LAND INVESTIGATION AND GEO-TRACKING AT THE NORTHEAST SWALE – PART I

GRADE 4-8

THE IDEA

Taking students onto the land to look at the land is the first part of this adventure. Students were led by a geologist, a teacher and a lead interpreter form Meewasin to look at the rocks, water and habitat. While investigating students engaged in discussions and hands-on investigation about the land, rocks, water; how they were developed; where they came from; their importance to investigating the land. As the students looked at the land, they found and discussed rocks from the area. They then began to we used a GPS to landmark the rocks. We also took pictures of where these rocks were located. This was also done to other interesting landmarks that the students found.

THE PROCESS

Materials: GPS devises, camera, land with different natural rocks and land/rock formations

Group 1: The 2 geologists lead the students on a walk through the North-East Swale area. They were stopping at different areas throughout the land where they found rocks. Geologists would then talk about what the rocks were, how they for formed, what they might tell a geologist about the minerals or specific indicators of mining that could exist because of the rocks.
The student then used the GPS devices to record the location of the rock. They then took a picture of the rock also.
After the group(s) did their land search they came back with their data to be used in the part two of the lesson back at the school.

Group 2: The students used the same land to investigate, but this time they went with Kenton from the Meewasin River Valley. They again walked and investigated the land. Kenton would point out information that connected weather to the erosion, human invasion on the land to change the environment and eco-systems, and other environmental factors that impact the land by our use of the rocks and other elements of the land.

The idea of the different perspectives was to show the students that there are many ways of thinking about the land. We wanted them to see the deep connections between finding elements to be mined and thinking about keeping the integrity of the land around them. We wanted them to explore the land and find a passion for the interest of the land with a broadminded world view in the end.

THE CURRICULUM CONNECTIONS

This project was part of a multi-grade project and it was done with grade 4-8 students. These are some of the connections we used in our project.

Grade 4

A. Science Outcomes

1. **HC 4.1** Investigate the interdependence of plants and animals, including humans, within habitats and communities. (CP, SI)
2. **HC 4.2** Analyze the structures and behaviours of plants and animals that enable them to exist in various habitats. (SI)
3. **HC 4.3** Assess the effects of natural and human activities on habitats and communities and propose actions to maintain or restore habitats. (CP, DM)
4. **RM 4.1** Investigate physical properties of rocks and minerals, including those found in the local environment. (CP, SI)
5. **RM 4.2** Assess how human uses of rocks and minerals impact self, society, and the environment. (DM)
6. **RM 4.3** Analyze how weathering, erosion, and fossils provide evidence to support human understanding of the formation of landforms on Earth. (CP, SI, TPS)

B. Social Studies Outcomes

1. **DR 4.1** Analyze how First Nations and Métis people have shaped and continue to shape Saskatchewan.
2. **DR 4.2** Describe the origins of the cultural diversity in Saskatchewan communities.
3. **RW 4.1** Analyze the strategies Saskatchewan people have developed to meet the challenges presented by the natural environment.
4. **RW 4.2** Investigate the importance of agriculture to the economy and culture of Saskatchewan.
5. **RW 4.3** Assess the impact of Saskatchewan resources and technological innovations on the provincial, national, and global communities.

Grade 5

A. Science Outcomes

1. **WE 5.3** Analyze the impact of weather on society and the environment, including technologies that help humans address weather conditions. (DM)

B. Social Studies Outcomes

2. **DR 5.1** Analyze the historic and contemporary relationship of people to land in Canada.
3. **DR 5.2** Assess the impact of the environment on the lives of people living in Canada.
4. **PA 5.3** Develop an understanding of the nature of the treaty relationship between First Nations and Canada's federal government.
5. **RW 5.1** Explain the importance of sustainable management of the environment to Canada's future.
6. **RW 5.2** Hypothesize about economic changes that Canada may experience in the future.

C. Language Arts

6. **CR6.1** View, listen to, read, comprehend, and respond to a variety of texts that address identity (e.g., Growing Up), social responsibility (e.g., Going the Distance), and efficacy (e.g., Making Our Community More Peaceful).
7. **CC6.1** Create various visual, multimedia, oral, and written texts that explore identity (e.g., Your Choices), social responsibility (e.g., Looking for Answers), and efficacy (e.g., Systems for Living).

D. Art

8. **CR6.2** Investigate and identify ways that the arts can express ideas about identity.

Grade 6

A. Science Outcomes

1. **DL 6.1** Recognize, describe, and appreciate the diversity of living things in local and other ecosystems, and explore related careers. (CP, SI)
2. **DL 6.2** Examine how humans organize understanding of the diversity of living things. (CP, SI)
3. **DL 6.3** Examine and describe structures and behaviours that help: individual living organisms survive in their environments in the short-term, species of living organisms adapt to their environments in the long term.

4. **DL 6.5** Assess effects of micro-organisms on past and present society, and contributions of science and technology to human understanding of micro-organisms. (CP, DM, SI)

B. Social Studies Outcomes
   1. **RW 6.2** Contribute to initiating and guiding change in local and global communities regarding environmental, social, and economic sustainability.
   2. **DR 6.3** Appraise the strategies human societies have used to orient themselves within time and place in the natural environment.
   3. **IN 6.1** Evaluate and represent personal beliefs and values by determining how culture and place influence them.
   * These indicators focus on place and how humans interact, impact and/or assess what their role is as citizens regarding their responsibility when living with other organisms.

Grade 7

A. Science Outcomes
   1. **IE 7.1** Relate key aspects of Indigenous knowledge to their understanding of ecosystems. (CP)
   2. **IE 7.2** Observe, illustrate, and analyze living organisms within local ecosystems as part of interconnected food webs, populations, and communities. (SI)
   3. **IE 7.4** Analyze how ecosystems change in response to natural and human influences and propose actions to reduce the impact of human behaviour on a specific ecosystem. (DM, CP)
   4. **EC 7.1** Analyze societal and environmental impacts of historical and current catastrophic geological events, and scientific understanding of movements and forces within Earth's crust. (SI)
   5. **EC 7.3** Investigate the characteristics and formation of the surface geology of Saskatchewan, including soil, and identify correlations between surface geology and past, present, and possible future land uses. (DM, SI)

B. Social Studies Outcomes
   6. **DR 7.1** Analyze and use various types of maps (that provide differing perspectives and information for differing purposes) in order to situate current issues in Canada, and in a selection of Pacific Rim and northern circumpolar countries.
   7. **RW 7.3** Assess the ecological stewardship of economies of Canada and the circumpolar and Pacific Rim countries.

C. Language Arts
   8. **CR7.1** View, listen to, read, comprehend, and respond to a variety of texts that address identity (e.g., Thinking for Oneself), social responsibility (e.g., Participating and Giving Our Personal Best), and efficacy (e.g., Doing Our Part for Planet Earth).
   9. **CR7.5** Listen critically to understand and analyze oral information and ideas from a wide range of texts (e.g., complex instructions, oral explanations and reports, opinions or viewpoints, messages presented in the media).
   10. **CC7.1** Create various visual, oral, written, and multimedia (including digital) texts that explore identity (e.g., Exploring Thoughts, Feelings, and Ideas), social responsibility (e.g., Taking Action), and efficacy (e.g., Building a Better World)

B. Art
   1. **CR7.3** Examine and describe how arts expressions of various times and places reflect diverse experience, values, and beliefs.
   2. **CC7.1** Reflect on and express insights about how knowledge and skills learned in school transfer to one's future life and work.

C. Career Ed
   1. **CC7.2** Analyze the contributions work makes to the individual and their community, including globally.
   2. **CC7.1** Reflect on and express insights about how knowledge and skills learned in school transfer to one's future life and work.

Grade 8

A. Science Outcomes
   1. **CS 8.1** Analyze the characteristics of cells and compare structural and functional characteristics of plant and animal cells. (SI)
   2. **CS 8.2** Demonstrate proficiency in the use of a compound light microscope to observe plant and animal cells. (SI)
   3. **FD 8.1** Investigate and represent the density of solids, liquids, and gases based on the particle theory of matter. (SI, TPS)
   4. **FD 8.2 I&K** Examine the effects of forces in and on objects in fluids, including the buoyant force. (CP, SI, TPS)
   5. **FD 8.4 C&E** Identify and interpret the scientific principles underlying the functioning of natural and constructed fluid systems. (CP, SI)

6. **WS 8.1** Analyze the impact of natural and human-induced changes to the characteristics and distribution of water in local, regional, and national ecosystems. (CP, DM)
7. **WS 8.2** Examine how wind, water, and ice have shaped and continue to shape the Canadian landscape. (DM, SI)
8. **WS 8.3** Analyze natural factors and human practices that affect productivity and species distribution in marine and freshwater environments. (CP, DM, SI)

B. Social Studies Outcomes
1. **DR 8.1** Develop an understanding of the significance of land on the evolution of Canadian identity.
2. **PA 8.3** Present the evolution of a piece of legislation, from its first conception to its implementation.
3. **RW 8.3** Critique the approaches of Canada and Canadians to environmental stewardship and sustainability.

C. Language Arts
1. **CR8.1** View, listen to, read, comprehend, and respond to a variety of texts that address identity (e.g., Becoming Myself), social responsibility (e.g., In Search of Justice), and efficacy (e.g., Building a Better World).
2. **CR8.5** Listen critically to understand, gather information, follow directions, form an opinion, and analyze oral presentations for diverse opinions, presenter's point of view, values, and biases, stereotypes, or prejudices.
3. **CC8.1** Create various visual, oral, written, and multimedia (including digital) texts that explore identity (e.g., Telling One's Life Story), social responsibility (e.g., Examining the Influence of Popular Culture), and efficacy (e.g., Creating Turning Points).
4. **CC8.8** Write to describe a landscape scene; to narrate a personal story or anecdote and a historical narrative; to explain and inform in a presentation of findings, a biography, a documented research report, and a résumé and covering letter; and to persuade in a mini-debate and a review.

D. Art
1. **CR8.2** Investigate and identify ways that today's arts expressions often reflect concern for social issues.
2. **CR8.3** Investigate and identify how arts expressions can reflect diverse worldviews.

E. Career Ed
1. **CC8.2** Determine the contributions that work and work alternatives such as volunteerism make to the community and identify their importance to society.

THE NEXT STEPS

1. Look at the Geo-Mapping lesson to connect how to use the data
2. Develop a plan on how to connect the development of land for mining with a positive affect on the land. Using the lesson on Coal mining and how they use their technology to bring the land back to almost exactly the way it was found (drones, plants in greenhouses, tractors/graters with GPS land tracking in reclamation)
3. Use the pictures taken for an art/poetry project. Write about the land and the student's connection.
4. Bring some rock back to test it in the grade 4 and 7 classrooms… scratch/hardness/color/shape/size etc.