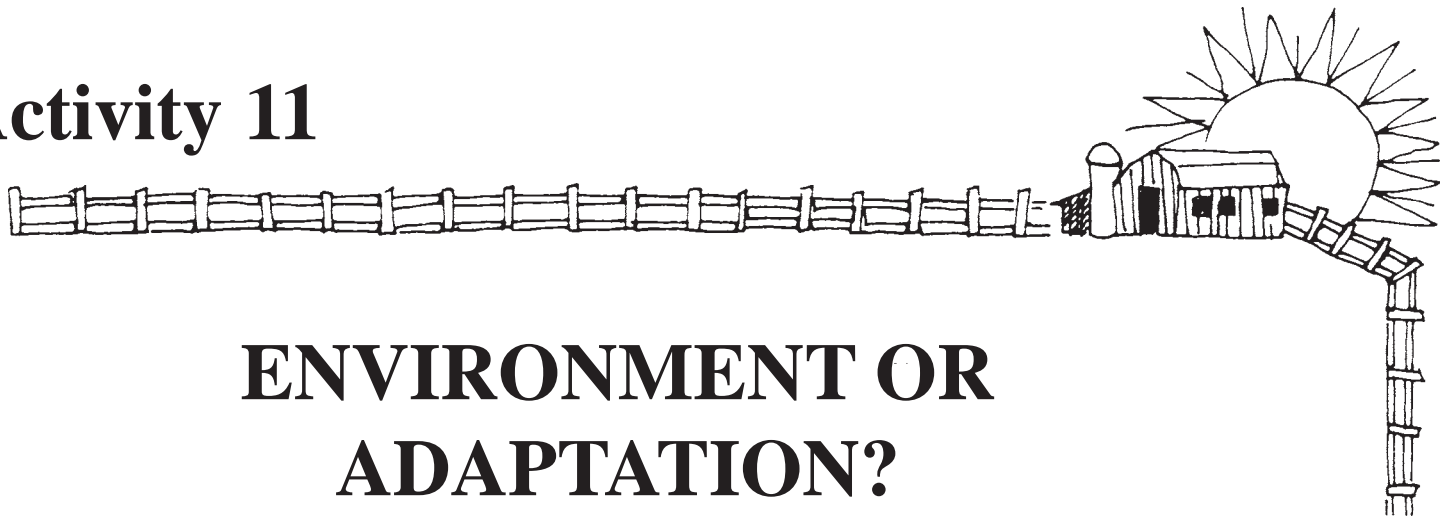


Activity 11



ENVIRONMENT OR ADAPTATION?

STUDY QUESTION:

How do I make my environment more comfortable?

THE ACTIVITY:

Students categorize farm management practices.

CURRICULUM FIT:

Science Program of Studies – 2000 Grade 4

General Outcomes

4–10 Demonstrate knowledge and skills for the study, interpretation, propagation and enhancement of plant growth.

Specific Learner Outcomes

1. Describe the importance of plants to humans and their importance to the natural environment. Students who meet this expectation should be able to give examples of plants being used as a source of food or shelter, and be aware of the role plants play in the environment; e.g., preventing erosion, maintaining oxygen.
4. Recognize that plant requirements for growth; i.e., air, light energy, water, nutrients and space; vary from plant to plant and that other conditions; e.g., temperature and humidity; may also be important to the growth of particular plants.
5. Identify examples of plants that have special needs.
6. Recognize that a variety of plant communities can be found within the local area and that differences in plant communities are related to variations in the amount of light, water and other conditions.
9. Nurture a plant through one complete life cycle—from seed to seed.

10. Describe the care and growth of a plant that students have nurtured, in particular:
- identify the light, temperature, water and growing medium requirements of the plant
 - identify the life stages of the plant
 - identify the reproductive structures of the plant.
11. Describe different ways that seeds are distributed; e.g., by wind, by animals; and recognize seed adaptations for different methods of distribution.

Social Studies Program of Studies – 1990 Grade 4

General Outcomes

The availability and use of natural resources affects people and their environment.

Specific Learner Outcomes

The environment can affect the way people live.

- The ways in which the environment (climate, landforms) affects people and the way they live (for example, because Southern Alberta is dry and flat, sheep and cattle ranching predominate)
- The natural and human-made components of the environment; e.g., natural: rivers, forests, water; human-made: dams, buildings, roads

Our way of life and our environment are affected by the presence and use of natural resources.

natural resources renewable resources

- People modify and change the environment according to their needs; e.g., the construction of roads
- Changes in technology can affect our use of natural resources

Social Studies Program of Studies - Draft 2003 Grade 4

General Outcomes

4.1 Alberta: A Sense of the Land

General Outcome Students will demonstrate an understanding and appreciation of how elements of physical geography, climate, geology and paleontology are integral to the landscapes and environment of Alberta.

Specific Learner Outcomes

4.1.1 Value Alberta's physical geography and natural environment:

- Appreciate the diversity of elements pertaining to geography, climate, geology and paleontology in Alberta (LPP)
- Appreciate how land sustains communities and quality of life (ER, LPP)

4.1.2 Critically examine the physical geography of Alberta by exploring and reflecting upon the following questions and issues:

- What are the major geographical and natural vegetation regions, landforms and bodies of water in Alberta (e.g., prairie region, forests, rivers, hoodoos, Rocky Mountains, oil sands)? (LPP)

4.1.4 Analyze how Albertans interact with their environment by exploring and reflecting upon the following questions and issues:

- How do Albertans deal with competing demands on land use in Alberta (e.g., conservation, solar and wind power, recreation, agriculture, oil exploration, forestry)? (ER, LPP)

AGRICULTURE CONCEPTS:

Capital and Technology Intensive Nature of Agriculture Production, Processing and Marketing

PURPOSE:

- To show the practical application of knowledge of the environment and adaptations in a familiar industry.
- To identify actions which are specifically related to the environment or adaptation development.

MATERIALS REQUIRED:

Supplied in this lesson.
Optional - plants or seeds for experimentation.

TIME REQUIRED:

2 - 5 class periods.

BACKGROUND - For the Teacher

Farmers make effective use of research which results in modifications of plants and animals. Different breeds of plants and animals are developed to thrive in special environments.

PROCEDURE

Part 1

Introduction

1. Two ways for organisms to thrive in their environment are:
 - a) Modify or change the environment to meet the needs of the organism.
 - b) The organism must develop special characteristics in order to adapt to the environment.

Effective farm management employs both of these strategies to improve the productivity of both plants and animals.

Part 2

Definitions

2. Present the introduction to this lesson. Discuss
 - “What is an environment?”
 - “What is an adaptation?”
 - “How are environments and adaptations related?”

Part 3

Exploring the concepts

3. Look at the classroom environment.
Ask the students to suggest ways that the classroom environment has been modified to meet their needs.
4. Have students suggest some ways that farmers might modify the environment of their livestock or crops to encourage greater production.

Part 4

Adaptations

5. Ask students to suggest some common adaptations of animals. Adaptations are characteristics which are developed to enable an organism to survive in its environment. Examples are webbed feet, seeds in the form of burrs. Through selective breeding of plants and animals special characteristics can be developed. These may make the organism more successful in producing food for humans. See how many examples of this form of management the class can suggest.
6. Introduce the Dairy Cow - Example.
7. Have students suggest some other adaptations that farmers might encourage in their plants and animals.
8. Ask the students to do the work sheet, “Effective Farm Management”

Part 5

Activity

9. Have students create specially adapted Alberta plants or animals. They may gettogether in groups to assemble a model of a well managed farm operation. Students should be prepared to defend their inventions.

Part 6

Conclusion

10. Review the worksheets.
11. Have the students decide which management techniques they could recognize from the road.
12. Which are the responsibility of the farmer?
13. Which depend on the assistance from other people in agribusiness?
14. Display the models and have students explain their creations with the class.

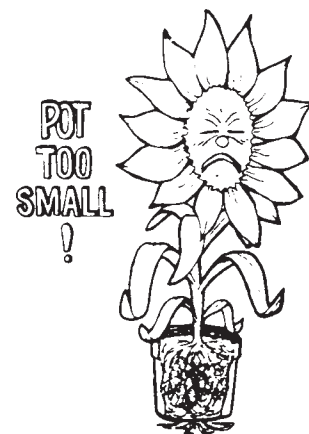
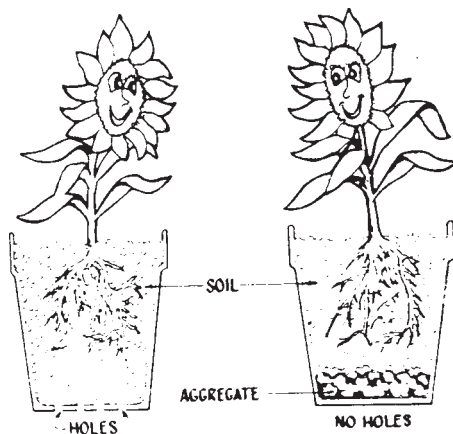
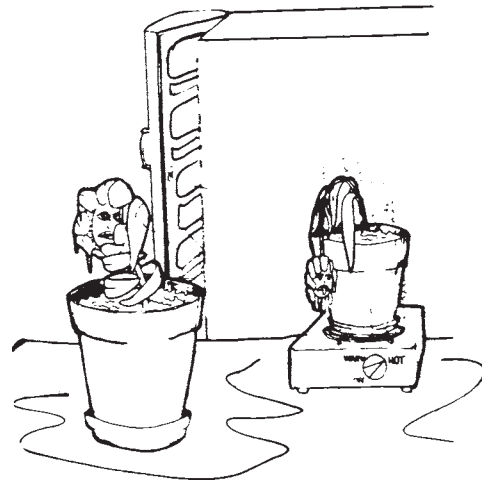
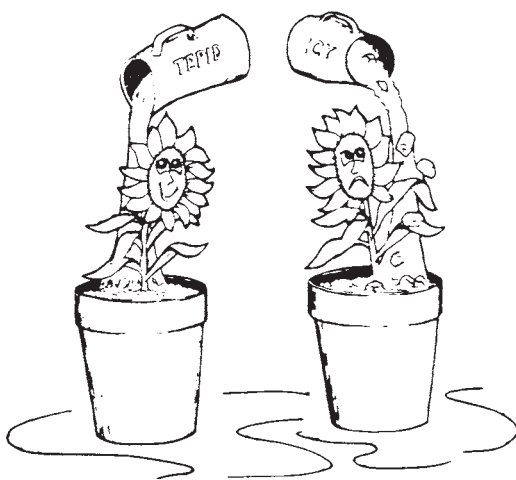
FOR DISCUSSION

1. Who are some of the people who might help farmers with their management? environment? adaptation?
2. How does good farm management affect the consumer (people in this class)?

RELATED ACTIVITIES

1. Using several plants of different varieties, study the effects of environmental change. (i.e. drought resistance, or light sensitivity.)

Good plants to include may be cactus, or low light tropicals. This will help to show the special adaptations of some species.





EFFECTIVE FARM MANAGEMENT

Decide which of the following Farm Management Practices are examples of:

1. Changing the environment.
2. Developing special adaptations.

If the example is environmental, make an "X" in the environmental column.

If the example is adaptation, make an "X" in the adaptation column.

Farm Management Practices	Environment Change	Selecting Adaptations
1. Dig water holes in various places in the pasture so cattle will use the whole pasture.	<input type="checkbox"/>	<input type="checkbox"/>
2. Develop early maturing grain to avoid frost in a short growing season.	<input type="checkbox"/>	<input type="checkbox"/>
3. Develop special breeds of sheep which grow wool that is good for rug making.	<input type="checkbox"/>	<input type="checkbox"/>
4. Plant shelterbelts to control wind.	<input type="checkbox"/>	<input type="checkbox"/>
5. Raise chickens that have small bodies and lay good numbers of large eggs.	<input type="checkbox"/>	<input type="checkbox"/>
6. Make special feeds to help animals grow quickly or produce more.	<input type="checkbox"/>	<input type="checkbox"/>
7. Keep dairy cattle in small places to increase feed intake and limit exercise so that they increase their milk production.	<input type="checkbox"/>	<input type="checkbox"/>
8. Develop special wheat with a solid stem which will resist attacks by sawflies.	<input type="checkbox"/>	<input type="checkbox"/>
9. Irrigate certain areas to assist growth of certain plants.	<input type="checkbox"/>	<input type="checkbox"/>
10. Laying hens are given extra light in winter to encourage them to continue production.	<input type="checkbox"/>	<input type="checkbox"/>

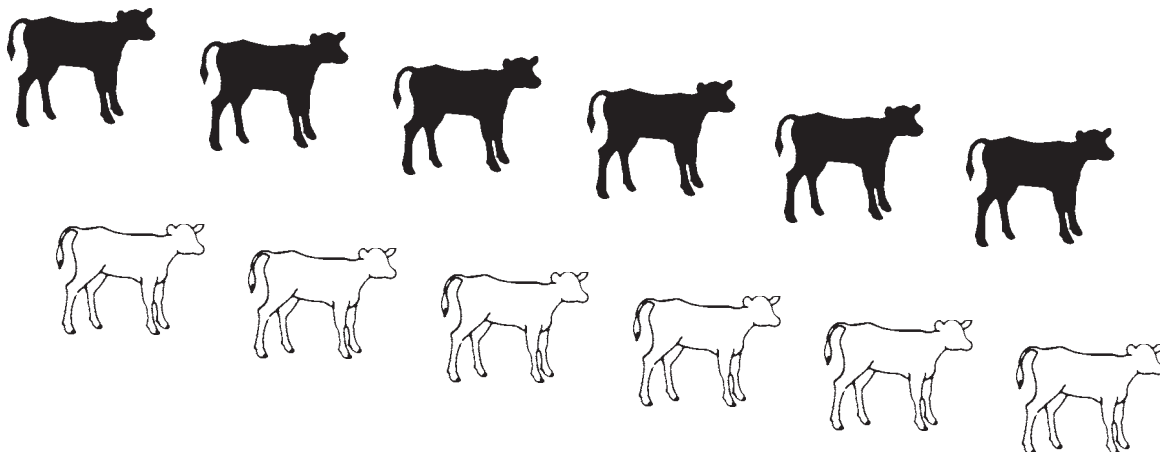
STUDENT RESOURCE

DAIRY COW ADAPTATIONS



People all over the world use dairy products. Milk, cheese and butter are part of the diet in most countries. Although most of the milk is from dairy cows; milk from goats, sheep, water buffalo and horses is also used.

Dairy cattle as we know them, did not always exist. These breeds developed because of careful selection by cattle producers. This was done by breeding the sons and daughters of good producing cows. The good animals were kept and poor producers were culled. Because people used the breeding stock in their area, many related animals were bred to each other. After several centuries this began to produce cattle that looked similar to each other in size, conformation, colour and production. As the volume of milk increased, milk and milk products were made available to more people. City dwellers were able to buy the volume of milk they needed daily.



One dairy cow produces enough milk to feed 12 to 15 calves in one year.