SCIENTISTS IN SCHOOL
SCIENTIFIQUES À L'ÉCOLE

Teacher Resource Package

Let us help you piece together the science!

Background Information an overview of the topic and theoretical concepts.

Hands-on Activities

Activity 1 - pen/paper activity
Activity 2 - short, easy-to-do activity (30-60min)
Activity 3 - short, easy-to-do activity (30-60min)
Activity 4 - longer activity (greater than 1 hr)
Activity 5 - complex activity

Teacher Resources

Literary Resources
Website Resources
Interactive White Board Resources
Multi-media

Student Resources

Literary Resources
Interactive Websites

Please help us improve our teacher resource packages!

If you have any feedback about this package or suggestions for new resources to include, please don't hesitate to contact us at: inquiries@scientistsinschool.ca.

Backyard Bugs

Imagine that you are sitting in your backyard on a warm sunny Saturday morning relaxing, reading a book and enjoying a cold drink. Absently, you swat at a tickly thing on your leg. It's still bothering you and you swat at it again. Finally, it annoys you so much that you look to see what is on your leg. It is a bright blue-green bug. Very cool! What is it? Is it an insect? Where did it come from? Even though there are nearly twice as many insects in the world as all other kinds of animals combined, their world is so small that we often don't notice or think about it. Wherever we live, there are bound to be bugs nearby: under the ground, on the ground, in water, in the air, on plants and trees and even in our homes. Backyard bugs are important to life on earth and benefit humans in countless ways. Many are pollinators and are vital for producing new plants, fruits and vegetables. Some are decomposers breaking down waste and enriching the soil. Bugs are also an important food source for many animals, including humans. Insects and other backyard bugs are fascinating creatures!

Background Information

Identification

All bugs belong to the kingdom Animalia. The most common type of bug that creeps and crawls in the backyard belong to the phylum Arthropoda. There are more than 1.1 million described species of bugs and new species are continuously being discovered. Arthropods include insects, spiders, centipedes and millipedes. All of these animals have an exoskeleton which is a hard rigid outer covering that supports and protects the body. They also have three or more pairs of jointed legs, segmented bodies and they are bilaterally symmetrical.

Arthropods, found in our backyards, can be divided into these groupings:

- insects such as dragonflies, butterflies, moths, lice, beetles, wasps, bees, crickets and grasshoppers. Insects have an exoskeleton, three body parts (head, thorax and abdomen), six legs, compound eyes and one pair of antennae;
- arachnids such as spiders, mites, ticks and scorpions all have eight legs;
- crustaceans such as sow bugs and pill bugs (sometimes called roly polys) have numerous legs;
- millipedes and centipedes have numerous body segments which are not differentiated into the thorax and abdomen.

Other animals that crawl in the backyard include snails and slugs (phylum Mollusca) and worms (phylum Annelida).

Insect Body Parts

Insects belong to the class Insecta and are a very diverse group of animals with over 900,000 living species classified. This represents approximately 80% of all living animals. Scientists identify insect species based on their body structures. These structures also help us understand how insects function and behave.

Insects are identified by their six legs and three body parts: the head, thorax and abdomen. On the head are the compound eyes, antennae and mouth parts. The mouth can be very different depending on the insect. Moths and butterflies have a proboscis, which is a long tube that can be rolled out of the way. It is the perfect type of mouth to gather nectar. House flies have a wide fleshy tip for a mouth which is great for absorbing liquid on contact. Antennae will also vary depending on the species. Moths have feathery or thread-like antennae, while dragonfly antennae are short and stubby. The thorax is the middle region of an insect's body where the six legs and wings (if they have any) are attached. Their legs often end in claws to help grip onto surfaces. The legs are adapted for various

types of movement depending on the insect and habitat in which it lives. The legs may be used for walking, jumping (e.g. grasshopper), burrowing in soil (e.g. dung beetle), seizing prey (e.g. praying mantis) and tasting (e.g. butterfly). Most insects have a pronotum that covers the first segment of the thorax and helps protect the insect from predators. On a grasshopper, the pronotum looks like a saddle. The last main body part is the abdomen which contains most of the organ systems and can have some unusual adaptations like a stinger in bees. The thorax and abdomen both have spiracles. These are small holes which allow the insect to breathe as they do not breathe through their mouths.

Insect Life Stages

Metamorphosis is a change in the form and function of an insects' body. All insects begin their life as an egg and then become larvae. As the larvae eat and grow, they will shed or moult their exoskeletons, often several times. About 85% of insects, including beetles, bees and butterflies, go through a complete metamorphosis. The larvae, which do not look like the adult form, will enter a pupae stage before becoming an adult. It is advantageous for the insect to go through a complete metamorphosis as the adult and larvae usually eat very different things, therefore they do not compete for the same food. For example, monarch larvae eat milkweed leaves, whereas the adult butterflies drink nectar from a variety of flowers. The other 15% of insects go through a gradual and incomplete metamorphosis. Among these insects, the wingless larvae are called nymphs and they often look very similar to the adult form. Praying mantis is an example of an insect that undergoes this type of metamorphism.

Appearance

Camouflage is an important survival adaptation for all backyard bugs. Their colours help them to blend into their environment to hide them from predators and/or their prey. Some toxic bugs are brightly coloured; this serves as a warning to potential predators not to eat them

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Spiders

Spiders are very well known creatures and they belong to another class, Arachnida. This group also includes ticks, mites and scorpions. They can be found on every continent except for Antarctica. Scientists estimate that there are over 30,000 different species of spiders. All spiders are predators and may even eat other spiders. The male of the species is usually smaller than the female. One of the fascinating things about spiders is that they have an oily coating over their bodies so that they do not get stuck to their own web.

Spiders can be identified by their two body parts and eight legs. They do not have antennae or wings. The first section of their body, called the cephalothorax, is a combination of the head and thorax and houses up to eight eyes, mouth, stomach and brain. Pedipalps, which look like very short legs but function more like antennae, are part of the mouth. The pedipalps assist in holding the prey and in some species are used to shape the web. Spiders are very agile because their legs have six joints; the legs are joined onto the cephalothorax. Spiders' legs are covered with hairs which are used to smell and pick up vibrations. The abdomen is the second body section. It contains important internal organs including the digestive system, reproductive organs and lungs. At the tip of the abdomen are the spinnerets and the silk glands. There are usually six spinnerets and the silk is produced in tiny pores in the spinnerets. Some spiders build new webs each day or night depending on when they hunt. Some will ingest the old web so that they can make more silk. However, not all spiders use a web to catch their prey.

Fun Fact

Scientists believe that there are
6 - 10 million different species of insects.

Activity 1: My Pet Beetle

Time: 20 minutes

Other Applications: Art

Key Terms: symmetry

Group Size: Individual

Materials (per student):

- ☐ template of beetle (provided)
- ☐ scissors
- ☐ crayons/markers/paint
- ☐ craft/popsicle stick
- ☐ glue or tape
- ☐ 2 chenille stems or pipe cleaners

Learning Goal: Students will learn about the body and spot pattern of ladybugs.

Ladybugs are the friends of gardeners and farmers. Both the larvae and adult forms will eat many pests found in our fields and gardens such as mealybugs, aphids and scale insects. Ladybugs come in many colours including bright red, orange, yellow and black. The colouration is thought to warn away predators. Ladybugs can secrete a fluid which gives them an awful taste. Ladybugs appear to have two main body parts – a black head and a red body. They have a small black head and a bigger black pronotum that is actually part of the thorax that is protecting the head. Sometimes the pronotum can have spots on it too. Like newly hatched ladybugs, some adults have no spots. Those that do have spots have a symmetrical pattern on their body. Insects have bilateral symmetry meaning that if a line is drawn down the center of their bodies, the two halves will be mirror images.

Two websites for photos and images of ladybugs include:

- http://www.nhm.org/site/activities-programs/citizen-science/lost-ladybug-project/identifying-ladybugs *(11/06/15)*;
- http://bugguide.net/ {search for ladybugs} *(11/06/15)*

Procedure:

1. Hand out art supplies and a copy of the beetle template to each student. Explain to students the concept of symmetry.
2. Have students draw spots on one wing.
3. Have students draw spots on the other wing so that it is exactly the same as the first wing. Encourage the students to draw the spots in the same position and the same size, so the wings are symmetrical.
4. Have students colour their ladybug.
5. Have students cut out the ladybug and write their name on the back. Glue or tape a craft stick to the end of the beetle to make a handle for their puppet.
6. Have the students cut up the chenille stems into shorter pieces. Ask students: How many legs does an insect have? (6) How many antennae does a beetle have? (2) Tape the chenille stems to represent the legs and antennae ensuring they are symmetrical.

Fun Fact: Hungry Ladybug!

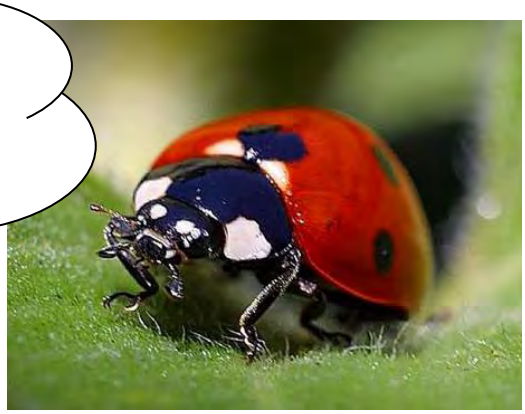
Over its lifetime, a ladybug can eat over 5,000 aphids!

Extensions:

1. Recite the “Ladybird, Ladybird” rhyme and have students act it out using their puppets.
2. Create a bookmark or fridge magnet: Using bug templates (e.g. beetle template, butterfly template) have students colour and decorate their art using sparkles and chenille stems for body parts.
   - Fridge Magnet: Using a glue gun (adults only), glue their artwork onto a clothespin. Attach a magnetic strip to the bottom of the clothespin with a glue gun.
   - Bookmark: Glue the body of the butterfly to a hairclip with a glue gun.
3. Create a caterpillar: Remove the lids from egg cartons and cut the bottom in half. Students can decorate their caterpillar by painting or colouring. Glue on wiggly eyes. Cut chenille stems to length and thread through holes in head to make antennae. Similarly add chenille stems to represent caterpillar legs.
4. Create a “Jumpy Spider”: Cut a 6 cm circle from poster board to represent the spider’s body. Cut a small hole in the centre. Have students add eyes and colour designs on the body. Attach eight pieces chenille stems or pipe cleaners together to represent the legs. Tie a 30 cm piece of string to the centre of the legs. Slip the string through the hole in the poster board/body. Have fun making the spider jump!

Ladybird, Ladybird!

Ladybird, ladybird, fly away home!
Your house is on fire and your children all gone.
All except one, and her name is Ann,
And she hid under the baking pan.
~ traditional nursery rhyme

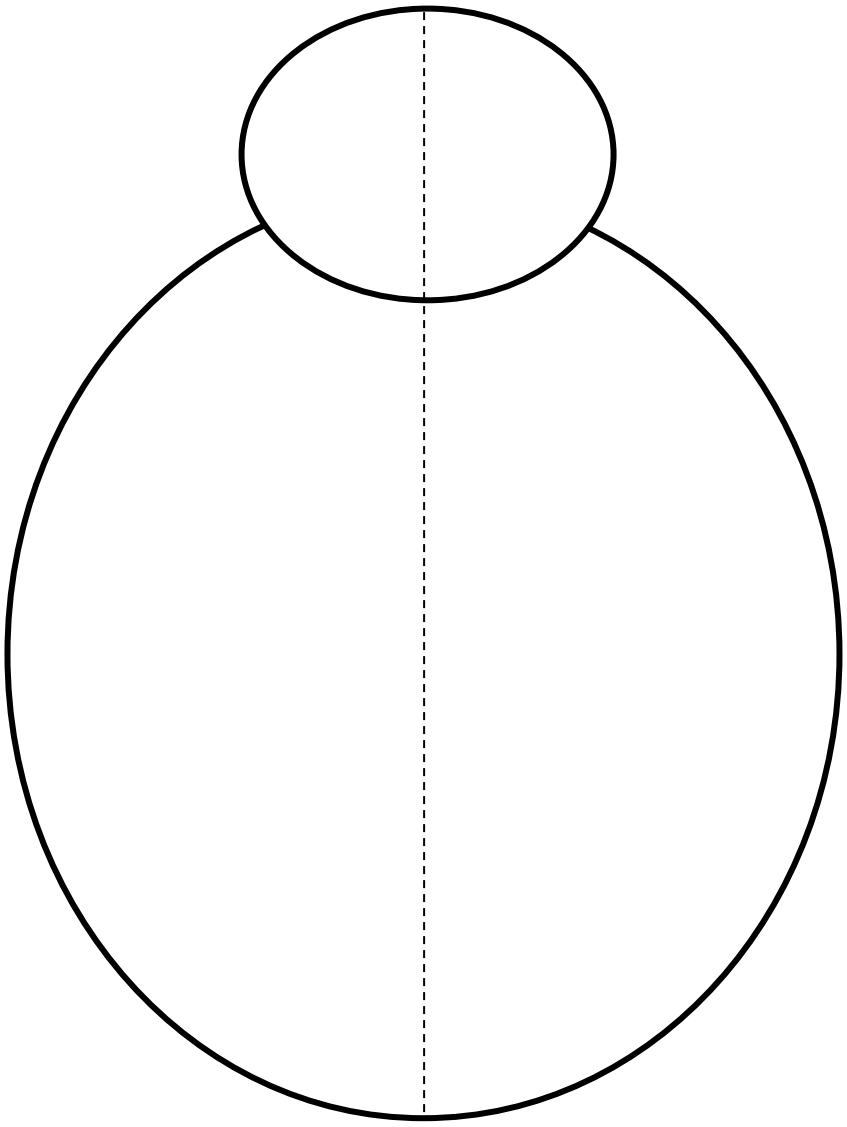


Source: Jon Sullivan, Wikimedia Commons

Fun Fact: Cool Caterpillar Legs!

Caterpillars all have six true legs and many will have additional paired legs called prolegs. Prolegs are useful for walking and attachment. During metamorphosis the prolegs disappear and the butterfly or moth that emerges has six legs.

Beetle Template



Activity 2: Count the Ants: What do Ants Like to Eat?

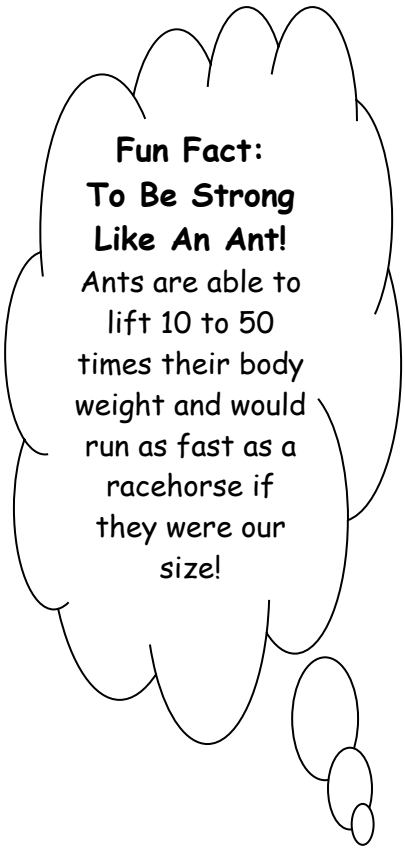
Time: 20 minutes

Other Applications: Math

Group Size: Pairs

Materials (per pair of students):

- ☐ paper towel
- ☐ piece of candy
- ☐ small square of bread
- ☐ small chunk of apple
- ☐ small slice of carrot
- ☐ "Count the Ants!" datasheet



Learning Goal: Students will learn if ants have any food preferences.

Ants are pretty incredible creatures. They have a very definite social structure with workers, soldiers, males and a queen. There can be millions of ants in one colony. The workers have a short life expectancy of 45-60 days. The following website is a good source of information on ants:
http://www.biokids.umich.edu/critters/Formicidae/ *(11/06/15)*.

Procedure:

1. Have students search the playground to see if they can find any ants. They may discover a line of ants that are using a foraging trail.
2. Let the students decide where they would like to put their food, encouraging them to put them near any ant trails or ant hills found. NOTE: Make sure the students don't pick up the ants as they can bite and some can sting (e.g. red fire ants).
3. Place the pieces of candy, bread, apple and carrot on a piece of paper towel. The paper towel will make it easier to see the ants.
4. Leave the food pieces for 30 minutes or longer depending on ant activity.
5. Provide each pair of students with a "Count the Ants!" datasheet. Have the students count the number of ants on each different piece of food. Have the students circle the corresponding number on their datasheet.
6. Graph the results as a class to determine which food the ants like the best.

Observations:
The results will vary depending on the day and the nearness to the ant hill. Ants tend to prefer sweet treats so the apple and candy will probably have the most ants attracted to the samples. Ants will eat meat, cheese, bread and most food.

Discussion:
Ants are very industrious creatures. They are in the same family as wasps and bees. They are considered social insects as their society has very specific roles for each ant. Ants will leave a pheromone trail from the colony to a food source so that all the other workers will be able to find the source of food.

Extensions:

1. Experiment with different types of food (e.g. honey, lemon).
2. Build an ant colony for the classroom and let the students observe their tunnels. There are many websites with information (e.g.http://www.artistshelpingchildren.org/kidscraftsactivitiesblog/2011/02/how-to-make-an-ant-farm-jar-and-watch-an-ant-colony-build-mazes/ *(11/06/15)*.

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Name(s): _____

_____

Count the Ants!

Food	Number of Ants
	0 1 2 3 4 5 6 7 8 9 10 lots
	0 1 2 3 4 5 6 7 8 9 10 lots
	0 1 2 3 4 5 6 7 8 9 10 lots
	0 1 2 3 4 5 6 7 8 9 10 lots

Activity 3: Building a Bug Pitfall Trap!

Time: 90 minutes

Group Size: Individual or Pairs

Materials:

- ☐ clean empty plastic container (e.g. yoghurt container, margarine container)
- ☐ garden trowel
- ☐ insect bait (e.g. honey, jam)
- ☐ magnifying glasses, if available

Learning Goal: Students will learn about and identify insects and bugs that live in their local environment.

Pitfall traps are useful to study ground-dwelling insects and possibly other bugs such as millipedes, centipedes and spiders.

Procedures:

1. Have students bring in a clean plastic recyclable container.
2. Dig a hole in the ground large enough to hold the container. Place the container in the hole and fill in around the container with dirt. The open end of the container should be even with the surface of the ground.
3. Place a teaspoon of insect bait, such as jam or honey, in the trap.
4. After 30 minutes, check the trap for bugs. How many are there? What type of bugs did you trap? Are any of them insects?
5. Use field guides (see resources) to help identify the bugs.
6. Let the bugs go and repeat two more times. Did you capture anything new?
7. Do not forget to fill the holes when you are finished.
8. Create a class chart for the type and number of bugs found.

Observation:
The type and number of bugs will depend on the weather conditions and the time of year.

Extensions:
Try having the students move the trap to different environments within the school yard such as under a bush, near a tree, in the shade or in the sun. Does this change the results?

Try and cover the trap with a piece of wood to keep it dark and moist. Does this change the results?

Fun Fact:

Shrill Call of Cicadas on a Hot Summer Night!

A swarm of adult cicadas can make sounds nearly 120 decibels loud (louder than a rock concert) and they can be heard 1.6 kilometers away. When baby cicadas hatch, the nymphs burrow themselves into the ground and live there for 2 to 17 years depending on the species. They grow by feeding on the fluids in tree roots.

Activity 4: Feed me, I'm Yours!

Time: 30 minutes

Key Terms: recycle

Group Size: Individual

Materials:

- ☐ unused sponge
- ☐ cotton string
- ☐ scissors
- ☐ funnel
- ☐ measuring cup
- ☐ petroleum jelly (e.g. Vaseline)
- ☐ wire or strong string

Materials per student:

- ☐ 2 L plastic bottle with lid
- ☐ large metal nut or small stone
- ☐ 1 cup of white sugar
- ☐ 1.75 L warm water

Learning Goal: Students will learn which insects are attracted to the feeder.

Butterflies are beautiful and popular insects for people of all ages. They are important pollinators that are essential for the health of their natural habitats. Creating a butterfly feeder out of a recycled water bottle will help the environment and butterflies!

Procedure:

1. Have students bring in a clean recycled 2 L plastic bottle.

Teacher Preparation Before Class

2. Cut sponges into pieces: 2.5 cm thick x 4 cm wide x 1.5 cm long.
3. Cut an "X" approximately 2 cm high near the bottom of the plastic bottle on one side.
4. Tie one end of a 40 cm piece of string around a large metal nut or small stone. Tie the other end to the sponge. The weight will keep the string/wick in the water.

Student Procedure:

5. Push the washer/stone, string and then the sponge strip into the hole in the bottle, leaving 1-2 cm. of sponge extending from the bottle. The sponge should be a tight fit in the hole. It will become soaked with butterfly food but not dripping. The string will act like a wick moving the butterfly food into the sponge.
6. Making Butterfly Food: Using a funnel, pour 1 cup of sugar into the bottle. Fill the bottle about ¾ full of warm water. Put the cap on the bottle tightly, turn upside down and carefully shake to dissolve the sugar. Doing this over the water table or a sink will help in case the cap is not on tightly.
7. Create a hanger by tying approximately 50 cm of string or wire around the lid. Have students put a small amount of petroleum jelly on the string near the lid. This will prevent ants from visiting the feeder.
8. Hang the bottle outside in an area where you can observe it from inside. If possible, hang the feeder near flowers. Record what insects come to visit the feeder.

Observation:

Butterflies will enjoy this feeder. Using an insect identification guide you will be able to identify different species of moths and butterflies.

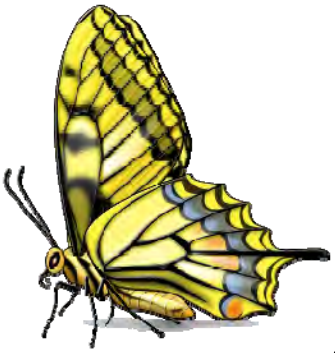
NOTE: this feeder will also attract some stinging insects so caution is important.

Discussion:
Look closely at the butterfly at the feeder, and let's look at how it is different from a moth. Moths come in all sizes but one of the best ways to tell if it is a moth or a butterfly is to look at the antenna. Most moths have antennae that look like feathers or threads while butterfly antennae generally look like clubs. Moths usually tent their wings over their back while butterflies fold their wings. As scientists find out more and discover new species the differences are becoming blurred.

Here is a good website to use as a guide to some common butterflies in your area.
http://onnaturemagazine.com/butterfly-and-moth-guide.html *(11/06/15)*
http://www.insectsofalberta.com/butterflies.htm *(11/06/15)*

Extension:
Purchase silk or plastic flowers and glue them onto the butterfly feeder.

Metamorphosis by Stella Waldron
(sung to "Up On The House Top)
First comes a butterfly and lays an egg,
Out comes the caterpillar with many legs.
Oh, see the caterpillar spin and spin,
A little chrysalis to sleep in.
Oh, oh, oh, look and see
Oh, oh, oh, look and see
Out of the chrysalis my, oh, my,
Out comes a pretty butterfly!



First I Am A Fuzzy Thing

At first I am a fuzzy thing.
I creep along the ground.
(2 fingers on one hand creep up other arm)
I wrap myself in a cocoon.
I never make a sound.
(roll hands together then hold still)
Then something funny happens,
I cannot tell you why.
I have two wings, away I fly.
For now I am a moth.
(Open hands, and link thumbs,
palms facing self "fly" hands upwards)
~ adapted from Elizabeth Morales

Activity 5: Let's Build a Bug Garden!

Time: 1 week

Group Size: 6

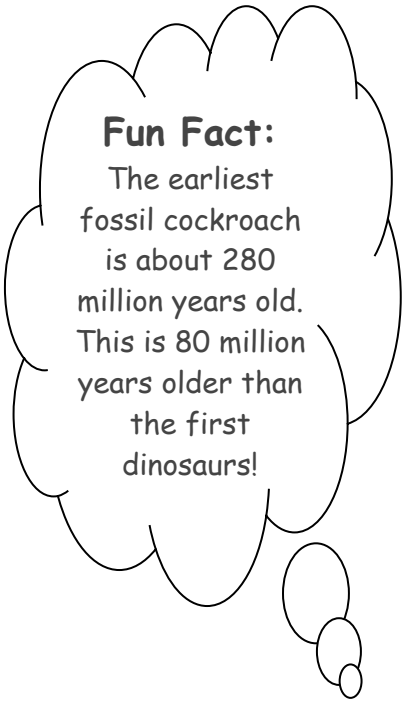
Materials:

- ☐ large plastic container
- ☐ small shovel/trowel
- ☐ sand
- ☐ soil from a garden
- ☐ twigs and leaves
- ☐ rocks
- ☐ small dish for water

Learning Goal: Students will learn about the different bugs that live in the soil.

Procedures

1. Begin by locating an area in the playground where a good variety of garden bugs have been observed (e.g. pill bugs, sow bugs, earthworms, millipedes).
2. Add a 1 cm layer of sand to the bottom of a clean plastic container to help with drainage.
3. Partially fill the container with soil from the collecting area. Ensure that the soil does not contain any "unfriendly" bugs such as bugs that bite or sting.
4. Have the students arrange small rocks, large twigs, a few leaves and a small dish of water to recreate the garden environment.
5. If the plastic container does not have a lid, cover it with cheesecloth secured by a rubber band. If it does have a lid make sure that small air holes are in the lid to allow the bugs to breathe.
6. Create a viewing centre by placing the container on a table with magnifying glasses/paper/pencil/crayons.
7. Encourage the children to observe the bug garden daily and draw pictures of what they see.
8. Share observations as a group regularly.
9. After one week, release the bugs and replace the soil back to the collecting area.



Observations:

The inhabitants of an area will vary depending on the time of year and the area of garden/playground where the soil was retrieved. Have the students look at whether the creatures are insects. How do they move and where do they live? How do they behave?

Discussion:

Our soil is full of wonderful creatures that ensure that the plants we need to live have nutritious soil to grow in. Two of the most common bugs in our area are pill bugs and sow bugs which are not insects but crustaceans like crayfish and lobsters. They look similar but one of the key differences between these crustaceans is that a pill bug can curl their entire body and antennae into a ball whereas as a sow bug cannot. These crustaceans also sometimes go by other names such as roly polys or potato bugs. The nickname "potato bug" is incorrect and refers to an insect called a Jerusalem cricket.

Sow bugs, pill bugs and millipedes help break down organic matter, thereby releasing nutrients into the soil. Despite their names, millipedes do not have a thousand legs but most have between 100 to 400 legs. Centipedes are carnivores and eat other bugs.

Teacher Resources

Literary Resources

Have you seen bugs? Joanne Oppenheim and Ron Broda. 1996. North Winds Press. ISBN 0590243225. A wonderful poetry book with great facts about bugs.

Bugs of Ontario. John Alcorn. 2003. Lone Pine Publishing. ISBN 1551052873.

Website Resources

http://www.ontarioinsects.org *(11/06/15)*
A general resource on insects with an emphasis on Ontario as well as a great list of resource books.

http://www.royalalbertamuseum.ca/research/lifeSciences/invertebrateZoology/bugsfaq/bugsfaq.htm *(11/06/15)*
Information on insects and spiders commonly found in Alberta.

http://www.monarchwatch.org *(11/06/15)*
General information on monarchs as well as using them in classroom.

http://www.bugfacts.net *(11/06/15)*
Great pictures and general facts about all types of bugs.

http://bugguide.net *(11/06/15)*
Useful website for information on insects, spiders and other creatures.

Interactive Whiteboard Resources

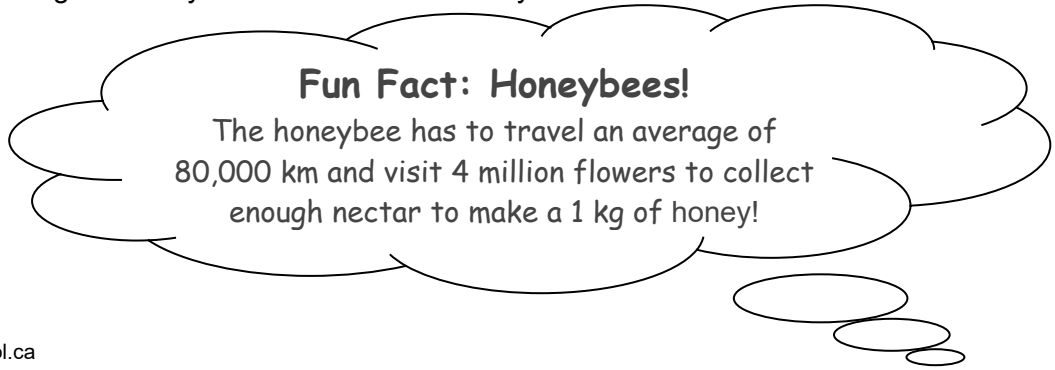
"Insects"
http://exchange.smarttech.com/details.html?id=6db7ac4b-ae9f-4220-979a-331134c3dee8 *(11/06/15)*
This has interactive activities to help learn about insect characteristics and their lifecycle. Also includes a great difference comparison of butterflies and moths.

"Insects"
http://exchange.smarttech.com/details.html?id=4851048f-3687-418d-be61-e3fe578204aa *(11/06/15)*
A collection of great insect photos.

"Bugs Bugs"
http://exchange.smarttech.com/details.html?id=3ac7cff3-0b9f-44ac-b761-18b2728bb0a8 *(11/06/15)*
Some great drag and drop activities on bugs.

Multi-media

http://www.natgeotv.com/ca/great-migrations/videos/growing-up-butterfly 3:00 minutes *(11/06/15)*
Great video capturing the life cycle of a monarch butterfly.



Student Resources

Literary Resources

How to Hide a Butterfly and other insects. Ruth Heller. 1985. Grosset &Dunlop. ISBN 044840477X
A good book for children on insects and camouflage.

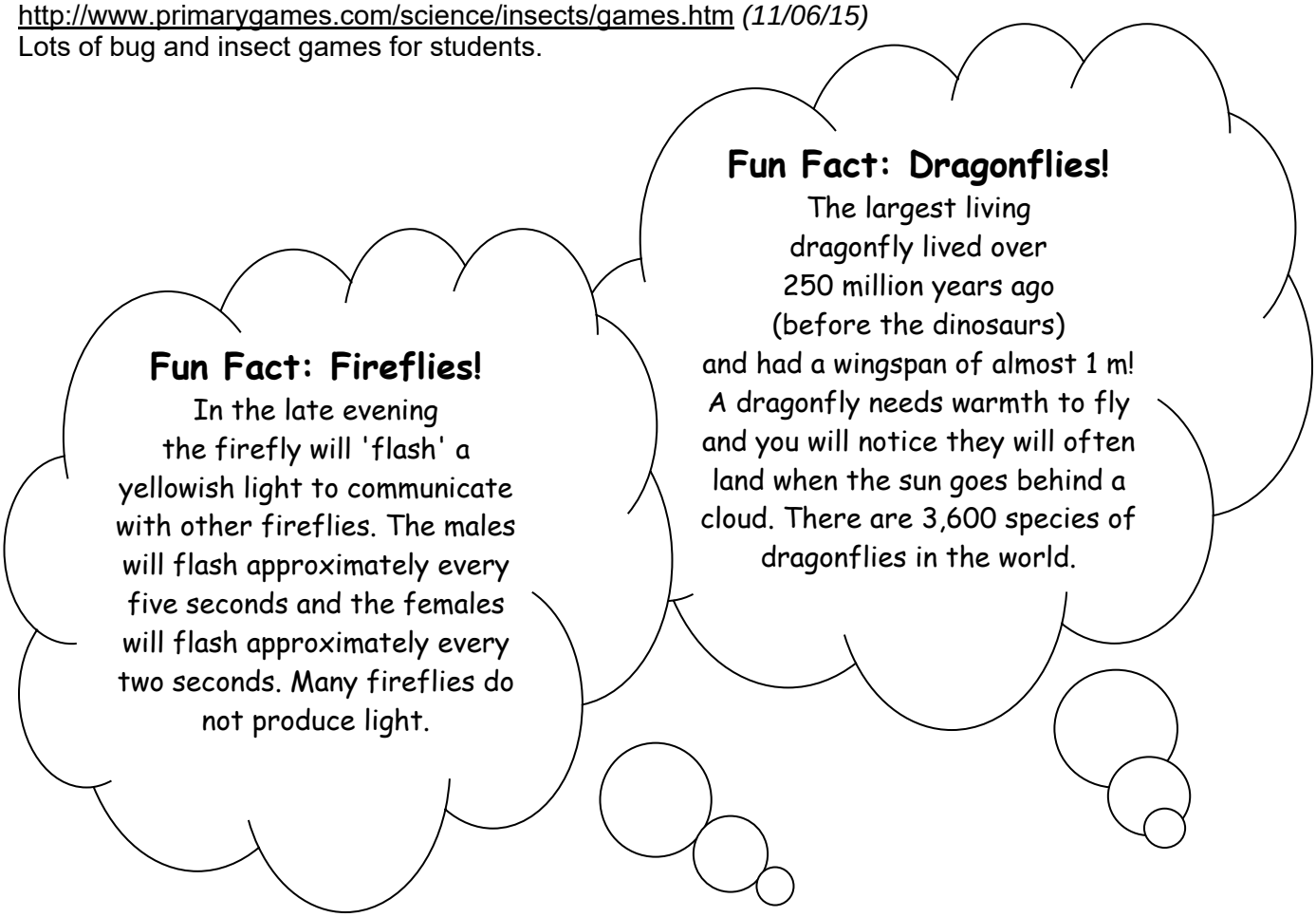
Spot the bug. Tom Jackson. 2013. DK publishing. ISBN 9781465402479
A good field guide for children.

Caterpillars. Chris Earley. 2013. Firefly books. ISBN 1770851836
A guide to raising and finding caterpillars. There are other books in this series including one on dragonflies.

Ultimate Bugopedia. Darlene Murawski and Nancy Hanovich. 2013. National Geographic Society. ISBN 1426313764. Wonderful photographs.

Interactive Resources

http://www.primarygames.com/science/insects/games.htm *(11/06/15)*
Lots of bug and insect games for students.



References
In addition to resources listed above, the following websites were also used to develop this package:
www.sciencekids.co.nz/sciencefacts/animals/insect.html *(10/31/13)*; http://www.funology.com/facts-about-insects-and-bugs/ *(10/31/13)*; http://www.kidzone.ws/lw/spiders/facts02.htm *(10/31/13)*; http://museumvictoria.com.au/bugs/life/cycles.aspx *(11/6/13);* http://www.uky.edu/Ag/Entomology/ythfacts/4h/unit1/labgrass.htm *(11/6/13)*; http://www.uky.edu/Ag/CritterFiles/casefile/spiders/anatomy/spideranatomy.htm#palps *(11/6/13)*.

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Get kids excited about science

Science Education Through Partnership

Scientists in School is a leading science education charity that reaches more Kindergarten to Grade 8 youth than any other science non-profit in Canada – more than 700,000 in the 2018-19 school year.

Through our hands-on, inquiry-based science, technology, engineering, math (STEM) and environmental classroom and community workshops, we strive to ignite scientific curiosity in children so that they question intelligently; learn through discovery; connect scientific knowledge to their world; get excited about science, technology, engineering and math; and have their interest in careers in those fields piqued.

By making science a verb - something you do - our workshops allow children's natural curiosity to reign, inspire kids to see themselves as scientists and engineers, and make connections between science and the world around them. This sets the stage for a scientifically-literate future generation who will fuel Canada's economic prosperity and think critically about the scientific challenges facing our society.

Scientists in School relies upon corporate, community, government and individual donors, as well as school board partners for support to develop new programs, continuously improve our existing programs, reach new geographic areas, provide complimentary workshops to less-privileged schools, and subsidize the cost of every one of our 24,872 annual classroom workshops.

Our Partners

Catalyst Level:

Natural Sciences and Engineering Research Council of Canada, TD Friends of the Environment Foundation

Innovation Level:

Amgen Canada, John and Deborah Harris Family Foundation, Nuclear Waste Management Organization, Ontario Power Generation, Toronto Pearson International Airport

Imagination Level:

ArcelorMittal Dofasco, General Motors Canada, McMillan LLP, Superior Glove Works Ltd., TELUS

Discovery Level:

Alectra Utilites, Aviva Community Fund, Cadillac Fairview, CAE, Cameco Corporation, Canadian Nuclear Safety Commission, Carolyn Sifton Foundation, Celestica, Hamilton Community Foundation, MilliporeSigma, Modern Niagara, Niagara Community Foundation, Pendle Fund at the Community Foundation of Mississauga, Purdue Pharma, S.M. Blair Family Foundation, Society of Petroleum Engineers Canadian Educational Foundation, Syngenta Canada Inc., Systematix Inc., The McLean Foundation

Exploration Level:

Ajax Community Fund at Durham Community Foundation, Brant Community Foundation, Cajole Inn Foundation City of Brantford, Community Foundation Grey Bruce, Dwight and Karen Brown Family Fund – Ottawa Community Foundation, Elexicon Energy, LabX Media Group Charity Fund at the Huronia Community Foundation, Siemens Milltronics Process Instruments, The Community Foundation of Orillia and Area, The County of Wellington, The Source, The Township of Tiny, Whitby Mayor's Community Development Fund