Grade 4: Did we do that?

A Study of Alberta's Geography

and the Benefits and Drawbacks of Land Use

Overview:

What we do on the land ie agriculture, forestry, oil and gas development, recreation, and the expansion of cities/ towns affects the quality of our environment ie water quality, amount of natural areas, mammal habitat, etc.

With so much happening on the landscape, how can we balance environmental quality with our need to grow and make money?

The answer lies in planning today, so we can have what we want in the future, both environmentally, and economically.

In this activity, students will learn about Alberta's ecoregions and what land-uses can be found in each region. Using www.albertatomorrow.ca, students will investigate the connection between what we do on the land, and the quality of our environment. Students will create a future simulation that balances our economic needs and environmental quality.

Objectives:

The students will:

- Learn about Alberta's Regions and the diverse ecosystems that exist in Alberta.
- Locate themselves on maps and see what's happening in their local area.
- Learn what kinds of activities are taking place on our land, and what the result is on our socio-economic and environmental indicators.
- See what a difference making a plan for the future will have on our environment.

Duration: approximately 12 classes.

Alberta Curriculum Links:

Social Studies

- All areas of 'Dimension of Thinking' from the Grade Four Social Studies Program

- 4.1 Alberta: A Sense of the Land- Students will demonstrate an understanding and appreciation of how elements of physical geography, climate, archeology and paleontology are integral to the landscapes and environments of Alberta.
- 4.1.1- appreciate the diversity of elements pertaining to geography in Alberta
    - Appreciate how land sustains the community and quality of life
    - Demonstrate care and concern for the natural environment through life choices and action.
    - Appreciate the variety and abundance of natural resources in Alberta
- 4.1.2- examine, critically, the physical geography of Alberta by exploring and reflecting upon:
    - What are the major geographical and natural vegetation regions, landforms and bodies of water in Alberta.
    - What are the significant natural resources in Alberta and where are they located?
    - How are Alberta's parks and protected areas in Alberta important to the sustainability of Alberta's natural resources?
- 4.1.4- Analyze how Albertans interact with their environment by exploring and reflecting upon:
    - In what ways do the physical geography and natural resources of a region determine the establishment of communities?
    - How are natural resources used by Albertans?
    - How do Albertans compete with competing demands on land use?
    - Who's responsibility should it be to ensure the preservation of provincial and national parks and protected areas in Alberta?

Science

- All Grade Four Science 'Skills' and 'Attitudes' are developed through this project
- Topic A- Waste in Our World: Recognize than human activity can lead to the production of waste, and identify alternatives for the responsible use and disposal of materials.
    - Identify and classify waste that results from human activity
    - Describe alternative methods of disposal and possible advantages and disadvantages of each.

- Identify actions that individuals and groups can take to minimize the production of waste.
- Develop and implement a plan to reduce waste.

- Topic E- Plant Growth and Changes
  - Describe the importance of plants to humans and their importance to the natural environment. (Examples of plants being used as shelter and food, preventing erosion, providing oxygen, etc.)

Procedure:

Prior to having starting the activity, teachers should **Register** for a Teacher account at www.albertatomorrow.ca and create a class. Students will register as students in your class. Once logged in all videos can be found under **Videos** on the left hand side of the screen.

PART 1- Alberta's Regions (Duration 3-4 class periods)

1. Define Geography and Region
2. Look at a map of Alberta – identify/discuss/explore Alberta's Regions (using text books, websites etc)
3. Watch 'Natural Landscapes' video- found in the **Video** section.
4. Have groups of students research and become 'experts' on the geography of each of Alberta's regions. In a 'jigsaw' formation, have students regroup and teach each other about what they have learned about their region.

Part 2- Use of Natural Resources (Duration 3-4 classes)

1. Define Land-use: Brainstorm a list of things that take place on Alberta's diverse landscapes.
2. Watch the first part of the video *Introduction* (4:31- cumulative effects of all the land uses together)- stopping to discuss/explain along the way.
3. Discuss (from video) how land use can bring both good things (benefits) and challenges (drawbacks) for our province.
4. Watch the following videos in **small groups** and make a list of the benefits and drawbacks, as well as general information regarding land use:
   a. Water Consumption
   b. Agriculture

c Oil and Gas

d Forestry

e Mammal Habitat

f Fish Habitat

5. Have small groups present their information learned from videos and re-watch videos as a large group if necessary.

Part 3- Additional Results of Land Use (Duration 2-3 classes)

1 Review the impact of natural resources on Alberta's natural environment as well as the benefits that we receive from such a resource-rich province.

2 Discuss that there are other factors/implications with all this development and land-use in Alberta, both positive and negative.

3 As a large group or in a few smaller groups with adult leaders, watch and discuss the following videos:

a Human Population

b GDP

c Greenhouse Gasses

d Water Quality

e Ecological Goods and Services

4 **So as not to lose hope**...watch the "Best Practices" video, pausing to discuss ways we can do to and are trying to do to minimize the impact that human activity has on Alberta's environment.

Part 4- Simulator and Land Use Assessment (Duration 3-4 classes)

1 **Go to www.albertatomorrow.ca and register for a student account. Please do not use your real name in your username. Once you have created your account and log in**

2. Click on "Explore".
   a. Zoom in and find your school, or house. Click on the green "+ Scenario" button at the top.
   b. Click on "Create New Scenario"
   c. Create a "Historic" scenario for your watershed. Click on your desired watershed. You may look at sub-watersheds also.
   d. Once you have chosen your study area, click "Run Scenario".

3. Either in a large group or smaller groups with a teacher leader, zoom in on your study area.
    a. Find significant local land-marks
    b. Observe patterns on the land that signify different land-uses ie cutblocks, irrigation pivots, filled in sloughs and wetlands, agricultural fields and golf courses.
4. Click on the Play Button.
    a Identify what each color represents
    b Watch the 1910-2020 simulation. This would be when their great great great grandparents were alive.
        i Have students look at the colors and how they change
        ii Have the students look at the dials and how they change (Note- which dial do we want to go up and which do we want to go down? What does this mean?)
5. Click "+scenario".
    a. This time, choose "Business as Usual"
    b. Choose your study area again
    c. Click "Run Scenario".
6. Press the Play button and observe changes from 2020- 2050. This is what might happen if we keep on doing things the same way we have in the past.
7. What would happen if we didn't change our habits? We just keep doing what we always do? This is looking into the future when the students are all grown up, have a job, and have their own kids. Identify changes on the map and the dials.
8. **In a large group to model and then kids in small groups**
    a. Click on "Create New Scenario"
    b. Choose "Landuse"
    c. Name your plan and type a brief description.
9. Choose your study area.
    a. Click "Next" What you see on the indicator dials are the levels as of 2020. Your first job is to set goals for 30 years from now. Move the goal slider to where you want the indicator to be in the year 2050. (if you are unsure of what the indicator is measuring, click on it and watch the video) Remember to set realistic goals.
10. Set and save goals for:

i. Natural landscapes

ii. Water quality

iii. Human population

iv. GDP ($$$$)

v. Water consumption

11. Click "Next" You will now decide how you will reach your goals by changing the landscape.
    a. Click on "changes"

    b. Choose the landscape type or landuse you wish to add in the future and click the location where you want it to grow. ie, if you want to have more grassland in the future, click on the yellow grassland icon and then click on the map where you want to increase grasslands in the future. Remember, the simulator will only allow that change to be made if it is possible to change the current landscape type/landuse to what you want.

    c. You may choose to adjust the level of Industrial Activity, which beneficial management practices you want to use, and which Climate Change scenario you wish to see, or save this step for later and click "Next".

    d. Click "Run Scenario" and then click "Play"

12. Did you reach your goals or not (the goal dot will be green if you reached your goal, yellow if you got close, and red if you didn't reach your goal.)

Are their changes reasonable and practical?

Part 5- Best Practices and Conclusion (Duration- 1 Class)

1 Did they reach their goals? Why or why not?

2 What are some things they can do personally to make a healthier environment? What are some things they can do personally to try to reach their goals?

3. Watch the "Best Practices "video.

4. Have them revisit their land-use plan.

5. Now click on Management Practices. Watch the management practice video. You must make a decision on how much industrial activity you want in the study area and what management practices you wish to use from this year on.

a. Decide which Management Practices you want to use.

b. Move the Industrial Activity slider and see how it changes the indicators. Decide where you want it to be.

3 What are some of the things we need to see happen on a large scale to improve and ensure the preservation of our natural environment?

4 List 3 Trade-offs we may have to accept in the future.