yellowlees' Website – *Grade 5 Resources*.

<http://www.spiritsd.ca/teachers/jon.yellowlees/index2.html>

Greater Saskatoon Catholic: St. Volodymyr Website - *Renewable Resources in Saskatchewan*. http://www.scs.sk.ca/vol/grades/gr7/renewable_resources.htm

Overhead marker, overhead transparency of incomplete 6 section Frame, completed 6 section Frame to use as teaching guide, students have copy of incomplete 6 section Frame

Jot note graphic organizer or chart

Flap Book Template (can be created or refer to resource available from Prairie Spirit Central Learning Resource Centre)

Flap Book Rubric

Activity:

Prior to every lesson, the Unit Organizer is placed on the overhead to identify for students how the unit is progressing within the context of the big picture (review what they have covered and where they are going). The teacher and students check off activities and topics they have completed.

Students will spend one period in the library/computer room researching a resource in Saskatchewan. After the individual research is completed, the teacher will compile the information interactively with the students onto an adaptation of a Content Enhancement Frame. The teacher will have a completed Frame entitled “Where and How Energy is Consumed in Saskatchewan” to use as a guide. **(Training in Content Enhancement – The Framing Routine is compulsory)**

Resources that will be assigned include:

Natural Gas, Oil, Uranium (nuclear), Coal, Wind, Water, Forestry, and Sun

Students can use this graphic organizer to keep track of information and reference their information. Encourage the students to access more than one resource.

	Jot Note 1	Information Source	Jot Note 2	Information Source
1. Name of energy source:				
2. Where can this energy source be found in Sask.?				
3. What is the energy source used for? How is it used?				
4. How is the energy source produced?				
5. How is the energy source transported?				
6. What are the effects of 3, 4 & 5 on the environment?				

The (Adapted) Framing Routine Device on the following page is an instructional tool developed and researched at the University of Kansas Center for Research on Learning (Edwin S. Ellis, 1998). It is one of a number of teaching devices designed for teachers to use as they teach content information to classes containing diverse student populations. It is a data-based teaching instrument that has been found effective when used with a planning routine as well as a teaching routine that combines cues about the instruction, specialized delivery of the content, involvement of the students in the cognitive processes, and a review of the learning process and content material (Bulgren, Lenz, Deshler & Schumaker, 1995). It has not been shown to be an effective tool if it is simply distributed to students.

Topic: Where and How energy is consumed in Saskatchewan					
Energy Source (Resource)	Location - Where is the energy source (resource) found in Saskatchewan?	Consumption – What is the energy source (resource) used for (how it will be consumed)?	Production - How is the energy source (resource) produced?	Transportation - How is the energy source (resource) transported?	Effects on the Environment – What are the effects of production, consumption, and/or transportation of the energy source (resource) on the environment?
Natural Gas					
Oil					
Uranium (nuclear energy)					
Coal					
Wind					
Water					
Forestry Organic (biomass)					
Sun (solar)					
So What? (What is important to understand about this?)					

Activity:**Creation of Flap Books**

Information regarding flap books and templates can be found in:

Gunderson, C., & Scotten, S.. (2005). Assess in One Page or Less: Grades 6-8.

Westminster, CA, p. 34-35. (available at Prairie Spirit School Division East Learning Resource Centre)

Flap books are made by taking two or more sheets of paper and layering them approximately an inch apart, then folding them over and stapling them at the top near the centre. On the flaps, students can place the headings or main topics. On each page, students can list the supporting details. Information for the flap books can be taken off the frame.

Evaluation:

1. Collect Jot Notes Chart – give marks for completion
2. Using a flap book template, have students create a flap-book quick reference guide to the source of energy that they researched. The following rubric categories could be used to evaluate this project.
3. Marks can be given for completion of Frame.

	1	2	3	4
Completeness and accuracy of information				Each section has been accurately and completely answered with only relevant information.
Creative layout and formatting				Over and above! High levels of creativity went into planning the overall layout and formatting of this project.
Bibliography				Expertly follows the expected bibliography format.
COPS				Amazing! Absolutely no distracting COPS errors to be found.

Lesson Five

Topic: Renewable and nonrenewable sources of energy
Sources of renewable energy

Time: 1 class

Learning Objectives:

Science 7:

- 1-2 Identify those resources in Saskatchewan that are renewable
- 2-4 List sources of renewable energy
- 2-5 Discuss why each source identified is classified as renewable
- 1-1 Distinguish between renewable and nonrenewable resources (revisit last lesson)

ELA 7:

4-1 Listening

- Listen for a variety of purposes including: to gather information, to follow directions, to participate in a discussion, to form an opinion, to understand information, and to enjoy and appreciate

4-2 Listening

- Formulate questions before listening
- Make inferences based on text and prior knowledge
- Draw on prior knowledge and experiences by considering what students know and need to know about the topic
- Draw conclusions based on the evidence presented

6-2 Reading

- Set a purpose for reading
- Draw conclusions based on the evidence presented
- Reread to clarify understanding when necessary

Materials:

Overhead, Overhead Marker

Overhead transparency of completed Unit Organizer

The Giving Tree by Shel Silverstein

Concept Comparison Device (completed ahead of time by the teacher to use as a lesson guide)

Blank transparency of Concept Comparison Device

Student copies of the article – “What’s a Renewable Resource?” (provided)

Refer back to the chart in the previous lesson to identify renewable and nonrenewable resources.

Exit Slip – Renewable and Nonrenewable Resources

Websites listed in this section – library resources – renewable and nonrenewable resources

Assessment Chart

Activity Prior to Motivational Set:

Prior to every lesson, the Unit Organizer is placed on the overhead to identify for students how the unit is progressing within the context of the big picture (review what they have covered and where they are going). The teacher and students check off activities and topics they have completed.

Motivational Set:

Instructional Strategy: Think Aloud

Read aloud The Giving Tree by Shel Silverstein. Use the Think Aloud strategy to draw students' attention to how to make inferences about content as they read. Demonstrate how to activate your schema related to a subject (familiar or unfamiliar) before and during reading. Question the author's meaning as it relates to renewable and nonrenewable sources of energy. Visualize key scenes from the story that help you to decide if "The Giving Tree" was a source of renewable energy or not.

Activity:

Print off and have the students read the article which follows to help them create background knowledge of the differences between renewable and nonrenewable resources.

After reading the excerpt, the teacher and the students interactively complete a Comparison Chart comparing renewable and nonrenewable resources (reference will also be made to the Frame created in the last lesson and the story "The Giving Tree"). The teacher should have a completed Comparison table to use as a guide. Place the blank comparison table entitled "Renewable and Nonrenewable Resources" on the overhead. If this is the first time using this Content Enhancement Routine, tell the students the comparison table is a device that can be used to compare two concepts or ideas. It will help them to explore similar and different characteristics between the resources that have been studied in this section. They can then group the similarities and differences into categories and come up with a summary statement. Point out to students that the table will answer the unit self-test question "Compare renewable and nonrenewable resources in Saskatchewan." Show students how they can utilize the comparison table to answer this question. (After filling out the device, the teacher may point out to the students that when doing a comparison essay, the summary may be the basis for the thesis statement, the categories the body, and the characteristics the supporting details.) **(Training in Content Enhancement - Concept Comparison Routine is compulsory)**

What's a Renewable Resource? What is a Nonrenewable Resource?

A natural resource that can be used to benefit people and can then be replaced for other people to enjoy is called a renewable resource.

A resource that is in limited supply and cannot be replaced again is called a non-renewable resource.

The difference between the two kinds of natural resources has a lot to do with where they're from!



For example, your shirt and jeans are probably made from cotton -- which comes from a plant. Farmers harvest the cotton crop every year, but the plants grow back and produce more cotton. Cotton, like Incense-cedar trees, is renewable!

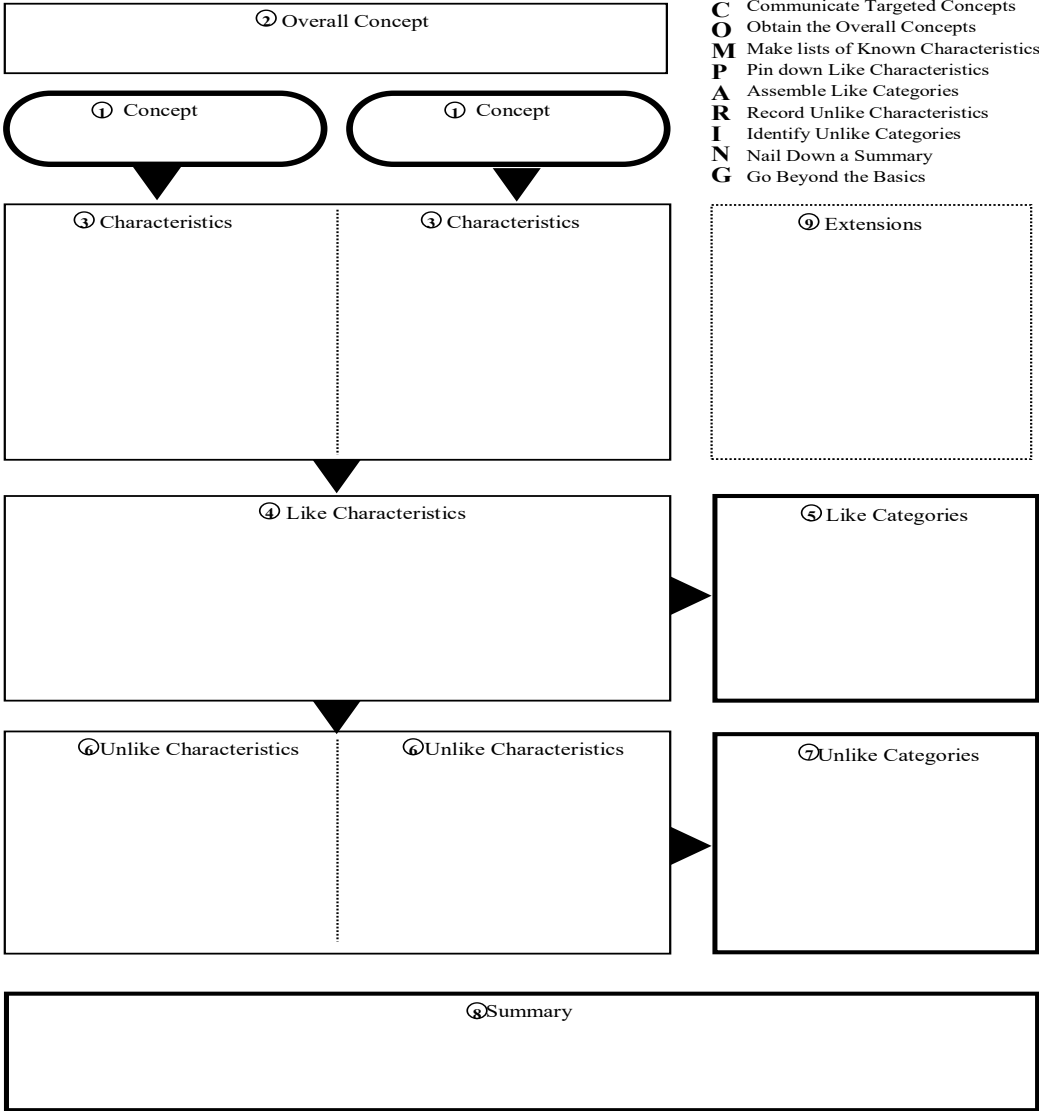


In contrast, the gasoline in your family car is made from oil that is pumped out of the earth. Since there is only so much oil, and the earth cannot replace the oil that is pumped out, we will eventually run out of this non-renewable resource.

From: http://www.scs.sk.ca/vol/grades/gr7/renewable_resources.htm

The Concept Comparison Routine Device on the following page is an instructional tool developed and researched at the University of Kansas Center for Research on Learning (Keith Lenz, Janis A. Bulgren, Jean B. Schumaker, and Donald D. Deshler, 1995). It is one of a number of teaching devices designed for teachers to use as they teach content information to classes containing diverse student populations. It is a data-based teaching instrument that has been found effective when used with a planning routine as well as a teaching routine that combines cues about the instruction, specialized delivery of the content, involvement of the students in the cognitive processes, and a review of the learning process and content material (Bulgren, Lenz, Deshler & Schumaker, 1995). It has not been shown to be an effective tool if it is simply distributed to students.

Comparison Table



Assessment:

Exit slip (true and false format) to check comprehension related to the science/ELA objectives.

Exit Pass		
Before you leave Class today (you must know):		
T <input type="checkbox"/>	F <input type="checkbox"/>	A resource that is in limited supply and cannot be replaced is renewable.
T <input type="checkbox"/>	F <input type="checkbox"/>	A resource that can be used to benefit people and then can be replaced is called renewable.
T <input type="checkbox"/>	F <input type="checkbox"/>	A resource that is in limited supply and cannot be replaced is nonrenewable.
T <input type="checkbox"/>	F <input type="checkbox"/>	Shirts and jeans that are made from cotton come from a renewable resource.
T <input type="checkbox"/>	F <input type="checkbox"/>	Gasoline is an example of a renewable resource.

This chart may be kept by the teacher, placed in a student portfolio, or placed in a student's notebook depending on the method of record keeping.

Mastery of Content/Skills Assessment

Name: Date:	Mastered Content	Beginning to Comprehend	Requires Reteaching of Content
I can identify those resources in Saskatchewan that are renewable.			
I can list sources of renewable energy.			
I can explain why each source identified is classified as renewable.			
I can distinguish between renewable and nonrenewable resources.			
I can formulate questions before listening.			
I can make inferences based on the text and my prior knowledge.			
I can draw on my prior knowledge and experience by considering what I know and need to know about the topic.			
I can draw conclusions based on the evidence presented.			

Evaluation:

Completion of Concept Comparison Device

Lesson Six

**Topics: Sources of renewable energy
Benefits, disadvantages, and interesting points about resources**

Time: 3-4 classes

Learning Objectives:

Science 7:

- 3-2 Create a list of benefits, disadvantages, and interesting points about each of the resources
- 3-3 Reach a class consensus on the desirability, possibility, and implications of increasing the use of renewable forms of energy
- 5-1 Explore the reciprocal relationships between the natural and constructed worlds

ELA 7:

7-1 Writing

- Write to explain, to report, to persuade, and to inform (e.g., a news story, factual account, explanation, business letter)
- Identify purpose and audience for writing
- Revise final drafts for clarity of meaning and appropriate detail by adding, rearranging, or deleting ideas
- Proofread final drafts for writing conventions

5-2 Speaking

- Use volume appropriate to the purpose, audience, and situation and modulate voice for effect
- Use gestures and facial expressions to enhance meaning of talk
- Present ideas clearly and at a rate that enables others to follow
- Speak to explain, report, persuade, and inform

Materials:

Overhead, overhead transparency of completed Unit Organizer
Information from previous lesson
Chart paper, markers
Assessment Chart
Presentation Rubric

Activity Prior to Instructional Strategy:

Prior to every lesson, the Unit Organizer is placed on the overhead to identify for students how the unit is progressing within the context of the big picture (review what they have covered and where they are going). The teacher and students check off activities and topics they have completed.

Instructional Strategy: Cooperative Learning/ Discussion/Consensus Building

In small or large groups, create lists of benefits, disadvantages, and interesting points about each of the resources studied in the previous lessons. Post these lists around the room. Present and discuss the lists of information as a whole class. Use key questions to encourage students to consider the desirability, possibility, and implications of increasing the use of renewable forms of energy. Try to reach a class consensus on the desirability, possibility, and implications of increasing the use of renewable forms of energy.

Activity:

Based on information gained from previous lessons, have students create a persuasive poem revealing the advantages and disadvantages of each student's researched resource. The writer would obviously downplay the view they were not supporting. Each student will present his/her poem to the class. The teacher should demonstrate effective ways to present a poem to a class e.g. voice, tone, expression, props, gestures, facial expression, and body language. The poem format and structure is up to the teacher.

* To provide students with an understanding of how to write persuasively about a topic, teachers may reproduce the following poem. The poem could be used with an overhead marker to underline or highlight specific word choices that argue for the topic and reasons why another option is not favorable.

Bedtime Negotiations

by Cary Pepper-Martens /07

Dear Parents,
I should not have to go to bed at eight.
I should go to bed at nine.
For when I go to bed that late,
I wake up feeling just fine!

I jump from underneath the sheet.
Grumbly grouchiness? There is no sign.
My attitude simply cannot be beat,
when I go to bed at nine.

But early to bed, for me does not
make me wake up and want to shine,
and honestly, one hour more isn't a lot
for two such understanding and loving parents as mine.

Let's try it for a week or two
I promise to step quick and tow the line.
You'll be amazed at how well I do,
Going to bed at a quarter past nine!

Assessment:

This chart may be kept by the teacher, placed in a student portfolio, or placed in a student's notebook depending on the method of record keeping.

Name:	Mastered Content	Beginning to Comprehend	Requires Reteaching of Content
Date:			
I can write/speak to persuade.			
I can identify a purpose and audience for my writing.			
I can revise my final draft for clarity of meaning and appropriate detail by adding, rearranging, or deleting ideas.			
I can proofread my final draft for writing conventions. (less than 9)			
I can modulate my voice for effect. (*)			
I can use gestures and facial expressions to enhance the meaning of my talk.			
I can present ideas clearly and at a rate that enables others to follow.			

Evaluation:

A teacher (or student and teacher) made rubric may be used to evaluate this assignment.

The following might be included as headings: word choice, voice, tone, expression, props, gestures, facial expression, and body language.

Criteria	0	1	2	3
Nonverbal Skills				
Eye Contact	Does not attempt to look at audience at all, reads notes the entire time	Only focuses attention to one particular part of the class, does not scan audience	Occasionally looks at someone or some groups during presentation	Constantly looks at someone or some groups at all times
Facial Expressions	Has either a deadpan expression or shows a conflicting expression during entire presentation	Occasionally displays both a deadpan and conflicting expression during presentation	Occasionally demonstrates either a deadpan OR conflicting expression during presentation	Gives audience clues to what the content of the poem is about; Appropriate expression, never notice a deadpan or conflicting expression
Posture	Sits during presentation or slumps		Occasionally slumps during presentation	Stands up straight with both feet on the ground.
Vocal Skills				
Enthusiasm	Shows absolutely no interest in topic presented	Shows some negativity toward topic presented	Occasionally shows positive feelings about topic	Demonstrates a strong positive feeling about topic during entire presentation
Vocalized Pauses (uh, well uh, um)	10 or more are noticed	6-9 are noticed	1-5 are noticed	No vocalized pauses noticed
Content				
Topic Announced	Audience has no idea of the topic		Vaguely tells audience what the topic is about	Clearly explains what they are covering
States details to support opinion	Does not give any details	Gives only one detail to support opinion	Gives two details to support opinion	Gives three or more details to support opinion
Visual Aid	Poor, distracts audience and is hard to read	Adds nothing to presentation	Thoughts articulated clearly, but not engaging	Visual aid enhances presentation, all thoughts articulated and keeps interest
Professionalism of Presentation	Mumbles, audience has difficulty hearing, confusing	Thoughts don't flow, not clear, does not engage audience	Thoughts articulated clearly, though does not engage audience	Presentation is organized and the interest level of the audience is maintained

Adapted from: <http://www.tcet.unt.edu/START/instruct/general/oral.htm>

Lesson Seven

Topic: Explore reciprocal relationships (give and take) between natural and constructed worlds.

Time: 2- 3 classes

Learning Objectives:

Science 7:

5-1 Explore reciprocal relationships (give and take) between natural and constructed worlds

ELA 7:

6-2 Reading

- Set a purpose for reading
- Make jot notes to assist recall of the main idea(s) expressed by the author
- Recall and relate in own words major ideas and supporting details
- Make inferences based on text and prior knowledge

Materials:

Optional Activity: (Possible Speaker for the Office of the Treaty)

Overhead, overhead transparency of completed Unit Organizer

“Who Owns This Land” – Yashinsky (Touch the Earth, p. 42)

“Hug a Tree: A Chipko Movement” Silver and Valley (Touch the Earth, p. 44)

“The Lakes of Ontario” Lunn (Touch the Earth, p. 58)

“Red Wrigglers” Kuglin (Touch the Earth, p. 92)

Frame – Reciprocal Relationships Between Natural and Constructed Worlds

Debate Rubric (optional dependent on activity chosen)

Activity Prior to Motivational Set:

Prior to every lesson, the Unit Organizer is placed on the overhead to identify for students how the unit is progressing within the context of the big picture (review what they have covered and where they are going). The teacher and students check off activities and topics they have completed.

Motivational Set:

Teacher demonstration - a reciprocal relationship is a give and take situation where both sides get what they need/want. In this demo, choose a student to have a thumb war with (1, 2, 3, and 4 I declare a thumb war!). The goal is for each person to score 10 points in 30 seconds. This should be very difficult!

Next, explain that in a reciprocal relationship there should be some give and take.

Set up the thumb war again. This time discuss with your “opponent” the goal. The goal was for each person to get 10 points in 30 seconds. The instructions said nothing about a winner and a loser. Cooperation might be in order.

Play again. First, allowing your partner to take 10 points (you keep your thumb in the down position to be tagged). Then you also take 10 points from your partner. Have a student watch the clock. Not only did you both get what you needed, but it was likely more time efficient as well.

Instructional Strategy: Jigsaw

Remind students of the procedures involved in a jigsaw. Using the articles, poems, songs, and stories provided, separate the students into groups to jigsaw the pertinent information related to reciprocal relationships with nature. Teachers should help students set a purpose for reading by providing a lead or sentence stem for students to think about while they are reading and discussing their initial piece of literature. A graphic organizer such as a Content Enhancement Frame may be of benefit for students as they prepare to become “experts” on their initial pieces of literature and help them identify positive and negative reciprocal relationships. (Note: In “The Lakes of Ontario” the benefits are inferred. For example, you used to be able to swim there, but pollution prevents you from doing it now.)

The teacher will have students jigsaw into their second group. In their new groups, students can share their information and discuss the following big question: Big Q: How have humans helped to create or destroy positive and sustainable reciprocal relationships with nature?

If using the “Frame” that follows, complete it interactively with the students in order for it to be effective – (Training in Content Enhancement – The Framing Routine is compulsory).

The Framing Routine Device on the following page is an instructional tool developed and researched at the University of Kansas Center for Research on Learning (Edwin S. Ellis, 1998). It is one of a number of teaching devices designed for teachers to use as they teach content information to classes containing diverse student populations. It is a data-based teaching instrument that has been found effective when used with a planning routine as well as a teaching routine that combines cues about the instruction, specialized delivery of the content, involvement of the students in the cognitive processes, and a review of the learning process and content material (Bulgren, Lenz, Deshler & Schumaker, 1995). It has not been shown to be an effective tool if it is simply distributed to students.

The FRAME Routine Key Topic **Reciprocal Relationships Between**
Natural and Constructed Worlds is about...

ways in which humans have helped to create or destroy positive and sustainable reciprocal relationships with nature...

☐ **Main idea**
Short Story or
Article

☐ **Main idea**
Positive (helped to
create)

☐ **Main idea**
Negative (destroyed)

Essential details

Who Owns this Land

Essential details

Essential details

Hug a Tree

The Lakes of Ontario

Red Wrigglers

So What? (What's important to understand about this?)

Extension:

This could be developed into a debate.

Assessment:

Journal writing could provide a quick look into student comprehension. Another method would be for students to use the postcard blackline master to write/send a succinct message about what they have learned with regards to the big question. Note: this postcard could actually be mailed home to encourage parent involvement.

Evaluation:

Students will be marked on their answers to the Big Question utilizing a teacher made rubric based on synthesis of knowledge. See the sample rubric provided from the 2007 Assessment for Learning document or the following:

Possible Debate Rubric:

Name: _____ Date: _____
 Assessed by: Teacher Self Peer Other

Criteria	Level 1 Under Developed	Level 2 Developing	Level 3 Competent	Level 4 Strong
Organization and presentation of opening speeches	-some attempt to organize ideas in a constructive speech -position is weakly supported	-constructive speech is delivered -main ideas presented with some support	-main ideas are clearly presented and supported in a constructive speech	-effective well-organized constructive speech
Structures rebuttal and conclusions correctly and shows effective critical listening skills	-weak rebuttal and conclusion -does not note flaws in opposing team's argument	-some remarks given in rebuttal and conclusion restates opening -finds 1 to 2 flaws in opposing team's argument	-good arguments made in rebuttal and conclusion restates and expands opening -states more than 2-4 flaws in opposing team's argument	-very effective rebuttal that analyzes flaws in opposite team's speech and conclusion -captures the big ideas with elaborated support and examples

Adapted from:

c. Oxford University Press (Canada) 2000. Permission to reproduce for classroom use restricted to schools purchasing Identities 7: Actions and Reactions.

Lesson Eight

Topic: The impact human activity has on land, water, and animals

Time: 1 – 2 classes

Learning Objectives:

Science 7:

4-2 Explores the implications or consequences of human action

ELA 7:

4-2 Before Listening and 6-2 Before Reading

- Make predictions about the text
- Recognize author's point of view and reasons for choosing it

4-2 During Listening and 6-2 During Reading

- Make connections to the text

4-2 After Listening and 6-2 After Reading

- Recall and relate in own words, major ideas and their supporting details
- Reread to clarify understanding when necessary

Materials:

Overhead, overhead transparency of completed Unit Organizer

Video or Book: The Lorax by Dr. Suess

Exit Slip – Human Activity

Newspaper Ad Rubric

Activity Prior to Instructional Strategy:

Prior to every lesson, the Unit Organizer is placed on the overhead to identify for students how the unit is progressing within the context of the big picture (review what they have covered and where they are going). The teacher and students check off activities and topics they have completed.

Instructional Strategy: Think Aloud

(Before) Prior to reading the book or viewing the video entitled “The Lorax,” students will make predictions by discussing the title, examining the cover, and looking at the illustrations. The teacher will lead this discussion through the “think aloud” comprehension strategy.

(During) While reading the book the teacher will explicitly lead students to make text-to-text connections, text-to-self connections, and text-to-world connections.

(After) Discussion Questions

What were some of the environmental dangers for the Lorax?

What is Dr. Suess's message? (care of the environment is an individual responsibility)

Reread the last two pages to reinforce this message.

Follow-up Activity:

Create a newspaper advertisement that portrays: a) the impact human activity has on land, water, and animals or b) the message that care of the environment is everyone's responsibility.

Assessment:

Exit Slip – Related to the student's ability to recognize the author's point of view and reasons for choosing it.

What you must know to leave class today?

1. What impact does human activity have on land?

2. What impact does human activity have on water?

3. What impact does human activity have on animals?

Evaluation:

Teacher or student and teacher made rubric for a newspaper advertisement

Lesson Nine

**Topics: The impact human activity has on land, water, and animals
Effects of production and use of energy on the environment**

Time: 4-5 classes

Learning Objectives:

Science7:

4-2 Explore the implications or consequences of human action

ELA 7:

5-1 Speaking

- To explain, report, and inform (e.g., give multi-step instructions, give short report)

Before

- Access information and ideas from a variety of sources

During

- Present ideas clearly and at a rate that enables others to follow

6-1 Reading

- Read for a variety of purposes including: to gather information, to follow directions, to give a response, to form an opinion, to understand information, and to enjoy and appreciate

Before

- Set a purpose for reading

- Activate prior knowledge about the author's background, writing style, and bias

- Formulate questions before reading

During

- Make jot notes to assist recall of the main idea(s) expressed by the author

- Make inferences based on text and prior knowledge

After

- Summarize major ideas

7-2 Writing

- Select and use the appropriate strategies and the language cueing systems and conventions before, during, and after writing to ensure communication of ideas, including:

Before

- Identify, evaluate, select, and acknowledge relevant ideas and information from two or three sources

During

- Acknowledge sources

8-2 Viewing

- Prepare to view

- Set a purpose for viewing

- Make inferences based on visual presentation and prior knowledge

Materials:

Overhead, overhead transparency of completed Unit Organizer

Copies of the following stories, articles, and poems

“Gaia: A Medical Report” Conway (Touch the Earth, p. 21)

Activity: Literature Circle

Break students into groups of 4-5. Provide each group with a piece of literature (see materials on page 51). Students should be familiar with the roles associated with literature circles. The roles suggested for this activity are: Discussion Director, Word Smith, Illustrator, Fact Finder, and Questioner.

After sufficient reading and work time, students complete their role sheets and have a discussion. An option could be that students hold their meeting/discussion in front of the entire class so that everyone becomes familiar with the other pieces of writing. Another option is that students would read and break into literature roles for all five of the readings (listed on page 51).

Big Question: Each group can work together to answer the following big question. In this piece of literature, how has human activity had a positive or negative impact on land, water, or animals?

Sample - Literature Circle Role Sheets are provided for the following roles: Discussion Director, Illustrator, Summarizer, Wordsmith, Connector, Character Educator, Recorder and Discussion Director, and a Record Sheet

Literature Circle Role Sheets which follow are from: Buckman Arts Magnet Elementary School. <http://www.buckmanelementary.org/notes/archives/>

Evaluation:

Forms of evaluation might include participation checklists, peer and self evaluation, and completion of role worksheets.

Discussion Director



Name: _____

Book: _____

Date: _____

Assignment: pages _____ to _____

Discussion Director: Your job is to develop a list of questions that your group might want to discuss about this part of the book and direct the discussion by asking each member for their input based on their current role. Don't worry about the small details; your task is to help people talk over the "big ideas" in the reading and share their reactions. Usually the best discussion questions come from your own thoughts, feelings and concerns as you read, which you can list below, during or after your reading.

Possible discussion questions or topics for today:

1. _____
2. _____
3. _____
4. _____
5. _____

Sample Questions:

What was going through your mind while you read this section?

What questions did you have when you finished this section?

Did anything in this section surprise you?

Can anyone predict what will happen next?

Connections: What did today's reading remind you of?

Assignment for tomorrow: p _____ - p _____

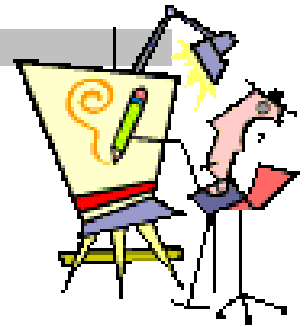
Illustrator

Name: _____

Book: _____

Date: _____

Assignment: pages _____ to _____



Illustrator: Your job is to draw some kind of picture related to the reading. It can be a sketch, cartoon, diagram, flow chart or stick-figure scene. You can draw a picture of something that's discussed specifically in your book, or something that the reading reminded you of, or a picture that conveys any idea or feeling you got from the reading. Any kind of drawing or graphic is okay - you can even label things with words if that helps. **Make your drawing on this paper. If you need more room, use the back.**

Presentation Plan: When the Discussion Director invites your participation, you may show your picture without comment to the others in the group. One at a time, they get to speculate what your picture means, to connect the drawing to their own ideas about the reading. After everyone has had a say, you get the final word: tell them what your picture means, where it came from, or what it represents to you.

Connections: What did today's reading remind you of?

Assignment for tomorrow: p _____ - p _____

Summarizer

Name: _____

Book: _____

Date: _____

Assignment: pages _____ to _____



Summarizer: Your job is to prepare a brief summary of today's reading. Your group discussion will start with your 1-2 minute statement that covers the key points, main highlights, general idea and **essence** of today's reading assignment.

Summary:

Key Points:

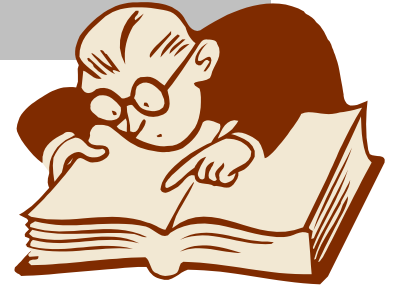
1. _____
2. _____
3. _____
4. _____

Connections: What did today's reading remind you of?

Assignment for tomorrow: p _____ - p _____

Wordsmith

Name: _____
 Book: _____
 Date: _____
 Assignment: pages _____ to _____



Wordsmith: Your job is to locate a few special sections of the text that you think your group would like to read aloud. The idea is to help people remember some interesting, powerful, funny, puzzling, or important sections of the text. You decide which passages or paragraphs are worth hearing, and then jot plans for how they should be shared. You can read the passages aloud yourself, or ask someone else to read them, then discuss them as a group.

Location	Reason for Picking	Plan for Reading
Page _____ Paragraph _____ _____	_____	_____
Page _____ Paragraph _____ _____	_____	_____
Page _____ Paragraph _____ _____	_____	_____

Reasons for picking a passage:

important	funny	controversial
surprising	confusing	informative

Powerful Vocabulary: List new words and their meaning.

Connections: What did today's reading remind you of?

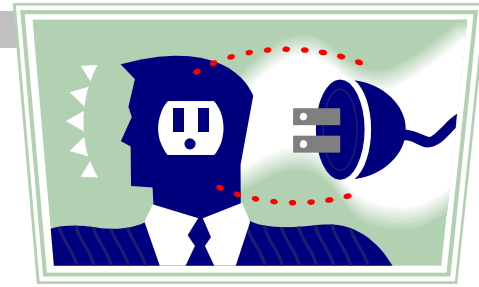
Connector

Name: _____

Book: _____

Date: _____

Assignment: pages _____ to _____



Connector: Your job is to connect the contents of the reading selection to current or past real world events and experiences. You will also connect the reading to other forms of literature, music, art and/or media.

Real World Connections: Relate current reading to real situations.

Experiences: Relate current reading to real experiences you or others have had.

Literature and Media Connections: Relate current reading to other books, movies art, television, music and other media.

Character Educator

Name: _____

Book: _____

Date: _____

Assignment: pages _____ to _____

Character Educator: Your job is to identify the character traits of the main character(s) and state your proof to support your ideas. Use the ten attributes from the Character Education posters for suggestions.

List the main
character's traits

and give a reason for your answer.



Rate your participation:

(Circle)

- | | |
|---------|-----------------------------------|
| 1 2 3 4 | I read the required pages |
| 1 2 3 4 | My research stimulated discussion |
| 1 2 3 4 | I asked other members to comment |
| 1 2 3 4 | I participated in the discussion |

Recorder and Discussion Director (another option)

Meeting Date: _____

Name: _____

Group:

Novel: _____ **Pages Read** _____ **to** _____

Recorder: Your job is to make sure all paper work is complete and organized into the Group Binder

-Role Page Assignment page is signed

-Role Sheets are dated, completed and placed in binder in the following order:

Recorder and Discussion Director, Summarizer, Investigator, Illustrator, Character Artist

Answer the following questions”

1. Two things your group did well to function effectively.

2. Two things you could do to improve the function of the group.

Discussion Director: Your job is to develop a list of questions that your group might want to discuss about this part of the book. Don't worry about the small details; your task is to help people talk over the “big ideas” in the reading and share their reactions. Usually the best discussion questions come from you own thoughts, feelings and concerns as you read, which you can list below, during or after reading.

Possible discussion questions or topics for today:

1.

2.

3.

4.

Connections: What did today's reading remind you of?

Assignment for tomorrow: p _____ - p _____

Assignment for tomorrow: p _____ - p _____

Co-op Member's Name	Session 1	Role	Session 2	Role	Session 3	Role	Session 4	Role	Session 5	Role	Session 6	Role	Session 7	Role	Session 8	Role	Session 9	Role	Session 10	Role	Presentation	Role

Discussion Director will check the completion of each member's role at the start of each session.

DD Discussion Director
W Wordsmith

I Illustrator
C Connector

S Summarizer
CE Character Ed

Lesson Ten

Topics: Effects of the production and the use of energy on the environment
Implications of increasing use of renewable forms of energy on the environment

Time: 2-3 classes

Learning Objectives:

Science 7:

2-3 Consider some of the effects of production, transportation, and use of energy on the environment

3-3 Reach a class consensus of the desirability, possibility, and implications of increasing the use of renewable forms of energy

ELA 7:

8-1 Viewing

- View for a variety of purposes including: to understand and to gathering information, to form an opinion, and to enjoy and appreciate

8-2 Viewing

- Select and use the appropriate strategies and the language cueing systems and conventions to construct meaning before, during, and after viewing grade appropriate texts

Before

- Prepare to view
- Draw on prior knowledge and experiences by considering what students know and need to know about the topic

During

- Make connections to prior knowledge and experiences (i.e., relate text to self, text to other texts, and text to world)
- Make inferences based on visual presentation and prior knowledge

After

- Recall and summarize main points, important details, and techniques employed
- Reflect and re-view in light of purpose
- Relate what was seen to personal experiences or needs
- Express and support personal reactions to and opinions of the visual

Materials:

Overhead, overhead transparency of completed Unit Organizer

Movie “An Inconvenient Truth” Al Gore – 96 minutes

Viewing Guide

Activity:

Prior to every lesson, the Unit Organizer is placed on the overhead to identify for students how the unit is progressing within the context of the big picture (review what they have

covered and where they are going). The teacher and students check off activities and topics they have completed.

(Before) Prior to viewing the video, build on students' prior knowledge in regards to destruction of the environment by having a class discussion.

(During and After) Have students complete the viewing guide which follows.

(After) Have a class discussion based on students' answers to the viewing guide.

An Inconvenient Truth Viewing Guide

What in the film -- a fact, an image, a story -- triggered a strong reaction for you?

What sort of world do you want to leave for future generations?

What did you learn from watching the film that you didn't know before -- or that is more important for you now?

Do you want proof that climate change is happening and that humans are having an impact on the environment?

What information in the film made climate change more real to you? Or, why did the information not make climate change seem real?

What made the information in the film trustworthy for you, or what made you question the information?

Climate change is kind of hard to believe. What does it mean for us when we accept the reality of climate change?

What kind of evidence is necessary before taking dramatic action on climate change?

How do those of us who are not experts in climate science sort out the reliability of the research? (How do we know who and what to trust?)

Who else do you think should see this film? What difference would it make if you could get that person to see and discuss the movie?

Adapted from: Eco-Justice Ministries: *An Inconvenient Truth: A Discussion Guide for Churches* <http://www.justicecamp.org/pdf%20files/TruthGuide.pdf>

Evaluation:

Mark the viewing guide. The teacher can create a rubric to mark the view guide.

Lesson Eleven

Topic: Sustainable use of the land and water resources

Time: 1 -2 classes

Learning Objectives:

Science 7:

2. Explore the implications or consequences of human actions (I)

ELA 7:

Content Objectives:

- Recognize some problems facing the environment
- Recognize possible changes to the environment within a lifetime
- Create and describe practices which show respect and care for the environment

Grade 7 Language Study: Communicating With Clarity and Correctness

1. Pragmatic Cues and Conventions

1-1 Identifying audience, role, purpose, and situation are important when considering the appropriate and correct language to use and in order to understand what is heard, read, or viewed

4-1 Listening

- Listen for a variety of purposes including: to gather information, to follow directions, to participate in a discussion, to form an opinion, to understand information, and to enjoy and appreciate

4-2 Listening

- Select and use the appropriate strategies and the language cueing systems and conventions to construct meaning before, during, and after

Before

- Prepare to listen
- Draw on prior knowledge and experiences by considering what students know and need to know about the topic
- Set purpose(s) for listening in a variety of situations

During

- Concentrate on the message of the speaker and respond with interest
- Anticipate and predict the speaker's message and meaning
- Separate own ideas and opinions from speaker's ideas and opinions
- Recognize the main ideas and supporting details
- Draw conclusions based on evidence in presentation
- Determine whether fact or opinion is expressed in speaker's viewpoint

After

- Recall and summarize main points and supporting detail
- Relate what was heard to personal experiences or needs

Materials:

Overhead, overhead transparency of completed Unit Organizer

Zero Tillage Speaker

or

A Forest for All – Simulation Activity
Speaker Listening Guide

Activity:

Prior to every lesson, the Unit Organizer is placed on the overhead to identify for students how the unit is progressing within the context of the big picture (review what they have covered and where they are going). The teacher and students check off activities and topics they have completed.

Speaker Activity:

Prior to the speaker coming to talk to the class, go over the listening learning objectives in the grade 7 ELA curriculum and the listening guide below. Discuss briefly what is meant by Zero Tillage and what it means to the soil. Pass out the Sample Listening Guide which follows to be filled in and discussed with the class after the speaker.

Sample Listening Guide

Name of student: _____

Nature of spoken presentation: _____

Where heard: _____

Name of speaker: _____

- *Speaker's expressed purpose:*

- *Qualifications of speaker:*

- *Main idea(s) presented:*

- *Noteworthy features of presentation:*

- *Personal reaction to presentation:*

- *In what ways was the talk effective? Ineffective? Why?*

Listening Guide for Speaker from:

Sask Learning. (April, 1999). English Language Arts: A Curriculum Guide for the Secondary Level. Regina: Saskatchewan Learning.

<http://www.sasked.gov.sk.ca/docs/ela102030/teach3.html>

Simulation Activity: A Forest for All

Canadian Pulp and Paper Association	<u>A Forest For All: A Simulation Activity for Level 7-12 Students</u>		Marwill Communications Inc.: Toronto, ON Ph: (416) 466-2617 or (416) 466-6463
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This simulation is an excellent opportunity for students to become involved in the environmental issues that the question of forestry and deforestation provides.

Evaluation:

Speaker Listening Guide or marks assigned for participation in simulation activity

Lesson Twelve

**Topic: Substituting renewable energy sources for nonrenewable energy sources
Energy conservation and alternate forms of energy**

Time: 4-8 classes (dependent on which projects are assigned by the teacher)

Learning Objectives:

Science 7:

3-1. Describe how renewable energy sources could be substituted for nonrenewable energy sources (M)

3-3. Reach a class consensus on the desirability, possibility, and implications of increasing the use of renewable forms of energy (K)

*5-3. Examine how the development of technology effects change in the physical world and in society

ELA 7: (Learning Objectives are dependent upon which projects students choose to complete – visual, written, oral, representing)

All students will take part in the discussion and answer questions 1 to 7.

4-2 Listening

-Select and use the appropriate strategies and the language cueing systems and conventions to construct meaning before, during, and after listening

Before

- Prepare to listen

- Draw on prior knowledge and experiences by considering what students know and need to know about the topic

During

- Concentrate on the message of the speaker and respond with interest

- Separate own ideas and opinions from speaker's ideas and opinions

After

- Recall and summarize main points and supporting detail

- Relate what was heard to personal experiences or needs

- Analyze and evaluate what was heard

- Seek additional information from other sources as needed or desired

5-2 Speaking

- Select and use the appropriate strategies and the language cueing systems and conventions before, during, and after speaking to promote understanding of ideas

Before

- Identify purpose for speaking

During

- Present ideas clearly and at a rate that enables others to follow

- Summarize personal viewpoint in clear and meaningful ways

After

- Summarize ideas discussed and state own view in light of discussion

Materials:

Overhead, overhead transparency of completed Unit Organizer

Discussion questions

Projects and accompanying evaluation tool to mark the projects

Activity:

Prior to every lesson, the Unit Organizer is placed on the overhead to identify for students how the unit is progressing within the context of the big picture (review what they have covered and where they are going). The teacher and students check off activities and topics they have completed.

Discuss Questions/Topics

(adapted from Science: A Curriculum Guide for the Middle Level: Unit – Renewable Resources)

Numbers one to three should be discussed with the entire class.

Numbers four to seven could be assigned to groups and then their answers shared with the class.

1. What type of energy is used in Saskatchewan? Which nonrenewable sources could be replaced with renewable?
2. Have you ever seen or heard of the following:
 - A house heated by geothermal energy
 - A house that is heated by solar energy
 - A property that has potential for geothermal heat extraction
 - A machine that captures and stores geothermal energy
 - A solar oven
 - A solar water heater
 - A house that gets its power from wind generated power
3. What are some technological advances that you have seen in your lifetime? What are some of the technological advances that your parents or grandparents have seen in their lifetimes? What effects have they had on the physical world and society?
4. One day the sun will run out of fuel and stop providing enough heat for life to exist on earth. Does this mean the sun is a non-renewable resource?
5. There is a finite amount of matter on the earth. This means that matter cycles are essential for maintaining a constant supply of matter for new life. Is there a finite amount of energy on the earth? Is energy recycled in a way similar to matter?
6. Suppose that electricity was cut off from your house for two weeks in January. What would you have to do to survive in your house for that time period? How would you cook? How would you keep warm? How would you prevent your water from freezing?
7. Suppose you have constructed a solar heated house. Identify substances that would be used to store heat to be released at night or on cloudy days. Devise an experiment to determine which of the substances is best for storing heat.

After discussion, the teacher could assign one or all of the following projects:
(adapted from Science: A Curriculum Guide for the Middle Level: Unit – Renewable Resources)

1. Design and build a solar water heater that works by focusing the sun's light on a container of water. Chart the rate at which it heats water. What are the advantages and disadvantages of this type of heating system?
2. Design and build a solar water heater that works by focusing the sun's light through closed tubes. Chart the rate at which it heats water. What are the advantages and disadvantages of this type heating system?
3. Research existing designs of solar ovens. Design and build a solar oven.
4. Research and write a report on any of the topics in number two above. Prepare a project board and presentation highlighting the key points from your report (visual, written, and oral).
5. Prepare both an interview (Q and A style) and a magazine advertisement selling one of the topics in number two above (visual and written).

Evaluation:

Create a rubric appropriate to the project assigned by the teacher.

Sample Project Rubric Follows

Name: _____

Date: _____

Project Title: _____

Teacher(s): _____

Energy Conservation and Alternate Forms of Energy - Project



Process	Below Avg.	Satisfactory	Excellent
1. Has clear vision of final product	1, 2, 3	4, 5, 6	7, 8, 9
2. Properly organized to complete project	1, 2, 3	4, 5, 6	7, 8, 9
3. Managed time wisely	1, 2, 3	4, 5, 6	7, 8, 9
4. Acquired needed knowledge base	1, 2, 3	4, 5, 6	7, 8, 9
5. Communicated efforts with teacher	1, 2, 3	4, 5, 6	7, 8, 9
Product (Project)	Below Avg.	Satisfactory	Excellent
1. Format	1, 2, 3	4, 5, 6	7, 8, 9
2. Mechanics of speaking/writing	1, 2, 3	4, 5, 6	7, 8, 9
3. Organization and structure	1, 2, 3	4, 5, 6	7, 8, 9
4. Creativity	1, 2, 3	4, 5, 6	7, 8, 9
5. Demonstrates knowledge	1, 2, 3	4, 5, 6	7, 8, 9, 10
6. Other:	1, 2, 3	4, 5, 6	7, 8, 9

Total Score: _____

Teacher(s) Comments:

Lesson Thirteen

Topic: Caring For Our Planet

Time: 4 -6 classes

Learning Objectives:

ELA Content Objectives:

Recognize some problems facing the environment

Recognize possible changes to the environment within a lifetime

Create and describe practices that show respect and care for the environment

6-1 Reading

- Read for a variety of purposes including: to gather information, to follow directions, to give a response, to form an opinion, to understand information, and to enjoy and appreciate

6-2 Reading

- Select and use the appropriate strategies and the language cueing systems and conventions to construct meaning before, during, and after reading to grade appropriate texts

7-1 Writing

- Write to explain, to report, to persuade, and to inform (e.g., a news story, factual account, explanation, business letter)

7-2 Select and use the appropriate strategies and the language cueing systems and conventions before, during, and after writing to ensure communication of ideas

Materials:

Overhead, overhead transparency of completed Unit Organizer

“Mother Goose and Grimm” Peters (Touch the Earth, p. 67)

“Ten Commandments for the Earth” (Touch the Earth, p. 18)

“Success Stories: Preserving Endangered Species” Drake and Love
(Touch the Earth, p. 48)

Activity:

Prior to every lesson, the Unit Organizer is placed on the overhead to identify for students how the unit is progressing within the context of the big picture (review what they have covered and where they are going). The teacher and students check off activities and topics they have completed.

Read the three stories/articles above to set the tone for a discussion on taking care of our planet. The stories can be read and discussed as a jigsaw activity.

Develop and carry out an action plan:

Individually, in partners, small groups, or as the entire class set up an action plan for taking care of the planet.

Choose an issue ~ Investigate the issue ~ Design an action plan ~ Take action ~ Present your issue & action ~ and ~ Impact your community and the globe!

This site may give students some ideas for ways to take care of the environment:

50 Ways to save the environment

-in your home

-in the yard

-in the office

-in the car

-in the office

-at the store

-in your life

<http://www.justgive.org/html/guide/50waysenvironment.html>

The following sites can provide resources for setting goals or action plans and criteria for measuring progress. Students can delegate roles to carry through the action plans.

<http://www.myglobalaction.com/2.html>

<http://www.goal-setting-guide.com/school.html>

<http://www.ces.ncsu.edu/depts/fourh/greenlight/youthdev/Goal-teen.php>

<http://www.araratcc.vic.edu.au/Water/main/others/page1.htm>

Culminating Activity (Optional)

Field Trip

Plan a field trip to Beaver Creek Conservation Site to explore ways in which we care for our environment locally. The staff at Beaver Creek is familiar with the Grade 5 Science program and quite regularly brings that age group through their site. The teachers should call in advance and explain the intended outcomes for this grade 7 unit in order for the staff to develop a plan.

Our Visit:

The students walked through one of the trails as the guide pointed out the various ecosystems and the habitats within them. The guide explained the ecological impact of man. Students were able to see the various habitats of many local animals.

Students also participated in an activity that helped them learn about the interconnectedness of life in an ecosystem and how one small change can have a major impact.

One of the highlights of the trip was a visit with the shepherd. He taught students about predators and prey.

No matter what focus you want, the staff at Beaver Creek Conservation Site can plan a day to meet your objectives.

You may contact Beaver Creek Conservation Site by calling: 374-2474

Resource List

Author	Title	ISBN	Source	Copyright Date
ALTC Advanced Learning Technologies Consortium	Rubistar 4 Teachers		http://rubistar.4teachers.org/index.php (University of Kansas Center for Research on Learning)	2006
Barry, J., Huser, G., and Siamon, S.	<u>Touch the Earth</u> (Nelson Mini-Anthologies)	0-17-603945-7	Toronto, ON: Nelson Canada	1993
Bouchard, David	<u>If You're Not From The Prairies</u>	0-969097	Vancouver, BC: Rain Coast Books & Summer Wild Productions	1993
	<i>Buckman Arts Magnet Elementary School</i>		http://www.buckmanelementary.org/notes/archives/	Retrieved June 8, 2007
Bulgren J. et. al.	<u>The Content Enhancement Series: The Concept Comparison Routine</u>		Lawrence, KS: Edge Enterprises	2002
Canadian Pulp and Paper Association	<u>A Forest For All: A Simulation Activity for Level 7-12 Students</u>		Toronto, ON: Marwill Communications Inc. Ph: (416) 466-2617 or (416) 466-6463	
Church, Angie (Creator of Website)	<i>My Global Action: Berkley High School Students ~ Changing the World with Global Action Plans: Help the Environment</i>		http://www.myglobalaction.com/2.html	Retrieved June 4, 2007
Draper, Margaret & Coghill, Judity	<u>Teacher Instruction and Assessment Design Handbook: Identities 7: Actions and Reactions</u>		Toronto, ON: Oxford University Press	2000
Dr. Suess	<u>The Lorax</u>	860039	New York: Random House	1971
Earth Day Network	<i>Ecological Footprint Quiz</i>		http://www.earthday.net/footer/print/index.asp	2002
	<i>Eco-Justice Ministries: An Inconvenient Truth: A Discussion Guide for Churches</i>		http://www.justicecamp.org/pdf%20files/TruthGuide.pdf	c. 2006 Retrieved, June 1, 2007
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Guggenheim, Davis (Director)	<i>"An Inconvenient Truth"</i> (96 minutes – Al Gore, Billy West)		Paramount Home Entertainment	November 21, 2006
Gunderson, C. & Scotten, S.	<u>Assess in One Page or Less: Grades 6-8</u> (available at Prairie Spirit East Library)	1-4206-3117-9	Westminster, CA: Teacher Created Resources	2005
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Lenz, Keith B. et. al	<u>The Content Enhancement Series: The Unit Organizer</u>		Lawrence KS: Edge Enterprises	2005
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Nikitina, Ariana	<i>Goal Setting Guide</i>		http://www.goal-setting-guide.com/school.html	c. 2007 Retrieved June 8, 2007
Saskatchewan Learning	<u>English Language Arts: A Curriculum Guide for the Middle Level</u> (Grades 6-9)		Saskatchewan Learning	2005
Saskatchewan Learning	<u>Science: A Curriculum Guide for the Middle Level</u>		Saskatchewan Learning	September, 1993
Saskatchewan Learning	<u>English Language Arts: A Curriculum Guide for the Secondary Level. Sask Learning</u>		http://www.sasked.gov.sk.ca/docs/ela102030/teach3.html	April, 1999
Saskatchewan Learning – Learning Technology Unit	<i>SaskSchools.ca</i>		http://www.saskschools.ca/~aboriginal_res/evaluation/jrnlrub.htm	Retrieved April 4, 2007
Silverstein, Shel	<u>The Giving Tree</u>		New York: Harper and Row	1964
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Tate, Jo Computers Across the Curriculum - Ararat Community College	<i>I*EARN Schools (Solutions for Environmental Problems Facing the Environment</i>		http://www.araratcc.vic.edu.au/Water/main/others/page1.htm	Date Last Modified February 22, 1999 Retrieved June 8, 2007
Teachnology, Incorporated: Consulting Services	<i>Teachnology the Online Teaching Resource: Rubrics</i>		http://www.teachnology.com/web_tools/rubrics/	©1998-2007 Retrieved October 2005
Texas Center for Educational Technology	<i>Technology Applications Center For Educator Development: Oral Presentation Rubric</i>		http://www.tcet.unt.edu/START/instruct/general/oral.htm	Last updated or revised: 2006-06-23. Retrieved May 6, 2007
Yellowlees, Jon	<i>Prairie View School – Jon Yellowlees' Website</i>		http://www.spiritsd.ca/teachers/jon.yellowlees/index2.html	

APPENDIX

LAND USE IN SASKATCHEWAN

A great deal of land in Saskatchewan has been altered from its true original state and turned into agriculture land. We have about 29, 788, 545 hectares of land for agricultural use; however, it is important to note that agricultural land is of varying quality.

See the Statistics Canada handout for total agriculture land and its soil quality.

35.6 million hectares of land in Saskatchewan is provincial forest land (within this is land that includes water, recreation and timber growth sites).

Approximately 59,366 square km (251,366 square mi) of Saskatchewan is inland water.

From: Fung, Ka-iu, Ed. Atlas of Saskatchewan. Saskatoon: University of Saskatchewan, 1999.

The following pages are from:

Statistics Canada Pages 126-132

http://www.statcan.ca/english/kits/hae2000/pdf/c5_1.pdf

5.1 Agricultural resources

Today, 11% of the earth's land surface—more than 1.47 billion hectares of land¹—is under crops. Globally, each hectare of cropland supports an average of more than 4.1 people.² This average, which was fewer than 3.5 people in the mid-1980s, increases as global population expands, currently at a rate of about 1.4% per year.

5.1.1 Agricultural land supply

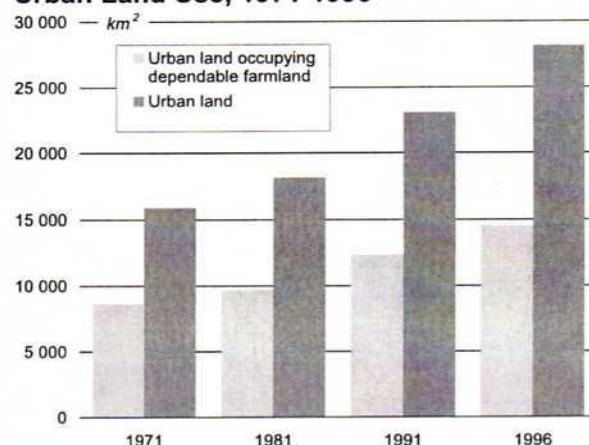
The Canada Land Inventory (CLI) provides an estimate of the supply of agricultural land in Canada. CLI soil capability classes 1 to 3 represent Canada's dependable land for crop production (Map 5.1.1, Table 5.1.1 and Text Box 5.1.1). Soils in these classes have fair to high capability for crop production and are considered suitable for long-term use. Some soils in CLI classes 4 and 5 are used for crop production today, although they are subject to severe limitations.

As shown in Table 5.1.1, Canada has 454 630 km² of dependable land. This represents about 5% of our total land area. Saskatchewan and Alberta are home to the largest areas of dependable land, with 162 988 km² and 107 289 km², respectively; Ontario follows with 72 833 km².

Prime agricultural land—CLI class 1—is in very limited supply in Canada. It occupies less than one-half of one percent of Canada's land area. The bulk of this land (52%) is located in southern Ontario, which has 21 568 km² of CLI class 1 land. It is estimated that 37% of this land can be seen from the top of Toronto's CN tower on a clear day.³ Other provinces with significant prime land areas include Saskatchewan (9 997 km²) and Alberta (7 865 km²).

Virtually all of Canada's dependable agricultural land is currently used for agriculture, unless it is paved over or built on. And, as can be seen in Figure 5.1.1, the amount of dependable agricultural land paved over or built on increased substantially between 1971 and 1996. As Canadian cities and towns expanded during this period, some 12 250 km² of land were given over to urban uses. Of this area, almost half (5 900 km²) was dependable agricultural land.

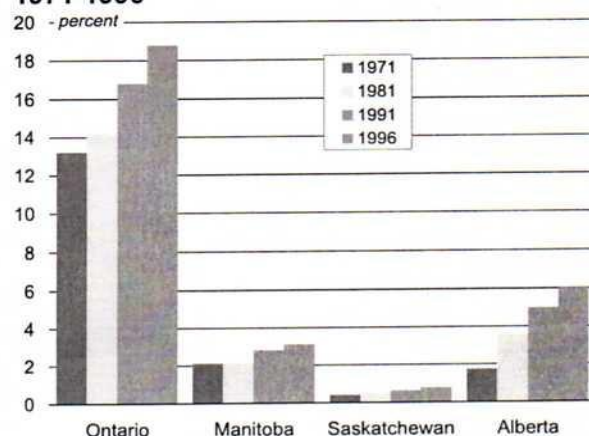
Figure 5.1.1
Urban Land Use, 1971-1996



Sources: Statistics Canada, Census of Population, and Environment Accounts and Statistics Division.

By 1996, approximately 19% of Ontario's prime agricultural land (CLI class 1) had been displaced by urban uses (Figure 5.1.2). By the same year, Alberta had lost 6% of its prime land. Saskatchewan, the other province with a significant amount of prime land, had lost less than 1%.

Figure 5.1.2
Class 1 Farmland Occupied by Urban Land, 1971-1996



Sources: Statistics Canada, Census of Population, and Environment Accounts and Statistics Division.

1. This is an area roughly 1.5 times the size of Canada.

2. World Resources Institute, 1998, *World Resources 1998-99*, Oxford University Press, London.

3. Environment Canada, 1979, *Canada's Special Resource Lands*, Ottawa.

Map 5.1.1
Dependable Agricultural Land



Sources:
 Environment Canada, 1992, Lands Directorate, CGIS Database.
 Statistics Canada, 1999, Environment Accounts and Statistics Division, Environmental Information System (EIS) Database.

Table 5.1.1
Canada Land Inventory: Soil Capability for Agriculture

Province/Territory	Agricultural soil capability class							Organic ¹	Unclassed ²	Not classified	Total area
	1	2	3	4	5	6	7				
	km ²										
Newfoundland	-	-	19	166	915	2 074	6 441	2 179	14 469	379 457	405 720
Prince Edward Island	-	2 616	1 415	498	761	-	277	67	2	25	5 660
Nova Scotia	-	1 663	9 829	4 244	822	133	35 160	1 163	9	2 467	55 490
New Brunswick	-	1 605	11 511	20 321	17 003	115	18 386	1 328	1 153	2 018	73 440
Quebec	196	9 071	12 772	25 805	16 586	107	205 996	15 169	1 321	1 253 658	1 540 680
Ontario	21 568	22 177	29 088	26 246	19 153	11 403	112 213	25 633	7 827	793 272	1 068 580
Manitoba	1 625	25 306	24 407	23 941	23 238	20 922	10 886	47 417	38 582	433 626	649 950
Saskatchewan	9 997	58 744	94 247	38 931	87 363	39 501	2 255	27 886	11 270	282 135	652 330
Alberta	7 865	38 371	61 053	92 796	110 931	39 307	41 914	59 920	26 589	182 445	661 190
British Columbia	211	2 355	6 920	17 017	66 717	54 191	152 548	-	-	647 842	947 800
Yukon Territory ³	..	..	..	..	..	..	..	..	..	483 450	483 450
Northwest Territories ³	..	..	..	..	..	..	..	..	..	3 426 320	3 426 320
Canada	41 461	161 908	251 261	249 965	343 488	167 752	586 077	180 762	101 222	7 886 715	9 970 610
	percent share by class										
Newfoundland	-	-	0.01	0.07	0.27	1.24	1.10	1.21	14.29	4.81	4.07
Prince Edward Island	-	1.62	0.56	0.20	0.22	-	0.05	0.04	-	-	0.06
Nova Scotia	-	1.03	3.91	1.70	0.24	0.08	6.00	0.64	0.01	0.03	0.56
New Brunswick	-	0.99	4.58	8.13	4.95	0.07	3.14	0.73	1.14	0.03	0.74
Quebec	0.47	5.60	5.08	10.32	4.83	0.06	35.15	8.39	1.31	15.90	15.45
Ontario	52.02	13.70	11.58	10.50	5.58	6.80	19.15	14.18	7.73	10.06	10.72
Manitoba	3.92	15.63	9.71	9.58	6.77	12.47	1.86	26.23	38.12	5.50	6.52
Saskatchewan	24.11	36.28	37.51	15.57	25.43	23.55	0.38	15.43	11.13	3.58	6.54
Alberta	18.97	23.70	24.30	37.12	32.30	23.43	7.15	33.15	26.27	2.31	6.63
British Columbia	0.51	1.45	2.75	6.81	19.42	32.30	26.03	-	-	8.21	9.51
Yukon Territory ³	..	..	..	..	..	..	..	..	..	6.13	4.85
Northwest Territories ³	..	..	..	..	..	..	..	..	..	43.44	34.36
Canada	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Notes:

Figures may not add up to totals due to rounding.

Dependable land is the sum of Canada Land Inventory classes 1, 2 and 3.

1. Peatlands, bogs and marshes capable of supporting agricultural production and distinguishable from mineral soils by their high organic content.

2. Unmapped areas, water, forest reserves, national parks, urban areas and provincial parks.

3. Not covered by the Canada Land Inventory.

Sources:

Environment Canada, 1992, *Agricultural Land Use Change in Canada*, Ottawa.

Statistics Canada, Environmental Accounts and Statistics Division.

Text Box 5.1.1

Canada Land Inventory Classes 1, 2 and 3—Canada's Dependable Agricultural Land Base

Class 1 – Soils in this class have no significant limitations for crops. These deep soils are level or have very gentle slopes, are well to imperfectly drained and have a good water-holding capacity. They are easily maintained in good tilth and productivity, and the potential for damage from erosion is slight. They are moderately high to high in productivity for a wide range of field crops adapted to the region.

Class 2 – Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices. These deep soils have a good water-holding capacity, can be managed with little difficulty and are moderately high to high in productivity for a fairly wide range of field crops. The moderate limitations on these soils may be from any one of a number of factors, including mildly adverse regional climate; moderate effects of erosion, poor soil structure or low permeability; low fertility correctable with lime; gentle to moderate slopes; and occasional overflow or wetness.

Class 3 – Soils in this class have moderate to severe limitations that restrict the range of crops or require special conservation practices. Under good management, these soils are fair to moderately fair in productivity for a wide range of field crops adapted to the region. Conservation practices are more difficult to apply and maintain. Limitations arise from a combination of two of the factors described under Class 2, or from one of the following factors: climate, erosion potential, low fertility, strong slopes, poor drainage, low water-holding capacity and salinity.

Note:

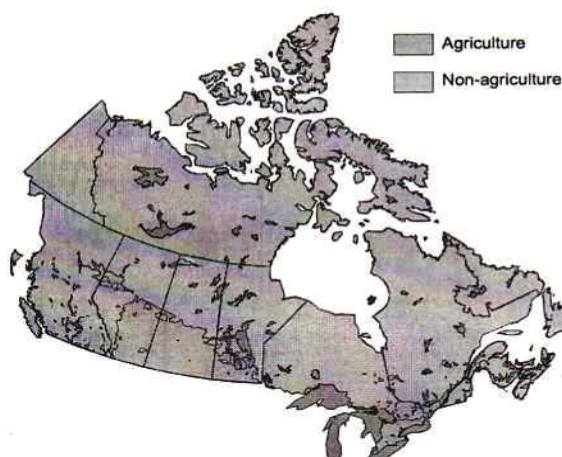
For more detail on the Canada Land Inventory and for a complete description of all land classes, please visit the Natural Resources Canada Web site at <<http://www.cgdi.gc.ca>>.

5.1.2 Agricultural land use

In 1996, Canada had 681 000 km²—about 7.4% of its land—in agriculture. Map 5.1.2 shows the distribution of this land. Table 5.1.2 shows that the total area of Canadian agricultural land peaked in the 1940s and 1950s and has remained stable since the 1960s.

In contrast, the number of farms has been declining steadily since the 1940s. In 1996, 276 548 farms were in operation, compared with 732 832 in 1941. With the decline in the number of farms has come an increase in average farm size, from 96 hectares in 1941 to 246 hectares in 1996.

Map 5.1.2
Agricultural Land



Source:
Statistics Canada, Agriculture Division.

Text Box 5.1.2

Census of Agriculture Land Definitions

Agricultural land – Total area of land operated on farms.

Cropland – Sum of all areas reported for field crops, tree fruits, berries, grapes, vegetables, nursery products, sod and Christmas trees.

Summerfallow – Land from which no crop is harvested, but that is worked or sprayed during the crop season, primarily for moisture conservation.

Improved pasture – Grazing land that has been improved by seeding, draining, irrigating or fertilizing, or had brush or weed control applied to it.

Cultivated land – The sum of cropland, improved pasture and summerfallow.

Improved land – The sum of cropland, improved pasture and summerfallow, as well as a portion of other land (for census years after 1986).

Unimproved land – Native pasture, rangeland, woodland, bogs and marshes.

Source:
Statistics Canada, Agriculture Division.

Table 5.1.2
Farms and Agricultural Land, 1901-1996

Year	Improved farmland				Unimproved agricultural land ²	Total agricultural land	Number of farms number	Average farm size hectares per farm
	Cropland	Improved pasture	Summer-fallow thousand km ²	Other land ^{1,2}				
1901	81	--	--	41	135	257	511 073	50.3
1911	144	--	10	43	244	441	682 329	64.6
1921	202	31	48	5	284	570	711 090	80.2
1931	236	32	68	11	313	660	728 623	90.6
1941	228	34	95	14	331	702	732 832	95.8
1951	252	40	89	11	312	704	623 087	113.0
1961	253	41	114	10	280	698	480 877	145.1
1971	278	41	108	10	250	687	366 110	187.7
1976	283	41	109	9	242	684	338 552	202.0
1981	309	41	97	14	198	659	318 361	207.0
1986	332	36	85	7	218	678	293 089	231.3
1991	335	41	79	--	--	678	280 043	242.1
1996	349	43	63	--	--	681	276 548	246.1

Notes:

1. Refers to barnyards, laneways and other unclassified lands.

2. Other land and unimproved agricultural land can no longer be compiled because of census questionnaire changes.

Sources:

Statistics Canada, Agriculture Division.

Statistics Canada, 1998, *Handbook of Agricultural Statistics*, Catalogue No. 21-503, Ottawa.

Table 5.1.3
Agricultural Land Area and Average Farm Size by Ecozone, 1971 and 1996

Ecozone ¹	Agricultural land			Proportion of ecozone in agricultural land			Average farm size		
	Ecozone area km ²	1971	1996	Change 1971-1996	1971 percent	1996	1971 hectares per farm	1996	Change 1971-1996 percent
Boreal Shield	1 876 142	20 160	15 526	-23.0	1.07	0.83	101.6	128.6	26.5
Atlantic Maritime	202 619	29 240	22 033	-24.6	14.43	10.87	85.6	106.3	24.2
Mixed Wood Plains	113 971	74 616	65 883	-11.7	65.47	57.81	62.1	80.2	29.0
Boreal Plains	704 719	123 960	136 289	9.9	17.59	19.34	240.1	311.5	29.7
Prairie	464 070	419 921	420 582	0.2	90.49	90.63	340.0	432.0	27.0
Montane Cordillera	490 234	17 064	18 547	8.7	3.48	3.78	203.5	188.9	-7.1
Pacific Maritime	213 000	1 664	1 687	1.4	0.78	0.79	19.5	15.9	-18.8
Canada	4 064 755	686 624	680 550	-0.9	16.89	16.74	187.5	246.1	31.2

Notes:

Figures may not add up to totals due to rounding.

1. Includes only ecozones where agriculture is practised.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Agriculture is dependent on ecological conditions. Most of Canada's ecozones have little or no agricultural land, while one consists almost entirely of agricultural land (see section 3.1—**Environmental geographies** for more detail on Canada's ecozones). For example, Table 5.1.3 shows that 90.6% of the Prairie ecozone was devoted to agriculture in 1996; this explains why very little of this ecozone remains in its natural state. The Mixed Wood Plains ecozone in eastern Canada had the next highest proportion of agricultural land, with more than 57.8% of its area in agriculture.

For the most part, the acreage of agricultural land expanded in western ecozones between 1971 and 1996, while it declined in eastern ecozones. The Boreal Plains ecozone experienced the greatest increase in agricultural land area (9.9%). The largest decline (-24.6%) occurred in the Atlantic Maritime ecozone.

In both 1971 and 1996, farm sizes varied significantly across ecozones. The eastern ecozones and those in British Columbia tended to have relatively small farms,

while the Prairie ecozone tended to have much larger farms.

Looking more closely at the cultivated portion of agricultural land, Table 5.1.4 shows some significant changes between 1971 and 1996. In particular, cropland area increased by 25.5% during this period. At the same time, total agricultural land actually declined by nearly 1% (Table 5.1.3). Most of the increase in cropland occurred in the west, where large areas of summerfallow land were converted to full-time crop production. The largest decline in summerfallow area was in the Prairie ecozone, where more than 34 000 km² of summerfallow land were put to other uses. Some western ecozones also saw significant new ground broken for crop production between 1971 and 1996.

The decline in the practice of summerfallowing means that more land was cropped on a full-time basis than was the case 25 years earlier. The practice of summerfallowing has declined largely in response to evidence that it contributes to soil salinization.

Table 5.1.4
Cultivated Agricultural Land by Ecozone, 1971 and 1996

Ecozone ²	Cropland			Summerfallow			Improved pasture			Total cultivated land ¹		
	1971	1996	Change 1971-1996	1971	1996	Change 1971-1996	1971	1996	Change 1971-1996	1971	1996	Change 1971-1996
	km ²		percent	km ²		percent	km ²		percent	km ²		percent
Boreal Shield	5 741	5 779	0.7	271	129	-52.2	2 740	1 070	-60.9	8 752	6 979	-20.3
Atlantic Maritime	8 459	7 996	-5.5	191	32	-83.4	3 481	1 312	-62.3	12 132	9 340	-23.0
Mixed Wood Plains	39 520	44 098	11.6	1 069	232	-78.3	11 672	3 716	-68.2	52 261	48 046	-8.1
Boreal Plains	49 007	66 202	35.1	17 222	6 904	-59.9	6 715	13 440	100.2	72 944	86 546	18.6
Prairie	173 005	221 725	28.2	89 353	55 199	-38.2	15 179	22 427	47.8	277 537	299 351	7.9
Montane Cordillera	1 981	1 002	-49.4	45	31	-32.7	549	219	-60.1	2 575	1 252	-51.4
Pacific Maritime	570	2 385	318.3	65	81	24.5	1 045	1 307	25.0	1 680	3 773	124.5
Canada	278 285	349 187	25.5	108 216	62 607	-42.1	41 381	43 491	5.1	427 882	455 286	6.4

Notes:

Figures may not add up to totals due to rounding.

1. The sum of cropland, summerfallow and improved pasture.

2. Includes only ecozones where agriculture is practised.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

5.1.3 Management practices

Land management practices have considerable impact on the quality of agricultural land. Proper land management can increase soil fertility, serving to preserve and enhance land stocks. On the other hand, poor management can lead to soil degradation and a diminishing stock of usable land. A number of management practices that conserve soils are currently in use by farmers (Text Box 5.1.3).

Table 5.1.5 presents information on tillage practices compiled from the Census of Agriculture. Information on three tillage types was collected for the 1991 and 1996 census years. The area tilled conventionally declined by 23.3% during the period. Conventional tillage has the greatest potential negative impact on soil of the three tillage types listed in the table. The largest declines occurred in the Montane Cordillera and the Boreal Plains ecozones, where conventionally tilled areas declined by 43.7% and 28.4%, respectively. Table 5.1.5 also indicates that the more environmentally benign tillage types—conservation and no tillage—gained a larger share of the area prepared for seeding, increasing nationally by 23.6% and 135.3%, respectively. The largest proportionate increase in conservation tillage area occurred in the Atlantic Maritime ecozone, where the area tilled by this method increased by 63.1%. The Prairie ecozone had the largest absolute area increase for conservation tillage, with an increase of more than 10 000 km² over 1991 levels. The practice of no tillage jumped by the greatest share (324.1%) in the Mixed Wood Plains, while the Prairie ecozone again had the largest absolute increase in area (20 000 km²).

Text Box 5.1.3

Methods of Soil Conservation

Several agricultural techniques that maintain and improve soil have been developed. No-till agriculture, for example, involves planting crops directly into the residue of the previous year's crop. This practice disturbs the soil's surface only minimally, conserving moisture, soil structure and organic matter and minimizing the risk of erosion. Conservation tillage is a similar practice that retains most of the residue from the previous crop at the soil surface. Both of these methods differ from conventional tillage, which incorporates most of the previous crop's residue into the ground, leaves the surface exposed to erosion and accelerates the decomposition of organic matter.

Green manures are crops that are grown specifically to be ploughed into the soil, adding both organic matter and nutrients in the process. They also prevent erosion by covering soil that would otherwise be left bare. Legumes (e.g., clover and vetch) are often used for this purpose because, unlike most other crops, they can collect nitrogen from the air. Their growth thus represents a net gain of nitrogen since they do not extract all of their nitrogen requirements from the soil.

Crop rotations can be used to prevent the build-up of pest populations and avoid depleting the same soil nutrients year after year. They also serve to improve soil structure when deep-rooting or high-residue crops are used in the rotation.

There are many other methods of improving soil and preventing erosion. A more detailed account can be found in *The Health of Our Soils: Toward Sustainable Agriculture in Canada*.¹

1. Acton, D.F. and L.J. Gregorich (eds.), 1995, *The Health of Our Soils: Toward Sustainable Agriculture in Canada*, Centre for Land and Biological Resources Research, Agriculture and Agri-Food Canada, Catalogue No. A53-1906/1995E, Ottawa.

Table 5.1.5
Tillage Practices by Ecozone, 1991 and 1996

Ecozone ¹	Land prepared for seeding			Conventional tillage			Conservation tillage			No tillage		
	1991	1996	Change 1991-1996	1991	1996	Change 1991-1996	1991	1996	Change 1991-1996	1991	1996	Change 1991-1996
	km ²		percent	km ²		percent	km ²		percent	km ²		percent
Boreal Shield	2 080	1 772	-14.8	1 694	1 407	-16.9	298	265	-11.1	88	100	13.5
Atlantic Maritime	3 092	2 871	-7.2	2 731	2 294	-16.0	289	471	63.1	73	106	44.8
Mixed Wood Plains	31 064	31 122	0.2	24 731	19 801	-19.9	5 209	6 557	25.9	1 123	4 764	324.1
Boreal Plains	51 725	47 203	-8.7	41 208	29 508	-28.4	9 488	13 892	46.4	1 028	3 803	269.9
Prairie	201 285	203 249	1.0	128 657	99 810	-22.4	55 488	66 355	19.6	17 140	37 084	116.4
Montane Cordillera	737	492	-33.3	586	330	-43.7	121	108	-10.5	31	54	77.3
Pacific Maritime	304	221	-27.5	259	194	-25.2	18	20	13.5	28	7	-76.2
Canada	290 288	286 928	-1.2	199 866	153 343	-23.3	70 910	87 668	23.6	19 512	45 918	135.3

Note:

1. Includes only ecozones where agriculture is practised.

Sources:

Statistics Canada, Agriculture Division, and Environment Accounts and Statistics Division.

5.1.4 Agricultural crop and livestock production

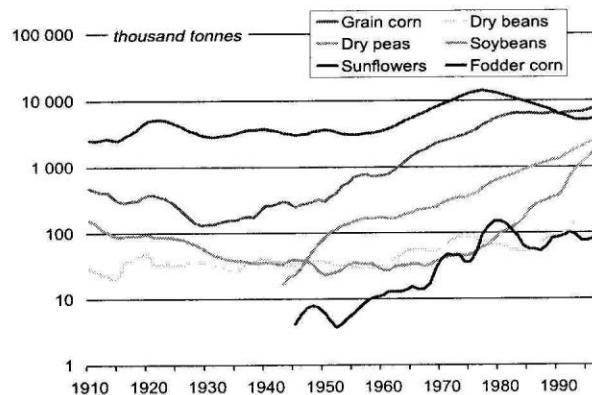
Crop production has more than quadrupled since 1910 (figures 5.1.3 and 5.1.4).¹ Many factors have contributed to this rise—new technologies involving mechanization, genetics, nutrient science and irrigation enable the farmer to be more productive than ever before.

Increased output has not come without costs to the environment. Pollution problems such as eutrophication of water bodies and soil erosion are linked to modern agricultural practices (see section 6.3—**Water quality** for more detail).

Figure 5.1.5² shows a large increase in cattle and pig stocks and a significant decline in sheep and horse stocks from earlier in the century. The number of cattle has more than doubled and the number of pigs has tripled since 1908.

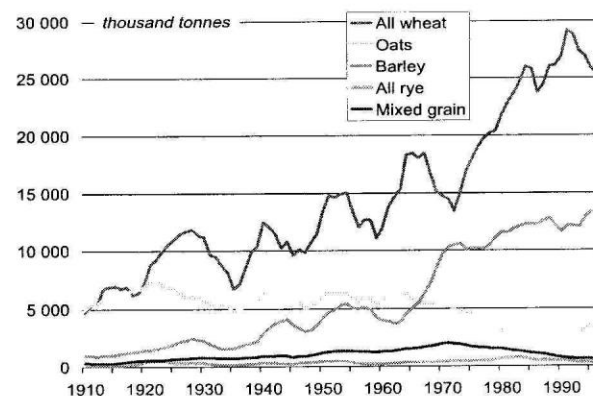
Livestock can also have significant environmental impacts. Based on ratios developed in the United States,³ Canadian livestock generate the waste equivalent of an estimated 220 million people, almost seven times the population of Canada.

Figure 5.1.3
Selected Field Crop Production, 1910-1996
(Five-year Averages)



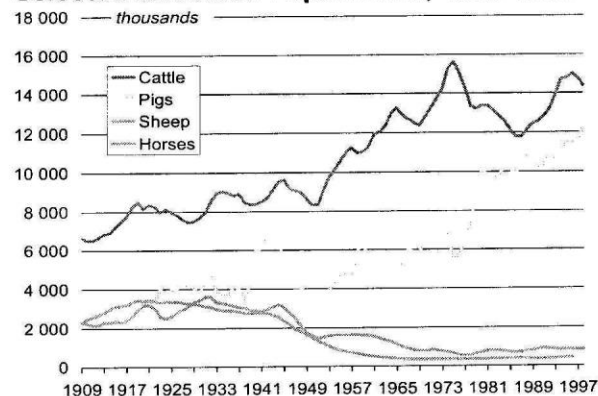
Source:
Statistics Canada, Agriculture Division.

Figure 5.1.4
Production of Major Small Grains in Canada, 1910-1996
(Five-year Averages)



Source:
Statistics Canada, Agriculture Division.

Figure 5.1.5
Selected Livestock Populations, 1909-1998



Source:
Statistics Canada, Agriculture Division.

1. Only major crops are included in figures 5.1.3 and 5.1.4.

2. Only selected livestock groups are included in Figure 5.1.5.

3. National Research Council, 1979, *Ammonia*, Washington, D.C.