

Grade 2: Insects: Underground Insect Safari



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INTRODUCTION

Students will learn about insects and what they need to survive in the boreal forest.

The following games and activities will develop skills for description and classification of small invertebrate animals, the needs of those animals, and how those needs are met in order to survive. Students will also learn about their own responsibility in caring for living things that live in the forest.

LEARNING OBJECTIVES:

By the end of this lesson, students will:

- Be able to differentiate between insects and spiders.
- Recognize different local species of small flying and crawling animals in the Boreal Forest.
- Recognize where the insects make their homes and special adaptations that help insects survive

LOCATION:

A rural, forested setting is ideal, but in more urban places go to a natural area within city limits or a provincial park.

SET UP:

Keep the supplies like trowel and magnifying jars in containers that are easy to carry. Scout out the hike route beforehand (know how far to go, where to stop and talk, and interesting things to point out).

Prepare pipe cleaners for 'Camo Critters' activity.

Extra Activity

Prepare scent canisters for 'Insect Communication' activity.

SAFETY PLAN:

Leader must carry a first aid kit and be aware of their surroundings on the hike (i.e., bear safety). Ensure any students with bee, wasp, or other severe allergies carries their Epi-pen.

GRADE: 2

TEACHER PREPARATION TIME: 15-30 Minutes

LESSON DURATION: 60 Minutes

PRE-REQUISITE: None

WORKSHEETS: Attached

CONNECTIONS TO SCIENCE CURRICULUM TOPIC E:

- E-1 Recognize different crawling and flying animals
- E-2 Compare and contrast local species
- E-2 Identify at least three invertebrates
- E-3 Recognize homes where animals meet basic needs of air, food, water, shelter, and space
- E-3 Describe special characteristics that help the animal survive in its home
- E-4 Identify each animals role in the food chain and food sources
- E-6 Identify ways animals avoid predators

MATERIALS

Attached Worksheets

- Insect vs. Spider Sheet
- Rotten Log Organism Sheet
- Centipede vs. Millipede Sheet

Additional

- At least 40 pipe cleaners in at least 4 different colours (one colour should blend into the game area)
- 10 pails or baskets

Per student or pair

- 1 trowel
- 1 small container
- 1 magnify glass (optional)

Extra Activity

- 20 cotton balls
- 20 film canister or other small containers
- 10 samples of strong smelling items

PROCEDURE:

1. Introduction: (Approx. 5 minutes)

Introduce topic for the day and rules (Boundaries, respecting wildlife, any other rules that apply to your class, etc.)

- 'What is the name of the biggest forest in Alberta?' Answer: Boreal Forest!
(If you don't live in Northern Alberta, ask a question about the forest you live in)
- 'The Boreal Forest is one of the **biggest on Earth**; it goes around the whole globe and is an important habitat for many species of insects. It is really important so I want to make sure you all learn the name. Let's yell it as loud as we can!' Answer: Boreal Forest!
- 'We are going to be going on an insect hunt today to find some of the insects that live here. We are going to learn the names of as many insects as we can. We will also be learning about the homes where they live. The location of their homes can also tell us a lot about how they meet their needs.'
 - 'What are some things that people need to survive?' Answer: Food, shelter, water, space
 - 'Do you think insects need the same things?' Answer: Yes
 - 'Insects need many of the exact same things as we do but they find them in different ways and different places. When we want a drink we go to a sink and turn on the tap. At night when we need shelter, we go into our houses. While we're out hunting for insects, look at where their homes might be and how you think they meet all of their needs.'

Curriculum Links: E-3 Recognize homes where animals meet basic needs of air, food, water, shelter, and space

2. Insect vs. Spider: (Approx. 10 minutes)

The following kinesthetic activity will help students identify the visual difference between insects and spiders. They will identify different parts of insects and spiders then work together in two teams. It is a great warm-up activity for the fieldtrip but could also easily be done in a classroom.

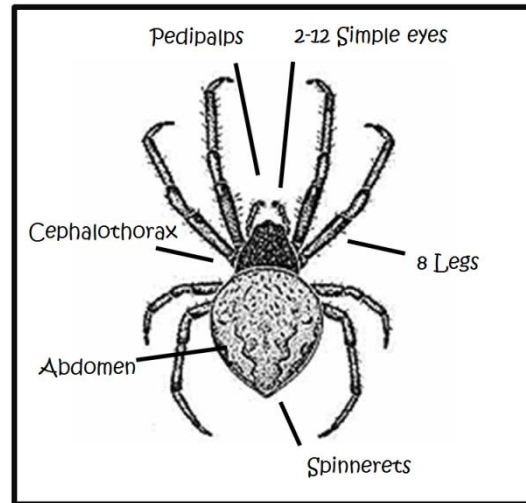
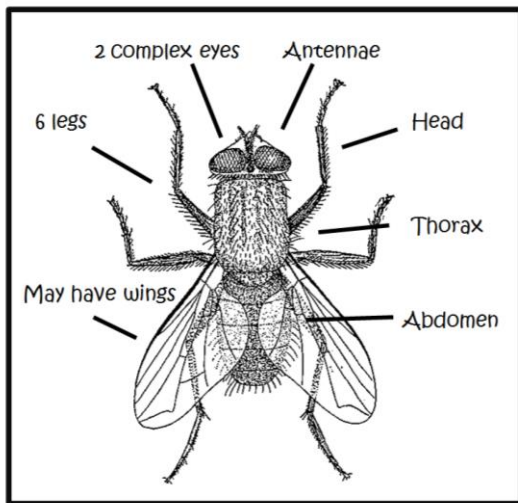
Standing in a circle

- 'What kinds of insects do you think we will find today?' Answer: Spiders, ants, moths, butterflies, bees, slugs, beetles, lady bugs, etc...
- 'How can we tell the difference between all these different kinds of small animals?' Answer: We look at their body shape

Activity: 'Let's do a quick activity to make sure we can tell them apart.'

- Split the students into two groups. One group will be the insects and the other group will be the spiders.
- Ask the students to raise their hand and tell you all the different parts of an insect or a spider's body.

INSECTS	SPIDERS
3 body parts – head, thorax, abdomen	2 body parts – cephalothorax and abdomen
Antennae – to sense environment	Pedipalps
2 complex eyes	Usually 8 simple eyes...but can have from 2 to 12.
6 legs	8 legs
May or may not have wings	Spinnerets to spin web



(See Appendix A for full insect vs. spider diagrams).

- The group could act out each part of their organism as you discuss the differences (e.g. for the insect, 3 kids could represent the body and 6 for legs).
- Challenge the kids to move across the ground as a unit.

Curriculum Links: E-1 Recognize different crawling and flying animals
 E-2 Compare and contrast local species
 E-3 Describe special characteristics that help the animal survive in its home

3. Underground Insect Safari (20 mins)

Give students an opportunity to explore and find some of the small crawling and flying underground animals they have been learning about.

Standing in a circle

- Students work really well in this activity when they are working in pairs. Before you start the activity make sure that each student has a partner.
- Set boundaries for the bug hunt. The students will likely bring their findings to you but they may want you to come into the forest to inspect. So setting a boundary of being able to see you at all times may not work. It may be good to pick a central object that they must be able to see at all times or put up some flagging tape that they can't go past.
- Also set some kind of a word or phrase that means to come back.
- Ask the students where some good places to find insects might be:
 - Inside/under rotting logs
 - Under leaf litter
 - Underneath the bark of dead trees
 - In the soil near trees or rotting logs
- The students will bring you some bugs that they are having a hard time identifying. Use the attached insect identification sheet (Appendix B) or your field guide.
- Depending on your time, you may want to select two different types of areas and compare what types of bugs they find in each place.
- Hand out materials to students. Depending on the number of containers, either give each student or each pair of students a container, magnifying glass, and trowel. Let the students know that the equipment is to be treated gently and will break if used for banging against trees or throwing around.
- There are two insect identification sheets in Appendix B that can be printed off and laminated for each pair of students.

Curriculum Links: E-1 Recognize different crawling and flying animals
E-2 Identify at least three invertebrates

4. Safari Conclusions: (Approx. 10 minutes)

Siting in a circle

- After you bring all the children back together from their bug hunt, end with a sharing circle. Ask the students who found insects to share with the class what kind of insect they found and where they found it.
- When they identify their insects, ask them how they know it is a fly and not an ant, or a beetle and not a spider, etc.
- Pass the insects around the circle and give the kids time to inspect all of the student's findings.
- Explain that we need to put these insects back in a good place where they can find food, water, and shelter. If in a provincial park and need to reinforce that parks and protected areas are meant to protect all the animals and plants that live there. Ask the students to find a good home for their insects similar to where they found them.

Curriculum Links: E-2 Compare and contrast local species
E-3 Recognize homes where animals meet basic needs of air, food, water, shelter, and space

5. Camo Critters Game (Approx. 10 minutes)

The following kinesthetic activity will help students identify how small animals use camouflage to avoid predators and their place in the food chain. Students will be able to identify that insects are a food source for other animals.

Take 40 coloured pipe cleaners in at least four colours and cut them in thirds. The game will be played with about 120 critters made up of 30 of each of the 4 colours (one colour should blend/camouflage into the game area – like green objects on a green lawn).

Activity:

Standing in a circle

- Before playing this game, the teacher needs to scatter the coloured objects throughout an area of about 20 square metres.
- Ask students ‘what do birds like to eat?’ Answer: Insects, worms, etc.
- Pair up students and put them in a line along the playing area about 15 m from where you laid out the critters. Use a basket or bucket to mark their spot. The students play the role of birds looking for insects to ‘eat’ and the basket is the bird’s nest where they will gather all the critters.
- One partner at a time will run out to the playing area and collect one critter. Birds have to be fast when they are catching food so the students have to grab the first critter they see.
- Then they will run back to their partner and deposit the critter into their basket/nest. Once they ‘high-five’ their partner, their partner can run out to the playing area to find a critter.
- Let them play for a few minutes until most of the critters have been collected but not all.
- At the end of the game ask the students to group their critters by colour and count how many of each they have.

Conclusion Questions:

Sitting or standing in a circle

- Ask them ‘which critters do you have the most of and which do you have the least?’
- Most likely they will have the most of a bright colour and the least of the colour that matches the surroundings (i.e. green critters blending into the grass). Ask the students ‘what colour would you want to be if you were insects that lived in the grass?’, ‘what colour would you want to be if you lived in the dirt?’, and why they chose those colours.
- Now let the students go find any leftover pipe cleaners and bring them back. Notice the colour of the pipe cleaner when they return it and ask why they think they missed it the first time around.

Curriculum Links: E-4 Identify each animal’s role in the food chain and food sources
E-6 Identify ways animals avoid predators

‘Thank you for being such a great class on our fieldtrip. We sure learned a lot today!’
The lesson plan is now complete but if you still have extra time you can play the extra activities below.

EXTRA ACTIVITIES:

1. Insect Communication: (Approx. 10 minutes)

Count the number of students you have and divide it by two. This will tell you how many scents you will need. To make a pair of scent containers, soak two cotton balls in a given scent and place one in each container (See Appendix C for scent examples). It is a good idea to secretly number the bottom of all the containers to keep track of what the scents are and if the students found their correct partner. For example if containers 1 and 2 are recorded to have vinegar and containers 3 and 4 have soy sauce, if students with containers 1 and 4 claim they are a match you will know after checking the bottom of their containers to ask them to try again

Standing in a circle

- 'We all know insects can't talk, but they do communicate. One way they do is through their sense of smell.'
- 'What types of things do you think they say to each other using their sense of smell?'
Answers: Where is the food? Are you a boy or a girl insect? Watch out for danger!
- The activity is designed to get students to see the world from a bug's point of view. (Also a great opportunity to practice the "no talking" rule)

Activity:

'Let's see if you can locate your partner like insects can.'

- Distribute one canister randomly to every student
- Tell your students that, 'one other person has the same scent as you do and the object of the activity is to find that person. Walk around and smell each other's canisters until you find a match. No talking is allowed!'
- Get everyone to take a seat with their partner once they find each other or they can link arms.

Conclusion Questions:

Sitting or standing in a circle

- 'Was it easy to find your partner?'
- 'What made it hard to find your partner?'
- 'How confident were you that you'd found your partner?'
- 'Was it easy to communicate this way?'
- 'Would you want to only communicate this way? Why/Why not?'

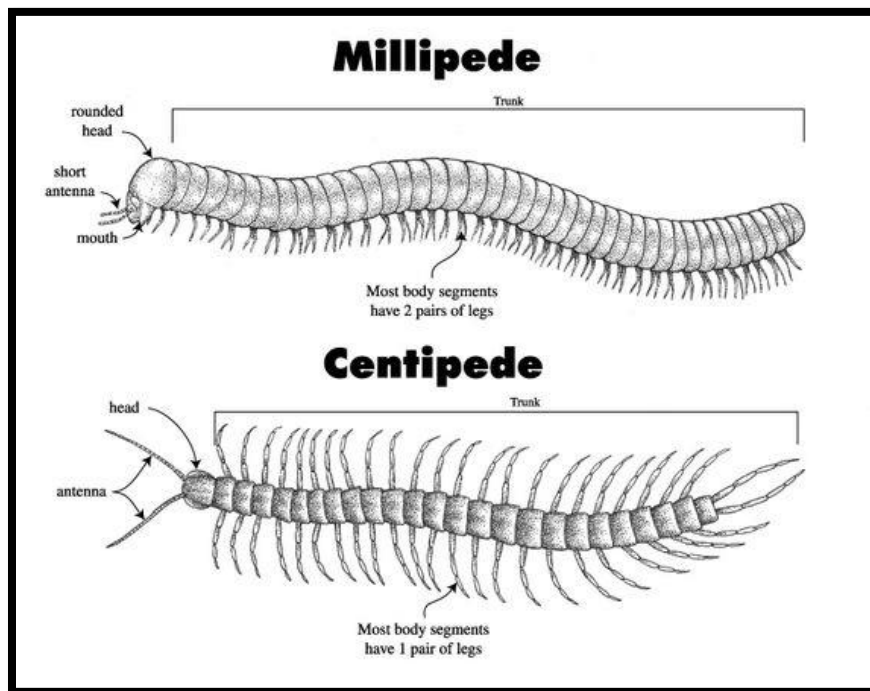
Curriculum Links: E-3 Describe special characteristics that help the animal survive in its home

2. Millipede Walk (Approx. 5 minutes)

This can be used as a short ice breaker activity.

Activity:

- Start by asking kids what their favourite insect is.
- “What about a millipede? What’s a millipede like?” Answer: Millipedes have two pairs of legs per body segment, but centipedes only have one pair. Millipedes move a lot slower and feed on decaying matter. Centipedes move quickly and are carnivores.
- ‘We’re going to make our very own millipede as a class!’
- Get students to line up one behind the other with their hands-on shoulders of the person in front of them. If the students are too close, spread them out a bit.
- “You are now a millipede! How many eyes does a millipede have? Right, only two so I will be the eyes. I will be holding the hands of the person in the front (with my eyes open) guiding you while walking backwards. You are all the body of the millipede, so you must keep your eyes closed. No peeking!”
- See how far your class can make it before the millipede gets broken up.



Millipedes have rounded bodies, 2 pairs of legs on most body segments, and are decomposers (eat decomposing materials).

Centipedes have flatter bodies, 1 pair of legs on most body segments, and are carnivorous (eat other insects).

See Appendix D for a full page millipede vs. centipede diagram.

3. Centipede Tag (Approx. 5 minutes)

This can be used as a short ice breaker activity if the students are energetic and to reiterate centipede body features.

Activity:

- One student will start as 'it'
- When they tag another student, the pair will link arms and pursue their classmates together.
- Every time someone new is tagged they will link arms on the end of the line of students.
- The running chain of students can pretend they are a centipede, chasing its prey.

4. Grasshopper and Ant Tag (Approx. 5 minutes)

This can be used as a short ice breaker activity if the students are energetic and to highlight a cool predator and prey dynamic found in the Boreal Forest between insects.

Activity:

- Start by asking the kids if any of them would enjoy eating some ants for a snack. Explain that even though we may not want to eat them, insects are food for many different animals. Some of these animals are small, like other insects and some are very large, like bears!
- Students will pair up, link arms, and spread out around the playing area.
- All the pairs will stay stationary except one. One student will be 'it' and playing a grasshopper. The student running will be an ant.
- All the other pairs are two ants hiding in a colony (ant house). There is only enough room for two ants so if an ant comes in one side (links arms with one of the pair) the ant on the other side gets pushed out (unlinks arms with their original partner) and is now being chased by the grasshopper.
- There should only ever be two students running at once. This form of tag allows some resting so the group won't get tired as quickly and keeps the students engaged because they have to pay attention to when it might be their turn.

5. Mingle: Spider, Queen Ant, and Beetle (Approx. 10 minutes)

This can be used as a short ice breaker activity if the students are energetic and to reiterate the differences in body features between insects and spiders.

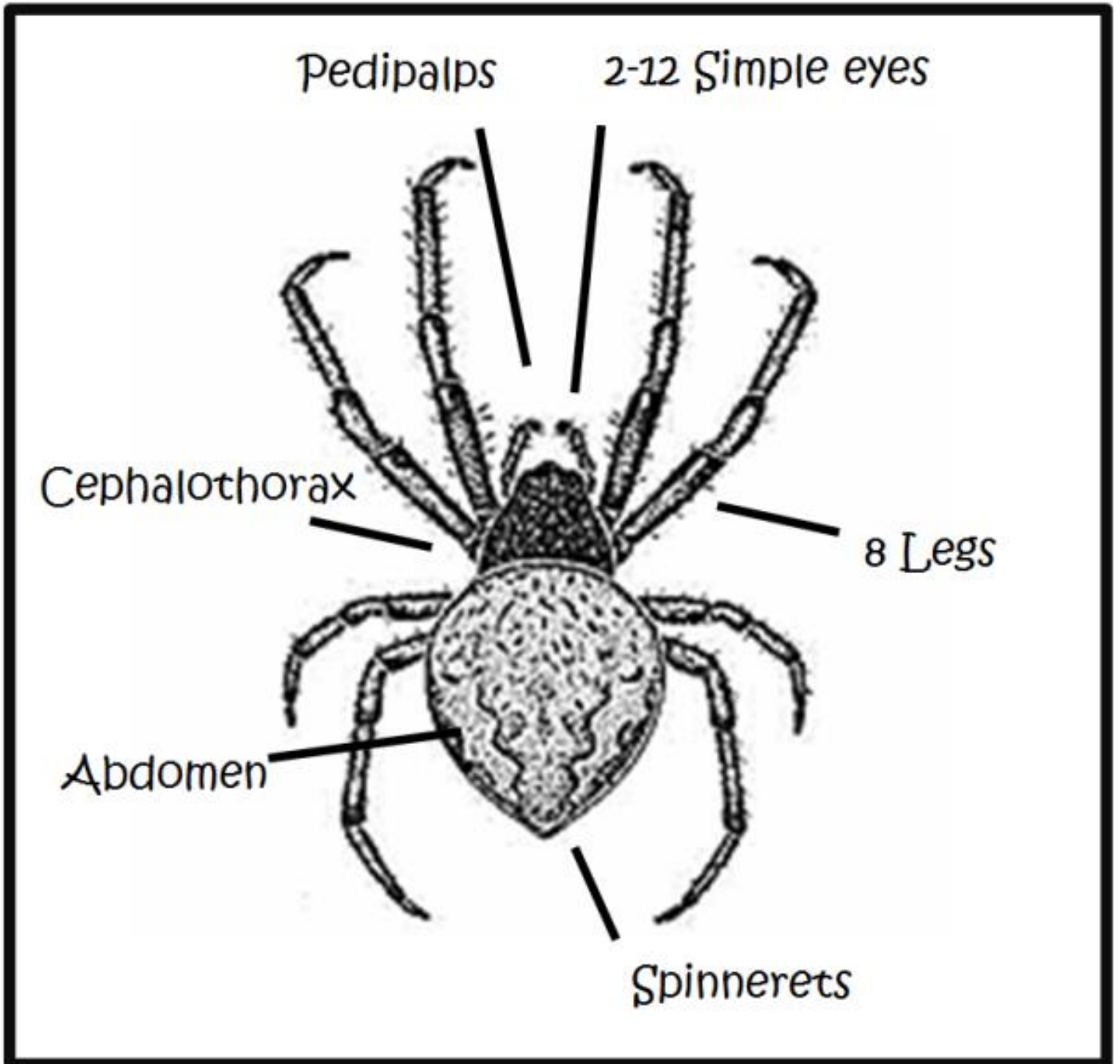
Activity:

- There are three different actions that the group will need to learn before the game starts:
 1. Spider (in pairs): Standing one in front of the other, the front person will extend their arms like a spiders pedipalps (fangs). The student at the back will put their hands on their partner's shoulders. The students together form the cephalothorax and abdomen.
 2. Queen Ant (in pairs): one partner goes down on one knee and the other stands behind them and pretends to put a crown on their head.
 3. Beetle (in a group of 3): The group of three students will link arms, symbolizing the head, thorax, and abdomen.
- Once the students know the actions and have practiced them a few times the game can begin.
- All the participants mingle around in a tight group chanting 'mingle mingle mingle!'
- Then the leader yells out one of the actions.
- The last pair or group of three to complete the action is out and will join the leader to pick and shout out actions.
- Continue until only a few players remain. Repeat.

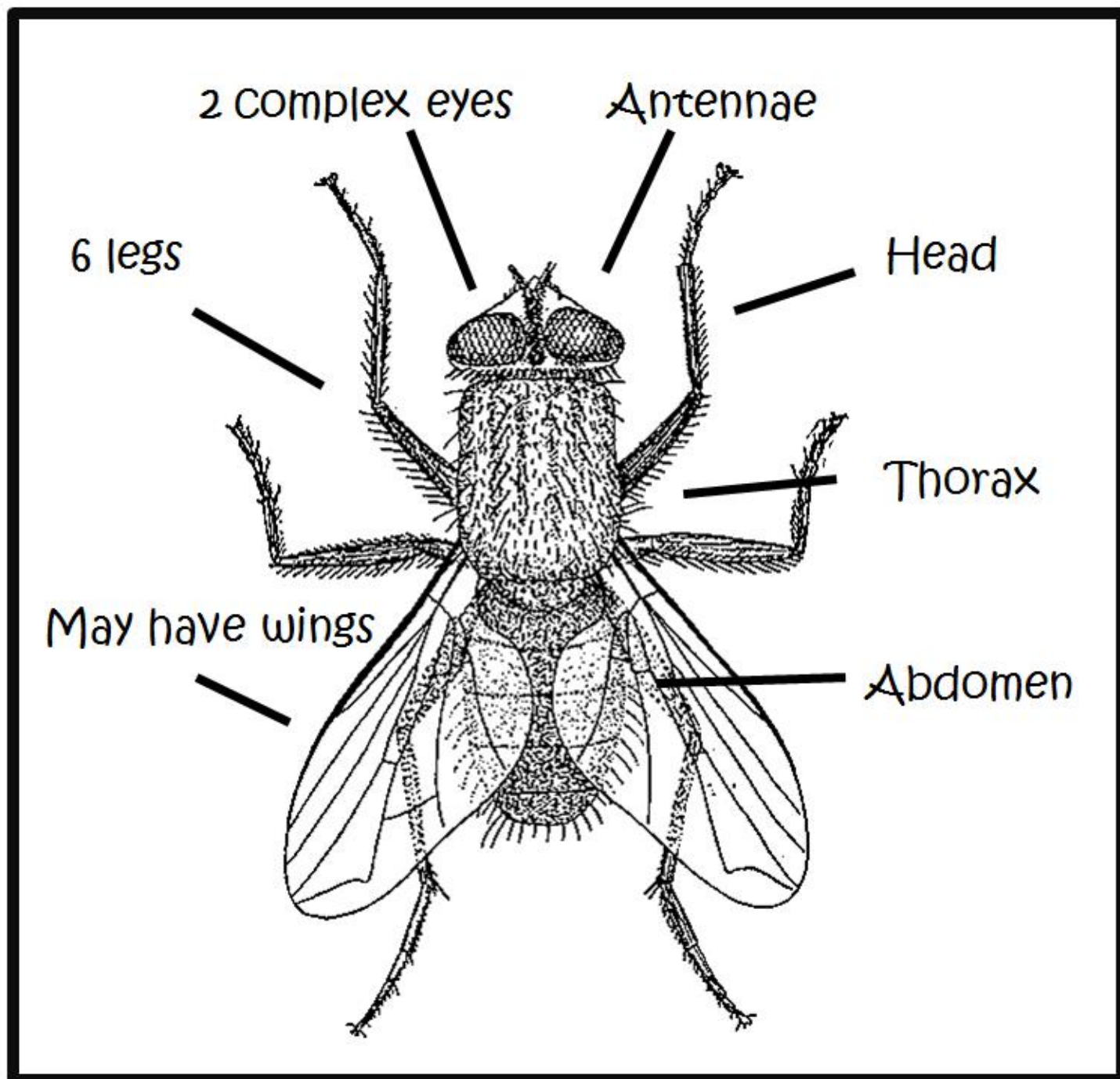
APPENDIX A:

Insects vs. Spiders Diagrams

Body Parts of a Spider



Body Parts of an Insect



APPENDIX B:

Rotten Log Organisms Sheet

Rotten Log Organisms



Fungi



Lichen



Moss



Tree Seedling



Shrub Seedling



Aphid



Click beetles
and larvae



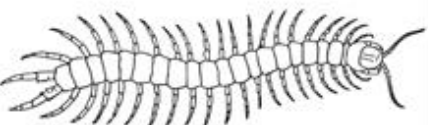
Spruce Beetle



Bark beetles
and larvae



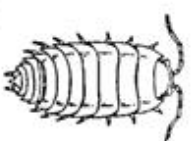
Millipede



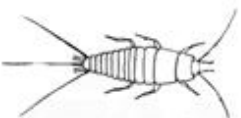
Centipede



Termite



Wood louse
or sow bug



Bristletail



Earthworm



Daddy
Long-legs



Springtail



Slug



Moth
Cocoon



Butterfly Chrysalis



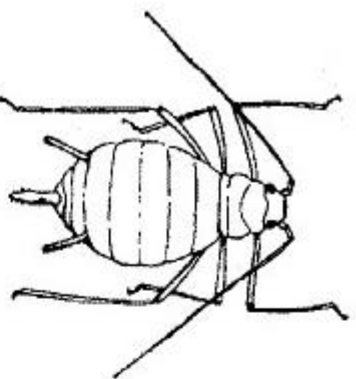
Cricketer



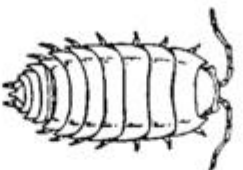
Land Snail

Every rotting log will be home to a slightly different community of organisms. Here are some to look for!

Soil Organisms



Aphid



Sow Bug



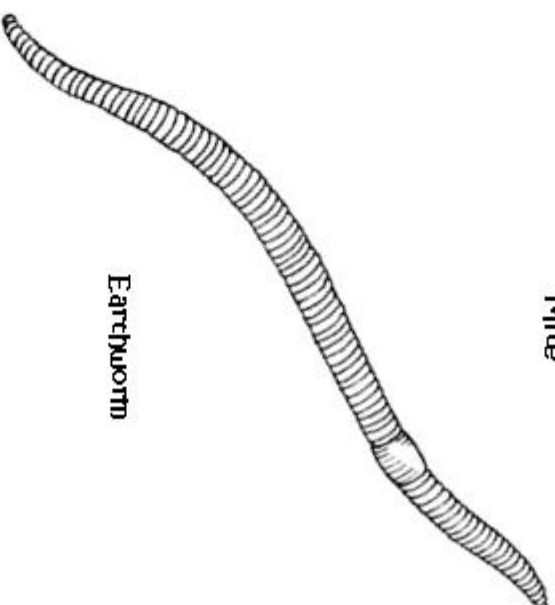
Centipede



Mite



Millipede



Earthworm



Spider



Wire worm

Some creatures you may find in the soil

APPENDIX C:

Insect Communication Activity: Scents

1. Scent Examples:

- Vinegar
- Olive oil
- Garlic
- Vanilla extract
- Peppermint extract
- Citrus juice
- Pickle juice
- Menthol
- Root beer
- BBQ Sauce
- Soy Sauce
- Horse Radish
- Hot sauce
- Shampoo
- Lotion
- Spices like turmeric or sage

Perfumes work well but may act as an irritant to students with fragrance allergies. Use natural substances as much as possible.

APPENDIX D:

Centipede vs. Millipede

