Alberta Parks

Bugology I & II

Field Study Planning Guide

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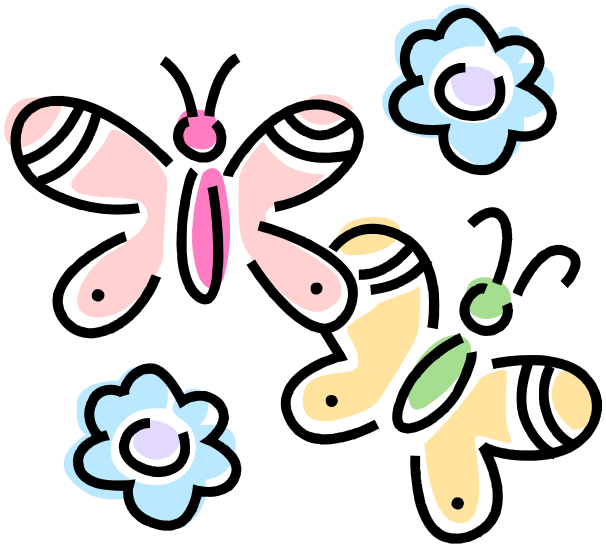


1.0 Introduction

Welcome to the teacher's planning and activity package for **Bugology I**. This half-day program was developed to offer students a natural environment experience that supports both the Grade 2 Alberta Elementary Science Curriculum Topic E: Small Crawling and Flying Animals and the goals of Alberta Parks:

- **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

Bugology I is a guided program that consists of three components:

- Preparatory activities, that are multidisciplinary in nature, to be completed at the school.
- A half-day field study conducted in a protected area that takes students through experiential activities focused on invertebrates and interdependencies within forests.
- Post-visit activities, to be done at the school, that 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 E: Small Crawling and Flying Animals (Grade 2) in the Elementary Science Program of Studies.

- Recognize that there are many different kinds of small crawling and flying animals, and identify a range of examples that are found locally.

- Compare and contrast small animals that are found in the local environment. These animals should include at least three invertebrates.
- Recognize that small animals, like humans have homes where they meet their basic needs of air, food, water, shelter and space; and describe any special characteristics that help the animal survive in its home.
- Identify each animal's role within the food chain. To meet this expectation, students should be able to identify the animals as plant eaters, animal eaters or decomposers and identify other animals that may use them as a food source.
- Identify ways in which animals are considered helpful or harmful to humans and to the environment

There are additional curriculum connections within the Language Arts, Social Studies and Mathematics program of studies.

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 where satellite reception is available. 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

Many 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?

☐ 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.
- Wear 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:

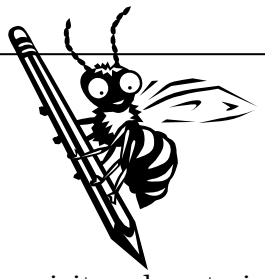
- Wildlife live in parks and protected areas because they are able to meet their needs for food, water, shelter and space. Feeding them is not necessary. In fact, it can create significant hardships for them because they become dependent on this food and the learned behaviors associated with this can also be dangerous for them**. Do not feed or harass wildlife**. Observe them quietly from a distance.

- 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 and 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 that could mistake 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.

Abdomen – The part of an animal's body that contains the digestive system and all the organs of reproduction.

Adaptation – physical characteristics or behaviour, which helps a plant or animal live successfully where it does.

Antennae – Delicate sense organs on an insects head which it uses to smell, touch, taste, or hear the world.

Arachnid – An arthropod with four pairs of legs, a body divided into two parts, and has simple eyes.

Camouflage – body colour or markings that help an animal hide from its predators.

Cephalothorax – The head and thorax of arachnids are combined in this body region..

Complete Metamorphosis – A life cycle that has 4 stages of growth: egg, larva, pupa and adult.

Compound eye – An insect's main pair of eyes, made up of many smaller eyes.

Decomposer – any plant or animal that gets its energy by feeding on and breaking down dead plants or animals into smaller pieces that will become part of the soil.

Exoskeleton: The hard, outer skeleton of an arthropod, which supports the muscles and soft internal organs

Habitat – The home of a plant or animal.

Incomplete (Simple) Metamorphosis – A life cycle that contain 3 stages: egg; nymph; and adult.

Invertebrate – A small animal that has no backbone.

Larva – The immature stage of some insects that looks completely different from their parents.

Metamorphosis – The transformation of a juvenile insect into an adult.

Molt – The process in insects and spiders of shedding the exoskeleton to grow or change into adults.

Nymph – A life stage of some insects. Nymphs are similar to adults, but do not have fully developed wings.

Pedipalp – An appendage on the cephalothorax of arachnids, used to touch, taste, smell, and hold prey. Male spiders use these to deposit sperm.

Pollinate – To transfer pollen from the male reproductive organs of a plant to the female organs of the same plant.

Predator – An animal that hunts another animals for food.

Pupa – A stage that many insects undergo during metamorphosis.

Scavenger – An animal that feeds on rotting organic matter, like food scraps, dung, and dead animals.

Thorax – The middle section of an insect's body.

3.2 Basic Needs

1. Have a class discussion about basic needs. What do humans need to survive? Are the students clear about the difference between needs and wants? Humans need food, water, shelter, space and air. They may want a Play Station 2 or an Ipod but we do not need them to survive. Do the student's pets need the same things? What do house and garden plants need to survive? Do wild plants and animals need the same thing?
2. Pick an animal that your students are familiar with (e.g. chickadee, squirrel, and rabbit) and discuss with your class how this animal meets each of its basic needs.
3. Spend some time in the schoolyard looking for places that offer animals (including invertebrates) opportunities to meet their basic needs.

3.3 Food Chains

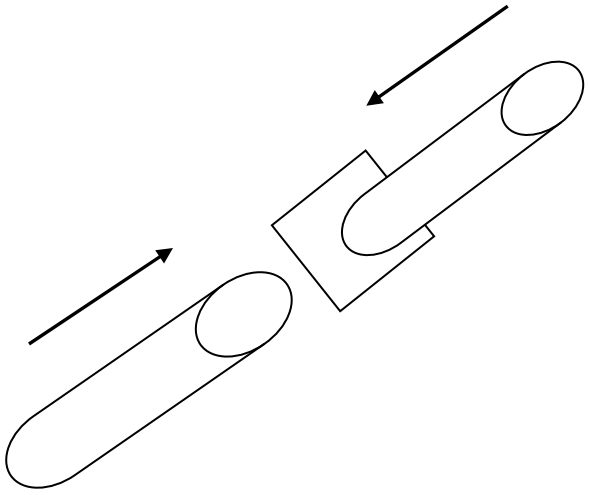
1. Explain food chains to the class. Start with the sun as the source of all energy on Earth. Next are the plants, the ***producers***. They use energy from the sun to make their own food. The plant eaters (***herbivores***) come next, followed by the animal eaters (***carnivores***). The ***decomposers*** come last as they break down dead material by feeding on it. The small pieces become part of the soil, adding nutrients to help plants grow.
2. Ask the students to select a favourite food and then draw an energy chain for it. Plant products, such as potato chips or apples, will have a shorter chain than the meat choices, such as hotdogs or hamburgers.

3.4 Classification of Invertebrates

1. Discuss how animals are the same or different and how they can be put into groups based on physical characteristics. Start by putting animals into one of two groups: vertebrates and invertebrates.
2. Invertebrates are the largest group of arthropods and are divided into smaller groups or ***orders***. The orders are: Hymenoptera (Bees and Wasps), Lepidoptera (Butterflies and Moths), Siphonaptera (Fleas), Diptera (Flies), Coleoptera (Beetles), Dictyoptera (Cockroaches), Orthoptera (Grasshoppers), Odonata (Dragonflies and Damselflies), Hemiptera (True Bugs), Ephemeroptera (Mayflies), Thysanura (Silverfish).
3. Show the students how invertebrates are broken down into smaller groups based on physical characteristics. Use pictures of one example from each group. A simple classification might be:
    - Insects – three distinct body parts (head, thorax, abdomen), 3 pairs of legs, one pair of antennae and an external skeleton.
    - Spiders – two distinct body parts (head, abdomen) and four pairs of legs.
    - Centipedes – at least 15 pairs of legs, one pair per body segment.

3.3 Pooter Practice

1. Invertebrates can be quite small and hard to pick up without damaging them. A pooter is a simple, homemade device for collecting invertebrates and placing them into a container for closer study. To make a pooter, you will need:
    - 1 thick straw
    - 1 thin straw
    - Small piece of nylon stocking material approximately 3 cm x 3 cm
    - Tape
2. Cut both straws in half (you now have enough to make two pooters). Place the nylon over the end of the smaller straw. Slide the thick straw over the nylon and thin straw. Tape the straws together.
3. To collect an invertebrate, students put the larger straw end very close to the small insect and put the small straw end into their mouth. By carefully sucking air, the invertebrate will be sucked up into the pooter. The nylon will stop the animal from going into the student's mouth. As soon as the animal goes up the straw, students quickly put a finger over the straw end and move the straw to a magnifying cube. Removing the finger from the bottom of the pooter allows the invertebrate to drop into the container. If it doesn't come out, tap the pooter on the side of the container or GENTLY blow through the straw until the animal does drop out.
4. Be sure to put the student's names on the pooter. Students should NOT share posters. Students can practice using their pooters in the classroom by picking up tiny pieces of paper (e.g. from the hole punch tray).
5. Bring the pooters to your field session in the spring.



3.4 Metamorphosis Game:
From Knee High Nature: Spring in Alberta 1991

The purpose of this game is to move from one stage to another of a butterfly's life in the proper sequence and not to be caught by the predator.

1. Review the two types of metamorphosis: ***complete*** and ***incomplete***.
2. Divide the students into four equal sized groups. Each group spreads out to four different stations: butterflies, eggs, caterpillars and ***pupae***. Students will role-play each stage of a butterfly's life. Butterfly – skips about, arms flapping. Egg – huddled into a small ball. Caterpillar – crawling around on hands and knees, pretending to eat leaves. Pupa – hiding under a towel or blanket. Have the students practice at each station.
3. When the children are ready, call CHANGE. Each group moves to the next stage. That is, the eggs crawl to the caterpillar station and crawl around like caterpillars. The caterpillar group crawls to the pupa station and hides under the blanket. The hatched pupae fly to the butterfly station and continue to fly around. The butterflies fly on to the egg stage and huddle into a ball.
4. Continue to say CHANGE until the children are familiar with their roles. Introduce a predator like a robin. The robin can only eat caterpillars and the robin must walk and flaps his or her wings like a bird. Continue the game. If a caterpillar is caught, it becomes a robin as well.

4.0 Post-visit Activities

4.1 Creature Count

1. Review the results of the Creature Count. Were there any creatures that no one found? Where do students think those live? Why do they think none were seen?
2. Have the students complete a bar graph or pictograph of the results. Possible methods include:
    - Each student uses his or her own data.
    - Compile the data for the entire class and then each student completes a graph of the number of each creature found.
    - Graph the number of creatures species found in each of the ecosystems studied.

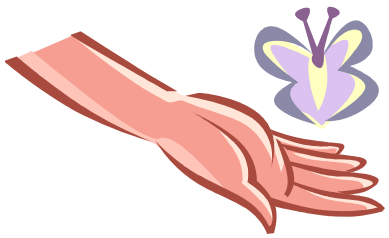
4.2 Creature Comparison
Select two invertebrates that most students found. Have the class compare and contrast these two invertebrates: where do they live, how do they move, how do they meet their basic needs, how do they escape predators, etc.?

4.3 Important Invertebrates
Through class discussion, compile a list of the many different ways invertebrates affect the environment and people. Some possible answers are:

- Pollinate flowers
- Food source for many animals
- Assist with the decomposition of dead plants and animals
- As scavengers they "clean-up" the environment
- Provide honey and silk for people
- Are enjoyable to hear and watch
- Can carry diseases
- Destroy crops and other plants
- Cause discomfort due to bites.

4.3 Getting Involved
By helping students understand the important role insects play in the health of our 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 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.



Alberta Parks

Bugology I

A field study program for Grade 2

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Updated November 2007