



INTRODUCTION FOR PARENTS

Below are the 'Specific Learning Expectations' of Topic E of the Alberta Science curriculum for grade 2 (text in bold). The activities below cover all these except #7. We have added notes to help you guide your student.

1. **Recognize that there are many different kinds of small crawling and flying animals, and identify a range of examples that are found locally.**
 - Count the legs on any small creatures you will find: spiders have 8, insects such as beetles or ants have 6.
 - You may find sowbugs or pillbugs. These look like tiny armadillos and have segmented armoured plates on top and 14 legs underneath. Pillbugs roll up when disturbed, sowbugs don't.
 - You may also find centipedes (usually about 15 or more pairs of legs) and millipedes (rounder body than a centipede, two pairs of legs per segment rather than one, even more legs than a centipede, and roll up into a spiral when afraid).
2. **Compare and contrast small animals that are found in the local environment. These animals should include at least three invertebrates - that is, animals such as insects, spiders, centipedes, slugs, worms.**
 - Look to see if the small animal has wings. Many beetles have wings folded up under two hard wing cases. If you find a ladybug, try putting it somewhere high up and watch it raise its wing cases, open its wings and fly off.
3. **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.**
 - Look at the shape of the small animals you find. Many that live in soil or under rocks are flattened.
 - Look at the legs - long legs are for running fast on surfaces, short legs are for living in burrows and tight spaces.
 - Try spraying a little water over a beetle - it has a waterproof outer covering (its exoskeleton) not just to keep it dry in the rain, but also to keep water in and prevent it drying out on a hot day.
 - Look at the big eyes on a house fly. They can see the slightest movement, making flies very hard to swat! Watch a house fly at rest and you will notice it is always grooming around its eyes, keeping them spotlessly clean.
4. **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.**
 - Examples of animal eaters: centipedes, spiders, ground beetles, soldier beetles, wasps, and dragonflies.
 - Examples of plant eaters: flower beetles, aphids, bumble bees, and butterflies.
 - Examples of decomposers: pillbugs, sowbugs, millipedes, and house flies.

5. Describe the relationships of these animals to other living and nonliving things in their habitat, and to people.

- Insects and flowers have an important relationship – many insects are pollinators. Look for pollen baskets on a bumble bee's back legs, or grains of pollen stuck to its hairy body.
- Many small creatures feed off dead plants and animals, helping return nutrients to the soil. Gardeners love ladybugs because they eat other small animals, like aphids, that damage plants.

6. Identify and give examples of ways that small animals avoid predators, including camouflage, taking cover in burrows, use of keen senses and flight.

- Some insects like ladybugs (poisonous) or wasps (can sting) are brightly coloured as a warning to potential predators.
- Other insects you may find will be camouflaged. For example, many caterpillars are green like a leaf or striped like a leaf stem; sowbugs and pillbugs are brown like the soil and dead leaves they live in.

7. Describe conditions for the care of a small animal, and demonstrate responsible care in maintaining the animal for a few days or weeks.

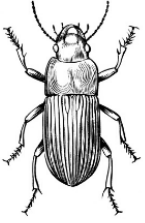
- *Not included in activities below*

8. Identify ways in which animals are considered helpful or harmful to humans and to the environment.

- Mosquitoes are an obvious example of an insect that is harmful. The females bite humans to obtain protein to make eggs, and in doing so can pass diseases like malaria or West Nile fever.
- Other small animals can damage crops. You may find aphids, small green or black insects clustered on leaves or stems. These pierce the plant to feed on sap, removing nutrients and introducing disease to the plant.
- Humans also benefit from small animals. Pollinators are crucial to world food supplies. Burrowers aerate soils. Decomposers, like dung beetles, return nutrients to the soil. Dung beetles are one of our most important insect groups because they get rid of the mountains of poop produced by animals worldwide – what would the world be like without them?

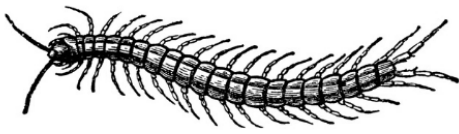
IDENTIFICATION GUIDE FOR PARENTS

Common small animals you may find, and things to look at if you do.



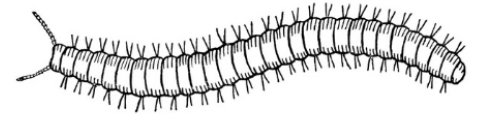
Ground beetles: Count the legs – it has 6, so it is an insect. Notice the flattened shape for living under stones, under logs, and in leaf litter. Notice the wings cases – underneath these there are thin transparent wings it can use for flying but only in an emergency, usually it walks. Ground beetles hunt and eat other little animals.

Spiders are not insects – they have 8 legs and 2 main body parts (insects have 3). Some hunt other small animals, some trap them in webs. Notice that spiders don't have wings.



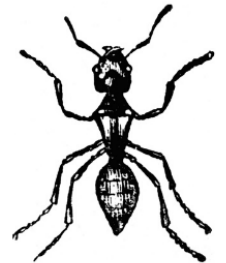
Centipedes have lots of legs (so not an insect) and have a flattened shape like a ground beetle so they can slide under stones and dead wood. They eat other small animals. They are brown color to hide from predators, such as birds, shrews, or even big ground beetles.

Millipedes have even more legs than a centipede and 2 pairs on each segment, not one pair (like a centipede). They roll up into a tight spiral when disturbed (centipedes don't do this). They eat dead and decaying plant matter so are an example of a **decomposer**.



Wasps have 6 legs (so are insects) and 2 pairs of wings (unlike flies which only have 1 pair). They are not camouflaged at all! Bright colours warn predators to leave it alone – it can sting. If you find a dead wasp look for the point of the stinger showing at the tip of the abdomen (if you can't see it carefully press the abdomen and it will emerge). The wasp can't actively sting when dead but if you touch the stinger it can still penetrate the skin, so be careful! Wasps are an example of a **social insect**, an insect that lives in a colony rather than alone like a beetle or millipede.

An **ant** is a social insect like a wasp and lives in a colony. Different kinds of ants eat different things – plants, other animals, or both. When outside, look for **ant farms**, a line of ants going up and down the stem of a shrub to a colony of aphids (small green or black insects) clustered around a leaf stem or the underside of a fresh new leaf. The ants protect the aphids from predators and in return collect **honeydew**, a sweet liquid emitted from the rear end of the aphids.

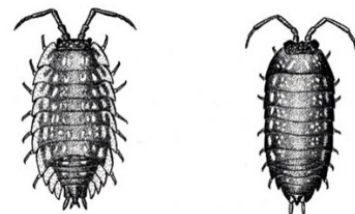


Mosquitos are an obvious example of an insect that is harmful to humans. The females bite to obtain protein to make eggs, and in doing so can pass diseases like malaria or West Nile fever. Note: the males do not bite, but live off nectar and are important pollinators of some plants.



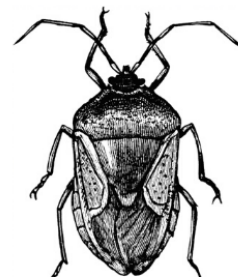
Bumble bees, like wasps, can sting and are brightly coloured as a warning to predators. They have 4 wings, 6 legs, and are an example of **pollinators**, a group of animals very important to human food production. Pollinators spread pollen from one plant to another resulting in the plants developing seeds (like sunflower and canola) and fruits (like apples, pears, and blueberries). On the rear legs of bumble bees are **pollen baskets** about the size of a grain of rice; look for these and for yellow or orange pollen grains stuck on their hairy heads and bodies.

Sowbugs (left) and **pillbugs** (right): These have 14 pairs of legs and segmented plated bodies. Pillbugs can roll up when touched but not sowbugs. They are related to crustaceans and eat dead things so are called decomposers.



Ladybugs are another type of beetle. They are loved by gardeners as they eat many garden pests, like aphids. Count the spots if you find one - the 7-spotted ladybug is an introduced species, native species can have 2 spots, 3 spots, no spots, or blotches instead of spots - there are lots of different sorts! These beetles will fly readily if you put them on your hand and hold it up high. You can watch the wing cases lift, the wings underneath unfold, and the insect take off. Take a photo if you find a ladybug and send to www.lostladybug.org

Shield bugs and **stink bugs**: if you find a dead one flip it over and look at the long needle-like mouthparts it uses to stab into plants and suck up sap. If you find a living one, try touching it, and expect a nasty smell! This is thought to be a defense against predators.



Houseflies: Unlike other insects, flies have two wings. Check out the large eyes too - one of the reasons it is so hard to catch a living fly. They eat dead and decomposing food, dabbing at it with little sponges at the end of their **proboscis**, or feeding tube, and sucking up the liquid. Amazingly, they taste with their feet! Houseflies can spread disease, not by biting you like a mosquito, but through contaminating food that you then eat.