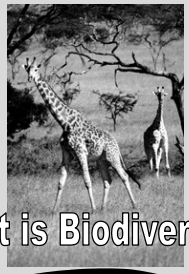
Bioblitz



What is Biodiversity?

"Finding out"

Learners undertake an eco-regional survey to determine the biodiversity in their area

Grading: Y Y Y Y

Time: ⧖⧖

Place: Inside/Outside

Group size: 4 - 6 / Individual

Activity Outcomes:

Learners are able to:

- use an eco-regional survey questionnaire
- carry out a biological inventory of a nearby natural area

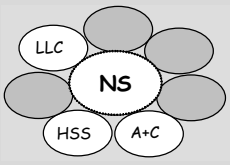
Assessment:

- Assess co-operative learning by using a groupwork checklist
- Peer assessment of group reports and conclusions

Skills:

- Collecting information
- Identifying organisms
- Recording
- Making conclusions

Learning Area links



Background

"You do not have to travel to the rain forests of the Amazon or explore the entire region you live in to discover biodiversity. Just walk out of the door and you will find an amazing diversity of life in your backyard, your schoolyard, a nearby stream, pond, field or vacant plot."

Learners will have a chance to explore the diversity of life in their surrounding community, designing and carrying out an eco-regional survey of a local area.

Activity Guidelines

Needed: *Copy of "BIO BLITZ SURVEY" , plastic bags, plastic containers to collect specimens, thermometers, magnifying glasses and field guides to help learners identify insects, camera (if available).*

See Hands-on Schoolyard Life. A field guide by David L. Christians. Gather other information about trees, plants, animals in your area.

See "Do's and Don'ts of fieldwork" & "Animal Signs to look for."

- Find a nearby natural area where learners can conduct their survey.
  - School grounds, a river bank or a nature park can all work. Just be sure that your area is safe for your learners and that you have the permission of the owners.
- Take the learners to study the area and allow 30 minutes to conduct their survey.
- Learners will also need to sketch a quick "site map" of the area.
- Learners collect specimens to take back to classroom.
- Learners indicate on their maps where the species were found.
  - [***WARNING:*** **Animals, rare flowers, poisonous plants and endangered species should not be collected**.]
- Encourage learners to take photos or make sketches of items that should not be collected
- Groups report on their findings.

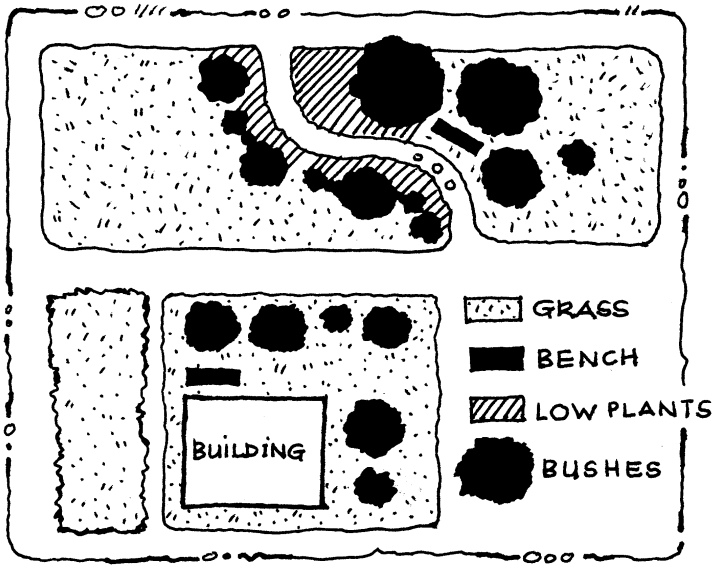
- The following questions could come from the discussions:
  - How many different living things did they find?
  - Where did they find them?
  - Did they find indigenous species?
  - How many alien species did they find?
  - Did the magnifying glasses make a difference?
  - Where did they find the greatest biodiversity?
  - Were they surprised by anything they found or did not find?

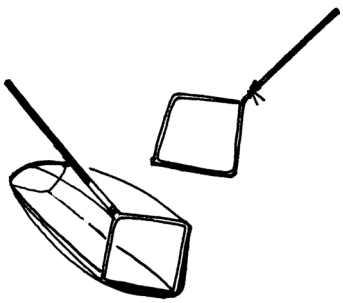
Note:

Learners might come to the following conclusions:

- They might have missed some organisms.
- Seasonal changes will affect organisms.
- Rapid assessment is very useful as it is a way of obtaining quick ways to determine the biodiversity of an area.

EXAMPLE OF SITE MAP





Sweep net:
A stocking around a bent coathanger wire makes a great net.

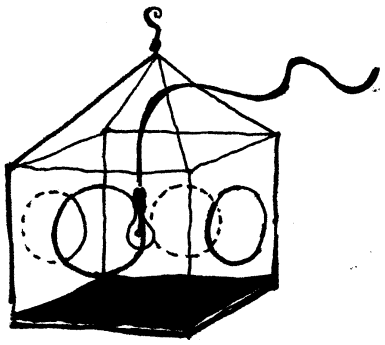
Variations:

Insect survey

Needed: *Nets, plastic bags, magnifying glasses, scissors Copies of "**Incredible insects**, "**Insect ID**" and "**Putting them in order**" for each group of learners.*

- Use the handouts "**Insect ID**" and "**Putting them in order**" with learners to familiarise them with insects' major features and to help them identify and classify the different insects.

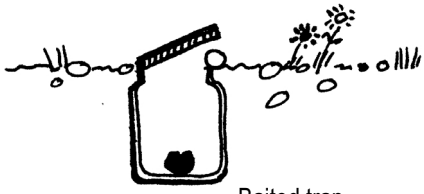
- Keep learners in teams of three. Instruct each team to pick one small area of the schoolyard and let learners take turns collecting flying insects with the sweep net until they have at least 10 insects (not more than 30). After each sweep, the net should be shaken into a plastic bag. The following traps can also be used:



Light trap

- **Light trap**: This device catches insects that are active at night. A simple light trap can be constructed using an empty cardboard box.

  Cut holes in the four sides of the box (approximately 100mm in diameter). Hang a 60w light bulb inside the box, so that the light can be seen through all the holes. Put a sheet of white paper in the bottom of the box. Tie strings to the corners of the box so that it can be suspended from a tree. Collect the insects that have collected on the floor of the box every morning



Baited trap

- **Baited trap**: This trap will catch insects that are attracted to organic materials which they assist in decomposing. Use any suitable glass jar (empty peanut butter jar will do fine) and bury it outside so that the mouth of the jar is flush with the soil surface. Use different kinds of bait – such as pieces of fruit, leftovers, meat, dung - in the bottom of the jar. Leave it, and inspect for insects daily.

- Learners identify the insects. Begin by dividing them into Orders and then distinguish between each species by using field guides. If they cannot identify the species, tell them to look at each insect's size, colour and shape and then to devise a description name for each species (i.e. molted black beetle; leaf-line grasshopper)
- Encourage learners to keep a record of the insects they have found, including the insect's distinguishing characteristics and location. They can use these to create a lab book together with their drawings and observations.
- Ask learners to choose **one** of the insects they have found and write a description of it. Tell them not to use the name of the insect even if they know it. Instead, tell them to write down all the other ways in which they can describe the insect to others.
- Make a poster that illustrates the diversity of insects in your area. Was there a lot of diversity? Why / why not?
- Learners investigate and record ways in which they can sample the diversity of insects on and under the ground. There are many fun and easy ways to find and study these insects. Pitfall traps, aspirators and Berlese funnels are just a few.

-BIOBLITZ SURVEY-

Area: ..... **Date:** .....

City/Town: .....

Team members: .....

Description (what the area looks like in general): .....

.....

.....

.....

.....

Sketch of Area:

Plants

Reptiles and Amphibians

Mammals

Insects

Other

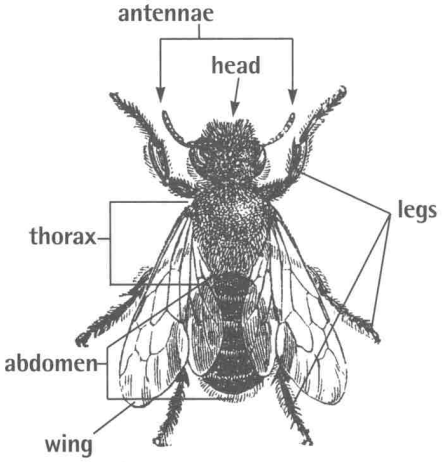
Birds

Non-insect Invertebrates

-Insect I.D.-

Is it an Insect?

It may seem difficult to tell the difference between a true insect and some of the other little creatures you find scurrying around. But if you look out for the following two characteristics - things that only insects share – you will find it is not so difficult.



1. **Insects have three main body parts: a *head*, a *thorax*, and an *abdomen*.**
2. **Adult insects have *six legs* (three pairs of legs).**

Another hint - If you find any tiny creature that has **wings** it is definitely an insect. Insects are the only small creatures that have mastered the art of true flight. Some may have two wings and others may have four. And in some groups, one set of wings can act as a cover for the other set. *Just remember:* **Not all insects have wings**. Scientists put insects that are similar to each other into groups called Orders. There are about 30 main Orders of insects. The chart titled "Putting Them in Order" will help you identify insects from some of the most common Orders you are likely to sweep up.

-Putting them in order-

Picture	Common Name	Order	Description
	springtails	Collembola	are tiny, jumping creatures that live in soil, decaying logs, and leaf mould (they jump by releasing a forked structure on their abdomen); colour varies from white to red to mottled; hard to see because of small size
	mayflies	Ephemeroptera	have a long, soft body; have two or three thread-like tails; are very common around ponds or streams; front wings are large and triangular and hind wings are small and rounded
	damselflies dragonflies	Odonata	have four wings with many veins and are erratic fliers; have large compound eyes; are often brightly coloured and found around water; length varies from about 25 to 125 mm; young live in water
	locusts crickets mantids	Orthoptera	often have four long and narrow wings; hind wings fold under leathery front wings; colour varies; can make sounds by rubbing one body part against another; large, hind legs are used for jumping
	stick insects	Phasmatodea	look like twigs or sticks; have brownish or green bodies; have long slender legs and move slowly; usually found on trees and shrubs; most are wingless in the United States

-Putting them in order-

Picture	Common Name	Order	Description
	cockroaches	Blattodea	have an oval, flattened body and long, hair-like antennae; have slender, front and hind legs and are often fast runners; some have wings, but others are wingless; in some species the hind wings fold under leathery front wings
	earwigs	Dermaptera	have long, slender bodies with a pincer-like structure, called a cerci, on their abdomen; adults usually have four wings; when at rest, the membranous hind wings fold under the short and leathery front wings
	termites	Isoptera	are small to medium-sized insects that live in social groups; front and hind wings (if present) are same size and held flat over the body; workers are pale and wingless; reproductive kings and queens have wings and compound eyes and swarm during mating season
	stoneflies	Plecoptera	have four wings with many veins; are poor fliers; are small or medium-sized and brown or drab-coloured; are usually found near water; young live in water
	fishmoths	Thysanura	very agile, wingless insects; body is covered in silvery scales; have long antennae; have three many-jointed appendages on the hind end of the abdomen; have compound eyes
	ambush bugs assassin bugs stink bugs	Hemiptera	body is broad or long and narrow; front wings are half leathery and half membranous and make a triangle where they fold across the abdomen; live in almost all habitats and have piercing-sucking mouthparts
	cicadas aphids leafhoppers	Homoptera	are closely related to the true bugs; many have four wings, although some, such as scale insects, don't have wings; wings at rest are held roof-like over the body; antennae are often short and bristle-like
	dobsonflies lacewings alderflies	Neuroptera	are soft-bodied insects with four membranous wings that have many veins; wings are held roof-like over the body when at rest; antennae are usually long and have many segments; adults are usually weak fliers
	beetles	Coleoptera	hind wings fold beneath hardened front wings; front wings make a line straight down their back where they meet; have chewing mouthparts; antennae come in a variety of shapes
	butterfies moths	Lepidoptera	have four wings, which are covered with scales that come off like dust when handled; have sucking mouthparts in the form of a coiled tube; butterflies usually have club-like antennae
	flies (mosquitoes, house files, and so on)	Diptera	are usually small and soft-bodied; have two, clear front wings; hind wings reduced to two, tiny knobbed structures called halteres that help flies keep their balance while flying
	fleas	Siphonaptera	are small, wingless insects that feed on the blood of birds and mammals; have flattened bodies and strong jumping legs; adults have sucking mouthparts and short antennae; body is covered with bristles and spines
	ants bees wasps	Hymenoptera	have four clear wings; abdomen usually is narrowly attached to thorax by a thin "waist"; often have a stinger at the tip of the abdomen

Do's of field work

- ☺ ***Do** be sure that you have all the materials you need before you head for the study site.*
- ☺ ***Do** be a careful observer.*
- ☺ ***Do** take careful notes about what you find, including information about the locations and characteristics of plants and animals.*
- ☺ ***Do** handle animals with care- and handle them as little as possible.*
- ☺ ***Do** replace logs and rocks in the position you found them.*
- ☺ ***Do** stay within the boundaries of your study area.*
- ☺ ***Do** try to identify unknown species while you are in the field.*
- ☺ ***Do** look for animal signs as well as actual animals.*
- ☺ ***Do** wash your hands carefully as soon as you return to the classroom.*

*Also, don't forget to look **everywhere**, including:*

- On the ground
- On tree trunks
- In tree branches
- In leaf litter
- On plant stems and leaves
- Under and around logs
- Under rocks

Don'ts of *field work*

- ☹ **Don't** damage trees or other plants by digging them up, ripping off leaves, or tearing at the bark. Be careful when collecting specimens.
- ☹ **Don't** put anything you find - such as berries, leaves, mushrooms, and bark - in your mouth. Also, don't put your fingers in your mouth until after you have returned to the classroom and washed your hands thoroughly.
- ☹ **Don't** chase after, shout, or throw things at animals you see.
- ☹ **Don't** touch or collect animal droppings, dead animals, mushrooms, or human refuse such as bandages, broken glass, rusty cans, or needles.
- ☹ **Don't** reach under logs or rocks, crevices, or other spaces if you can't make a visual check first.

Be careful

Learners will enjoy this activity because they can get outside and explore the diversity of life around them, but you need to make sure your learners and the insects are safe. Remember the following when planning this activity:

- ! Although your learners should not need to handle any insects, there is always a chance that someone could be stung. Find out if any of the students have an allergy to any type of insect sting, and have the necessary first aid on hand or have learners with other severe allergies stay inside and work on a related project or extension while the others are outside.
- ! Some insects can be harmed by handling and should not be collected. These include large-winged insects such as dragonflies and butterflies, whose wings are easily damaged. Learners who sweep up any of these insects should jot down a description of the insects and let them go.
- ! Remind learners to limit the time they spend identifying insects in the plastic bags, because most insects can not survive in the bags for long. Emphasise that one objective of this activity is to gain new respect for the diversity of insects, so the learners should do their best to preserve insect diversity in their schoolyard.

Animal Signs to Look For

In addition to looking for animals, keep your eyes open for animal signs. These signs include the following:

- Burrows
- Nests
- Digging and scratching marks
- Tracks
- Bones
- Feathers
- Insect galls
- Cocoons
- Spider webs
- Nibbled leaves and branches
- Droppings
- Feeding holes in dead trees and logs
- Runways and trails