

LAND-BASED LEARNING IN JUNIOR HIGH SCIENCE

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Background

The purpose of this project was to develop a series of 5E lessons utilizing land-based learning to teach a junior high unit on Space Exploration.

- Based on the Alberta Science 9 Space Exploration Unit
- Uses local Albertan & Canadian Indigenous knowledge

Conceptual Framework

- Alberta Teaching Quality Standards require the competency to apply foundational knowledge about First Nations, Métis, and Inuit¹
- Land-based learning is based in Indigenous ways of knowing and addressing the effects colonization²
- Land-based learning can lead to an increase in students' connection to and appreciation for their local community³

Professional Reflection

Developing this series of lessons increased my awareness of local Indigenous knowledge and the resources available to incorporate land-based learning into my classroom.

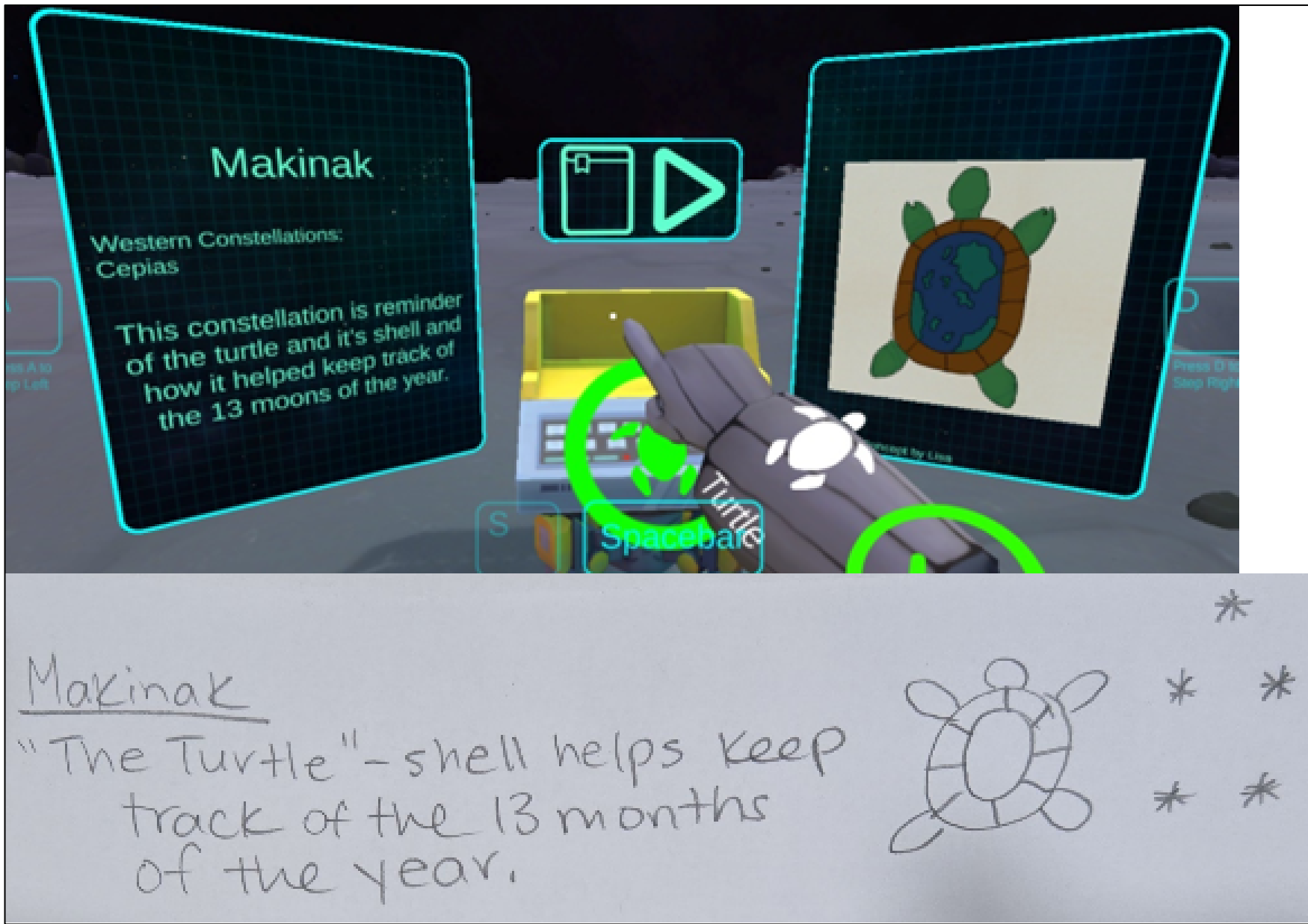


Figure 1. Image from StarScribe game in Lesson 1, showing information about a Cree constellation and student notes in science notebook.

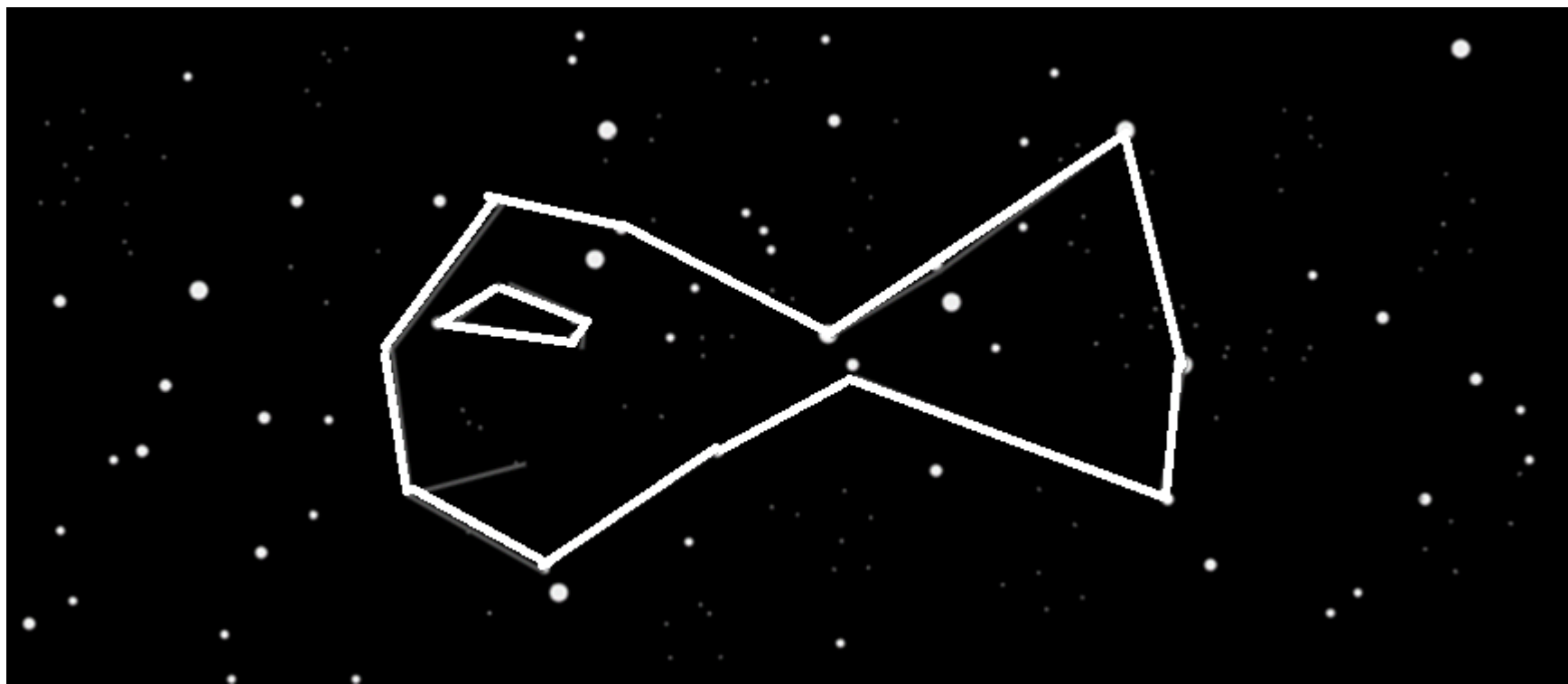


Figure 2. Sample student constellation of a fish, created on Google Slides from Lesson 2.

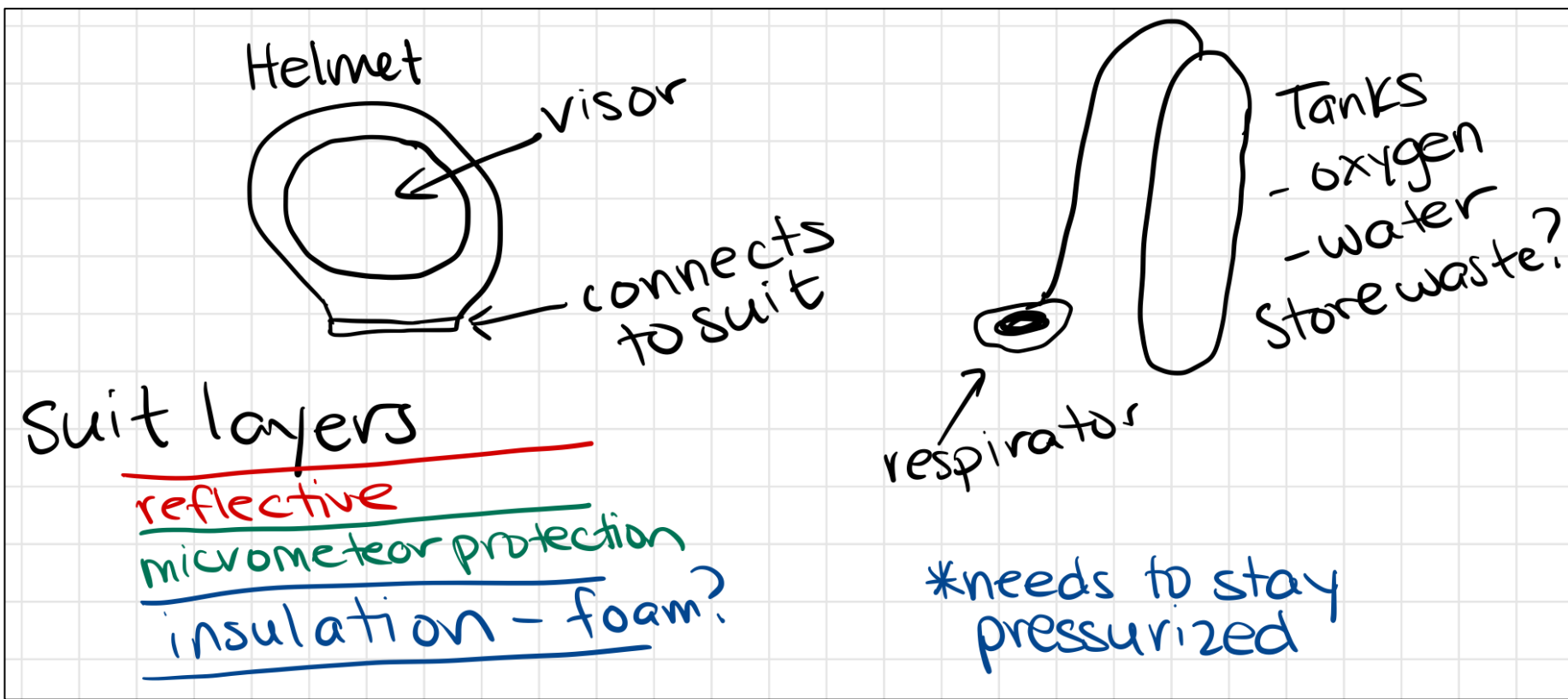


Figure 3. Sample student design of a model space suit built in Lesson 4.

Instructional Strategies

	Guiding Question	Summary
Lesson 1	What is the importance of the night sky to people around the world?	Examine significance of the sky to cultures around the world.
Lesson 2	What is the importance of the night sky to the Indigenous peoples of Alberta and Western Canada?	Examine significance of the sky to Cree people of Canada, then create their own constellation.
Lesson 3	How do traditional Indigenous peoples of Canada live in extreme Arctic environments? How does this compare to the extreme environments in space?	Examine conditions in extreme Earth environments (i.e.. Arctic) and compare to space.
Lesson 4	How can we use the engineering design process and Indigenous knowledge to create a prototype technology for use in colonizing Mars?	Build a model technology to help humans colonize Mars. Use the engineering design process to build and test a design.
Lesson 5	Should humans colonize space?	Apply knowledge from previous lessons to investigate and argue issues related to space exploration (ethical, economic, social, political).

References:

- Alberta Education. (2023). Teaching Quality Standard. Government of Alberta.
- Barnhardt, R., & Kawagley, A. O. (2005). Indigenous knowledge systems and Alaska Native ways of knowing. *Anthropology & Education Quarterly*, 36(1), 8-23.
- Webber, et al. *The Terrain of Place-Based Education: A Primer for Teacher Education in Canada*