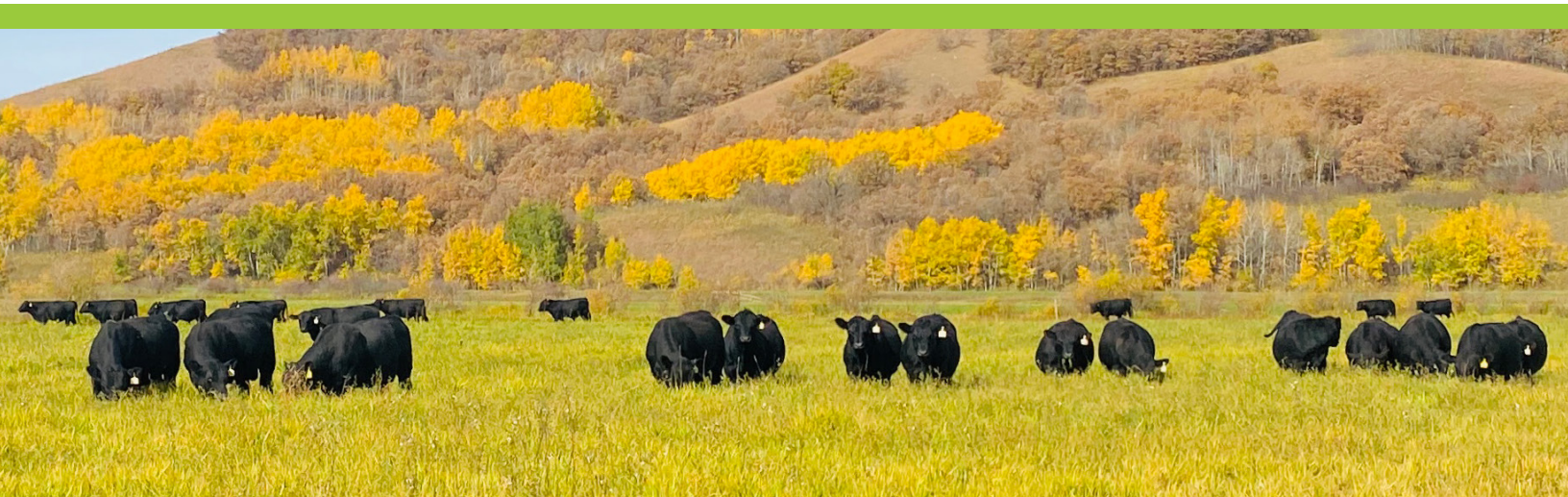




GUARDIANS OF THE GRASSLANDS

in the Classroom



www.GuardiansOfTheGrasslands.ca



Agriculture in the Classroom Canada (AITC-C) is the national voice of agriculture education. We believe in enhancing knowledge and appreciation of agriculture and food in Canada. As part of a cross-country effort, we work with our 10 provincial members to empower students and educators with accurate, balanced, and current curriculum-linked programs, resources, and initiatives focused on agriculture and food.

www.aitc-canada.ca

The Canadian Cattlemen's Foundation was established as a charity in 2014 to support sustainability and innovation within Canada's beef industry, through a network of 55,000 beef farms, ranches, industry related partners and donors. We work in partnership with donors and stakeholders to support next generation leadership development and sustainability initiatives for the Canadian beef industry.

www.cattle.ca

Acknowledgements

Agriculture in the Classroom Canada values the subject matter experts that led in the development of this resource:

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GUARDIANS OF THE GRASSLANDS

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Introduction:

This resource compliments *Guardians of the Grasslands*, a documentary that explores the current state of one of the world's most endangered ecosystems and the role cattle play in its survival. Through pre/post viewing questions, extension activities, and connections to further readings, students will explore the key topics of biodiversity, soil health, climate change, land management, and more.



To access the documentary [click here](#)
or visit www.GuardiansOfTheGrasslands.com

Supporting Partners



GUARDIANS OF THE GRASSLANDS

in the Classroom

Teacher Information

Scan the QR code to access all the lesson materials and weblinks in this resource.



Big Idea:

Explore the role of cattle in preserving the biodiversity of the Canadian grassland ecosystem.

Description:

In this resource, students will watch the *Guardians of the Grasslands* documentary, and will answer accompanying reflection questions. An online scavenger hunt will encourage students to dive deeper into ecosystem management and learn more about the biodiversity of the Canadian grasslands. Students will use their research skills to populate a board game that they can play with their classmates as a fun way to test their knowledge of the various conservation efforts, species, and careers associated with the grasslands.

Note:

Want to familiarize yourself with the lifecycle of Canadian beef cattle? [Visit the Canadian Cattlemen's Association](#) to learn the basics of beef production!



Estimated Time:
3 hours



Lesson Format:
Whole Class

Materials Required:

- Access to a device and the internet
- Scissors
- Pen/Pencil

To see where this resource fits into your curriculum, visit AITC-Canada.ca



Before Viewing

1. The coral reef and rainforest ecosystems are being damaged by human activity. Why do you think these ecosystems are important? Describe any initiatives that you know of that are meant to help protect these ecosystems. Where did you learn about these programs?

2. There is a lot of information out there about the impact of cattle on the environment. Describe some of the things you know or have heard about the impact of cattle on the environment.

Shade in the correct answer!

- | | TRUE | or | FALSE |
|--|-----------------------|----|-----------------------|
| 3. The Amazon Rainforest is the most endangered ecosystem in the world. | <input type="radio"/> | | <input type="radio"/> |
| 4. Western Canada has less than 25% of native grasslands left. | <input type="radio"/> | | <input type="radio"/> |
| 5. The Canadian beef industry practices sustainability and conservation efforts. | <input type="radio"/> | | <input type="radio"/> |
| 6. Cattle only eat grain and hay from harvested crops. | <input type="radio"/> | | <input type="radio"/> |
| 7. Pastures do not need to be reseeded after cows graze. | <input type="radio"/> | | <input type="radio"/> |
| 8. Saskatchewan does not allow cattle to graze on protected grasslands. | <input type="radio"/> | | <input type="radio"/> |
| 9. Cattle grazing can help conserve grassland ecosystems. | <input type="radio"/> | | <input type="radio"/> |

During Viewing

1. The grasslands are considered a carbon sink. How much carbon is sequestered in a 65,000 acre grassland ranch?

2. What is topsoil and what role does it play in maintaining the health of the grassland ecosystem?

3. Cattle act as a keystone grazing species to clear the top growth of grass on the grasslands. Why is this important for the health of the ecosystem?

4. What happened in Grasslands National Park when authorities planned for grasslands conservation that did not include grazers, and cattle were removed from the park's native grasslands?

5. What is a keystone species?



GUARDIANS OF THE GRASSLANDS

in the Classroom

After Viewing

- | | TRUE | or | FALSE |
|---|-----------------------|----|-----------------------|
| 1. Canada and the U.S. have lost more natural grassland than the Brazilian Amazon has lost rainforest. | <input type="radio"/> | | <input type="radio"/> |
| 2. 50% of Canada's natural grasslands have been converted for agricultural use, urban development, and roads. | <input type="radio"/> | | <input type="radio"/> |
| 3. Native prairie grasses store carbon in their extensive root systems. | <input type="radio"/> | | <input type="radio"/> |
| 4. Land that is cultivated for crop use and then seeded back to grass will return to original grassland after 15 years. | <input type="radio"/> | | <input type="radio"/> |
| 5. Grazing cattle on grasslands protects the endangered ecosystem and mimics how bison once roamed the prairies. | <input type="radio"/> | | <input type="radio"/> |

6. What are some plant and animal species that are found in Canada's grasslands?

7. Look back to the True or False questions you answered before watching the documentary. Would you change any of your answers now that you've watched it? Which ones and why?

Did you know?

Topsoil is created when inorganic rock, silt, sand, and minerals are mixed with dead organic material called humus and billions of living microscopic organisms.

8. Explain what carbon sequestration is in 2-3 sentences.

9. List three positive environmental impacts of cattle highlighted in the documentary. Compare these to any preconceptions you might have on this topic.

10. Research and describe some of the environmental services or benefits provided by healthy grassland ecosystems.

11. The Canadian grasslands ecosystem has had a complicated history with human management. How do you think the management of this ecosystem might have differed between the Indigenous peoples, European settlers, and Canadians today?



GUARDIANS OF THE GRASSLANDS

in the Classroom

Online Scavenger Hunt



Scan for
lesson
materials

1. Find the article '[Why Canada's prairies are the world's most endangered ecosystem](#)'. Read the article and answer the questions below:

- What percentage of the world does temperate grassland cover? _____
- Why are grasslands critical to an environment that does not receive a lot of precipitation?

2. Follow the 'plains bison' [hyperlink](#) to the Nature Conservancy Canada (NCC) website.

- What was the estimated number of bison in Canada in the early 1800s? _____
- Due to over hunting, what has the number of bison decreased to? _____

3. What protected grassland area is mentioned in the article 'Why Canada's prairies are the world's most endangered ecosystem' and the NCC's page on Plains Bison?

Did you know?

There can be over 100 different plant species in a 5 acre radius – the size of 4 and a half football fields.

4. Once you have found the protected grassland area from the previous question, follow either of those hyperlinks to the NCC's page and answer the following questions:
- a. How many acres is the protected grassland area? _____
 - b. One acre is the same size as 16 tennis courts! How many tennis courts would the area be? _____
 - c. What are the two main factors for the disappearance of mixed prairie grassland?

5. Continue to read through the article, then open this pdf: ['Beef's place in a healthy environment'](#) and answer the following questions:
- a. Much of the land used for the production of cattle is marginal land. What is marginal land and why is it a great fit for raising cattle?

 - b. What percent of pasture land that is used for raising cattle is not suited for crop production? _____

Did you know?

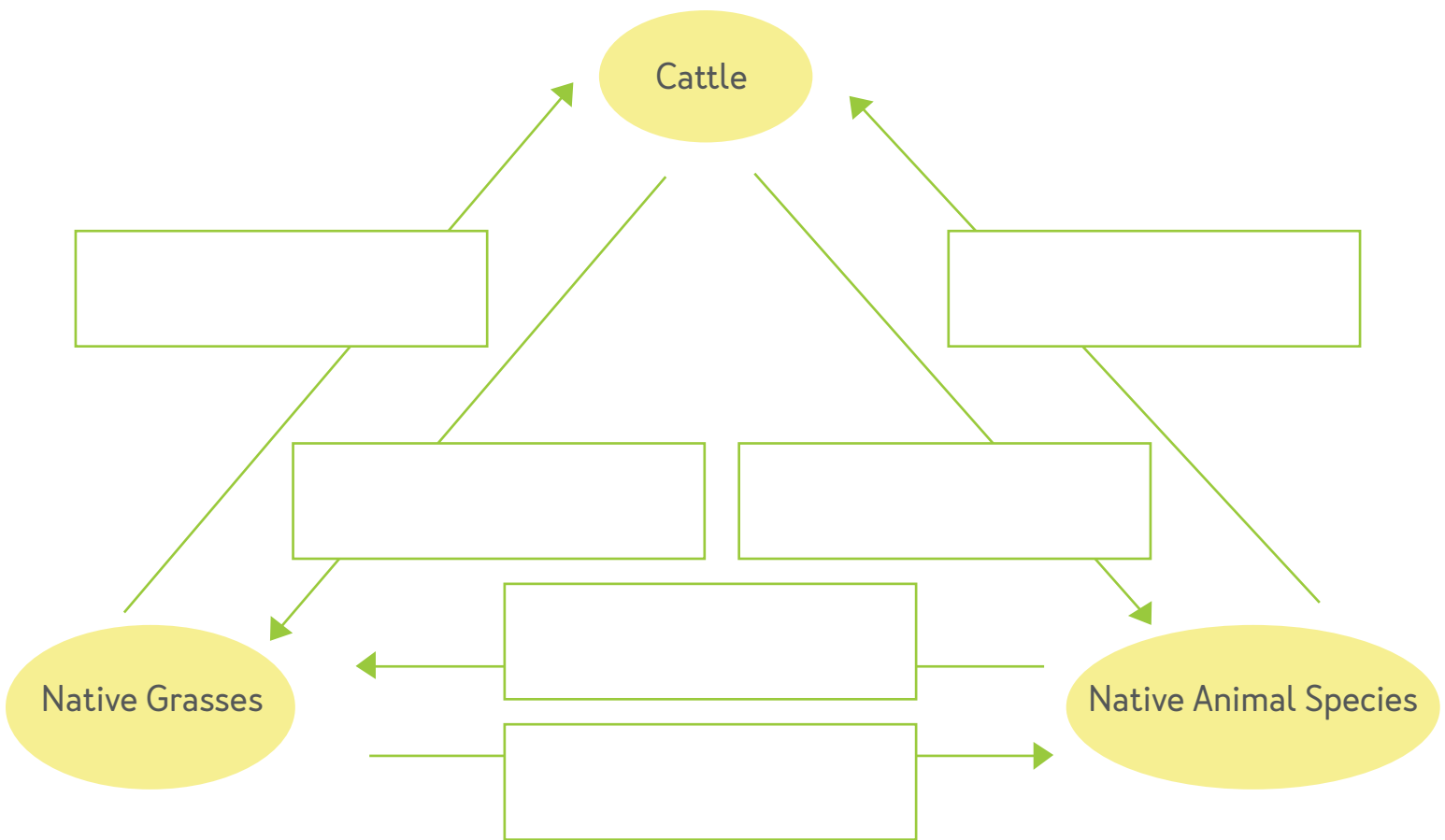
There's more than 80% of Canada's species at risk that depend on grassland.



GUARDIANS OF THE GRASSLANDS

in the Classroom

7. There are many symbiotic relationships in the grassland ecosystem. This refers to relationships in which the existence of one species benefits another.
- a. Find the Canadian Geographic article on '[How cattle ranching can help preserve species at risk in Canada's grasslands](#)'. Once you've read it, fill out the graphic organizer below to outline the various symbiotic relationships between cattle, native grasses, and native animal species. Include as many ways as you can think of that demonstrate how these different species allow each other to thrive in the Canadian Grassland ecosystem. Use information from all the articles you read today.



8. What type of symbiotic relationship does this diagram represent?

- a) Parasitism: one species benefits, the other is harmed
- b) Mutualism: both species benefit
- c) Commensalism: one species benefits, the other is unaffected

Shade in the correct answer!

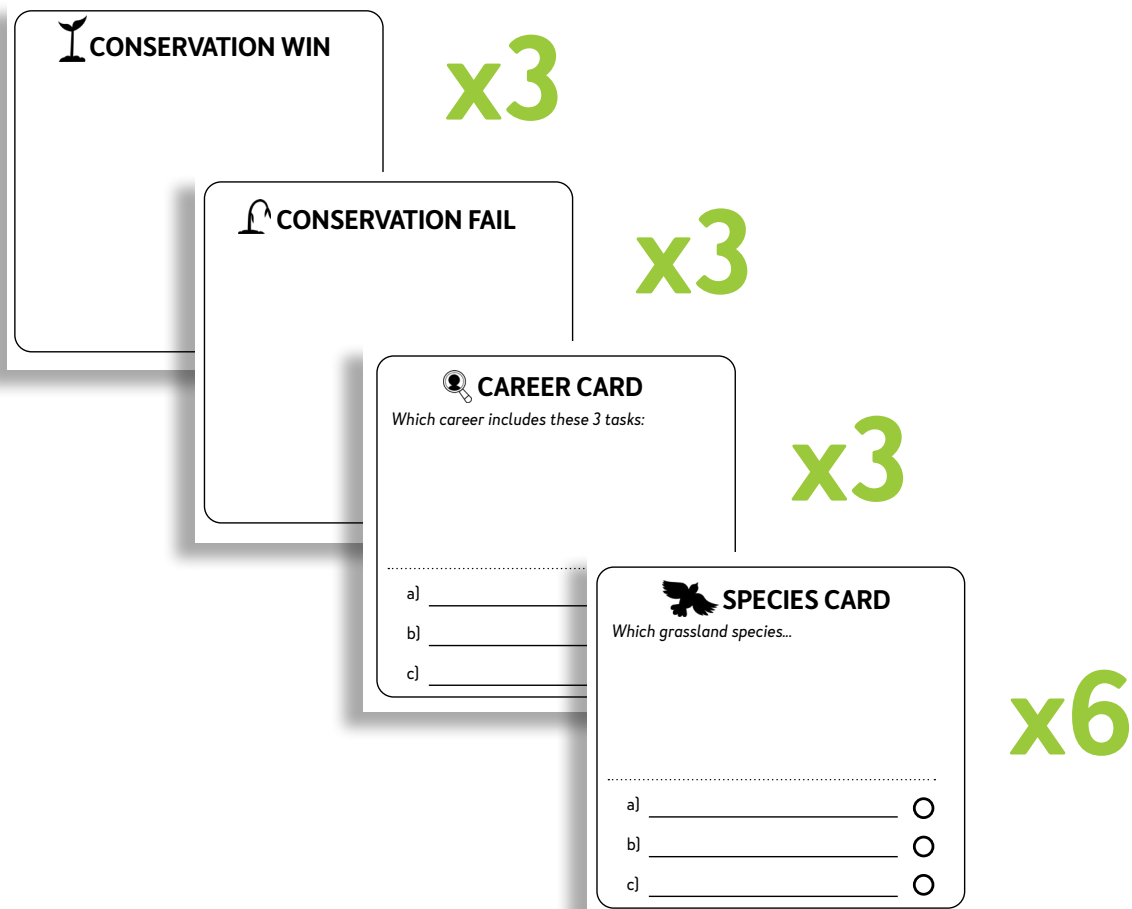
Build-Your-Own Board Game

Objective:

In this activity, students will use research skills to populate a grasslands focused, knowledge-based board game.

Instructions:

After watching *Guardians of the Grasslands* and completing the accompanying questions, students will conduct research to populate a variety of gameplay cards.





SPECIES CARDS

These cards will test your fellow players on some of the native species of plants and animals on the Canadian grasslands.

1. Use the websites below to explore some of the species that call the grassland ecosystem their native home.
2. You will create six multiple choice questions that will quiz your fellow players about some of these species. These questions should be structured: "Which grassland species...".
3. Along with the correct answer, you'll choose two other incorrect multiple choice options for players to choose from.
4. Write your question along with the multiple choice answers on the blank Species Cards.
5. Make sure to shade in the correct answer at the bottom of the card.


Note: Some of these websites just name the species that are endemic to the grasslands. Feel free to research these species further to help you create interesting questions!

[Hinterland Who's Who](#)
[The Nature of Things](#)
[Canadian Geographic](#)

[What Species are at Risk in Grasslands National Park](#)
[Grasslands National Park](#)

Example Card:





SPECIES CARD

Which grassland species...

is thought of as an indicator of good range health because they hide in open grassland with lots of litter which is a factor that predicts good forage production for the next season?

a) Pronghorn Antelope

b) Sprague's Pipit

c) Mormon Metalmark Butterfly

CORRECT [move forward 1] INCORRECT [move back 3]

Shade in the correct answer!

CONSERVATION CARDS

These cards will highlight some of the positive and negative steps that are being taken for grassland conservation.

1. Use the websites below to explore some of the initiatives that are helping the ecosystem, and write three of these on the “Conservation Win” cards.
2. Explore some of the issues and challenges that are harming the grassland ecosystem, and write three of them on the “Conservation Fail” cards.

[Nature Conservancy Canada](#)
[Alberta Wilderness Association](#)
[A Wider Vision for Grassland Conservation](#)

[Grasslands National Park Conservation](#)
[Birds Canada Conservation Incentive Guide](#)

Example Cards:



CONSERVATION WIN

In the year 2000, Nature Saskatchewan partnered with landowners to create a Habitat Enhancement Program for burrowing owls, Sprague’s pipit, and the piping plover! This initiative aims to enlarge pastures and reduce fragmentation through the seeding of native plant species, as well as use wildlife-friendly fencing on pastures.

MOVE FORWARD 1



CONSERVATION FAIL

The ongoing loss of grassland habitats has resulted in a 50% population decrease for the Baird’s sparrow, who relies on the Canadian grassland as a breeding ground.

MOVE BACK 3



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CAREER CARDS

We know that cattle ranchers play a critical role in the conservation of grassland ecosystems. There are countless other careers involved in supporting the health and production of beef cattle, as well as the maintenance and conservation of the grasslands themselves. These cards will highlight some of those careers.

1. Use the [thinkAG website](#) to explore some of the careers in agriculture, focusing specifically on those careers that could relate to beef production and grassland conservation (career profiles can be found within the six Holland Codes eg. Build, Help Create).
2. You will create three multiple choice questions that will quiz your fellow players about what some of these careers entail. These questions should be structured: "Which career includes tasks such as...". Reference the "In a Nutshell" and "Job Requirements and Duties" sections to find three tasks of each career, and write them on the Career Cards provided.
3. Along with the correct answer, you'll choose two other incorrect multiple choice career options for players to choose from.
4. Write all three multiple choice answers on the blank Career Cards. Make sure to shade in the correct answer at the bottom of the card.

Example Card:



CAREER CARD

Which career includes these 3 tasks:

- *Collect data and write reports on research and analysis*
- *Influence political issues and raise public awareness on different topics.*
- *Review agricultural policies that impact Canadians*

a) Policy Analyst

b) Agriculture Lab Technician

c) Irrigation Technician

CORRECT [move forward 1] INCORRECT [move back 3]

Shade in the correct answer!

Game Play:

Before you play

1. Fill out all three sets of cards (Species Cards, Conservation Cards, and Career Cards) with information gathered from internet research.
2. Get into groups of 3-4. As a group, combine your completed cards into 3 piles (Species Card Pile, Conservation Card Pile, and Career Card pile) and shuffle each pile.
3. Each player chooses a classroom material as their playing piece (eg. an eraser, paper clip, etc).
4. Put your game pieces on the START tile. You are ready to play Guardians of the Grasslands: The Game!

Playing the game

1. The player wearing the most colourful shirt starts the game. After they've completed their turn, the turn passes to the left.
2. Roll the dice and move your game piece the correct number of rock tiles. The four types of rock tiles you might land on are: Species, Conservation, Career, or blank.
3. Based on what type of rock tile you land on, the player to your left will pick up the resulting card and read the question out loud.
 - a. If it is a Species or Career card, they will read the question followed by the multiple choice options. Once you answer the question, you will move your game piece forward or backwards depending if you answered correctly or incorrectly according to the directions at the bottom of the card.
 - b. If it is a Conservation card, they will read out the Conservation Win or Fail, and you will move your piece forward or backwards according to the directions at the bottom of the card.
 - c. If you land on a blank rock tile, do not draw a card. The turn simply passes to the left.
4. The first person that makes it to the END tile wins the game!



SPECIES CARD

Which grassland species...

-
- a) _____
 - b) _____
 - c) _____

CORRECT [move forward 1] INCORRECT [move back 3]



SPECIES CARD

Which grassland species...

-
- a) _____
 - b) _____
 - c) _____

CORRECT [move forward 1] INCORRECT [move back 3]



SPECIES CARD

Which grassland species...

-
- a) _____
 - b) _____
 - c) _____

CORRECT [move forward 1] INCORRECT [move back 3]



SPECIES CARD

Which grassland species...

-
- a) _____
 - b) _____
 - c) _____

CORRECT [move forward 1] INCORRECT [move back 3]



SPECIES CARD

Which grassland species...

-
- a) _____
 - b) _____
 - c) _____

CORRECT [move forward 1] INCORRECT [move back 3]



SPECIES CARD

Which grassland species...

-
- a) _____
 - b) _____
 - c) _____

CORRECT [move forward 1] INCORRECT [move back 3]





CONSERVATION WIN

MOVE FORWARD 1



CONSERVATION WIN

MOVE FORWARD 1



CONSERVATION WIN

MOVE FORWARD 1



CONSERVATION FAIL

MOVE BACK 3



CONSERVATION FAIL

MOVE BACK 3



CONSERVATION FAIL

MOVE BACK 3



CAREER CARD

Which career includes these 3 tasks:

-
- a) _____
- b) _____
- c) _____

CORRECT [move forward 1] INCORRECT [move back 3]



CAREER CARD

Which career includes these 3 tasks:

-
- a) _____
- b) _____
- c) _____

CORRECT [move forward 1] INCORRECT [move back 3]



CAREER CARD

Which career includes these 3 tasks:

-
- a) _____
- b) _____
- c) _____

CORRECT [move forward 1] INCORRECT [move back 3]



CAREER CARD

Which career includes these 3 tasks:

-
- a) _____
- b) _____
- c) _____

CORRECT [move forward 1] INCORRECT [move back 3]



CAREER CARD

Which career includes these 3 tasks:

-
- a) _____
- b) _____
- c) _____

CORRECT [move forward 1] INCORRECT [move back 3]



CAREER CARD

Which career includes these 3 tasks:

-
- a) _____
- b) _____
- c) _____

CORRECT [move forward 1] INCORRECT [move back 3]



START

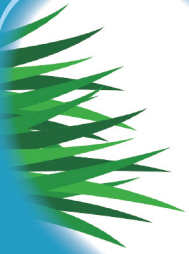


GUARDIANS OF THE GRASSLANDS

in the Classroom



FINISH





Before Viewing

Answer Key

1. The coral reef and rainforest ecosystems are being damaged by human activity. Why do you think these ecosystems are important? Describe any initiatives that you know of that are meant to help protect these ecosystems. Where did you learn about these programs?

Student responses may vary.

2. There is a lot of information out there about the impact of cattle on the environment. Describe some of the things you know or have heard about the impact of cattle on the environment.

Student responses may vary.

Shade in the correct answer!

- | | TRUE | or | FALSE |
|--|----------------------------------|----|----------------------------------|
| 3. The Amazon Rainforest is the most endangered ecosystem in the world. | <input type="radio"/> | | <input checked="" type="radio"/> |
| 4. Western Canada has less than 25% of native grasslands left. | <input checked="" type="radio"/> | | <input type="radio"/> |
| 5. The Canadian beef industry practices sustainability and conservation efforts. | <input checked="" type="radio"/> | | <input type="radio"/> |
| 6. Cattle only eat grain and hay from harvested crops. | <input type="radio"/> | | <input checked="" type="radio"/> |
| 7. Pastures do not need to be reseeded after cows graze. | <input checked="" type="radio"/> | | <input type="radio"/> |
| 8. Saskatchewan does not allow cattle to graze on protected grasslands. | <input type="radio"/> | | <input checked="" type="radio"/> |
| 9. Cattle grazing can help conserve grassland ecosystems. | <input checked="" type="radio"/> | | <input type="radio"/> |

During Viewing

Answer Key

1. The grasslands are considered a carbon sink. How much carbon is sequestered in a 65,000 acre grassland ranch?

2 million tonnes

2. What is topsoil and what role does it play in maintaining the health of the grassland ecosystem?

Topsoil is the top layer of soil, where plants grow. Topsoil is the conversion of inorganic, dead, rock and silt and sand into a “dark black life” (organic matter).

3. Cattle act as a keystone grazing species to clear the top growth of grass on the grasslands. Why is this important for the health of the ecosystem?

The prairies need grazers. Without grazers, there is a devastating impact on the natural development cycle of the grass. In the fall, the top growth of grasses dies, but the root in the soil keeps growing. If the dead top growth is not removed in the spring, it is more difficult for new growth to grow up through it, which results in the grass smothering itself. The grazers help to remove the dead growth so that the grass can start growing again in the spring.

4. What happened in Grasslands National Park when authorities planned for grasslands conservation that did not include grazers, and cattle were removed from the park’s native grasslands?

The grasslands lost its biodiversity and crested wheatgrass began to take over. This impacted wildflowers, pollinators and the homes of native birds that nest in native grasses.

5. What is a keystone species?

A species that many other species in the ecosystem rely on to the extent that if it was removed from the ecosystem, the system would change drastically.



GUARDIANS OF THE GRASSLANDS

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After Viewing

Answer Key

- | | TRUE | | FALSE |
|---|----------------------------------|----|----------------------------------|
| 1. Canada and the U.S. have lost more natural grassland than the Brazilian Amazon has lost rainforest. | <input checked="" type="radio"/> | or | <input type="radio"/> |
| 2. 50% of Canada's natural grasslands have been converted for agricultural use, urban development, and roads. | <input type="radio"/> | or | <input checked="" type="radio"/> |
| 3. Native prairie grasses store carbon in their extensive root systems. | <input checked="" type="radio"/> | or | <input type="radio"/> |
| 4. Land that is cultivated for crop use and then seeded back to grass will return to original grassland after 15 years. | <input type="radio"/> | or | <input checked="" type="radio"/> |
| 5. Grazing cattle on grasslands protects the endangered ecosystem and mimics how bison once roamed the prairies. | <input checked="" type="radio"/> | or | <input type="radio"/> |

6. What are some plant and animal species that are found in Canada's grasslands?

Crested wheatgrass, spear grass, blue gramma grass, deer, elk, grizzly bears, worms, bison, burrowing owl, black-tailed prairie dog, swift fox, prairie snake, etc.

7. Look back to the True or False questions you answered before watching the documentary. Would you change any of your answers now that you've watched it? Which ones and why?

Student responses may vary.

Did you know?

Topsoil is created when inorganic rock, silt, sand, and minerals are mixed with dead organic material called humus and billions of living microscopic organisms.

8. Explain what carbon sequestration is in 2-3 sentences.

Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide. This is one method of reducing the amount of carbon dioxide in the atmosphere. Grasses and other plants sequester carbon dioxide, which is beneficial to the environment because carbon dioxide in the atmosphere is a cause of global warming.

9. List three positive environmental impacts of cattle highlighted in the documentary. Compare these to any preconceptions you might have on this topic.

The mainstream/popular narrative surrounding cattle and the environment is that cattle contribute to climate change (due to their methane emissions) and the destruction of the rainforest (rainforests being clearcut for cattle farming). The positive environmental impacts cattle have is that they graze the grasslands, removing dead grass species and allowing different types of plants to grow and compete, leading to bio-rich communities in the grasslands.

10. Research and describe some of the environmental services or benefits provided by healthy grassland ecosystems.

Carbon sequestration, cultural significance to Indigenous peoples and settlers, help mitigate flooding, are a habitat for many types of wildlife, maintain soil stability, prevent soil erosion, and feed wildlife/livestock.

11. The Canadian grasslands ecosystem has had a complicated history with human management. How do you think the management of this ecosystem might have differed between the Indigenous peoples, European settlers, and Canadians today?

The Indigenous peoples managed the grasslands by not overhunting the herds of bison that were a keystone species of the grasslands at this time. European settlers came and overhunted these bison, began to use cattle. Canadians today also use cattle and the few bison that have been reintroduced to the area.



GUARDIANS OF THE GRASSLANDS

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Online Scavenger Hunt



Scan for
lesson
materials

Answer Key

1. Start on the [Guardians of the Grasslands website](#).
2. Find the article '[Why Canada's prairies are the world's most endangered ecosystem](#)'. Read the article and answer the questions below:
 - a. What percentage of the world does temperate grassland cover? 89%
 - b. Why are grasslands critical to an environment that does not receive a lot of precipitation?
Grasslands are critical for allowing water to infiltrate into the ground, providing base flow to rivers and streams, and holding water during floods.
3. Follow the 'plains bison' [hyperlink](#) to the Nature Conservancy Canada (NCC) website.
 - a. What was the estimated number of bison in Canada in the early 1800s? 60 million
 - b. Due to over hunting, what has the number of bison decreased to? 300
4. What protected grassland area is mentioned in the article 'Why Canada's prairies are the world's most endangered ecosystem' and the NCC's page on Plains Bison?
Old Man on His Back Prairie and Heritage Conservation Area

Did you know?

There can be over 100 different plant species in a 5 acre radius – the size of 4 and a half football fields.

5. Once you have found the protected grassland area from the previous question, follow either of those hyperlinks to the NCC's page and answer the following questions:
- How many acres is the protected grassland area? 13,088 acres
 - One acre is the same size as 16 tennis courts! How many tennis courts would the area be? 209,408 tennis courts
 - What are the two main factors for the disappearance of mixed prairie grassland?
settlement and conversion to cropland
6. Continue to read through the article, then open this pdf: 'Beef's place in a healthy environment' and answer the following questions:
- Much of the land used for the production of cattle is marginal land. What is marginal land and why is it a great fit for raising cattle?
Soil quality, moisture, growing season, and other limitations make this land unable to sustain annual field crops. Native and tame perennial grasses and other forages can thrive on these lands if they are grazed moderately and consistently. Raising cattle on marginal land allows us to raise food where we otherwise wouldn't be able to using feed that cannot be utilized by humans.
 - What percent of pasture land that is used for raising cattle is not suited for crop production? 85%

Did you know?

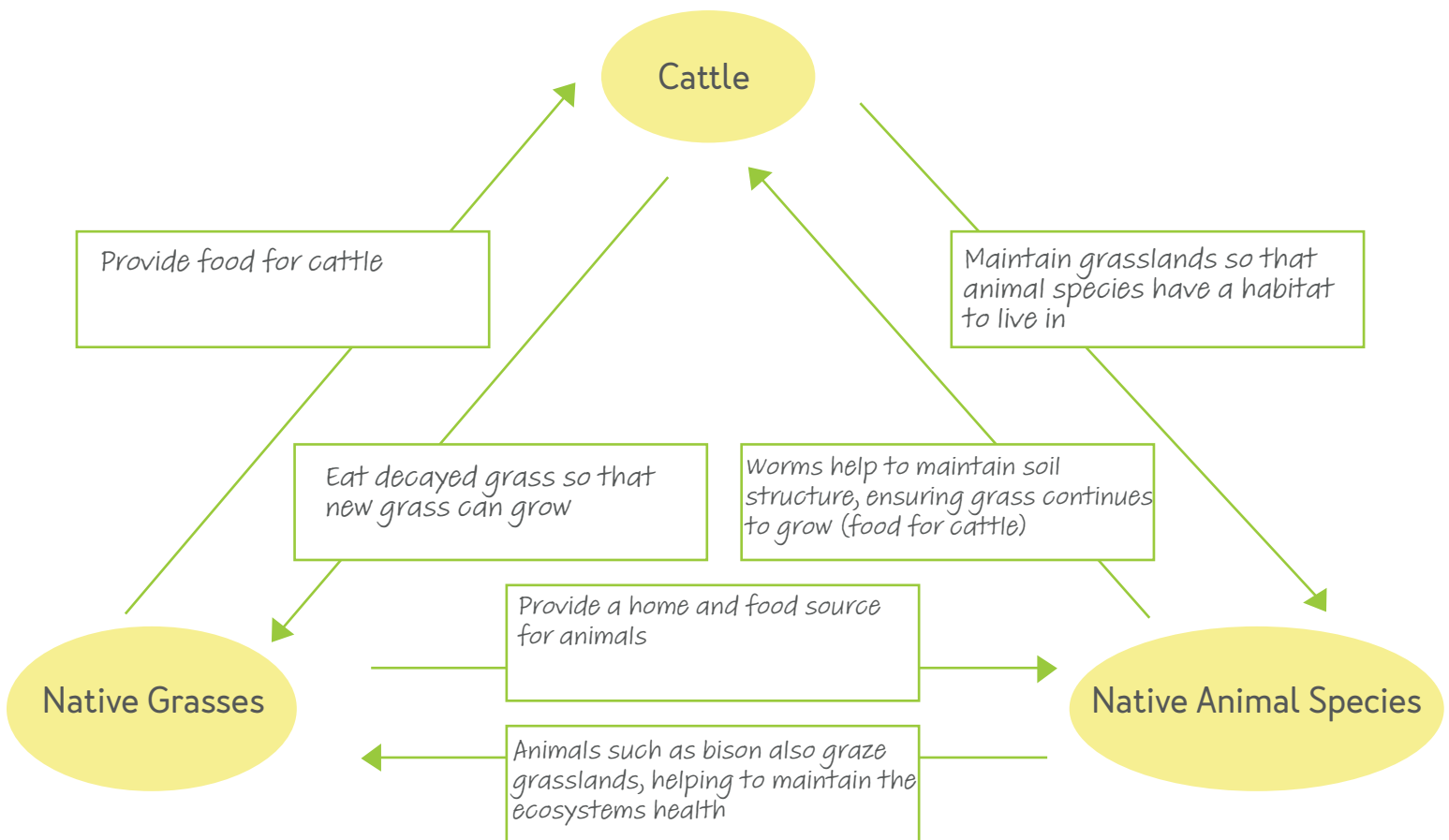
There's more than 80% of Canada's species at risk that depend on grassland.



GUARDIANS OF THE GRASSLANDS

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7. There are many symbiotic relationships in the grassland ecosystem. This refers to relationships in which the existence of one species benefits another.
- a. Find the Canadian Geographic article on [‘How cattle ranching can help preserve species at risk in Canada’s grasslands’](#). Once you’ve read it, fill out the graphic organizer below to outline the various symbiotic relationships between cattle, native grasses, and native animal species. Include as many ways as you can think of that demonstrate how these different species allow each other to thrive in the Canadian Grassland ecosystem. Use information from all the articles you read today.



8. What type of symbiotic relationship does this diagram represent?

- a) Parasitism: one species benefits, the other is harmed
- b) Mutualism: both species benefit
- c) Commensalism: one species benefits, the other is unaffected

Shade in the correct answer!

