GRADE 7 SCIENCE:

FIRST NATIONS KNOWLEDGE OF BIODIVERSITY AND CLIMATE CHANGE

ILLUSTRATED BY VIOLET GATENSBY, 2022.

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SOUTHERN LAKES CARIBOU IN THE SCHOOLS:

A COMMUNITY-BASED LEARNING RESOURCE

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 This publication is designed to provide local Indigenous Knowledge and Western scientific information in regard to the Southern Lakes Caribou. Please consult with local Elders, Knowledge Holders and community experts whenever possible.

Southern Lakes Caribou in the Schools: your local Southern Lakes Yukon First Nation Community Booklet or Southern Lakes Caribou in the Schools: Learning Resource

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GRADE 7 SCIENCE:

FIRST NATIONS KNOWLEDGE OF BIODIVERSITY AND CLIMATE CHANGE

BIG IDEAS

- Evolution by natural selection provides an explanation for the diversity and survival of living things
- Earth and its climate have changed over geological time

CONTENT	CURRICULAR COMPETENCIES
• Organisms have evolved over time • Survival needs • Natural selection • Yukon First Nations knowledge of changes in biodiversity over time • Evidence of climate change • Geological time and the recent impacts of humans (physical records and local Yukon First Nations knowledge of climate change)	Processing and analyzing data and information • Experience and interpret the local environment • Apply First Nations perspectives on Ways of Knowing, Doing and Being as sources of information Applying and innovating • Contribute to care for self, others, community and world through personal or collaborative approaches

LEARNING TARGETS

1. I am able to experience the local environment, and interpret how survival needs impact Southern Lakes Caribou populations.
2. I am able to utilize First Nations knowledge sources to understand changes in biodiversity over time.
3. I am able to contribute to care for self, others, community and world through collaborative approaches to understanding and reducing the effects of climate change.

PRIOR LEARNINGS

Prior to teaching the following activities and games, it would be helpful if the students had a basic overview of Southern Lakes Caribou seasonal movement and seasonal rounds. Some helpful resources are listed below.

- *Caribou in the Schools: Community Booklet (for your community)*
- Vitello, C. (2021, June 21). *Yukon and B.C. First Nations Initiatives Tackle Climate Change.* The Environment Journal. https://environmentjournal.ca/yukon-and-northern-bc-first-nations-initiatives-tackle-climate-change/

PART 1: OPENING CIRCLE AND KNOWLEDGE WEB

LEARNING TARGET:

I am able to experience the local environment and interpret how survival needs impact Southern Lakes Caribou populations.

MATERIALS

- **Chalkboard/whiteboard or large paper and writing tools**
- **Two ropes or four cones**
- **Climate change cards printed and cut out (Appendix 3C):**
  - **Red cards (increase in temperature):**
    - Plant growth: more food
    - Early blooming: less food
    - Melting permafrost: lack of shelter
    - Shift in vegetation zones: less space available
  - **Blue cards (increase of precipitation):**
    - Plant growth: more food
    - Heavy snowfall/deep snow: lack of access to food
    - Heavy rainfall: higher water levels
    - Spring and summer snowmelt: flooding
- **Community Booklet (for your community)**

TIME: ~60 MINUTES

OPENING: KNOWLEDGE WEB

Gather in a circle (outside, if weather permits) and begin by discussing changes in the seasons that students have observed in their environment/surroundings. Record their observations and reasons behind their statements to create a knowledge web. On a large piece of paper or a white/chalkboard with the title “Climatic Changes”, write down subtitles where comments will be organized by categories (food, water, shelter and space). Highlight the important connections between all organisms in a natural environment in relation to Caribou and how the fluctuation or changes in climate affect their survival.

ASK STUDENTS

- Have you noticed any changes in the seasons in recent years?

Share ideas.

Give students a chance to reflect and share their observations before giving guidance. Be more specific with ideas such as the change in temperature, difference in the amount of precipitation and how there have been more forest fires or flooding due to higher temperatures.

ASK STUDENTS

- Why are we seeing higher temperatures than ever before? (Due to a rise in greenhouse gases and a higher concentration of heat within the earth's atmosphere.)
- What factors are at play? (Compare the greenhouse gas effect to an actual greenhouse which holds in the heat from the sun's rays to keep plants warm. The earth's atmosphere has an outer ring of greenhouse gases which creates the same effect- it traps solar heat. Human activity is increasing greenhouse gases at an alarming rate through the oil and gas industry, power in automobiles and in our homes, gases produced through sewage treatment plants and chemicals used in products such as aerosols. These are just a few examples of how humans are releasing more carbon dioxide into the atmosphere.)
- What is climate change? (Changes in temperature and weather patterns.)
- Why is the impact of climate change important to discuss and understand? (All living organisms on our planet are affected by climate change, including the SLC. The SLC are at risk due to the warmer temperatures which have also affected precipitation levels and, in turn, affected their habitat, seasonal movement patterns, reproduction levels and much more.)

Highlight the web of knowledge recorded by blue (precipitation) and red (temperature) and share with students the climate change cards that will be used in the outdoor game.

ACTIVITY 1: OH DEER

Prep: Cut climate change cards for extended rounds.

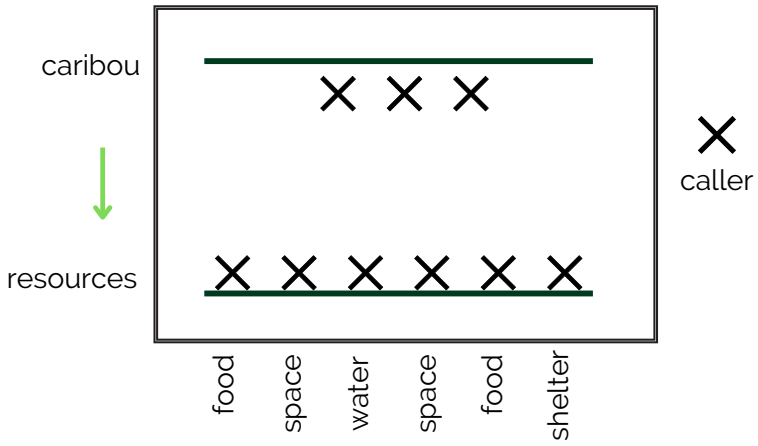
Head outside with the group into a large open play area with few obstacles. Place two ropes or cones parallel, ten to twenty feet apart, marking the play area. Students will all line up side by side and will be numbered from one to five (repeated until reaching the end of the line of students). It is essential that educators consider whether numbering students is appropriate, as it may be a trigger point for students or adults participating. Consider only naming the players rather than using numbers.

Share the numbered system and gestures as follows:

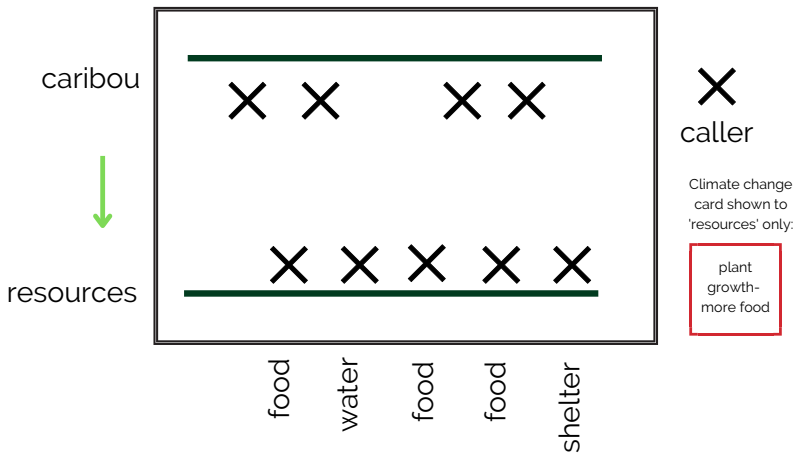
1. Woodland Caribou: they will choose which component they will look for
2. Food (shrubs/ lichen): hand over their belly
3. Water (rain and snow): hand over mouth
4. Shelter (esker or tree line): hands above head as a roof
5. Space (mountains, forests, grasslands): arms out to the side

Each player that represents number one/ Caribou will go to the opposite parallel line

Round 1



Round 2



Climate change card shown to 'resources' only:

plant growth- more food

while all other players will stay where they are to represent two to five/food, water, shelter and space.

Round 1: All players will begin on their line with their backs facing inward so as not to see which gesture the opposite players are holding. Give the Caribou a moment to make the gesture they would like to be in search of during this round while the other players will make the gesture that represents their component. On the count of three, each player will turn their body inward and reveal their gesture.

The Caribou will begin to move towards the opposite players who will stay on their line. Whatever gesture a Caribou has made, they will hold that while they head towards a player showing that same gesture. The first Caribou to get to the corresponding player will succeed in getting that component and take that player with them to become a Caribou. Any players left from two to five who were not matched with a Caribou will stay on their line to continue the next round.

Record the data from this round: how many players became Caribou and what component they represented beforehand.

EXTENSIONS

- Introduce the habitat impact cards due to climate change. Mix up the cards and choose one at random for the following round. For example, more food due to warmer temperatures—the players representing food will stay as that while players three to five can choose to change their component to food to represent an increase. Less food due to deep snow—players who were food will have a chance to change to one of the other components to show the effects of climate change.
- Continue rounds of the game while using different impacts due to climate change and be sure to record the data for students to discuss after or to graph as a visual representation of the effects on Caribou.

CLOSING

Discuss the rounds of the game and how they represent one year of a Caribou's life. Go over the collected data and shared thoughts from the group.

ASK STUDENTS

- What do animals need to survive?
- What impacts affected the survival rates of Caribou during the game?
- Do these factors also affect other wildlife and plantlife?

ASSESSMENT OPPORTUNITIES

Are students able to:

- Reflect on the effects of climate change in relation to the SLC?
- Group the effects of climate change based on the types of impacts they have?
- Describe what an animal's fundamental needs are for survival?

PART 2: CHANGES IN BIODIVERSITY

LEARNING TARGET:

I am able to utilize First Nations knowledge sources to understand changes in biodiversity over time.

MATERIALS

- **Four large pieces of paper or poster board with the questions written on them**
- **Paper and writing tools (optional)**
- **Collected nature pieces or other art supplies (optional)**
- **Community Booklet (for your community)**

TIME: ~60 MINUTES

OPENING: DRAWING ON OUR STORIES

Gather in a circle. Invite an Elder or Traditional Knowledge Holder to share stories about Yukon First Nations ways of Knowing, Doing and Being related to culture, language and nature. Invite students to share their connections with nature as well and leave space for questions and further discussions with the guest as needed.

ASK STUDENTS

- What is biodiversity? (Biodiversity comes from the Greek word 'bio' meaning life and the Latine word 'diversitas' meaning variety or difference. The whole word together means a variety of life.)
- How is biodiversity measured? (All species are linked in a phylogeny, a historical way of being grouped together depending on their relationships. This can also be seen through a tree of life, through respect for all organisms, care for the land and waterways, care for each other and the sharing of knowledge.
- How are Caribou affected by climate change? (With heavier snowfalls, it makes it harder for Caribou to dig for their food underneath. Caribou are also affected by the snowmelt and levels of water- if there is a flood, this will affect their travel routes and feeding grounds. These are just two examples.)
- What is being done to protect biodiversity? (An increase of greenhouse gases is causing floods, fires, extreme temperatures, droughts, and a loss of biodiversity. We need to consider how we can protect wetlands, grasslands, coastal regions, and forests. Stewardship initiatives and raising awareness is a good place to start.)

ACTIVITY 1: FOUR CORNERS

Prep: Write out each of the 4 questions on the large papers and place them in the 4 areas/ corners being used. Take students outside if the weather permits; alternatively this activity could be done in the classroom or gymnasium. Students will be a part of a group activity where they will be deepening their understanding of conservation by recognizing the role that Yukon First Nations have in caring for plants and animals as well as their role as stewards for the land and waterways. Highlight that historically, Yukon First Nations were not consulted when their Traditional Land was used for new purposes. It is of high importance that we as a society acknowledge their connections to the land as a step in Truth and Reconciliation.

There will be four questions posted on a big paper/poster board, one in each of the four corners of the space being used for this

activity. Read through the four questions and share that students will be choosing which corner they would like to focus on answering.

1. Why are weather patterns becoming less predictable?
2. Why and how are Caribou adapting to the changes in climate?
3. How are traditional seasonal practices affected by climate change?
4. How can we best prepare for continuous changes in the framework of biodiversity?

Each student will then go to the corner that represents the question that speaks to them either because they want to know more about its answer or perhaps because they know information related to that question already. Once each student has found their corner, they will pair up or as a whole group they will discuss the reasons for choosing that question. Students will spend time listening to each other and responding to what they heard while attempting to answer the question at hand.

CLOSING

After ten to fifteen minutes, have each group share with the rest of the class what they heard and how they feel about the particular question.

EXTENSIONS

- Have students consider their role in the effects of climate change and create a commitment to changing behaviour that can make a difference in relation to the SLC population. Consider sharing these commitments with the broader school community through audio (shared at announcements/assemblies) or visuals (posters in the school or community/ postcards or stickers).
- Students could create a gathering around sharing their commitments and invite other students or classes to do the same.

ACTIVITY 2: CAMOUFLAGE

Invite students outside to a play area that has obstacles for hiding behind, for example, trees, boulders and small hills. Discuss the benefits of animal adaptations which will allow them to survive by looking like their surroundings/environment. Camouflage empowers animals to hide from predators or to sneak up on prey.

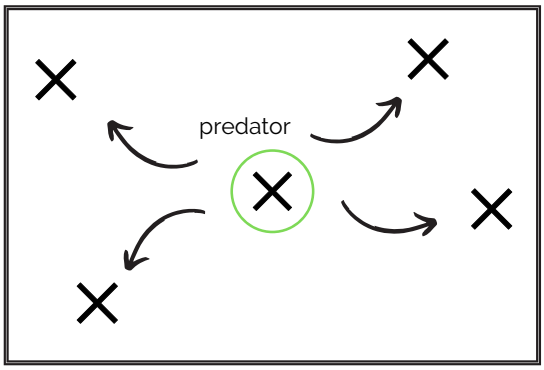
ASK STUDENTS

- What adaptations do Caribou have? (Caribou have fur that is darker or lighter in colour depending on the season, helping them stay hidden from predators while they eat or during calving season.)
- How do Caribou protect themselves? (They have large hooves that allow them to walk across frozen water or dig deep in the snow to find food. They are very good at hiding from predators, especially when they are digesting their food, by laying low in wooded or shrubbed areas.)
- How do the Caribou seasonal movements and changes through the seasons help them survive? (They movement patterns help them find food or find habitat havens depending on the time of year. For example, Caribou travel to higher elevations in the warmer months to avoid nagging insect bites.)

ASK STUDENTS

- What do our surroundings look like for this game: what do you observe?
- How might this area be beneficial for a Caribou to hide and camouflage from a predator?

Share ideas.



To begin the game, students will be the Caribou while one person is the predator. The predator's role is to stay in one spot, not moving their feet, but they can turn around and look high or low. The predator will have their eyes closed and the Caribou will begin by gently tapping the predator on the shoulder before running to find a hiding spot. The Caribou will have twenty-five seconds to find a good place where they will not be seen by the predator. Once the predator has counted to twenty-five, they will open their eyes and begin to carefully look for any signs of Caribou in the area. If the predator spots a Caribou, they call out that Caribou/student's name: "I see… behind the…" Any Caribou that are spotted must join the predator without giving away any details of where the others are hiding.

The game continues like this, each round giving the Caribou less time to hide (five seconds less per round). The Caribou must come out of their hiding to find food and water before finding a new hiding spot. When the predator(s) close their eyes and shout, "food and water in, 1, 2…" the hiding Caribou know that they are safe to run out and gently tap the predator on the shoulder before quickly finding their habitat haven.

Notes:

- A tree or a rock could be the spot that the Caribou tag, versus tagging a person as it can be overwhelming to have many people tap your shoulder while your eyes are closed.
- The Caribou who become predators are allowed to help look for Caribou from the same location as the main predator but they must also close their eyes for the counting moments, to give the Caribou a fair chance in searching for food and water.
- When the predator(s) have had a chance to look for one to two minutes, they should close their eyes and continue counting. Encourage them to call for food and water reminding them that this will tire the Caribou out and they may not be able to find another hiding spot in time so ultimately it is in the predator's best interest to not leave the looking for too long.

When all of the Caribou have been spotted or they run out of time to hide, the game ends.

EXTENSIONS

- Consider the season/surroundings in which you are playing and use seasonal camouflage (white suits for snow, camo for spring).
- Consider using coloured clothing that will match the environment or have students dress similar in colour to the Caribou to help them better camouflage.
- Include adaptations to the game. For example, introduce a flood which closes off an entire area for the Caribou to hide. Consider using flagging tape to mark off the areas that are not available due to effects of climate change.

ASSESSMENT OPPORTUNITIES

Are students able to:

- Connect changing weather patterns to climate change?
- Reflect on traditional practices in relation to SLC?
- Notice seasonal adaptations that Caribou use for survival in the face of climate change?

PART 3: INVESTIGATING CARIBOU COLLARS

LEARNING TARGET:

I am able to contribute to care for self, others, community and world through collaborative approaches to understanding and reducing the effects of climate change.

MATERIALS

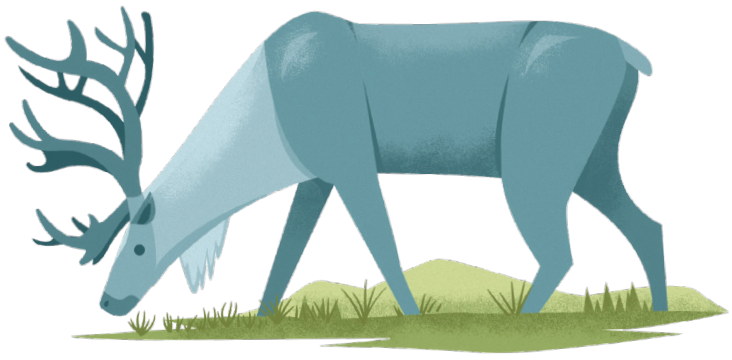
- **Ropes (optional)**
- **Found nature items to be collected during the activity**
- **Flagging tape (optional)**
- **Coloured blocks and/or cones (optional)**
- **Pictures of the collars used printed (Appendix 3D)**
- **Tokens printed and cut out (Appendix 3E)**
    - Harvest: to be placed where you would harvest Caribou
    - Protection: to be placed where Caribou need protecting
- **Six cards/pages outlining the perspectives (colours in Dän'ke, Kwanlin Dün First Nation) The De Bono Group- Six Thinking Hats[13] (Appendix 4A):**
    - **däk'äl/white:** information that is known or needed (facts)
    - **dätthäw/yellow:** bright optimism (positive outlook for benefits and values)
    - **jänǎch'ür/black:** risk management (difficulties to overcome, problems at hand)
    - **dät'äl/red:** feelings and hunches (emotions, feelings, likes, dislikes)
    - **jänńtl'ą̈r/green:** creativity and possibilities (new ideas, alternatives)
    - **jänńtl'ą̈rą/blue:** thinking process (the process of observing these six perspectives)
- **Community Booklet (for your community)**

TIME: ~60 MINUTES

PART 1: SIX THINKING HATS

Place students into small groups to represent each of the six perspectives. Allow groups to read or listen to the information provided about their perspective, and encourage students to start to think of themselves within the role.

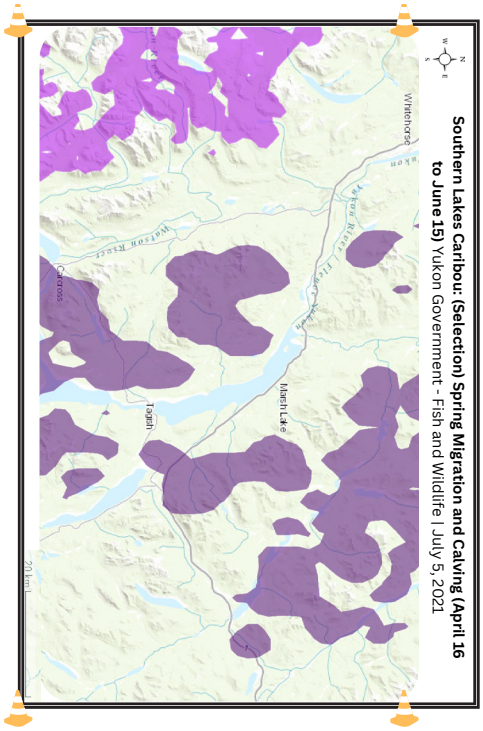
Once each group member has an understanding of the perspective they are representing (through one-on-one, small or large group discussion and research) have groups draw or design a symbol, logo, prop or icon to represent their group. This symbol should communicate the group's values and interests to other groups. **Note:** This could be a simple five minute activity, or a longer process to design a polished final symbol. Have each group display their symbol for the rest of the groups to see (e.g., on the board).



13 *Six Thinking Hats – De Bono Group.* (n.d.). https://www.debonogroup.com/services/core-programs/six-thinking-hats/.

PART 2: INTRO TO COLLARING AND MAPPING

Give a short introduction to the process of collaring the **Woodland Mezi** (Dän'ke, Tàa'an Män dialect) and why this is an important step in the recovery process.



ASK STUDENTS

- What is the process of collaring a wild animal? (Collaring is done with the use of a net gun and a helicopter. The Caribou are monitored from the helicopter, cornered safely, then the helicopter will land so that the crew can gently tie their legs and cover their eyes to reduce stress before attaching the collar. This is a quick process-ten to twenty minutes- and it is of high priority to do the work in silence with respect to the Caribou and staff safety.)
- Why is this done? (Collars can track animal activity- their interactions within geological features of the land. The collars are designed to fall off after gathering data; usually this happens in the winter months.)
- How can data about the SLC be collected with the use of collaring? (The collars can take photos and videos, which will inform us about their habitat, diet, obstacles etc.)

Introduce the concept of collaring as a colonial and controversial concept. Consider how this perspective might have some weight to it- should humans be interacting with Caribou in such close proximities? Why or why not?

Introduce the map of the Southern Lakes District. Review it inside by giving each group a copy of it or by projecting the map on a whiteboard or wall. Have students identify the features that they see (roads, community, river, creeks, hiking route and wildlife habitat). Continue outside to complete the activity, or complete the next steps inside.

Head outdoors to a preselected forested area with space to build a larger scale (~ 5 feet x 15 feet) version of the map. Start by reviewing its features. Ask students to identify the features that they see (roads, river, creeks and hiking route).

Next, facilitate the building of the map on the forest floor. Place four cones or markers on the ground to give students a map boundary. Focusing on one feature at a time, give students the materials needed to build the map in large scale on the ground (e.g., two students can use one rope to create the map border, three students can use another colour of rope for the river/creeks, four students can use blocks or another rope for the roads and hiking trails, and individual students can use coloured blocks or figures to mark the nests/dens).

Once the map is built, give students time (10-15 minutes) to look at the map, and decide where they will place their groups' three harvest tokens and three protection tokens. During this time you, Elders or Traditional Knowledge Holders and other visitors/resource people move from group to group to ask guiding/clarifying questions, and provide feedback on the decisions being made. After the time has elapsed, each group receives their tokens and is given ten plus minutes to place their tokens on the map.

CLOSING: REVIEWING PERSPECTIVES

When each of the groups have placed their tokens, then you and/or any visitors may now take on the role of a Yukon forester reflecting on the input from each perspective group. Foresters receive input from many perspective groups, work to understand the values and concerns of each group and aim to make forest management decisions that benefit the local community.

ACTIVITY: SPENDING TIME WITH ELDERS

Gather in a circle. Invite the students to acknowledge the Yukon First Nations Traditional Territory that the activity is taking place on. If they are present, introduce and welcome the visiting Elder or visitor. Go around the circle and have students introduce themselves.

Invite the visiting Elder or visitor to share their story about the SLC and the SLCRP. Ensure time for students to ask questions.

One or more students can present the guest with a homemade card and gift (craft made by students or wild-harvested flowers) to show gratitude for the time and/or teachings shared with the students.

If an Elder is not present, ask the students if they know of any Elders in their communities or lives that are important to them. Invite students to share any teachings they have learned about how to treat Caribou and how to act when out on the land related to Yukon First Nations Ways of Knowing, Doing and Being (e.g., sustainable or respectful harvesting practices, respect for the land, waters and seasonal activities).

ASK GROUPS

- Why did you choose to place your harvest token(s) where you did?
- Why did you choose to place your protect token(s) where you did?
- What changes (if any) would your group make after seeing the placement of tokens by other groups?
- If you could move any token(s) from another group, which would you move and why?

ASK STUDENTS

- Are there any patterns/commonalities in the placement of the tokens?
- Are there any conflicting areas (where harvest and protect tokens have been placed together)? If so, what could be done to find a common solution or compromise?

EXTENSIONS

- Before dismantling the map, you may choose to photograph the final map and/or have groups draw the placement of their group's tokens on their copy of the map for use in extension or follow-up activities (below).
- Create mixed groups of six students (each from a different perspective group). These mixed groups work to come to a decision on the final area to be opened for timber harvest. The groups present their final plan to the class, and hear the plans made by the other mixed groups.

ASSESSMENT OPPORTUNITIES

Are students able to:

- Make inferences on the beliefs, values and motivations of other local perspectives?
- State a reason for the placement of a harvest token? A protection token?
- Ask a question about the token placement of another group?

ASSESSMENT

GRADE 7 SCIENCE: FIRST NATIONS KNOWLEDGE OF BIODIVERSITY AND CLIMATE CHANGE

Formative and self-assessment opportunities are listed throughout the activity plans. The rubric below can be used or adapted as necessary for summative assessment. It may be used to assess the learning targets set out on the previous pages.

ASSESSMENT FRAMEWORK	1 EMERGING	2 DEVELOPING	3 PROFICIENT	4 EXTENDING
PART 1: I am able to experience the local environment, and interpret how survival needs impact SLC populations.	Is not aware of the effects of Climate Change and shows little awareness of how this affects the SLC in relation to habitat and their needs	Is aware of the effects of Climate Change and can show some links between how this affects the SLC, their habitat and needs for survival	Forms well constructed reflections about Climate Change including clear examples or the effects on the SLC's habitat and survival needs	Forms detailed reflections about Climate Change and the effects on the SLC with clear ideas and connections made to their habitat and fundamental needs for survival
PART 2: I am able to utilize Yukon First Nations knowledge sources to understand changes in biodiversity over time.	Not yet able to communicate aspects of biodiversity and the role of the SLC. Not showing an understanding of Yukon First Nations knowledge in relation to the land	Some communication is provided about biodiversity and links to the SLC. Showing some understanding of Yukon First Nations knowledge with some guidance	Provided clear ideas in reflecting on the concept of biodiversity and how it links to Yukon First Nations thoughts in relation to the SLC	Clearly assimilated the concept of biodiversity, the important role that the SLC have in relation to the land and Yukon First Nations sources of information
PART 3: I am able to contribute to care for self, others, community and world through collaborative approaches to understanding and reducing the effects of climate change.	May have little to no reflections about their role in understanding the effects of climate change. No questions were formed in relation to the Elder/Traditional Knowledge Holder	Some evidence of personal reflection in connecting the SLCRP's collaring to the effects of climate change. Some questions were formed and asked with support in relation to the Elder/Traditional Knowledge Holder	Provided reflections on the collaring process of SLC while creating appropriate questions for Elders/Traditional Knowledge Holders	Significant links have been made to the collaring of the SLC and climate change. Respectfully asks detailed questions in relation to Yukon First Nations ideologies to the Elder/Traditional Knowledge Holder

REFERENCES - GRADE 7 SCIENCE

Six Thinking Hats – De Bono Group. (n.d.). https://www.debonogroup.com/services/core-programs/six-thinking-hats/.

NOTES

1. Yukon First Nations Resources for Teachers, Yukon Schools, 2021-2022, http://lss.yukonschools.ca/uploads/4/5/5/0/45508033/nto_booklet_2021-2022.pdf.

2. Beaumont & Edwards, retrieved 2022, An introduction to yukon first nations heritage along the yukon river, Yukon schools, p. 35, http://lss.yukonschools.ca/uploads/4/5/5/0/45508033/an_introduction_to_first_nations_heritage_along_the_yukon_river.pdf.

3. "Game: Migration Mishaps." *Green Teacher,* 8 Jan. 2015, https://greenteacher.com/game-migration-mishaps/.

4. Fish and Wildlife, 2021, Southern lakes caribou: Monitoring a recovering woodland caribou herd in yukon, Yukon government, https://storymaps.arcgis.com/stories/f37506914b3643bc919321a2bd53b628.

5. *Yukon wildlife by species.* (2023, March 30). Government of Yukon. https://yukon.ca/en/outdoor-recreation-and-wildlife/yukon-wildlife/yukon-wildlife-species.

6. Fish and Wildlife, 2021, Southern lakes caribou: Monitoring a recovering woodland caribou herd in yukon, Yukon government, https://storymaps.arcgis.com/stories/f37506914b3643bc919321a2bd53b628.

7. *Dákeyi — "Our Country" - Yukon Geographical Place Names Board.* (2018, November 21). Yukon Geographical Place Names Board. https://yukonplacenames.ca/dakeyi/ (Southern Tutchone).

8. Caribou. (n.d.). *Southern Lakes Caribou* |. https://southernlakescaribou.com/.

9. Rudyk, M. (2019, January 11). First Nations work together to monitor caribou, with camera traps, GPS and traditional knowledge. CBC. https://www.cbc.ca/news/canada/north/southern-lakes-caribou-yukon-first-nations-1.4975111.

10. On the Land Gathering- Proceedings: Caribou and Community-Based Fish and Wildlife Workplan. (2019, June 7-8). Carcross/Tagish Renewable Resources Council. https://www.ctrrc.ca/index.php/all-files-docman/documents/113-on-the-land-gathering-2019-report/file.

11. Department of Environment. (2018, April 5). *Southern Lakes caribou recovery: Composition surveys* [Video]. YouTube. https://www.youtube.com/watch?v=PzRXP5oWNws.

12. Frédéric.Arps.Blogs. (2016, January 31). Caribou. *Indigenous Winter Poem. Winter Solstice story telling! — complete now!* Awesome Poetry From All Over. https://poetryisjustawesome.com/2014/12/19/caribou-indigenous-winter-poem-winter-solstice-story-telling/.

13. *Six Thinking Hats – De Bono Group.* (n.d.). https://www.debonogroup.com/services/core-programs/six-thinking-hats/.

14. Corp, P. (2023, February 1). *Flooding extremes in Northern Canada are becoming the new normal - The Weather Network.* The Weather Network. https://www.theweathernetwork.com/en/news/climate/impacts/flooding-extremes-in-northern-canada-are-becoming-the-new-normal.

15. *Disclaimer for Hydrometric Information - Water Level and Flow - Environment Canada.* (2021, December 14) https://wateroffice.ec.gc.ca/report/real_time_e.html?stn=09AB004&mode=Graph&start-Date=2021-12-14&endDate=2021-12-21&prm1=46&prm2=5.

16. *Yukon state of the environment interim report 2021.* (2021, December 1). Government of Yukon https://yukon.ca/en/yukon-state-environment-interim-report-2021.

17. National Film Board of Canada. (1979). *Canada Vignettes: The Egg.* https://www.nfb.ca/film/canada_vignettes_the_egg/.

18. National Film Board of Canada. (1987). *Dancing Around the Table, Part One.* https://www.nfb.ca/film/dancing_around_the_table_1/.

19. CBC News: The National. (2019, July 2). *"Where are you from?" Many Canadians struggle with identity question* [Video]. YouTube. https://www.youtube.com/watch?v=OSKM6tQxRms.

20. CBC Kids News. (2021, September 27). *What is reconciliation? | CBC Kids News* [Video]. YouTube. https://www.youtube.com/watch?v=WEj5vjc2EDk.

21. Reed, Gienapp, & Visser, 2014, Density dependence and microevolution interactively determine effects of phenology mismatch on population dynamics.

22. Science-based guidelines for management of northern mountain caribou in yukon: Summary, 2016, Yukon.https://open.yukon.ca/sites/default/files/northern-mountain-caribou-guidelines-2016_0.pdf.

23. Kellogg Biological Station. Michigan State University. (2011). K-12 Partnership Lesson Plan: A Game of Selection… You Win or You Die. Exploring Evolution by Natural selection. https://kbsgk12project.kbs.msu.edu/wp-content/uploads/2015/10/A-game-of-selection-lesson-plan.pdf.

24. Frequently asked questions, 2014, Yukon land use planning council, https://planyukon.ca/faq/

25. Fish and Wildlife, 2021, Southern lakes caribou: Monitoring a recovering woodland caribou herd in yukon, Yukon government, https://storymaps.arcgis.com/stories/f37506914b3643bc919321a2bd53b628.

26. Reaching group consensus, 2010, Learn alberta: Alberta Education, https://www.learnalberta.ca/content/ssmt/html/docs/reachingagroupconsensus.pdf.

27. Caribou. (n.d.-b). *Southern Lakes Caribou* |. https://southernlakescaribou.com/.

28. Fish and Wildlife, 2021, Southern lakes caribou: Monitoring a recovering woodland caribou herd in yukon, Yukon government, https://storymaps.arcgis.com/stories/f37506914b3643bc919321a2bd53b628.

29. *Our Guiding Principles — How We Walk with the Land and Water.* (n.d.). How We Walk With the Land and Water. https://www.howwewalk.org/our-guiding-principles.

CLIMATE CHANGE CARDS

Appendix 3C

Habitat impacts

plant growth-
more food

early blooming-
less food

melting permafrost-
lack of shelter

shift in vegetation zones-
less space

INCREASE OF PRECIPITATION

plant growth-
more food

heavy snowfall/ deep snow-
lack of access to food

heavy rainfall-
higher water levels

spring summer snowmelt-
flooding

COLLARING CARIBOU

Appendix 3D

Fish and wildlife, 2021, Collaring caribou: how and why we capture caribou, Yukon government: Southern lakes caribou, https://storymaps.arcgis.com/collections/9849a0b2f05a47a2a190d49d74b56f9f?item=2.

COLLARED CARIBOU

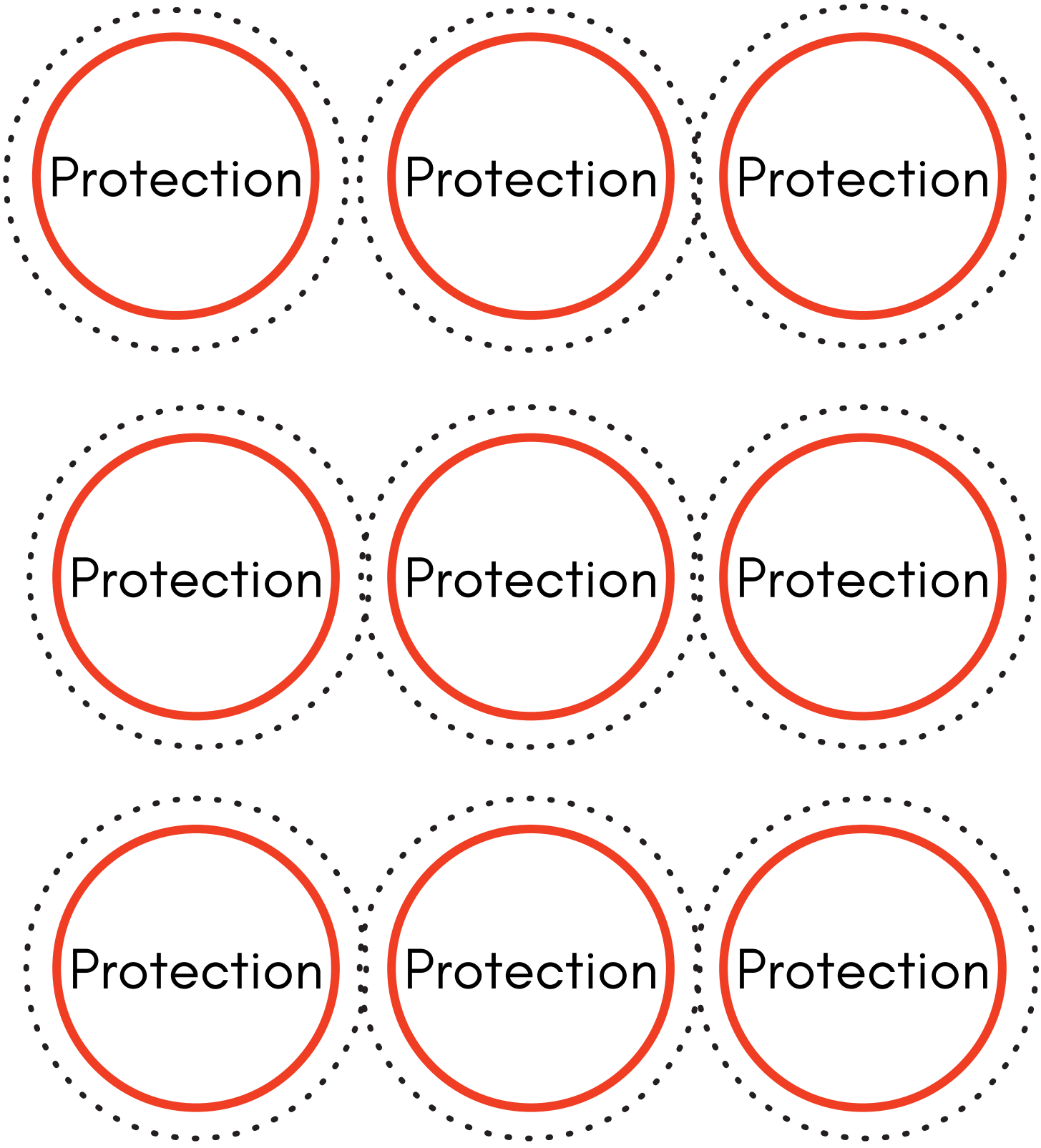
LOTEK GPS COLLARS FOR CARCROSS AND IBEX CARIBOU.

VISBAND TO IDENTIFY INDIVIDUAL CARIBOU FROM THE AIR.

TOKENS:
HARVEST & PROTECTION

Appendix 3E


Harvest
Harvest
Harvest
Harvest
Harvest
Harvest
Harvest
Harvest
Harvest


Protection
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SIX THINKING HATS

Appendix 4A

Six thinking hats, retrieved 2022, Debono group, https://www.debonogroup.com/services/core-programs/six-thinking-hats/.

express new ideas & new perceptions

creativity & possibility

rIsk management

difficulties to overcome & problems at hand

feelings & hunches

emotions, feelings, likes, dislikes

thinking process

observing the 6 perspectives

bright optimism

positive outlook for benefits

information that is known

facts