

GET INVOLVED WITH WILDLIFE PRESERVATION

Interested in preserving wildlife and wildlife habitat? Do you want to get your class actively involved? Wondering what you can do? **Join Northwest Wildlife Preservation Society's "Volunteer Team"!** To find out more about possible volunteer opportunities with us, please visit our website (www.northwestwildlife.com) or call **(604) 713-6686**. There are many exciting ways to get involved!



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Do you want to learn more about Insects?

Visit these great Websites!
www.bijlmakers.com/index.htm
www.insecta-inspecta.com
www.earthlife.net/insects/six.html
www.enchantedlearning.com/subjects/insects/printouts.shtml
<http://homeschooling.gomilpitas.com/explore/bugs.htm>
www.naturesongs.com/insects.html

Classroom Membership

We hope that your classroom will join us to help preserve wildlife and wild spaces by becoming a member of our society. Your \$35 classroom membership has many benefits. You will support habitat conservation and wildlife preservation and will also receive the following:

- 10% discount when booking Wildlife in the Schools presentations for your class
- 2 issues of our Critters newsletter annually
- Exciting wildlife education materials and activities
- NWPS "Owls Eyes" poster
- Application forms for your class to participate in Nature Walk & Workshop Program
- Discount on our wildly popular NWPS Wildlife Calendars

Looking for a fundraiser for your school or classroom?

Consider using NWPS Wildlife Calendars as a fundraiser for your school. We have worked with many schools to help them raise funds to support field trips, purchase of education materials and more, all while supporting NWPS' wildlife education programs. Your involvement is simple; calendars are available at 'no risk', you are able to return any that do not sell and are only responsible for payment for those that do.

To view the calendar, please visit www.northwestwildlife.com. For further information on this fundraising opportunity, please contact Melissa at **604-713-6698**.

FOR EDUCATORS

Exciting Wildlife Presentations:

Northwest Wildlife Preservation Society (NWPS) offers a variety of programs for audiences of all ages. These programs are designed to make discovering and appreciating BC Wildlife and wildlife spaces exciting. Our programs can easily fit into your curriculum, either as part of an existing lesson or as a separate lesson about the environment we all share.

Choose from...

- ☉ Bats
- ☉ Bears - BC & Beyond
- ☉ Climate Change & Wildlife
- ☉ Endangered At Home
- ☉ Frogs
- ☉ Oceans
- ☉ Owls
- ☉ Salmon
- ☉ Urban Wildlife
- ☉ Vancouver Island marmot
- ☉ Wildcats of BC
- ☉ Wildlife of BC
- ☉ Wolves

Critters Credits

Written by: **Anita Sigur, Nancy Zipursky & Becky Phillips**

Illustration (page 1) by: **Joanna Chan**

Design and others illustrations by: **Ana Isabel Agner**

Edited by: **Melissa Tupper**

Produced by: **Northwest Wildlife Preservation Society**

Address: 605-1112 W Pender St. - Vancouver, BC - V6E 2S1

Phone: **(604) 713-6686**

Fax: **(604) 713-6696**

Email: info@northwestwildlife.com

Website: www.northwestwildlife.com



Northwest
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CRITTERS

The Buzz about Insects

Investigating Aquatic Insects

Grab some gear from the house and head out to your favorite pond, stream or lake to fish for insects! You will be surprised by what you may find! What you will need:

A kitchen strainer

Tweezers

A light coloured pail

An Insect or Pond Field guide

A Plastic container (an old margarine container works well)

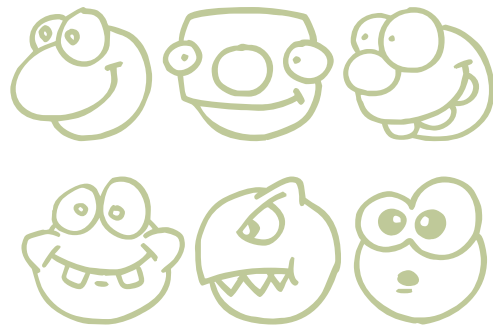
Rubber gloves (they will help keep your hands warm if the water is chilly)



1. Fill your pail full of pond or stream water. Once you catch some insects, you can transfer them into this pail (their new swimming pool) where they will happily swim around while you identify them.
2. Dip the strainer into the pond/lake to catch any insects swimming around. You may want to place the strainer near some aquatic plants, there will be lots in insects hanging around there.
3. Fill your plastic container half way up. Pick up a small rock and carefully place it into your container and gently rub it. You may find some insects here. Remember to gently place the small rock back where it came from.
4. Carefully transfer any insects from the strainer or container into the pail. Be careful when handling all these creatures.
5. Explore your pail. Use your field guide to identify the different creatures in your pail. Can you identify the insects? Count the number of legs, tails, and examine the shape, size and colour of the insect. What is its role within the ecosystem?
6. When you have finished with your new friends, carefully return them and the water from their swimming pool to their natural home in the pond or lake.



FUN FACTS



Cut and Collect!

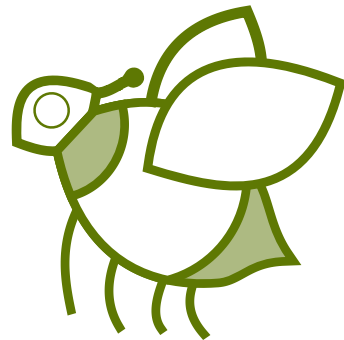
The longest insect is a huge stick insect. The females can be over 36 cm in length!!

Some butterflies have tongues almost as long as their body.

Ants can lift up to 50 times their own weight! That's like you lifting two small cars at the same time.

Dragonflies can fly at speeds up to 50 kilometres per hour.

There are 20,000 different species of bees.



Entomologists (scientists who study insects) discover 7,000 to 10,000 new species of insects each year. Some believe there may be 1 million to 10 million species still undiscovered.



There is a queen termite that lives in the tropics that is believed to be 50 years old.

Scientists have discovered that some insects are living thermometers. The snowy tree cricket has a very regular rate of chirping. In fact, if you count the number of chirps it makes in eight seconds and add four, you'll have the approximate temperature in Celsius.

Termites nests are literally cathedrals of clay. The nests can be 6 or 7 meters high.



Insects first appeared on earth at least 400 million years ago.

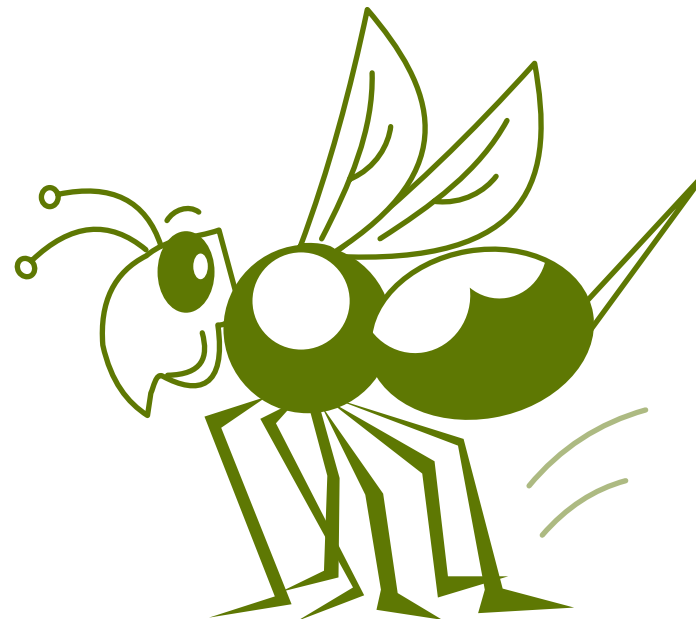
To make enough honey to fill a thimble, honey bees must collect nectar from 60,000 - 90,000 flower tubes.

A cockroach can live for 9 days without its head. It eventually dies from dehydration.

THE ORDER OF INSECTS



TO COLOUR:



There are thousands and thousands of different insects out there, and each plays a very important role in the natural world due to its own special characteristics, which make it unique. For an entomologist (a bug scientist), it is difficult to keep track of all these teeny, tiny bugs, so scientists have placed insects that have certain features in common into groups. **There are 28 of these groups for insects and these groups are called orders.**

Bees, wasps and hornets are grouped into one order because they have a number of similar characteristics. Yes, they all sting us (ouch!), but they have more in common than that. Their scientific name describes them as having four transparent wings and, if you look closely, narrow waists. This allows them to position the back end of their body in the perfect spot to lay their eggs or to defend their colony by stinging. Honeybees will actually give up their own life to defend their colony! When a honeybee stings, it leaves part of its abdomen behind, which makes it difficult to go on living.

Another order we are all familiar with is the Beauties of the Air - the butterflies and moths. Their scientific name means "scale-wings". Both butterflies and moths have scales that are arranged in unique, colorful patterns. These scales are actually tiny, flat hairs that cover the insects' body. They can be dusted off with one gentle touch, which is why you need to be very careful when observing these creatures. **So how can you tell the difference between a butterfly and a moth?** Generally, butterflies are more colorful than moths and can be seen flying around during the day. Moths are active during the night. When resting, butterflies will close their wings; moths, on the other hand, spread their wings out or wrap them around their bodies.

It is hard to believe the next group of insects has been around since the dinosaurs, because they are pesky ones! They are the flies, the gnats and the mosquitoes. Besides buzzing around and being annoying, these insects also all have two strong front wings. Their back wings have become little organs called "halteres". These organs help keep these two winged pests steady while flying about. Some of the insects in this group are bloodsuckers! Mosquitoes, horse flies, black flies and tsetse flies can pierce through skin with their needle-like mouth to take a little blood. Females need this blood to produce eggs.

Holy beetles! Beetles are one order of insects that survive everywhere on earth except in Antarctica. **Beetles are very good at adapting to new environments.** Perhaps it is because they are covered in beautifully colored armor, like a knight. Beetles' tough front wings act as a shield and protect them, while their hind wings do all the flying. Two beetles you may be familiar with are the ladybug and the firefly.

You can see how important it is to place all these insects into separate orders. It would get very confusing to keep track of all the thousands of insects individually! We have only touched on a few orders here and haven't even begun to talk about ants, the singers and the jumpers, like crickets and grasshoppers and the insect imposters, which are actually not insects at all, spiders!



the dragonfly



What flying insect do you know that zips or darts and is shiny green, shimmering blue or metallic bronze? If you guessed DRAGONFLY you are right. But maybe there are a few other facts you don't know about these Odonates (that's the name scientists use when talking about dragonflies).

Did you know that aerospace researchers are studying how dragonflies move about? If they can discover how dragonflies can fly backwards, change directions in mid-air, stop and hover then maybe we can improve our airplanes and spaceships by designing them after dragonflies.



Does your city have a mosquito problem in summer? Well, dragonflies really help us out with that. They love to eat mosquitoes, flies and gnats. Would you have guessed that a dragonfly is a carnivore? This means that like other animals which eat meat, they can be called 'carnivores'. There have even been reports of a dragonfly trying to eat a humming bird! Dragonflies will actually nip your hand if you pick them up.

And who eats dragonflies? They are a tasty treat for frogs and birds. People in many parts of Asia also eat dragonflies in much the same way as we eat prawns here in Canada!

What do dragonflies have in common with dinosaurs? They both were alive millions of year ago. In fact, dragonfly fossils have been found dating back 300,000,000 years! They were giants with wingspans up to 75 cm which is the same length as a bald eagle's wingspan. The largest ones we see today have a 19.1 cm wingspan (that is a bit smaller than a school ruler); overtime dragonflies have become much smaller than those that lived during the time of the dinosaurs.



What big eyes you have dragonfly. Dragonflies' eyes are called compound eyes because they are made of 30,000 lenses. We have only one lens in our eye. In fact, dragonflies can see something like a mosquito or a fly from 120 metres away!

Did you realize that a dragonfly spends 90-95% of its life underwater? It does so in the nymph stage. A nymph is an adult tucked into larval skin. Much like a snake, it sheds its skin as it grows larger. This is called "molting". When a nymph reaches the end of this stage, the larvae crawls out of its home in a pond or stream water and finds a new home in a dry spot. It emerges as an adult one week later.

Are dragonflies endangered? Not really, but many of their favorite water homes are being destroyed by the development of our wetlands.

In certain countries, dragonflies are very important to the culture. The first Japanese emperor, Jimmu Tenno, thought the islands of Japan looked just like the shape of a dragonfly as he looked down on his kingdom from the highest mountain. Because of this, Japan still has the dragonfly as its national emblem and this little insect is very respected in this culture.

Now that you are Dragonfly smart, see if you can impress your friends and family with some dragonfly facts!



the dragonfly

If you've ever tried to catch an insect, you know it's not very easy to sneak up on them! That's because their eyesight is very good at detecting motion. Most adult insects have two large compound eyes, made up of anywhere from a few to thousands of lenses! The more lenses they have, the more detailed the image they see. It's kind of like watching the same channel on a huge wall full of TV's. No wonder it is so hard to catch a flying insect, to the insect your hand looks like thousands of hands coming at them!

You probably already know that some insects, like bees and butterflies, drink the nectar from flowers. But what do other insects eat? Some eat fruit, vegetables or plants. Some eat other insects or animals. The female dauber wasp catches a live spider and seals him inside her mud nest for her young to eat when they hatch. Other insects, like fleas or mosquitoes, suck another animal's blood. Some insects even eat wood! Termite colonies can cause damage to people's homes by eating the wood in their walls.

Insects like mosquitoes, locusts and termites are not very popular. That's because they spread disease, eat our food crops or even destroy the walls of our homes. So would we be better off without any insects around? What do you think would happen if we could wave a magic wand and make all the insects disappear? As you've guessed, this would not be a good thing! Many animals like frogs, birds, bats and fish would go hungry and die because they need insects for food. For pollination, flowering plants need help from bees and other insects. Without insects, there would be fewer flowers and less fruits and vegetables for us to eat.

There would also be a lot of animal droppings and dead animals everywhere because there would be no insects to help clean them up. What a mess! Even though insects are sometimes thought of as annoying, scary or gross, most of them are harmless to people and the majority are very helpful. They might not help you clean up your room, but they do a lot of other important things for us and for the environment! Some insects make things that people find useful. Honeybees make delicious honey and wax, which is used to make candles. Silk worms make the strong, thin fibres that people can use to make beautiful silk clothing.

Some insects do an amazing job of controlling pests. Ladybird beetles, also called ladybugs, are very helpful to farmers and gardeners. They eat aphids and other bugs that eat food crops and flowers. The dragonfly is another insect that is helpful as well as beautiful. It eats two pests that can spread diseases: houseflies and mosquitoes.

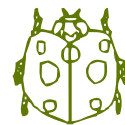
What's so great about ladybugs and dragonflies eating pests? Couldn't we just use bug spray instead? People are using lots of insecticides to get rid of insect pests. Unfortunately, insecticides (bug sprays) aren't only poisonous to bugs! They contain powerful chemicals that can hurt other animals, they can contaminate the water, and they can even make people sick. That's one reason entomologists are interested in learning more about insects. They hope to learn more about how to control pests without hurting other living things.

Insects are amazing creatures that play a very important role in our ecosystem. It is good to know which insects to avoid getting too close to because some of them can deliver a painful sting if they are scared! But it is also important to remember that most insects are nothing to be afraid of and fun to observe as they go about these busy activities. In fact, we can learn a lot about how all living things are connected by watching the many wonderful ways in which insects fit into the ecosystem. So next time you think about squishing a bug, think again!

5. _____



6. _____



7. _____



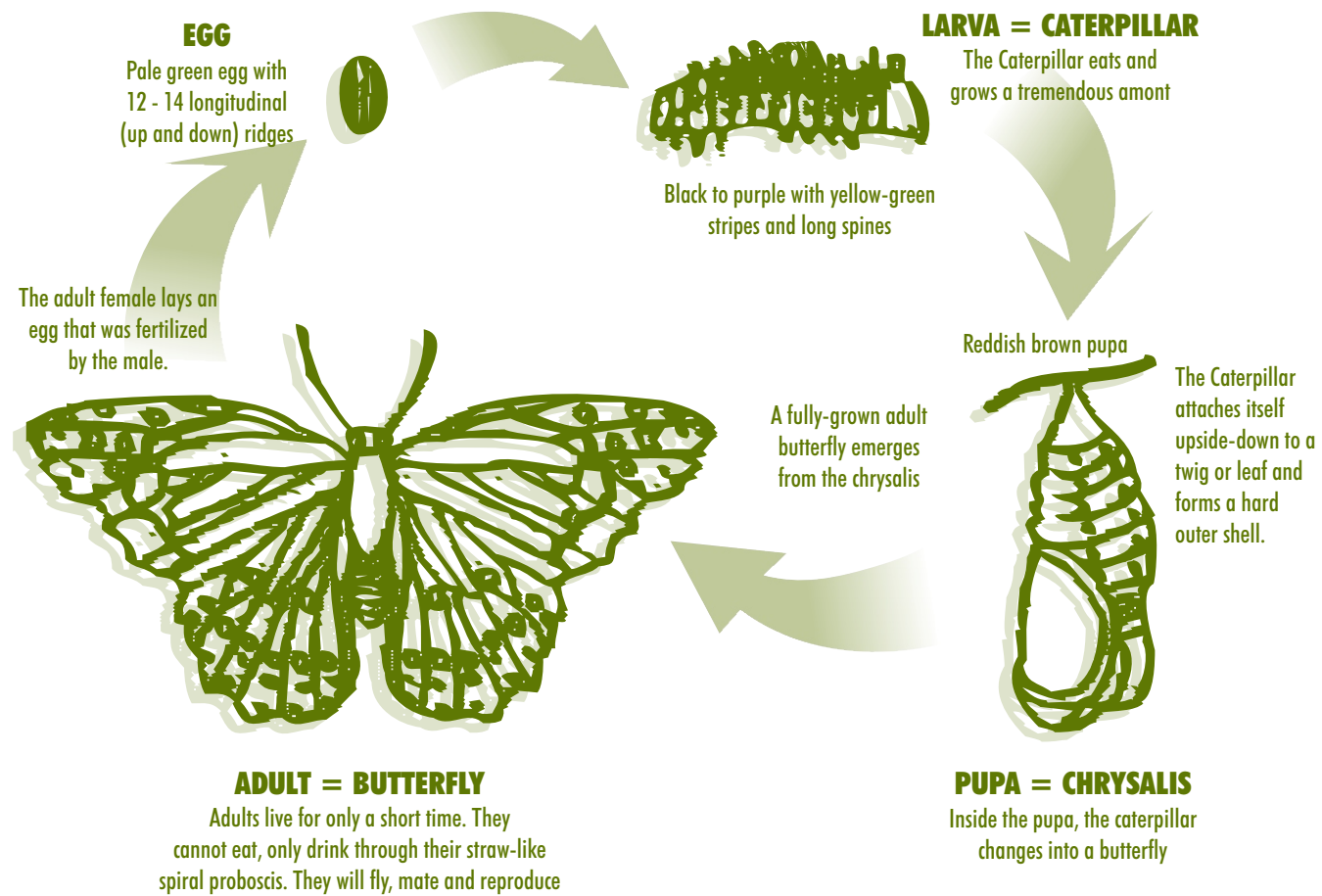
8. _____



ANSWERS: 1. Dragonfly 2. Fly 3. Grasshopper 4. Mosquito 5. Butterfly 6. Ladybug 7. Bee 8. Caterpillar



Butterfly Life Cycle



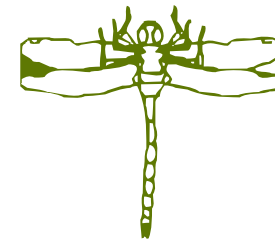
Almost all insects start their lives off as an egg, and then go through a number of changes before they become an adult. These changes are called metamorphosis. Some insects, like butterflies, go through a complete metamorphosis with four stages: egg, larvae, pupae, adult. At each stage the insect looks completely different. When the butterfly is a larvae, it is called a caterpillar. The caterpillar eats and eats and then finds a nice place to build a cocoon around itself. Butterfly caterpillars can spin thread from their mouthparts that they use to bind leaves together to form the cocoon. Inside the cocoon, during the pupae stage, the caterpillar's body goes through many changes. When it comes out, it waits for its wings to dry out and then discovers that it can fly! Imagine waking up one morning and finding that you have a pair of beautiful wings!

Not all insects go through these big changes. Some insects go through a gradual or incomplete metamorphosis. When these insects are young, they may or may not look like the adults. Some types of insects only change in size as they become an adult, while others change their shape and grow wings. Insects that look like the adult when they are young, like silverfish, are called nymphs. Insects that look very different from the adult when they're young are called naiads. The dragonfly is aquatic when it's a naiad, but when it becomes an adult it lives on land and it can fly.

Do you know the name of these insects?

Check your answers on the bottom of the next page.

1. _____



2. _____



3. _____



4. _____



INSECTS

Insects might be some of the smallest creatures in the animal kingdom, but they are more important than you might think! Did you know that more than half of all the living things on earth are insects? So far, over a million different types of insects have been discovered. Every year entomologists (scientists who study insects) add thousands more to the list!

If you want to find an insect, you don't have to look very far! Insects live almost everywhere: on land, trees, underground, in water or snow. Some even live on animals or even inside them! Insects are plentiful in steamy tropical jungles but you will also find insects in the very cold places like the Arctic and Antarctica. One of the few places you won't find insects is in the ocean, but even there, you'll see insects on the surface of the water, on the sand, and in tide pools.

Some people think insects are pretty scary. That's probably because some insects can be real pests. Black flies bite, bees sting and stink bugs spray smelly chemicals on you. It's important to remember that they don't do this just to bug you. In the case of mosquitoes, only the female bites and she does this because she needs blood to help her make eggs. Other insects use biting, stinging or spraying to defend themselves or their homes. Think of these itchy bites as insect karate!

Other ways insects protect themselves is by moving fast or jumping great distances. A flea can jump a hundred times its own length. That would be like you jumping over a 40 story building! Some insects use their colour or shape as camouflage to blend into the background so predators don't notice them. An example of this is the walking stick insect, who looks like a twig, or the tree hopper who looks like a thorn!

One kind of defence that all insects have is their hard shell, called an exoskeleton. The exoskeleton is a lot like a crab's shell or a knight's armor, it protects the soft body parts inside. The exoskeleton does not grow with an insect; therefore in time, the exoskeleton becomes too tight and must be shed in a process that's called molting.

What exactly is an insect anyway? Spiders and centipedes might look a little like their insect cousins, but they're not really insects. That's because all the creatures in the insect family have something that these critters don't have. All insects have six legs and three main body parts: a head, a thorax and an abdomen. Most insects also have one or two pairs of wings, which are attached to their thorax. Insects also have antennae attached to their heads, between their eyes and mouthparts, right where their nose would be if they had one!

Since insects don't have noses, you might think that they can't smell. In fact, insects have a very good sense of smell. Some use it to find food sources or read chemical messages left by other insects. Insects smell mostly by using their antennae. Some insects also use their antennae to touch, hear and taste.

