

Alberta Parks

**Waste in our Natural
World**

**Field Study
Planning Guide**

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1.0 INTRODUCTION

Welcome to the teacher's planning and activity package for **Waste in the Natural World**. This half-day program was developed to offer a natural environment experience for students that supports both the Grade 4 Alberta Elementary Science Curriculum Topic A: Waste and Our Natural World and the goals of Alberta's Parks and Protected Areas Program:

- **Preservation** – *to preserve in perpetuity a network of parks and protected areas that represent the diversity of the province's natural heritage as well as related cultural heritage.*
- **Heritage appreciation** – *to provide opportunities to explore, understand and appreciate the natural heritage of Alberta, and enhance public awareness and our relationship to and dependence on it.*
- **Outdoor recreation** – *to provide a variety of natural landscape dependent outdoor recreation opportunities and related facilities and services.*
- **Heritage tourism** – *to encourage residents and visitors to the province to discover and enjoy the natural heritage of Alberta through a variety of outdoor recreation and nature based tourism opportunities, facilities and accommodation services.*

1.1 Program Outline

Waste in the Natural World is a guided program that consists of three components:

- Preparatory activities to be completed at the school that are multidisciplinary in nature.
- A half-day field study conducted in a park or protected area that takes students through experiential activities focused on wetlands ecosystems.
- Post-visit activities to be done at the school are intended to reflect on and apply what the students have learned.

Note: Checklists, which will help you organize your field study, are provided in this package.

1.2 Program Objectives and Curriculum Fit

This field study program and the preparatory and post field study activities that complement it have been designed to address specific learner expectations from Topic A: Waste and Our World (Grade 4) in the Elementary Science Program of Studies.

- Identify plant and animal waster, and describe how they are recycled in
- Identify and classify wastes that result from human activity.
- Distinguish between wastes that are readily biodegradable and those that are not.
- Identify ways in which materials can be reused or recycled.
- Develop a flow chart for a consumer product that indicates the source materials, final product, its use and method of disposal.

- Identify actions individuals and groups can take to minimize the production of wastes, to recycle or reuse wastes and to ensure the safe handling and disposal of wastes.
- Develop and implement a plan to reduce waste, and monitor what happens over a period of time.

There are additional connections with the Grade 4 science curriculum Topic E: Plant Growth and Changes, and Social Studies Topic 4.1 Alberta: A sense of the Land.



2.0 PLANNING YOUR VISIT

Alberta's provincial parks and protected areas are ideal "outdoor classrooms". Our education staff provide direct programming and support materials to schools and youth groups in various sites. These services are aimed at increasing environmental awareness, understanding and stewardship of the natural world.

To provide your groups with the best experience possible, please review the following section thoroughly.

2.1 Safety in the Park

Your role...

School groups need to be prepared for the possibility of accidents. We strongly recommend that teachers and/or chaperones have a recognized and current first aid certification.

Our role...

In the event of an emergency, there are existing emergency response programs in place at our sites. On site personnel have basic first aid and CPR certification. As well, they can access emergency services such as local Emergency Medical Services, STARS Air Ambulance and R.C.M.P, by cellular and satellite telephone and radio. Depending on location, time of response is approximately 20 minutes.

Teachers can also access these resources by dialing 911. If you are guiding your own field study, please check with park personnel to verify your access to local communication sources.

2.2 Park Facilities

Most parks and protected areas offer groups the following facilities and services:

- A professional interpreter to guide you on your discovery (and to answer any questions about the visit package).
- All equipment needed for the field study (unless specified in this package).
- Staging/day use areas equipped with a shelter, water pump, pit toilets, and firepits.



2.3 Planning Checklist for Your Field Study

Did you remember to...?



- Arrange for transportation to and from the park.
- Confirm the meeting location with your interpretive guide.
- Prepare student material (if required) and complete pre-visit activities at school with students.
- Divide your students into small groups and select a volunteer leader for each group. We recommend 1 adult for every 5 students
- Arrange for and prepare adult volunteers. We appreciate their help and they will be expected to participate in the program. It would be beneficial to:
 - Clarify what their roles and responsibilities will be during the field-study.
 - Provide volunteers with any information they may need for the day.
 - Orient them to any specific health or student concerns.
- Ensure that students have lunches (if you are not preparing a BBQ) and that they are appropriately dressed for the weather. Students should wear long pants and bring rubber boots and an extra pair of socks.
- Encourage students to reduce garbage in the park by bringing garbage-free lunches such as: reusable lunch bags and containers, drinks in cans or bottles.
- Review and discuss the park rules and behavioural expectations found in the [Class Preparation Checklist For Your Field Study](#) on pages 7 and 8.



2.4 Class Preparation Checklist for Your Field Study



Here is a checklist of things to review at school prior to your field study.

- Discuss the roles and importance of provincial parks and protected areas.
 - Alberta contains many different natural landscapes and is home to numerous plant and animal species. Our parks and protected areas network helps to ensure that this environmental diversity is preserved for future generations. For more information on the parks and protected areas network, visit our web site at www.albertaparks.ca.

- Discuss how behaviour can affect the natural environment in a protected area. Have the class make a list of behaviours that show respect for living things and a commitment to their care. This list can include:
 - Leave ant hills, nests and rotting logs alone. These are homes for small animals.
 - Walk carefully around bushes and trees, rather than through them.
 - Stay on trails; do not pick or remove anything in a protected area, unless it is garbage.

- Discuss outdoor safety by creating an outdoor classroom safety plan. This plan could include:
 - Have a buddy that you spend the day with.
 - Always be in view of your teacher or adult leader.
 - Don't approach wild animals.
 - Wearing appropriate clothing for the season and for the activities of the day.

- Discuss behavioural expectations while in the park. Teachers are responsible for the behaviour and discipline of the student during our programs.
 - Explain that they are ambassadors for their school.
 - Review appropriate behaviour, both indoors and out.
 - Discuss the facility or the part of the park they will be visiting. Explain that the field study is a school, just a different location. All the school rules apply. Other schools will be using the park to work as well.



□ Discuss the Park rules:

- Wildlife live in parks and protected areas because they are able to meet their needs for food, water, shelter and space. Feeding them is not necessary. In fact, it can create significant hardships for them because they become dependent on this food and the learned behaviors associated with this can also be dangerous for them. **Do not feed or harass wildlife.** Observe them quietly instead.
- Thousands of people visit parks and protected areas each year. If each person took only one cone or picked one plant, it would still have a very significant impact on the natural environment. **Cutting, defacing, picking or removal of any plant, fossil, rock or other Park material is prohibited.** Take only pictures, leave only footprints.
- If those same thousands of people threw their garbage on the ground, it would be difficult to clean up and dangerous for wildlife who could confuse the litter for food. **Litter should be placed in garbage cans or in your pocket** if no garbage cans are available.
- Parks and protected areas should remain a natural place. Wildlife are not accustomed to pets chasing them or threatening them with noise. For these reasons, **pets must be on a leash** in the Park. This not only protects wildlife, it also protects people and their pets as well.
- Open fires are a threat to park habitat and human safety. For these reasons, **fires are permitted only in designated firepits** located in picnic area. When using a firepit, please provide your own roasting sticks and kindling. **DO NOT USE BRANCHES OR DEADFALL FROM THE PARK** for the fire, and remove all garbage from the firepit area. Ensure your fire is out completely before leaving.



3.0 PRE-VISIT ACTIVITIES

The following pages contain a variety of pre-visit and post-visit activities that complement your field study and provide students opportunities to practice the skills that they will be using during and after their trip. If possible, invite the adult volunteers into the classroom to also experience these activities.

Feel free to use your own activities or the ones described in this package. Choose activities that reflect each specific learner expectation from the curriculum that will be addressed on the field study day (see **Section 1.2 Program Objectives and Curriculum Fit**).

3.1 Vocabulary

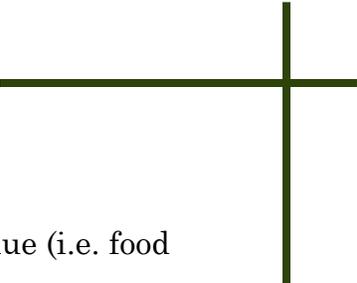
Review the following vocabulary with the class. This can be done in a number of ways:

- The words could be incorporated into the spelling program by using them in a weekly quiz.
- Students could be given a copy of the vocabulary list and asked to create poems or a crossword puzzle using the words on the list.

This terminology is used throughout the field study program. The more familiar students are with this vocabulary the more successful their field study experience will be.

- **Consumer** - Any living organism that cannot make its own food, and must eat plants and animals to get the energy it needs for survival.
- **Decompose**- To break down into simpler elements.
- **Decomposer** - Living organisms such as bacteria, insects, molds, or fungi that break down the remains and waste products of plants and animals.
- **Fungus (fungi)** - A plant which does not contain chlorophyll; a decomposer which draws nutrients from dead decaying matter.
- **Biodegradable** - Something that is able to break down (rot, decay, decompose) into simpler forms by natural processes.



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- ***Carnivore*** - Animal-eating or predatory consumer.
 - ***Garbage*** - Anything that is no longer considered of use or value (i.e. food waste, trash).
 - ***Herbivore*** - A plant-eating consumer.
 - ***Hyphae*** - Thread-like strands which form the mycelium on a fungus and from which the plant draws its nourishment.
 - ***Leaf Litter*** - Dead and dying leaves found on the surface of the soil.
 - ***Litter*** - In the natural community, the upper-most layer of soil, consisting mostly of decaying organic matter. In human communities, an accumulation of objects, especially discarded waste materials or scraps.
 - ***Mushroom*** - The reproductive body of a fungus which grows from the mycelium.
 - ***Non-biodegradable*** - Not capable of being decomposed by living matter, especially by bacteria, soil insects and non flowering plants such as fungus and moulds.
 - ***Omnivore*** - A plant and animal-eating consumer.
 - ***Organic material*** - Derived from living organisms containing carbon.
 - ***Photosynthesis*** - The process by which chlorophyll-containing plants convert light energy into chemical energy and synthesizes organic compounds.
 - ***Producer*** - A green plant that is able to make its own food using energy from the sun.
 - ***Recycle*** - To process waste materials into something useful.
 - ***Reduce*** - To use fewer consumable goods and create less waste.
 - ***Reuse*** - To use a product over and over without changing it.
 - ***Scavenger*** - An animal that feeds on dead organic matter.

- **Soil** - The top layer of the Earth's surface, suitable for the growth of plant life.
- **Spores** - The reproductive structure of plants such as fungi, mosses, or ferns.
- **Waste** - Something that is regarded as worthless or useless.

3.2 What is Waste?

Materials:

- Whiteboard and chalk

Procedure:

1. Introduce the subject by writing the word WASTE on the board. Ask students to provide one word that they associate with the term waste. (Each word must be different.) Write all these words down.
2. Introduce the term **biodegradable** and ask students if they know what it means. Can they find an example of biodegradable item in the list of words? Or a **non-biodegradable** item?
3. Ask students to tell you what the three R's represent. Divide the class into six groups. Assign each group a category from the following list:
 - Biodegradable
 - Non-biodegradable
 - Recyclable
 - Re-useable
 - Reducible
 - Non-recyclable, non-reusable, non-reducible
4. Ask students to place any word from the list on the board that fits within their category. Each group records their words on a separate sheet of paper.
5. Ask each group to read out the words they placed in their category. Which categories had the least numbers of words in it, the most? What does this tell us about how much waste could be managed through recycling, reducing or re-using?
6. To conclude the activity, ask the class to examine the words on the board again, and this time find word(s) which describe waste produced by organism in the natural environment. Which category would the word fit in? Can they think of any other examples of natural waste? From their review, is there anything in the natural world that can be placed in the categories: non-biodegradable, non-recyclable, non-reusable, or non-reducible? What does this tell us about the presence and values of waste in a natural community? A human community.

3.3 Falling to Pieces

Materials:

- Bag of Potting Soil
- Ten Containers (e.g. tin cans – a good “re-using” exercise)
- Masking tape and markers (for labeling)
- Large sheet of newsprint
- Following ten items
- Green leaf (can be from a house plant)
- Wooden match
- Slice of apple
- Slice of banana
- Small piece of paper
- Piece of polystyrene cup
- Plastic straw wrapper from a drinking box
- Potato chip bag
- Plastic drink top
- Metal bottle cap



Procedure:

Students set up an experiment to explore the concept of decomposition that is monitored over the course of the unit.

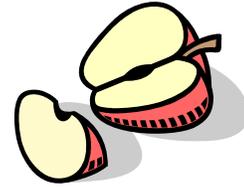
1. Review the meaning of the terms biodegradable and non-biodegradable.
2. To set up the experiment, divide the class into 10 groups. Instruct each group to fill a container with garden soil and bury one of the 10 items from the list. Label the container according to what is inside.
3. Ask students to predict which ones will decompose and in which order the items will ***decay or decompose***.
4. Once a week, assign different group of students to check the containers and record the status of each item on the chart. Remarks could compare the current item to its original form, what might be growing on it or breaking it down, if the colour or odor has changed, etc.

ITEM	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
Green leaf						
Wooden match						
Slice of apple						
Slice of a banana						
Small piece of paper						
Piece of polystyrene cup						
Piece of polystyrene cup						
Plastic straw wrapper from a drinking box						
Potato chip bag						
Plastic drink top						
Metal bottle cap						

3.4 A Rotten Time:

Materials:

- Soil
- 4 plastic containers
- 4 slices of apples
- 4 spoons
- Resealable plastic bag
- Water
- Earthworms or red wigglers (contact a local fishing shop for information about where to obtain live earthworms or Earth's General Store)
- Masking tape and a marker
- Seeds (Oilseed Rape or Alfalfa are best)



Background:

Soil forms when organic material decays, breaks down and mixes with inorganic materials such as clay, sand, or silt. The breakdown of organic material happens naturally with the help of decomposers such as soil organisms, which require oxygen and water to survive and carry out their roles in the decomposition process.

A plastic bag prevents oxygen, water, and decomposers from getting at the organic material preventing decomposition from happening (This is analogous to the plastic bags full of garbage that we send to the landfill every week). Students set up an experiment to determine what factors affect the rate of decomposition and decay in organic materials, and what soil components assist in the growth of plants.

Procedure:

1. Fill four containers with soil with equal amounts of soil.
 - Container 1:** burry an apple slice in the soil
 - Container 2:** seal an apple in a resealable plastic bag and bury it in the soil
 - Container 3:** burry an apple slice in the soil, with the addition of water, as needed, to keep the soil moist
 - Container 4:** burry an apple slice in the soil, with the addition of earthworms, and water (as needed to keep the soil moist).
2. Have the students predict the rate of organic decay in each of the containers.
3. Students then plant 3-4 seeds on each of the containers and place the containers by a window. Ask the students predict which soil treatment will provide the best medium for growth.
4. Check the containers daily for seedling development.

5. After four weeks, students remove or replant the seedlings and gently scoop out what is left of the apple slices from the soil. Students record their observations and discuss the following:
- What were the differences in the amount of decay of the apple weeks for decay of the apple slices?
 - Which decayed the fastest, which decayed the slowest?
 - What does this tell you about the components that are required for decomposition?
 - Which container(s) had the best seedling growth? What does this tell you about the relationship between decomposition, soil, and plant growth?

4.0 POST-VISIT ACTIVITIES

4.1 What's for Lunch?

Materials:

- Writing and drawing materials



Background:

Students trace some foods back to their source including the impact on wildlife and the environment along the way to the consumer. Students recommend, with explanations, some food habits that could benefit wildlife and the environment.

Procedure:

1. Generate a list of foods the students brought for lunch. Be sure to include packaging materials the foods came in.
2. Each student picks one food item to trace all the way back to its origins using a flow diagram – including where and how it grew, was harvested, was transported, was packaged, and was made available to the consumer... the student.
3. Next, draw possible and likely impacts to wildlife and the environment along the path their food took to get to them.
4. Share and discuss their findings.
5. Ask the students to think of one change that could be made in their lunch-time eating habits that would be likely to have a beneficial – or a less harmful effect on wildlife and the environment. Describe the reasoning for this change.
6. Have the students incorporate this change for one week. Were they able to stick to the change? Why or why not?

4.2 A Call to Action:

Materials:

- Dilemma Cards



Background:

Students are asked to examine their own values and beliefs related to wildlife, the environment and protected areas; and evaluate possible actions they might take that

have impact on wildlife and the environment. It is not the intent of this activity to prescribe “right” and “wrong” answers for the students. One exception is in the area where information about laws is conveyed.

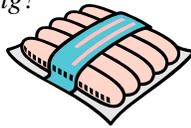
Procedure:

1. Divide the class into four groups, and give each group some dilemma cards. Each student draws a card and decides what he or she should do and why.
2. The student then reads his/her card and shares his/her decision to the rest of the group. Encourage students to ask other members about how they would answer the dilemma. The answers are shared among the group members

Dilemma Card #1

You are having a wiener roast with your family at Sylvan Lake provincial Park. After putting the wieners on the roasting sticks, what do you do with the plastic wrappers? Should you:

- Throw them into the fire?*
- Throw them into the trash?*
- Throw them into a recycling?*
- Other?*



Dilemma Card #2

You are hiking along the trails at Miquelon Lake Provincial Park with your dog Bandit. Bandit goes to the bathroom on the trail. Should you:

- Continue hiking and ignore what Bandit did?*
- Pick up after your dog and throw the “package” in the woods?*
- Pick up after your dog and carry the “package” to the nearest garbage can?*



Dilemma Card #3

You are on a picnic with your family and you see another family leaving to go home, without having picked up their own trash. It is obvious that the other family is going to leave litter all over the place. Should you:

- Move quickly and ask them to pick up their trash before they leave?*
- Wait for them to leave and pick up the trash for them?*
- Do nothing?*
- Other?*



Dilemma Card #4

You are camping at Dinosaur Provincial Park. After finishing washing the dishes, should you:

- Dump the soapy water in the bush next to your campsite?*
- Take the soapy water the nearest pond and dump it in there?*
- Take the soap water and dump it in the outhouse?*
- Other?*



Dilemma Card #5

You are camping with your family at Miquelon Lake Provincial Park when your uncle tells you to collect some kindling and fire wood from the forest. Should you:

- Listen to your uncle?*
- Go into the forest a pick up just a small amount of kindling and tell your uncle you could not find anymore?*
- Tell you uncle why it’s not a good idea?*
- Do nothing.*



Dilemma Card #6

You are hiking along the trails at Wm. A Switzer Provincial Parks and your see dead trees and leaves all over the place. Should you:

- Call the Provincial Government to complain about how messy the park is and tell them to clean it up?*
- Watch the log to see if you see anything living in it?*
- Do nothing?*
- Other?*



4.3 Getting Involved

By helping students understand the importance of maintaining a healthy environment, they will gain a better understanding of how it affects them as individuals and how they can affect the variety of life on earth or *biodiversity*. Have the students complete a web search on how they can become involved in preserving our protected landscapes. For example:

There are a number of parks and protected areas in need of volunteers. Visit our website at <http://www.cd.gov.ab.ca/involved/parks/volunteer/index.asp> for current opportunities.



Waste in Our Natural World

A field study program for Grade 4



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