

Grade 9 Resource (SNC1W) – Biology

Overview

Part 1 (Assessing prior knowledge about sustainability). Use the [slide deck](#) as a guide.

Materials: scrap paper or non-permanent white surfaces, markers, one dice per group.

Students will:

1. Come to a consensus on the definition of **sustainability** and provide 3 examples of sustainable practices. Students will write on a white-board or a scrap piece of paper.
2. Watch Isaac's Murdoch's video on [Should We Manage the Earth or Should the Earth Manage Us?](#) (2.25). Students reflect on the video (Dice Roll Reflect).
3. Connect Isaac's teachings to their definition of sustainability and revise. Students can share with the class why and how their definition changed from the start of the lesson.

Part 2 (can be done at the end of unit or after learning about sustainability)

Materials: article, mix and match cut outs (pre-cut and put into envelopes)

Students will:

1. Read a brief [article](#) on how Indigenous cultural burns can help manage wildfires and answer questions.
2. Check for understanding by completing the [Mix and Match](#).

The teacher may take up article questions using [solutions](#) and mix and match using [slide deck](#) (slides 12 - 15)

Consolidate Circle

Students will form two circles, an inner circle and an outer circle. Inner circle students face outer circle students so that pairs are formed. After the teacher poses the question related to sustainability, each student within the pair shares their thoughts. The inner circle will move to the right again (passing 3-4 students), followed by another question prompt. Students share their thoughts with a new partner. This is done 2 more times.

Learning Goals

We are learning to

- Investigate sustainable practices used by various communities, including Indigenous communities.
- Understand the importance of the dynamic equilibrium of ecosystems.

Success Criteria

I can ...

- *Define sustainability.*
- *Describe a sustainable practice I can incorporate in my life, home or school.*
- *Describe a sustainable practice based on Indigenous knowledge and ways of knowing, and I can explain how it keeps the ecosystem in balance.*

Curriculum Expectation(s)	
<p>Overall Expectations</p> <p>B1. Relating Science to Our Changing World Assess impacts of climate change on ecosystem sustainability and on various communities and describe ways to mitigate these impacts.</p>	<p>Specific Expectations</p> <p>B1.3 investigate and explain how sustainable practices used by various communities, including First Nations, Métis, and Inuit communities, reflect an understanding of the importance of the dynamic equilibrium of ecosystems</p>
<p>Student Prior Learning</p> <ul style="list-style-type: none"> Part 1 of this lesson can be done as a way to introduce the unit (no prior knowledge is necessary). Familiarity with nutrient cycles (e.g., carbon, nitrogen) would enhance Part 2 of the lesson. 	
<p>Lesson Descriptor</p> <p>Part 1 (Assessing Prior knowledge about sustainability). Use the slide deck as a guide.</p> <p>Materials: scrap paper or non-permanent white surfaces, markers, one dice per group.</p> <p>Students will:</p> <ol style="list-style-type: none"> Come to a consensus on the definition of sustainability and provide 3 examples of sustainable practices. Students write on a white-board or scrap piece of paper. Students share and listen to the other definitions in the class and can revise their definition as needed. Watch as class Isaac Murdoch's video on Should We Manage the Earth or Should the Earth Manage Us? (2.25). Participate in a Dice Roll Reflect by rolling a dice in their group, answering one reflection question about the video (# 1-6), depending on what number their dice lands upon (See questions on slide 7 on slide deck) Students connect Isaac's teachings to their definition of sustainability and may revise after watching the video. Students can share with the class why and how their definition changed from the start. <p>Part 2 (can be done at the end of unit or after learning about sustainability and/or nutrient cycles)</p> <p>Materials: article, mix and match (pre-cut and put into envelopes)</p> <p>Students will:</p> <ol style="list-style-type: none"> Read a brief article on how Indigenous cultural burns can help manage wildfires, and answer questions for comprehension. Teacher solutions are also provided here. Check for understanding by completing the Mix and Match. <p>Students match descriptions to the correct picture and place cut out descriptions directly on the diagram as they see best.</p> <p>Note: The teacher can take up the Mix and Match using the solutions provided on slides 12 - 15 on the slide deck.</p> <ol style="list-style-type: none"> Possible Extensions to Mix and Match <ul style="list-style-type: none"> If students are done early, have students cut additional pieces of paper and write and apply more terms from the unit to any of the 4 diagrams (e.g., lithosphere, atmosphere, biosphere, nutrients, 	



biotic, abiotic global warming, photosynthesis, decompose).

- Students can apply what they learned about the **carbon cycle** to their Mix and Match activity.
- Students could indicate the movement of carbon on their Mix and Match diagrams by drawing arrows and writing notes.
- Students can compare how the carbon cycle is affected in low intensity cultural burns and high intensity burns. Students can consider for example:
 - organisms breaking down sugar for energy and carbon dioxide released as waste.
 - dying organisms release their carbon molecules into the soil.
 - decomposers break down decaying organisms and release CO₂ into the air.
 - dead organisms could turn into fossil fuels.

Consolidate and Close

1. Students form two circles, an inner circle and an outer circle. Inner circle students face outer circle students so that pairs are formed. *If there is an odd number of students, the teacher can join in as a participant.

2. Within the pairs, students face their partners and each student shares **one new sustainable practice they can weave into their life**, starting today (e.g., eating less meat, taking shorter showers).

3. Then the teacher will direct the inner circle to move to the right by 3 people. (students can say 'hi' 'bye' as they pass their other classmates). With their new partners, this time each student can share a **duty or responsibility the government has to the Earth** (e.g., protecting the Greenbelt). Students justify their answers.

4. Then the teacher will direct the inner circle to move to the right again by 3 people. This time each student can reflect and share on the following: **Unsustainable practices result from a disconnection to the land. What is one way we can reconnect with the Earth, to strengthen that relationship?**

5. Finally, the inner circle will move to the right again, until they are facing their original partner. Each student can share **What was the most interesting or impactful thing you learned in this unit? Explain why.**

Resources

CBC News - The National. (2022, July 1). *How Indigenous fire-keeping could mitigate another Lytton, B.C., disaster*. YouTube. Retrieved October 30, 2022, from <https://www.youtube.com/watch?v=j3LR3TBd5hY>

Gray Smith, M., & Kimmerer, R. W. (2022). *Braiding Sweetgrass for Young Adults: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*. Lerner Publishing Group.

Mayes, F. (2021, September 30). How Indigenous 'cultural burns' can replenish our forests. CBC. <https://www.cbc.ca/news/science/what-on-earth-indigenous-fire-forests-1.6194999>

Should We Manage the Earth or Should the Earth Manage Us? (n.d.). LESSONS FROM THE EARTH & BEYOND - Home. Retrieved October 30, 2022, from <https://www.lessonsfromearthandbeyond.ca/>

Images

Images from www.canva.com