

Social Studies 9

Governments Have it Rough!

Can You Make Everyone Happy?

Overview:

Governments have to make some tough decisions. They have to balance the needs of various stakeholders. The decisions they make ultimately affect our quality of life. In the mock land use planning process, students will apply a land use simulator to learn how land use affects Alberta's economy and environment. Students will then negotiate to identify a land use plan that balances all of the stakeholders' goals. Group participation, presentations and activity sheets will be used to assess student performance.

Curriculum links:

9.2.3 appreciate the impact of government decision making on quality of life	Learn how government land use plans can determine quality of life through water quality, air quality, wildlife habitat, and other indicators.
9.2.5 critically assess the relationship between consumerism and quality of life in Canada and the United States by exploring and reflecting upon the following questions and issues: How does individual consumer behavior impact quality of life (e.g., environmental issues)?	Simulate the effects of shifts in consumer behavior on Alberta's economy and environment. For example, if demand for Alberta fossil fuels were to change by x% due to an x% decrease in global energy consumption, what would be the effects to Alberta's economy and environment?
9.2.6 access critically the interrelationships between political decisions and economic systems by exploring the following questions and issues: -How government decisions on environmental issues impact quality of life (ie, preservation, exploitation and trade of natural resources)? (PADM, ER)	Apply a land use simulator to investigate how land use decisions impact economic and ecological values that contribute to quality of life. Simulate the effects of a variety of possible government decisions on environmental issues. For example, what are the future environmental and economic effects of different quantities of protected area in Alberta?
9.S.1 Develop skills of critical thinking and creative thinking <ul style="list-style-type: none"> Evaluate, critically, ideas, information and positions from multiple perspectives Re-evaluate personal opinions to broaden understanding of a topic or an issue Generate creative ideas and strategies in individual and group activities 	Consider multiple perspectives from industry, government, and the private sector as they pertain to land-use issues. Work collaboratively to come up with future land-use plan
9.S.2 Develop skills of historical thinking <ul style="list-style-type: none"> Analyze selected issues and problems from the past, placing people and events in a context of time and place 	Look at the historical landscape and see how land-use and its effects have changed through time. Research local historical events that resulted in land-use changes.

<ul style="list-style-type: none"> Distinguish cause, effect, sequence and correlation in historical events and issues, including the long-and short-term casual relations Use historical and community resources to organize the sequence of historical events 	
9.S.3 Develop skills of geographic thinking <ul style="list-style-type: none"> Use geographic tools, such as GIS software to assist in preparing graphs and maps Construct diagrams, charts, graphs and table to analyze geographic information 	Use GIS programs to create maps, graphs and tables.
9.S.4 demonstrate skills of decision making and problem solving <ul style="list-style-type: none"> Take appropriate action and initiative when required in decision-making and problem – solving scenarios Participate in and predict outcomes of problem solving and decision making scenarios Propose and apply strategies or options to solve problems and deal with issues Propose and apply new ideas and strategies, supported with facts and reasons, to contribute to problem solving and decision making 	Work in a group to develop an Alberta land use strategy that best achieves the group land use goal.
9.S.5 demonstrate skills of cooperation , conflict resolution and consensus building	Negotiate Alberta land use options with groups that have differing goals to identify a land use strategy that balances the goals.
9.S.7 apply the research process	Use a land use simulation tool to research the effects land use in Alberta.
9.S.8 demonstrate skills of oral, written and visual literacy	Present recommended land use strategies to classmates. Debate the relative merits of Alberta's land use options with classmates.

ICT Curriculum Outcomes:**C.5 - Students will use technology to aid collaboration during inquiry.****Specific Outcomes**

- 3.1 access, retrieve and share information from electronic sources, such as common files
 3.2 use networks to brainstorm, plan and share ideas with group members

C.6 - Students will use technology to investigate and/or solve problems.**Specific Outcomes**

- 3.4 pose and test solutions to problems by using computer applications, such as computer-assisted design or simulation/modeling software

F.1 - Students will demonstrate an understanding of the nature of technology.**Specific Outcomes**

- 3.8 demonstrate an understanding that technology is a process, technique or tool used to alter human activity

Time to Complete

3-4 60 minute classes

Materials

- This activity is internet based and therefore requires computers with an internet connection.
- The printable activity sheets, land use results sheet, power point slide, and marking rubric can be downloaded from www.albertatomorrow.ca

Procedure**Introduction:**

Brainstorm different ways the land is used in Alberta.

Can we categorize these land-uses? *Try to get the students to categorize the suggestions into Resource Development, Human Activities, and Ecosystem Services.*

ie. A possible list may be:

<i>Resource Development</i>	<i>Other Human Activities</i>	<i>Ecosystem Services</i>
Oil and gas development Forestry Agriculture Industry (Factories) Etc.	Housing Construction Roads Etc.	Water – evaporation Plant growth and photosynthesis Animal Activity Greenhouse gas absorption Decomposition Etc.

Ask: Who decides what happens to the landscape? *The students should identify government as deciding what can happen on the landscape.*

Ask: How is your quality of life affected by political decisions? *Answers will vary.*

Governments must consider environmental, social and economic issues when making land use decisions. This can be challenging since different people have different goals for Alberta. The decisions governments make affect Albertan's quality of life by influencing the health of Alberta's environment, economy and communities.

In this activity, you will investigate the difficulties of making land use decisions that satisfy all stakeholders in Alberta.

Teacher note: Divide the class into groups, each one representing a different special interest group.

Part A: Videos

Have the student create an account at www.albertatomorrow.ca. They must create the account using the teacher's user name in order for the teacher to have access to their work. The videos are found in "Videos" on the left-hand side of the screen.

Part B: Land-Use Assessment

In order to plan for the future, it is important to see how land-use has changed in the past. You will use the simulator to see how your area has changed from 1910-2020. You can then project current growth rates into the future and see what will happen in your area from 2020-2050. Groups can then create their own landuse plan for the future that is different from the business as usual plan.

Part C: Future Land Use Plan

Divide the class into groups. Each group will be assigned a stakeholder role. (The number of groups depends on number of students in the class)

To help develop the plan, stakeholders have been brought together that are interested in achieving a variety of goals in Alberta over the next 30 years. The stakeholders are a forestry company, oil and gas company, farming association, economic development authority, land preservation society, watershed stewardship group, CO₂ reduction committee and fishing organization. It is the job of the stakeholders to help the government develop a land-use plan that supports their goals.

Each group will use the student worksheets to come up with a land-use plan that achieves your group's mission.

Part D: Government Decision Making

Governments consider environmental, social and economic issues when making a land-use decision. Environmental issues include topics like wildlife. Social issues include topics like a safe water supply and healthcare. Economic issues include the production of natural resources like timber, food and energy. Land use should be planned so that it achieves the environmental, social and economic goals of Albertans. This can be challenging because different people may have different goals. To identify a land-use plan that balances multiple goals, cooperation and communication among different groups is very important.

The Government of Alberta uses land use planning to make rules about the type of land-use that is allowed. For example, the government may decide to establish parks in some areas to protect environmental and recreational values, and to allocate some areas to natural resource development to provide jobs and revenue. These decisions affect Albertans' quality of life by influencing the health of Alberta's environment, economy and communities.

The teacher is representing the government and he/she needs your input to develop a land-use plan for Alberta. Each group will present to the class their goal for Alberta (i.e. their mission) and why it is important.

Remind the class that the goal of Land-Use Planning is to plan a development strategy that balances the economic, environmental and social goals of all Albertans. Explain that this means that a compromise is necessary. Suggest that the class should work together to try to find a development strategy that balances all groups' goals.

Have a main computer showing on the front screen. Ask each group to come up to set their goals and draw the future.

Once each group has set goals and drawn their future, have a student run the land use plan to see if the goals can be achieved. Most likely, all of the goals will not be able to be achieved because each group has different goals.

In order to reach the set goals, tradeoffs will be necessary. A trade-off occurs when decreasing one land-use goal makes it easier to achieve another land-use goal. The trade-offs may be take the form changing goals, or changing the future map drawing. Continue changing the goals and/or drawings until the class can decide on one land-use plan.

Part E: Concluding Discussion:

Discussion Questions:

1. How do government decisions on environmental issues impact your quality of life?
2. Does the government decision satisfy all?
3. What tradeoffs were necessary?

Assessment:

Rubric

Extensions:

The Government of Alberta has responded to the need for land-use plans by implementing the Land-Use Framework <https://landuse.alberta.ca> Go to this link and find out more about Alberta's Land-Use Framework.

Students research Alberta government policies on the environment.

Interview people in the community that represent groups similar to the stakeholder groups from your activity.

Answer Key:

Part A – Land-use Videos

- Go to www.albertatomorrow.ca, click on “Student” and register under school and class. Please do not use your real name in your username (for privacy reasons). Record your username and password somewhere so you can reference it if you forget. Once you have created your account, click on “simulator”. You will find the videos under **Videos** on the left hand side.
1. Define Sustainable Development: This means our actions today should not harm the health of ecosystems for future generations.
 2. Watch the “Natural Landscapes” video.
 3. What region of Alberta do you live in? Answers will vary.
 4. What type of land-use is present in your area? Answers will vary.
 5. Why is native prairie important? 5/11 species at risk in Alberta live in native prairie.
 6. Watch the “Mammal Habitat” video.
 7. How much woodland caribou habitat is left in Alberta? Half of what existed historically.
 8. How does human disturbance affect caribou? Roads, pipelines, seismic lines, well sites and cutblocks increase the chances of caribou encountering humans and wolf. Caribou prefer large tracts of undisturbed older forest.
 9. What are the factors that make Grizzly Bears populations so susceptible to decline? They have a low reproductive rate and don't reach breeding maturity until they are 5-7 years old. They breed only once every 3 or 4 years.
 10. What can be done to help Grizzly Bear populations? Limit the possibilities of human/bear encounters by limiting development in Grizzly Bear habitat.
 11. Watch the “Fish Habitat” Video.
 12. What do fish populations need to thrive? Fish require adequate food, cover from predators, and the ability to reproduce.
 13. How does human activity affect fish populations? The road network, as well as fishing pressure adversely affect fish populations.
 14. Watch the “Water Quality” Video.
 15. What is the unintended consequence of fertilizer application on lakes, rivers and ponds? Excess fertilizer runoff into lakes, rivers and ponds result in increased algae and plant growth. Once these plants die, they decompose, a process that uses up oxygen in the water. This can lead to fish kills and the gradual filling in of the water body, called eutrophication.
 16. Watch the “Water Consumption” Video.
 17. Why is water important to us? We need water to live, but our economy also relies on water.
 18. Watch the “Greenhouse Gas and Biotic Carbon Storage” Video.
 19. Describe the flow of carbon through an ecosystem. Carbon cycles between the living and non-living things in an ecosystem. Atmospheric carbon is taken in by plants in the process of photosynthesis. The animals eat the plants, and give off carbon through cellular respiration, and when they die and decompose. This carbon returns once again to the atmosphere.
 20. Watch the “GDP” and “Human Population” Videos.
 21. How does Alberta compare to the rest of Canada? Alberta has a higher GDP and population growth than any other province in Canada.
 22. Watch the following three videos: “Oil and Gas Production”, “Forestry”, and “Agriculture Production” Videos
 23. For each type of natural resource production describe the benefit to Albertans.
 - a. oil and gas
The industry provides us with gasoline, natural gas, nylon plastic, As well, the provincial government collects royalties from companies. That collected money goes to pay for things like education and healthcare. 7/100 jobs in Alberta are related to the oil and gas industry.

- b. Forestry
The forestry industry produce timber, pulp and paper. 2/100 jobs in Alberta is related to the forestry industry, and the industry provides money to the provincial government.
 - c. Agriculture
3/100 jobs in Alberta are related to Agriculture. Agriculture contributes to Alberta's GDP and provides you and I with food!
24. For each type of natural resource production describe the environmental liabilities.
- a. oil and gas
Ecosystems are disturbed to locate and extract oil and gas. Roads and seismic lines fragment wildlife habitat, making it less suitable for certain species. The industry uses large amounts of water.
 - b. Forestry
Forestry reduces the area of old growth forests which are reservoirs of biotic carbon. Forestry roads further fragment wildlife habitat.
 - c. Agriculture
Agriculture uses large amounts of water. Runoff from Agricultural practices impact surface water quality. Cows release large amounts of methane gas, a greenhouse gas. Tillage of fields also adds carbon to the atmosphere.
25. Watch the "Best Practices" video.
26. What do best practices do?
Best practices lower our impact on ecosystems.
27. List some of the best practices currently being used in Alberta.
Integrated resource management reduces the number of roads needed. Low tillage farming, and careful fertilizer application reduces the amount of nutrient runoff from farmlands. Some basic best practices are driving less, using renewable energy, and conserving energy and water at work, school, and home.

Part B – Land-Use Assessment

In this step, you will use the land use simulator to see the effects multiple land-uses have had on environmental indicators in the past.

1. Click on the green “+ Scenario” button at the top. Click on “Create New Scenario” Create a “Historic” scenario for your watershed. Click on your desired watershed. You may look at sub-watersheds also. Once you have chosen your study area, click “Run Scenario”.

2. Observe what happens to the indicators, as well as the areas of different landscape types after pressing the play button.

How did the environmental indicators change from 1910-2020? **ANSWERS WILL VARY DEPENDING ON THE AREA OF ALBERTA YOU ARE IN.**

- a. Natural landscapes? -

- b. Mammal habitat?

- c. Fish habitat?

- d. Water Quality?

- e. Biotic Carbon?

- f. Greenhouse Gas emissions?

3. How did the socio-economic indicators change from 1910-2020?

- a. Human Population?

- b. GDP?

- c. Water Consumption?

- d. Forestry?

- e. Agriculture?

- f. Hydrocarbon production?

4. What happened to the area of

- a. Grasslands:

- b. Wetlands:

- c. Forest: _____
- d. Urban Development: _____
- e. Agriculture: _____
5. Click "+scenario". Choose *Business as Usual Scenario*. If current trends continue, this is what will happen in your area.
6. How did the environmental indicators change from 2020-2050?
- a. Natural landscapes?

- b. Mammal habitat?

- c. Fish habitat?

- d. Water Quality?

- e. Biotic Carbon?

- f. Greenhouse Gas emissions?

7. How did the socio-economic indicators change from 2020-2050?
- a. Human Population?

- b. GDP?

- c. Water Consumption?

- d. Forestry?

- e. Agriculture?

- f. Hydrocarbon production?

8. What happened to the area of
- a. Grasslands: _____
- b. Wetlands: _____
- c. Forest: _____
- d. Urban Development: _____
- e. Agriculture: _____
9. Historically, the human population in Alberta has increased exponentially. What has the impact on quality of life been?
During this exponential growth, our quality of life has increased. However, we are now seeing the impact of this exponential growth on our environmental indicators in the form of lower water quality, increased greenhouse gas emissions, indicators that impact our quality of life.

10. Explain the relationship between human population growth and water consumption and agriculture.
As the human population grew, water consumption also grew. However, agricultural production decreased as urban development overtook agricultural areas.
11. How does population growth impact the GDP in this area?
As the human population grows, so does GDP.
12. Does and increase in GDP mean an increase in the quality of life?
Not necessarily
13. Is there another measuring tool that can be used to replace GDP that measures social, environmental and economic well being? Explain.
Measurements like Mark Aneilski's Genuine Wealth Index <http://www.genuinewealth.net/> and David Suzuki's Sustainability Within a Generation Plan measure more than just GDP in measuring our well being. <http://www.davidsuzuki.org/publications/reports/2004/sustainability-within-a-generation/>
14. What conclusions about environmental and socio-economic indicators can be drawn from the changes in your study area?
In general, socio-economic indicators go up at the expense of environmental indicators.
15. If historical rates continue, predict what will happen in your area in another 30 years.
GDP and human population will continue to grow as a result of increased resource development and environmental indicators will continue to decline. Wastes will build up and ecological goods and services will continue to decline.

Part C: Future Land-use Plan

You will now be assigned to a stakeholder group. Along with your group members, you must come up with a land-use plan for the next 30 years that reaches your organization's mission. Once complete you will compare your land-use plan and results to those of the other stakeholder groups. Then, together with the government, all the stakeholder groups will attempt to agree on a land-use plan for the next 30 years in Alberta.

Part D: Land Use Tradeoff Activity Sheet Answers

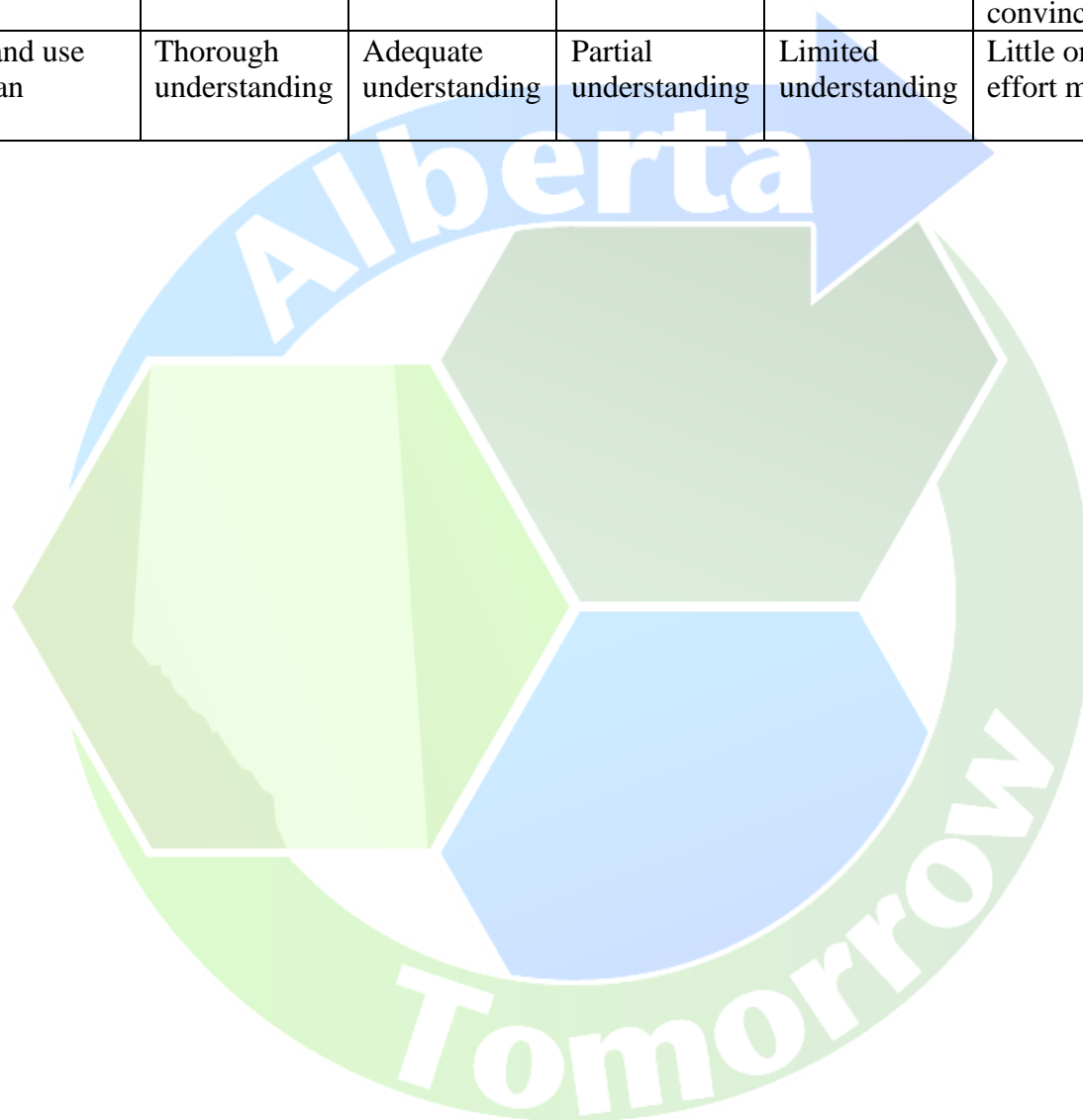
1. Answers will vary but it is not easy to please all stakeholders. Not everyone can have what they want and there will be trade-offs.
2. The student should describe how decreasing one land use goal helped achieve another land use goal.
3. Tradeoffs make land use planning difficult because land use strategies that maximize the goals of some groups can have a negative effect on the goals of other groups. This leads to disagreement.
4. Ways that decreasing natural resource development might improve quality of life in Alberta are (the student just needs to identify two): increase wildlife habitat, increase the quality of outdoor recreation, reduce water use (and therefore increase water supply). Ways that decreasing natural resource development might reduce quality of life in Alberta are (the student just needs to identify two): fewer jobs, less government revenue to pay for services like healthcare, and fewer products such as fuel, food and timber.

5. Personal choices we make affect the quality of the environment. We can make decisions that will decrease our environmental footprint by decreasing waste, water consumption, greenhouse gas emission, etc.



Marking Rubric:

	5 Excellent	4 Proficient	3 Satisfactory	2 Limited	1 Unacceptable
Presentation	Truly convincing	Somewhat convincing	Effort made to convince,	Limited to reading notes	No effort made to convince
Land use plan	Thorough understanding	Adequate understanding	Partial understanding	Limited understanding	Little or no effort made



Student Worksheets

Part A – Land-use Videos

- Go to www.albertatomorrow.ca, click on “Student” and register under school and class. Please do not use your real name in your username (for privacy reasons). Record your username and password somewhere so you can reference it if you forget. Once you have created your account, click on “simulator”. You will find the videos under **Videos** on the left hand side.

1. Define Sustainable Development:

2. Watch the “Natural Landscapes” video.

3. What region of Alberta do you live in?

4. What type of land-use is present in your area?

5. Why is native prairie important?

6. Watch the “Mammal Habitat” video.

7. How much woodland caribou habitat is left in Alberta?

8. How does human disturbance affect caribou?

9. What are the factors that make Grizzly Bears populations so susceptible to decline?

10. What can be done to help Grizzly Bear populations?

11. *Watch the "Fish Habitat" Video.*

12. What do fish populations need to thrive?

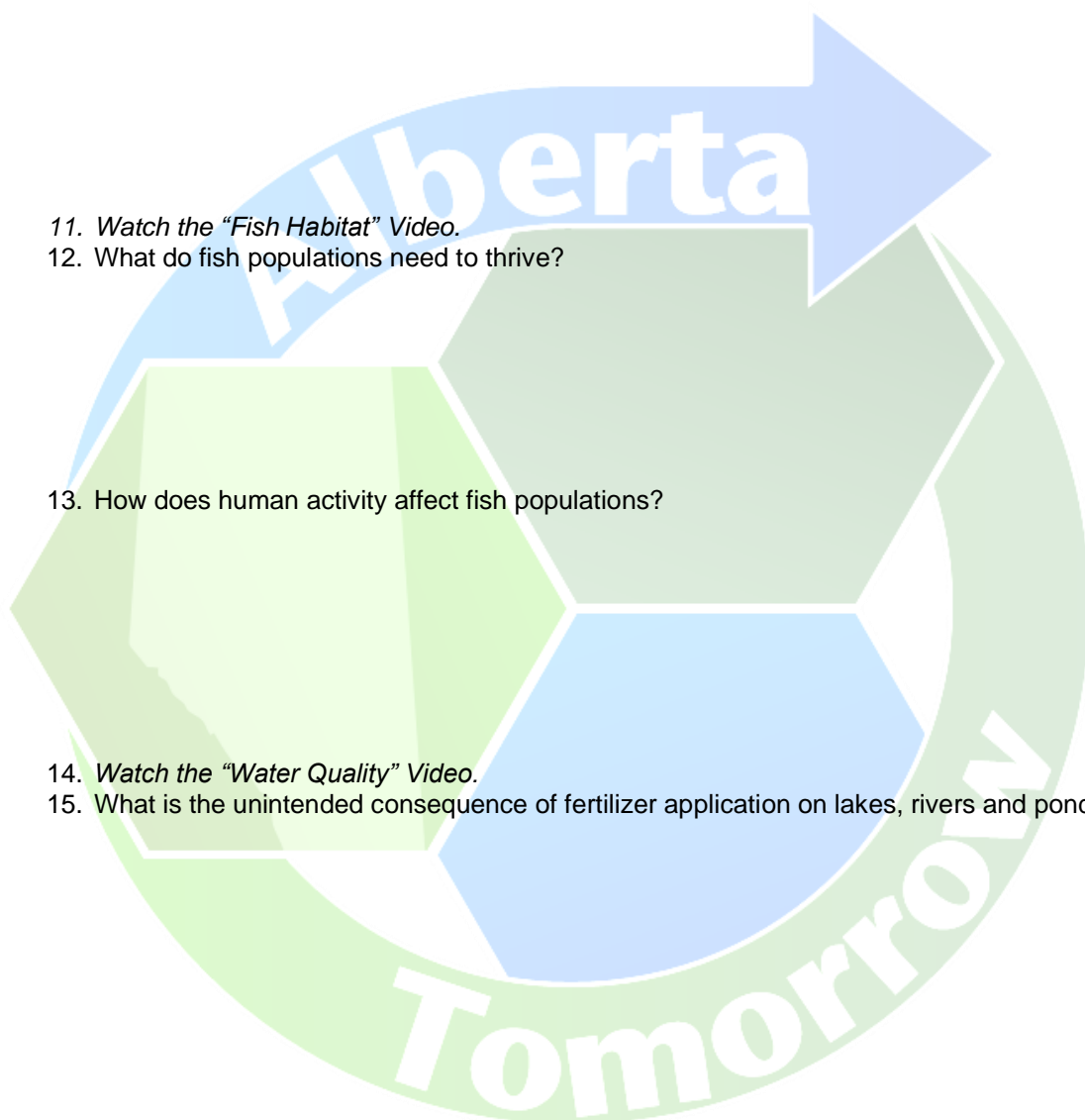
13. How does human activity affect fish populations?

14. *Watch the "Water Quality" Video.*

15. What is the unintended consequence of fertilizer application on lakes, rivers and ponds?

16. *Watch the "Water Consumption" Video.*

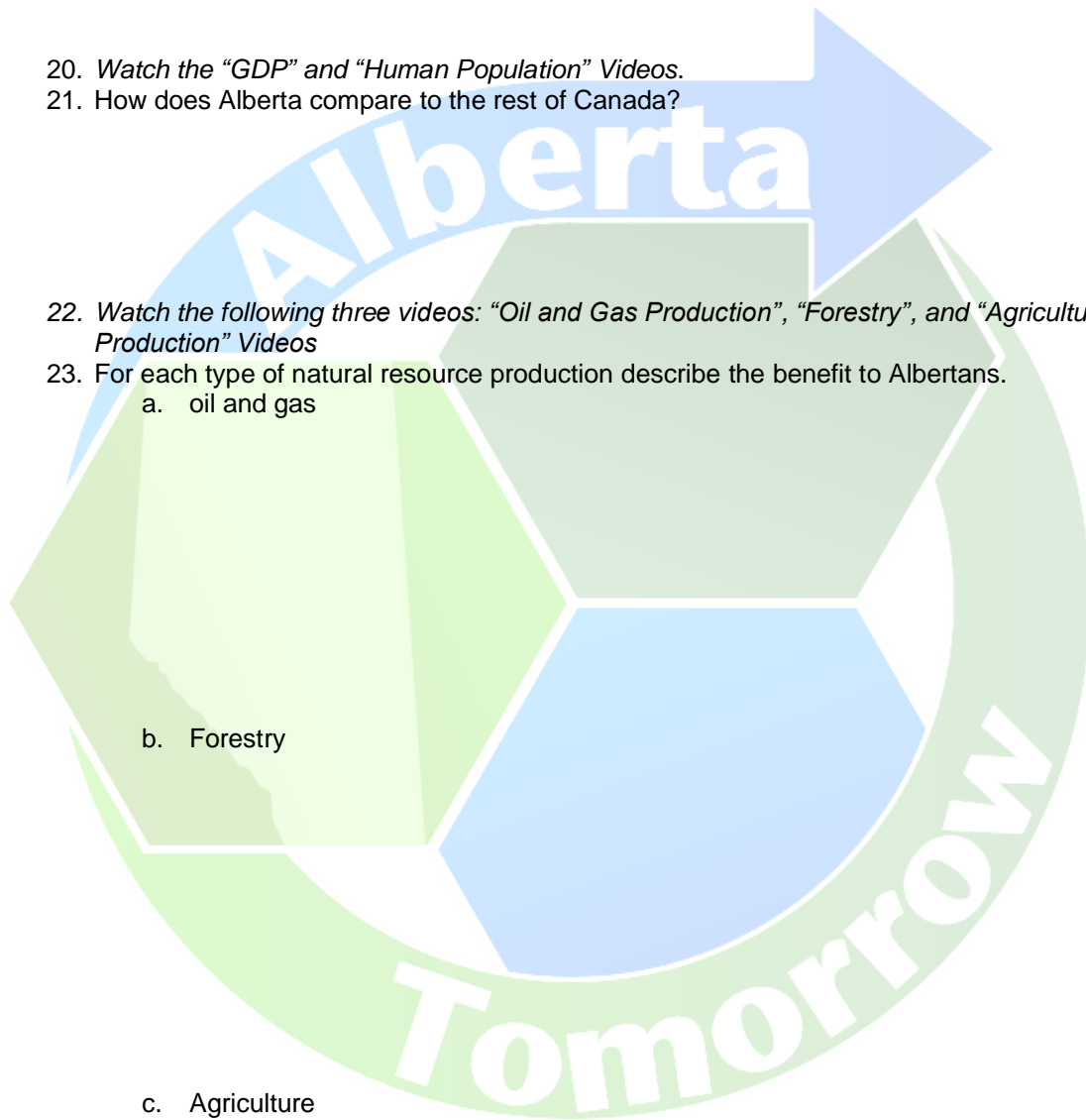
17. Why is water important to us?



18. Watch the “Greenhouse Gas and Biotic Carbon Storage” Video.
19. Describe the flow of carbon through an ecosystem.

20. Watch the “GDP” and “Human Population” Videos.
21. How does Alberta compare to the rest of Canada?

22. Watch the following three videos: “Oil and Gas Production”, “Forestry”, and “Agriculture Production” Videos
23. For each type of natural resource production describe the benefit to Albertans.
 - a. oil and gas
 - b. Forestry
 - c. Agriculture



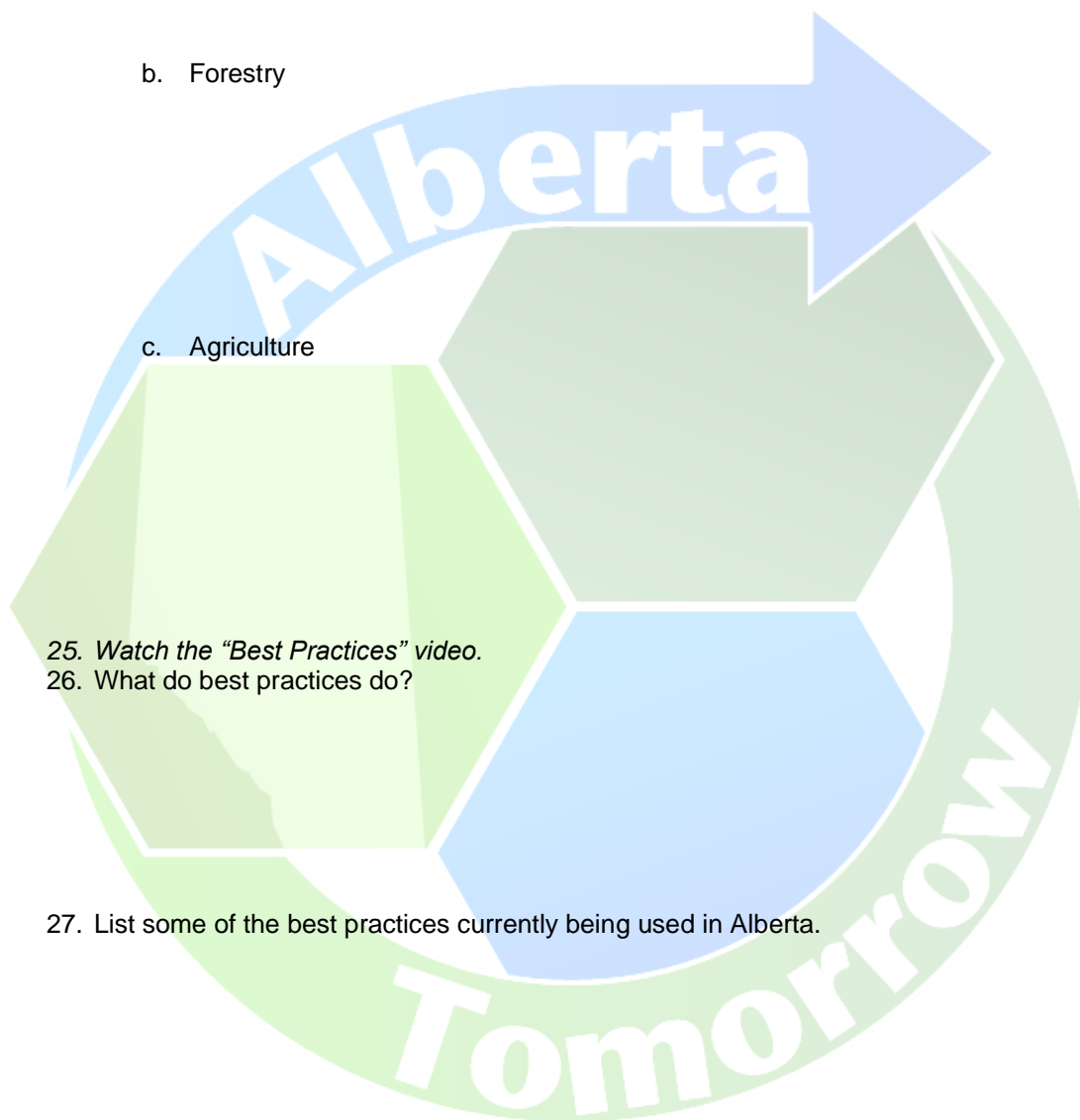
24. For each type of natural resource production describe the environmental liabilities.
- oil and gas

b. Forestry

c. Agriculture

25. Watch the "Best Practices" video.
26. What do best practices do?

27. List some of the best practices currently being used in Alberta.



Part B – Land-Use Assessment

1. Click on the green “+ Scenario” button at the top. Click on “Create New Scenario” Create a “Historic” scenario for your watershed. Click on your desired watershed. You may look at sub-watersheds also. Once you have chosen your study area, click “Run Scenario”.
2. Observe what happens to the indicators, as well as the areas of different landscape types after pressing the play button.

How did the environmental indicators change from 1910-2020? **ANSWERS WILL VARY DEPENDING ON THE AREA OF ALBERTA YOU ARE IN.**

- a. Natural landscapes?

- b. Mammal habitat?

- c. Fish habitat?

- d. Water Quality?

- e. Biotic Carbon?

- f. Greenhouse Gas emissions?

3. How did the socio-economic indicators change from 1910-2020?
 - a. Human Population?

 - b. GDP?

 - c. Water Consumption?

 - d. Forestry?

 - e. Agriculture?

 - f. Hydrocarbon production?

4. What happened to the area of
 - a. Grasslands: _____
 - b. Wetlands: _____
 - c. Forest: _____
 - d. Urban Development: _____
 - e. Agriculture: _____

5. Click "+scenario". Choose "Business as Usual" Scenario. If current trends continue, this is what will happen in your area.
6. How did the environmental indicators change from 2020-2050?
 - a. Natural landscapes? _____
 - b. Mammal habitat? _____
 - c. Fish habitat? _____
 - d. Water Quality? _____
 - e. Biotic Carbon? _____
 - f. Greenhouse Gas emissions? _____
7. How did the socio-economic indicators change from 2020-2050?
 - a. Human Population? _____
 - b. GDP? _____
 - c. Water Consumption? _____
 - d. Forestry? _____
 - e. Agriculture? _____
 - f. Hydrocarbon production? _____
8. What happened to the area of
 - a. Grasslands: _____
 - b. Wetlands: _____
 - c. Forest: _____
 - d. Urban Development: _____
 - e. Agriculture: _____
9. Historically, the human population in Alberta has increased exponentially. What has the impact on quality of life been?

10. Explain the relationship between human population growth and water consumption and agriculture.

11. How does population growth impact the GDP in this area?

12. Does and increase in GDP mean an increase in the quality of life? Why or Why not?

13. Is there another measuring tool that can be used to replace GDP that measures social, environmental and economic well being? Explain.



Group 1: Forestry Company

Mission: As a forestry company, your goal is to harvest as much timber as possible during the next 30 years. It is your job to make sure that Alberta's land-use plan achieves your goal.

To do this, you will:

1. Research the importance of the Forestry Industry in Alberta.
2. Develop a land-use plan that achieves your goal
3. Present and defend your land-use plan

Complete the following steps:

1. Click on "Create New Scenario" Choose "Landuse"
2. Choose your study area, and then click "Next"
3. You are seeing the current land use.
4. 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.
5. Click "Next" You will now decide how you will reach your goals by changing the landscape.
6. Click on "changes"
7. Choose the landscape type or landuse you wish to add in the future and click the location where you want it to grow.
 - a. 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.
 - b. 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.
8. Record the change you requested on Table 4 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".
9. Click "Run Scenario" and then click "Play"
10. Record whether you reached 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.)
11. Click on Management Practices. Watch the management practice video. You must decide on how much industrial activity you want in the study area and what management practices you wish to use from this year on.
12. Move the Industrial Activity slider to the level you wish to see moving into the future. Record your level. _____
13. Choose which Management Practices you wish to use.
14. If you still have not reached your goals, you can go back and change your goals by clicking on individual goals, or go back and make more changes to the landscape by clicking on landscape changes.
15. Screenshot your plan.
 1. Why is the forestry industry important to Alberta's economy?
 2. Did you reach your goal in 30 years?
 3. What else can you change to help you reach your goal?

4. What happened to the indicators that you didn't set goals for?



Group 2: Oil and Gas Executive

Mission: As an oil and gas executive, your goal is to produce as much oil and gas as possible in the next 30 years. It is your job to make sure that Alberta's land-use plan achieves your goal. To do this, you will:

1. Research the importance of the oil and gas industry in Alberta
2. Develop a land-use plan that achieves your goal
3. Present and defend your land-use plan

Complete the following steps:

1. Click on "Create New Scenario" Choose "Landuse"
2. Choose your study area, and then click "Next"
3. You are seeing the current land use.
4. 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.
5. Click "Next" You will now decide how you will reach your goals by changing the landscape.
6. Click on "changes"
7. Choose the landscape type or landuse you wish to add in the future and click the location where you want it to grow.
 - a. 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.
 - b. 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.
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9. Click "Run Scenario" and then click "Play"
10. Record whether you reached 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.)
11. Click on Management Practices. Watch the management practice video. You must decide on how much industrial activity you want in the study area and what management practices you wish to use from this year on.
12. Move the Industrial Activity slider to the level you wish to see moving into the future. Record your level. _____
13. Choose which Management Practices you wish to use.
14. If you still have not reached your goals, you can go back and change your goals by clicking on individual goals, or go back and make more changes to the landscape by clicking on landscape changes.
15. Screenshot your plan.

1. Why is oil and gas production important for Alberta?
2. Did you reach your goal in 30 years?
3. What else can you change to help you reach your goal?

4. What happened to the indicators that you didn't set goals for?



Group 3: Agricultural Producers Association

Mission: As a farming association, your goal is to produce as much food on farms as possible during the next 30 years. It is your job to make sure that Alberta's land-use plan achieves your goal. To do this, you will:

1. Research why agriculture production is important in Alberta
2. Develop a land-use plan that achieves your goal
3. Present and defend your land-use plan

Complete the following steps:

1. Click on "Create New Scenario" Choose "Landuse"
2. Choose your study area, and then click "Next"
3. You are seeing the current land use.
4. 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.
5. Click "Next" You will now decide how you will reach your goals by changing the landscape.
6. Click on "changes"
7. Choose the landscape type or landuse you wish to add in the future and click the location where you want it to grow.
 - a. 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.
 - b. 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.
8. Record the change you requested on Table 4 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".
9. Click "Run Scenario" and then click "Play"
10. Record whether you reached 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.)
11. Click on Management Practices. Watch the management practice video. You must decide on how much industrial activity you want in the study area and what management practices you wish to use from this year on.
12. Move the Industrial Activity slider to the level you wish to see moving into the future. Record your level. _____
13. Choose which Management Practices you wish to use.
14. If you still have not reached your goals, you can go back and change your goals by clicking on individual goals, or go back and make more changes to the landscape by clicking on landscape changes.
15. Screenshot your plan.

Analyze your results:

1. Why is Agricultural production important for Alberta?
2. Did you reach your goal in 30 years?

3. What else can you change to help you reach your goal?
4. What happened to the indicators that you didn't set goals for?



Group 4: Economic Development Authority

Mission: As a representative of various businesses and industries, your goal is development that will increase Alberta's GDP along with our growing population. It is your job to make sure that Alberta's land-use plan achieves your mission. To do this, you will:

1. Research how Oil and Gas Production, Forestry and Agriculture is important in Alberta
2. Develop a land-use plan that achieves your goal
3. Present and defend your land-use plan

Complete the following steps:

1. Click on "Create New Scenario" Choose "Landuse"
2. Choose your study area, and then click "Next"
3. You are seeing the current land use.
4. 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.
5. Click "Next" You will now decide how you will reach your goals by changing the landscape.
6. Click on "changes"
7. Choose the landscape type or landuse you wish to add in the future and click the location where you want it to grow.
 - a. 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.
 - b. 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.
8. Record the change you requested on Table 4 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".
9. Click "Run Scenario" and then click "Play"
10. Record whether you reached 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.)
11. Click on Management Practices. Watch the management practice video. You must decide on how much industrial activity you want in the study area and what management practices you wish to use from this year on.
12. Move the Industrial Activity slider to the level you wish to see moving into the future. Record your level. _____
13. Choose which Management Practices you wish to use.
14. If you still have not reached your goals, you can go back and change your goals by clicking on individual goals, or go back and make more changes to the landscape by clicking on landscape changes.
15. Screenshot your plan.
 1. Why are Agriculture, Forestry and Oil and Gas production important for Alberta?
 2. Did you reach your goal in 30 years?
 3. What else can you change to help you reach your goal?
 4. What other indicators might you consider?

Group 5: Conservation Organization

Mission: As an organization whose mission is protect natural areas, your goal is to increase the area of natural landscapes. Many wildlife species live in old forest and prairie habitat. It is your goal to make sure that Alberta's land use-plan achieves your mission. To do this, you will:

1. Research why natural landscapes are important in Alberta
2. Develop a land-use plan that achieves your goal
3. Present and defend your land-use plan

Complete the following steps:

1. Click on "Create New Scenario" Choose "Landuse"
2. Choose your study area, and then click "Next"
3. You are seeing the current land use.
4. 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.
5. Click "Next" You will now decide how you will reach your goals by changing the landscape.
6. Click on "changes"
7. Choose the landscape type or landuse you wish to add in the future and click the location where you want it to grow.
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 - b. 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.
8. Record the change you requested on Table 4 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".
9. Click "Run Scenario" and then click "Play"
10. Record whether you reached 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.)
11. Click on Management Practices. Watch the management practice video. You must decide on how much industrial activity you want in the study area and what management practices you wish to use from this year on.
12. Move the Industrial Activity slider to the level you wish to see moving into the future. Record your level. _____
13. Choose which Management Practices you wish to use.
14. If you still have not reached your goals, you can go back and change your goals by clicking on individual goals, or go back and make more changes to the landscape by clicking on landscape changes.
15. Screenshot your plan.

Analyze your results:

1. Why are natural landscapes important for Alberta?
2. Did you reach your goal in 30 years?
3. What else can you change to help you reach your goal?

4. What other indicators might you consider?



Group 6: Watershed Stewardship Group

Mission: As a citizens group, your goal is to minimize water consumption and maximize water quality in order to maintain a plentiful long-term quality supply of water to communities throughout Alberta. It is your job to make sure that Alberta's land-use plan achieves your goals. To do this, you will:

1. Research what affects water quality and water consumption in Alberta
2. Develop a land-use plan that achieves your goal
3. Present and defend your land-use plan

Complete the following steps:

1. Click on "Create New Scenario" Choose "Landuse"
 2. Choose your study area, and then click "Next"
 3. You are seeing the current land use.
 4. 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.
 5. Click "Next" You will now decide how you will reach your goals by changing the landscape.
 6. Click on "changes"
 7. Choose the landscape type or landuse you wish to add in the future and click the location where you want it to grow.
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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.
 8. Record the change you requested on Table 4 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".
 9. Click "Run Scenario" and then click "Play"
 10. Record whether you reached 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.)
 11. Click on Management Practices. Watch the management practice video. You must decide on how much industrial activity you want in the study area and what management practices you wish to use from this year on.
 12. Move the Industrial Activity slider to the level you wish to see moving into the future. Record your level. _____
 13. Choose which Management Practices you wish to use.
- If you still have not reached your goals, you can go back and change your goals by clicking on individual goals, or go back and make more changes to the landscape by clicking on landscape changes.

Screenshot your plan.

Analyze your results:

1. What affects water quality and water consumption in Alberta?
2. Did you reach your goals in 30 years?
3. What else can you change to help you reach your goals?

4. What other indicators might you consider?



Group 7: CO₂ Reduction Committee Group Activity Sheet

Mission: As a citizens group, it is your goal to decrease overall carbon emissions. It is your job to make sure that Alberta's land-use plan achieves your mission. To do this, you will:

1. Research what human activities affect biotic carbon storage and greenhouse gas emissions in Alberta
2. Develop a land-use plan that achieves your goal
3. Present and defend your land-use plan

Complete the following steps:

1. Click on "Create New Scenario" Choose "Landuse"
2. Choose your study area, and then click "Next"
3. You are seeing the current land use.
4. 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.
5. Click "Next" You will now decide how you will reach your goals by changing the landscape.
6. Click on "changes"
7. Choose the landscape type or landuse you wish to add in the future and click the location where you want it to grow.
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11. Click on Management Practices. Watch the management practice video. You must decide on how much industrial activity you want in the study area and what management practices you wish to use from this year on.
12. Move the Industrial Activity slider to the level you wish to see moving into the future. Record your level. _____
13. Choose which Management Practices you wish to use.
14. If you still have not reached your goals, you can go back and change your goals by clicking on individual goals, or go back and make more changes to the landscape by clicking on landscape changes.
15. Screenshot your plan.

Analyse your results:

1. Why is increasing biotic carbon storage and decreasing CO₂ emissions important for Alberta?
2. Did you reach your goals in 30 years?

3. What else can you change to help you reach your goal?
4. What other indicators might you consider?



Group 8: Fishing/Hunting Organization

Mission: As a fishing/hunting organization, your goal is to increase the quality of fish and wildlife habitat in the province to offer more recreational fishing and hunting opportunities to Albertans. It is your job to make sure that Alberta's land-use plan achieves your mission. To do this, you will:

1. Research what human activities affect biotic carbon storage and greenhouse gas emissions in Alberta
2. Develop a land-use plan that achieves your goals
3. Present and defend your land-use plan

Complete the following steps:

1. Click on "Create New Scenario" Choose "Landuse"
2. Choose your study area, and then click "Next"
3. You are seeing the current land use.
4. 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.
5. Click "Next" You will now decide how you will reach your goals by changing the landscape.
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9. Click "Run Scenario" and then click "Play"
10. Record whether you reached 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.)
11. Click on Management Practices. Watch the management practice video. You must decide on how much industrial activity you want in the study area and what management practices you wish to use from this year on.
12. Move the Industrial Activity slider to the level you wish to see moving into the future. Record your level. _____
13. Choose which Management Practices you wish to use.
14. If you still have not reached your goals, you can go back and change your goals by clicking on individual goals, or go back and make more changes to the landscape by clicking on landscape changes.
15. Screenshot your plan.
 - a. **Analyze your results:**
 1. How does human activity affect fish and wildlife habitat in Alberta?
 2. Did you reach your goals in 30 years?
 3. What else can you change to help you reach your goals?

4. What other indicators might you consider?



Group 9: Indigenous Group

Mission: As an Indigenous group, your goal is to increase accessibility to land for traditional uses including increasing fish and wildlife habitat, water quality and protected areas. It is your job to make sure that Alberta's land-use plan achieves your mission. To do this, you will:

1. Research what traditional land uses are and decide which dials in Alberta Tomorrow are applicable.
2. Research what human activities are affecting your ability to carry out traditional land uses.
3. Develop a land-use plan that achieves your goals
4. Present and defend your land-use plan

Complete the following steps:

1. Click on "Create New Scenario" Choose "Landuse"
2. Choose your study area, and then click "Next"
3. You are seeing the current land use.
4. 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.
5. Click "Next" You will now decide how you will reach your goals by changing the landscape.
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7. Choose the landscape type or landuse you wish to add in the future and click the location where you want it to grow.
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9. Click "Run Scenario" and then click "Play"

10. Record whether you reached 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.)
11. Click on Management Practices. Watch the management practice video. You must decide on how much industrial activity you want in the study area and what management practices you wish to use from this year on.
12. Move the Industrial Activity slider to the level you wish to see moving into the future. Record your level. _____
13. Choose which Management Practices you wish to use.
14. If you still have not reached your goals, you can go back and change your goals by clicking on individual goals, or go back and make more changes to the landscape by clicking on landscape changes.
15. Screenshot your plan.

Analyze your results:

1. How does human activity affect your ability to carry out traditional activities?
2. Did you reach your goals in 30 years? Why not? What else needs to be done?



Part D: Land Use Tradeoff

1. Was it easy for the class to decide upon a land-use plan? Explain.

2. A land-use trade-off occurs when decreasing one land-use goal makes it easier to achieve another land-use goal. Describe any trade-off that the class encountered while building a sustainable land-use plan.

3. Why do trade-offs make land-use planning difficult?



4. The government works with stakeholders to identify land-use plans that are best suited to achieve society's goals. Imagine that the government decided to reduce natural resource development. Based on what you learned using Alberta Tomorrow, list two ways that the decision might improve quality of life in Alberta and two ways that the decision might reduce quality of life in Alberta.



5. How do your personal consumer choices affect the quality of the environment?