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Climate Change Saskatchewan

CLIMATE CHANGE EDUCATION SASKATCHEWAN

**Cross-Reference Between
Saskatchewan Core Curriculum &
Selected Instructional Resource Materials**

SCIENCE
Middle Level: Grades 6 - 9

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Canada



SaskEnergy  **SaskPower**

CLIMATE CHANGE EDUCATION

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SCIENCE MIDDLE LEVEL: Grades 6 - 9

Major entry points - such as Knowledge, Skills and Attitude objectives - have been selected, including other statements and ideas from activities. Professional teachers may make other connections as they integrate instructional resources dealing with the topic of Climate Change.

LEGEND

<ul style="list-style-type: none">• CCTK (Climate Change Tool Kit)• ES (EarthSongs [video])• GT (Green Teacher)• NWW (National Wildlife Week 2002)• PIAD (Pembina Institute for Appropriate Development)	<ul style="list-style-type: none">• SEEDS (Society, Environment & Energy Development Studies Foundation)• SOILS (Project SOILS)• TEA (Toronto Environmental Alliance)• WET (Project WET)• WILD (Project WILD)
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KEY REFERENCES

CCTK. Climate Change Tool Kit. Teacher's Guide. (2002). Saskatchewan Science Centre. Community Programs Coordinator, Regina (306-791-7921).

ES. EarthSongs [video]. Waite, D. *EarthSongs* [also available as a music CD]. Regina, SK. Access Communications. Don.Waite@accesscomm.ca

GT. Green Teacher. (2001). Teaching About Climate Change. Cool Schools Tackle Global Warming. Gabriola Island BC: New Society Publishers. (www.newsociety.com) ISBN 0-86571-437-1.

Hughs, M. (1993). *The Crystal Drop*. Toronto, ON: Harper Collins. ISBN: 0-00-647534-5.

NWW. National Wildlife Week 2002. (In-progress). *Climate is Changing: Help Wildlife Weather the Storm*. Kanata, ON: Canadian Wildlife Federation. www.cwf-fcf.org

PIAD. Pembina Institute for Appropriate Development. (1999). Climate Change. Awareness and Action Education Kit. Drayton Valley, AB: PIAD. (www.pembina.org) ISBN 0-921719-26-4.

SEEDS. Society, Environment and Energy Development Studies Foundation. (2001). *Creating a Climate of Change. Resources for Teachers.* Calgary AB: SEEDS. (<http://greenschools.ca/SEEDS>) ISBN 0-9689830-0-6.

SOILS. Project SOILS. (1995). *Project SOILS Activity Guide* (2nd ed.). Regina, SK: Saskatchewan Soil Conservation. ISBN: 0-9699885-0-8.

TEA. Toronto Environmental Alliance. (1997). *Our Changing Climate. (Learning How to Take Charge of Climate Change at School, Home and in the Community.)* Toronto ON: TEA. (www.toronto.environment.org)

WET. Project WET. (1995). *Project WET Curriculum & Activity Guide* and (1997). *Saskatchewan Supplement to the Project WET Curriculum & Activity Guide: Resources and References for Saskatchewan Educators.* Moose Jaw, SK: Saskatchewan Water. <http://www.saskwater.com/hdocs/educatn/wet.htm>

WILD. PROJECT WILD. *Project WILD.* (1998). Kanata, ON: Canadian Wildlife Federation. ISBN 1-55029-082-7.

**MIDDLE LEVEL SCIENCE
(Grades 6-9)**

Grade 6 Science Curriculum

Instructional Resources

Earthquakes and Volcanoes (p. 611)

2.2 Describe the effects of volcanoes.

- p. 613, Activity: Have students research famous ... volcanoes...

GT (p. 16) “ ...Climate Variability.”

Ecosystems (p. 617)

1. Investigate factors which influence an ecosystem. (1.1 -1.2)
2. Inquire into the effects of change in an ecosystem. (2.1 - 2.7)
3. Develop a sense of responsibility for the preservation of the ecosystem. (3.1 - 3.4)

TEA

- pp. 20-21. L2: “Life Support System.”
- pp. 56-58. L9: “[Trees+]”

GT

- pp. 61-63 “...Clean Air Game.”
 - pp. 64-66 “...Sustainable Living...”
- TEA (pp. 17-19) L1: “Spaceship Earth.”

4. Understand the personal, moral, social and cultural aspects of how we interact in the ecosphere. (4.1 - 4.3)

- pp. 47-52. L7: “Top Secret [Cars].”
- pp. 53-55. L8: “Community...”
- pp. 61-63. L11: “Graph...[Cars].”

5. Understand how technology both shapes society and is shaped by it. (5.1 - 5.2)

- p. 619, Activity: Conduct a pond study ... protect the environment... responsibility...

- p. 621, Activity: Investigate ways in which farmers are trying to protect natural ecosystems.

GT

- p. 18. “... Good for Us?”
- pp. 64-66. “...Sustainable Living...”

Grade 6 Science Curriculum (continued)

Instructional Resources

Exploring Space (p. 623)

1.2 Investigate how Landsat is used to monitor aspects of Canada's environment.

1.7 Discuss the impact of the space program on the development of new technologies.

3. Appreciate the value and limitations of technology within society.

Energy in Our Lives (p. 629)

2.4 Examine and consider low energy use lifestyles.

CCTK

- pp. 20-22. Act. #4: "The Energy Resource Game"

GT

- pp. 32-34. "...Bus Afoot."
- pp. 56-58. "...Cool Schools..."
- pp. 59-60. "...Hot Water."

TEA

- pp. 65-70. L12: "Energy Use..."
- pp. 71-75. L13: "...Energy...Action Plan."

2.5 Explore the role of society in encouraging and enabling low-energy lifestyles.

GT

- pp. 25-27. "Solar Box Cooking."
- pp. 35-36. "...Cyclists."

3.2 Understand the social and cultural forces which underlay technological developments.

TEA

- pp. 77-86. L14: "[Energy] Research."
- pp. 82-88. L15: "TV Persuasion."
- pp. 89-90. L16: "[Energy presentation]."

3.3 Appreciate how technological developments affect culture and society.

GT (pp. 28-29) "Solar Car Sprints."

TEA

- pp. 47-52. L7: "Top Secret [Cars]."
- pp. 61-63. L11: "Graph [Cars]."
- pp. 96-105. L18: "World [Energy] Tour."

- p. 631, Activity: How do rechargeable cells and batteries get recharged?

GT (p. 24) "...Solar Electricity."

Grade 6 Science Curriculum (continued)

Instructional Resources

Earth's Climate (p. 643)

- | | |
|--|---|
| 1. Describe the Saskatchewan climate. (1.1-1.4) | GT
● pp. 16-19. "...Good for Us?" |
| 2. Identify and compare different world climates. (2.1-2.2) | |
| 3. Recognize long-term climatic patterns. (3.1-3.3) | ● p. 16. "...Climate Variability."
TEA (pp. 42-45) L6: "Impacts...Canada." |
| 4.3 Choose topics for in-depth study. [e.g., Climate Change!] | GT (p. 24) "...Context."
CCTK (pp. 8-12) "Modelling the Greenhouse Effect" |
| ● p. 643, Activity: ... concept of climate... | |
| ● Activity: How do ocean currents influence the Earth's climate?
... El Nino? ...La Nina? | |
| ● Activity: ... tilt of the Earth's axis... | |
| ● Activity: Elaine Wheaton ... global warming... Tim Ball... Which scientist is correct? | |
| ● Activity: Collect information on the debate about....global warming
... carbon dioxide ... other factors... | GT (pp. 11-13) "Activities...Concept."
TEA (pp. 38-41) L5: "Greenhouse Gases." |
| ● Activity: How do volcanoes affect the Earth's climate? | GT (p. 16) "... Climate Variability." |

Grade 7 Science Curriculum

Instructional Resources

The Basics of Life (p. 704)

2. Examine how natural and human-related alterations to the local environments during the past two hundred years have changed the ability of organisms to survive.
TEA (pp. 20-21) L2: “Life Support System.”
- 2.5 Respect the intricate support network which sustains life.
GT (pp. 53-55) “Taking Action...Schools.”
- 3.1 Value the environment.
GT (pp. 64-66) “...Sustainable Living...”
- 3.4 Consider the needs of other organisms in the context of human activity.
TEA (pp. 56-58) L9: “[Trees+]”
- 4.4 Criticize ideas and explanations encountered.
 - p. 706, Activity: ... appreciation for the life in their immediate environment.
 - p. 706, Activity: ... one organism to survive...

Saskatchewan - The Land (p. 709)

2. Recognize the weathering processes which have occurred since the last period of glaciation. (2.1 - 2.5)
GT (p. 15) “...Climate Variability.”
3. Appreciate how natural and human forces have shaped the land. (3.1 - 3.4)
- 5.2 Develop skills in reading and interpreting maps, diagrams, and other visual aids which are used to communicate information in the study of glaciers and soils.
 - p. 710, Activity: ...changes introduced when agriculture became dominant...
 - p. 712, Activity: ... What role do organisms play in the ecosystem?

Grade 7 Science Curriculum (continued)

Instructional Resources

Structures and Designs (p. 718)

- 3.3 Investigate the technical, social, and cultural implications of design and construction of objects.
[Look at this unit from the point of view of structures used historically and in contemporary society related to the varying climate in Saskatchewan; e.g., ‘greenhouse effect.’]

- GT**
- pp. 28-29. “Solar Car Sprints.”
 - pp. 35-36. “...Cyclists.”
 - pp. 64-66. “...Sustainable Living...”

Renewable Resources in Saskatchewan (p. 724)

2. Compare renewable and non-renewable sources of energy. (2.1 - 2.6)
3. Investigate critical attributes of renewable sources of energy. (3.1 - 3.3)
4. Develop “strong sense” critical and creative thinkers. (4.1 - 4.4)

- CCTK**
- pp. 36-39. Act. #9: “Converting Solar Energy into Heat”
 - pp. 45-47. Act. #12: “Fly a Solar UFO”
- TEA** (pp. 77-86) L14: “[Energy] Research].”

- GT** (pp. 64-66). “...Sustainable Living...”
- TEA**

- pp. 87-88. L15: “TV Persuasion.”
- pp. 89-90. L16: “[Energy Presentation]”

5. Develop an understanding that technology both shapes and is shaped by society. (5.2, 5.3)

- GT** (pp. 28-29) “Solar Car Sprints.”
- TEA** (pp. 108-111) L19: “Transitville.”
- CCTK** (pp. 40-41) Act. #10: “Using Solar Energy”
- GT** (pp. 22-24) “...Solar Electricity.”

- pp. 725-726. Many activities.

Temperature and Heat (p. 732)

- 3.3 Understand that temperature is one criterion in estimating the amount of heat present.

- CCTK** (pp. 13-14) Act. #2: “Heat, Heat, Heat”
- GT** (pp. 9-10) “Greenhouse Effect.”
- TEA**

- pp. 22-32. L3: “Greenhouse Effect.”
- pp. 33-36. L4: “Greenhouse Experiments.”

- 3.4 Explain why temperature difference rather than difference in quantity of heat determines the direction of heat flow.

- CCTK**
- pp. 27-29. Act. #6 “Radiometer Experiment”
 - pp. 42-44. Act. #11 “Build Simple Solar Cooler”

- p. 733, Activity: ... For each source of heat identified, explain how the heat is produced.

- GT**
- p. 31. “Geothermal.”
 - pp. 25-27. “Solar Box Cooking.”

Grade 7 Science Curriculum (continued)

Instructional Resources

Resource Use (p. 735)

1. Understand how resource-use decisions are made. (1.2 - 1.5, 1.7)

GT

- pp. 53-55. "Taking Action...Schools."
- pp. 59-60. "...Hot Water."
- TEA (pp. 97-105) L18: "World [Energy] Tour."

- 2.5 Discuss why reduce is a more preferable "R" than recycle.

GT

- pp. 64-66. "...Sustainable Living..."
 - pp. 56-58. "...Cool Schools..."
- TEA**
- pp. 65-70. L12: "Energy Use..."
 - pp. 71-75. L13: "...Energy...Action Plan."
- CCTK (pp. 23-26) Act. #5: "School Energy Audit."**

- p. 736, Activity:..... recycled paper...

- p. 738, Activity: Write short songs with a resource-use message.

Grade 8 Science Curriculum

Instructional Resources

The Moving Crust (p. 804)

- 1.4 Recognize energy sources and energy flows in the ecosystem.
- 2.4 Evaluate the effect of succession on ecosystems.
 - p. 810, Activity: ...dinosaurs ... [discuss] ... continental drift theory as it relates to the matter of climate change as a possible cause of extinction.

GT (p. 16) “ ... Climate Variability.”

Energy Resources in Saskatchewan (p. 816)

- 2.0 Study the creation of demand for, and the patterns of use of, fossil fuels.

TEA

- pp. 65-70. L12: “Energy Use...”
- pp. 71-75. L13: “ ...Energy ...Action Plan.”

- 2.4 Assess the impact that the use of fossil fuels has on Saskatchewan and Canadian environments.

GT

- pp. 61-63. “ ...Clean Air Game.”
- p. 39. “ ...Public Transit.”

- 2.5 Assess the impact that the use of fossil fuels has on Saskatchewan and Canadian societies.

TEA

- pp. 69-70. “Climate Change Round Table.”
- pp. 77-86. L14: “[Energy] Research.”
- pp. 92-95. L17: “Roundtable Discussion.”

- 3.0 Identify and evaluate methods for the conservation of fossil fuels and energy derived from fossil fuels. (3.1 – 3.5)

GT

- pp. 56-58. “ ...Cool Schools...”
- pp. 59-60. “ ...Hot Water.”
- pp. 64-66. “ ...Sustainable Living...”

TEA

- pp. 65-70. L12: “Energy Use...”
- pp. 71-75. “ ...Energy...Action Plan.”

- p. 817, Activity: ...plastics ...allocating scarce resources...

GT

- pp. 22-24. “ ...Solar Electricity.”

- p. 818, Activities: electricity use in our homes and schools...energy efficient lighting...

- p. 53+. “Taking Action...School.”
- pp. 59-60. “ ...Hot Water.”

Grade 8 Science Curriculum (continued)

Instructional Resources

Energy and Machines (p. 830)

3.4. Examine how the demands from society and individual members of society influence what machines are developed.

GT

- pp. 28-29. “Solar Car Sprints.”
 - pp. 35-36. “... Cyclists.”
- TEA**
- pp. 47-52. L7: “Top Secrets [Cars]”
 - pp. 53-55. L8: “Community...”

Grade 9 Science Curriculum

Instructional Resources

Saskatchewan Environment (p. 904)

- 1.2. Compare the geological history, the climate, the terrain, and native plants and animals of the regions.
- 2.0 Explore the effects of human activity on the landscape of Saskatchewan.
- 2.3. Describe the effects that the practice of agriculture and other resource industries have on the landscape.

GT

- pp. 14-16. "...Climate Variability."

- p. 18. "...Good for Us?"

Using Electricity (p. 915)

4. Develop students' appreciation of the value and limitations of technology within society.
- 4.3. Assess how the use of electricity and electrical devices has shaped our society and our lives.

GT

- pp. 64-66. "...Sustainable Living..."
TEA (pp. 77-86) L14: "[Energy] Research."
- pp. 22-24. "...Solar Electricity."
- pp. 56-58. "...Cool Schools..."
TEA
- pp. 65-70. L12: "Energy Use..."

Risks and Limits (p. 919)

- 3.1 Understand the natural environment and the conditions putting it at risk.
- 3.2. Establish arguments based upon human rights, human needs, or needs of the environment when examining social issues.

GT

- pp. 2-4. "...Context..."
- pp. 44-48. "...Gridlock..."
TEA (pp. 97-105) L18: "World [Energy] Tour."

Grade 9 Science Curriculum (continued)

Instructional Resources

The Atmosphere (p. 928)

- 1.3 Describe the Saskatchewan climate.
- 2.2 Distinguish between local effects and global effects of pollutants.
- 2.3 Discuss proactive and reactive methods of reducing air pollution.
- 3.1 Incorporate the vocabulary of climatology and atmospheric study into talk and writing.
- p. 929, Activity: How can the [air] pollutants or their effects be reduced?
 - Activity: [Investigate how] oceans and large bodies of water influence climate and weather in a region.
 - Activity: ... Discuss the processes that tend to keep the level of greenhouse effect at an appropriate one.

Diversity of Life (p. 935)

- 2.4. Debate the implications of alteration of the ecosystems.
- p. 935, Activity: [agriculture and] ... diversity of plant life... What are the positive/negative aspects of the conversion of huge amounts of land in Saskatchewan from prairie to land for growing grain?

CCTK (pp. 15-18). Act. #3: "Testing for Carbon Dioxide."
GT (pp. 9-10) "Greenhouse Effect."

GT

- pp. 14-16. "...Climate Variability."
- pp. 61-63. "...Clean Air Game."

- p. 35. "...Public Transit."

TEA

- pp. 38-41. L5: "Greenhouse Gases."

- pp. 33-36. L4: "Greenhouse Experiments."

GT (pp. 9-10) "Greenhouse Effect."

TEA (pp. 22-32) L3: "Greenhouse Effect."

TEA

- pp. 17-19. L1: "Spaceship Earth."
- pp. 42-45. L6: "Impacts... Canada."

GT (p. 18) "... Good for Us?"