

# Insect ABC's

## Resource Book



### What is an insect?

Insects are a class of living creatures within the arthropods that have a chitinous exoskeleton, a three-part body (head, thorax and abdomen), three pairs of jointed legs, compound eyes and one pair of antennae. They are among the most diverse groups of animals on the planet, including more than a million described species and representing more than half of all known living organisms. The number of extant species is estimated at between six and ten million, and potentially represent over 90% of the differing metazoan life forms on Earth. Insects may be found in nearly all environments, although only a small number of species occur in the oceans, a habitat dominated by another arthropod group, crustaceans.

Insects typically move about by walking, flying or sometimes swimming. As it allows for rapid yet stable movement, many insects adopt a tripedal gait in which they walk with their legs touching the ground in alternating triangles. Insects are the only invertebrates to have evolved flight. Many insects spend at least part of their lives underwater, with larval adaptations that include gills, and some adult insects are aquatic and have adaptations for swimming. Some species, such as water striders, are capable of walking on the surface of water. Insects are mostly solitary, but some, such as certain bees, ants, and termites, are social and live in large, well-organized colonies. Some insects, such as earwigs, show maternal care, guarding their eggs and young. Insects can communicate with each other in a variety of ways. Male moths can sense the pheromones of female moths over great distances. Other species communicate with sounds: crickets stridulate, or rub their wings together, to attract a mate and repel other males. Lampyridae in the beetle order Coleoptera communicate with light.



### Insect Anatomy Basics

#### The Head Region

The head region is at the front of the insect's body, and contains the mouthparts, antennae and eyes.

Insects have mouthparts designed to help them feed on different things. Some insects drink nectar, and have mouthparts modified into a tube called a proboscis to suck up liquid. Other insects have chewing mouthparts and eat leaves or other plant matter. Some insects bite or pinch, and others pierce and suck blood or plant fluids.

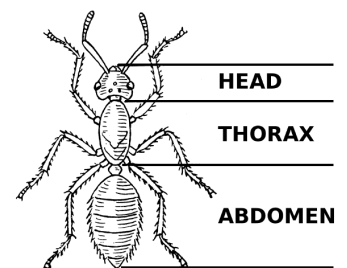
The pair of antennae may have obvious segments, or look like a feather. They come in different forms and are a clue to identifying the insect. Antennae are used to perceive sounds, vibrations and other environmental factors.

Insects can have two types of eyes – compound or simple. Compound eyes are usually large with many lenses, giving the insect a complex image of its surroundings. A simple eye contains just a single lens. Some insects have both kinds of eyes.

#### The Thorax Region

The thorax, or middle region of an insect's body, includes the wings and legs. All six legs are attached to the thorax. The thorax also contains the muscles that control movement.

All insect legs have five parts. Legs can be different shapes, and have different adaptations to help the insect move in its unique habitat. Grasshoppers have legs designed for jumping, while honey bees have legs with special baskets to hold pollen as the bee moves from flower to flower.



Wings also come in different shapes and sizes, and are another important clue to help you identify an insect. Butterflies and moths have wings made of overlapping scales, often in brilliant colors. Some insect wings appear transparent, with just a web of veins to identify their shape. When at rest, insects like beetles and praying mantis keep their wings folded flat against their bodies. Other insects hold their wings vertically, like butterflies and damselflies.

## The Abdomen Region

The abdomen is the final region in the insect body, and contains the insect's vital organs. Insects have digestive organs, including a stomach and intestines, to absorb nutrients from their food and separate waste matter.

## How many different types of insects are there?

There are over one million species of insects identified. With millions of different types of insects in the world, organizing and identifying them can be complex.

There are more than 30 different scientific groupings of insect types. Above these groupings, there are six main categories of bugs that all insects fall into. Once you know these categories, you'll know if you're looking at an insect; there is a difference!

Insects have a pair of antennae and compound eyes. They are hatched from eggs, and undergo metamorphosis at some point to achieve their adult form. Insects and arachnids fall into the category called arthropods, but they are separate divisions under that category. Arachnids include spiders, ticks and other eight-legged creatures. They have their own category because they've got eight legs, while all insects have six.

**Flies** include the housefly, mosquito, tsetse fly and stable fly. These creatures lay eggs in garbage, manure or water. Every creature in this category has a pair of wings and can fly. They hatch from their eggs into a larval stage where the creature resembles a small worm. From that stage, they grow into adults.



**Dragonflies** are an ancient group of flies that has thin, needle-like bodies and two sets of wings that are layered. Dragonflies and damselflies are carnivores that primarily eat mosquitoes and other small insects. These creatures lay their eggs in water, then spend the first part of their lives as water-dwelling nymphs.



**Butterflies and moths** have two pairs of wings and suck flower nectar with long, straw-like mouth tubes called probosces. Butterflies are active during the day, while moths are nocturnal. These creatures hatch from eggs and grow into caterpillars. The caterpillars then create a cocoon and transform into adult moths and butterflies. Most moths and butterflies only live for a few days, but those inhabit northern areas with a scarce supply of nectar may live for more than a year.



**Beetles** have round bodies and two pairs of wings. The outer wings form a hardened, protective shell for the inner wings. Beetles can fly just as well as they can walk, unlike flies, which typically use their legs for very short walks or grasping. Beetles range from the benevolent, such as the aphid-eating ladybug, to the destructive, such as the Asian Longhorn Beetle, which can kill trees. Beetles hatch from eggs into caterpillar-like grubs. As they grow, the grubs shed their skin and the adult form slowly emerges.



**Bugs** include the bedbug, water bug, stink bug and cicada. Some bugs hop, some bugs fly. Some burrow, some live on ponds. The one thing they all have in common are mouthparts that can pierce their food source and extract juices from it.



**Ants, bees and wasps** live and work in colonies that are cooperative in nature. They are social, working together for the good of the whole. Each member of the colony has a specific type of job. These creatures use movement and chemical signals to communicate. A single queen in the colony lays thousands of eggs that hatch as miniature versions of the adults. While bees and wasps always have wings, ants only develop them when it's time for a colony to expand.



There are still hundreds of insects in this world that have not been identified.

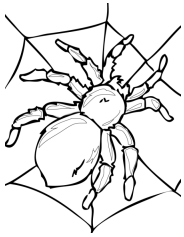
## Are insects harmful?

It's a natural reaction to be frightened of some insects. Surprisingly, of this enormous amounts of insects, less than 1% are harmful. However, this small percentage costs farmers billions of dollars each year. These insects eat about 10% of the country's crop.

## Why do we have insects?

Insects do serve a very important purpose. They play a valuable role in the pollination of plants. Many insects drink nectar, a sweet liquid found at the base of a flower. Growing up from the base of the flower is the stamen. This is the part of the flower that produces pollen. When the insects visit a flower to drink the nectar, some of the pollen on the stamen brushes off and sticks to the insect. When the insect lands on its next flower, some of the pollen brushes off the insect and sticks to the pistil. The pistil grows in the center of the flower. At the base of the pistil is where the seeds are made. The pollen moves down the pistil and into the flower where it helps to make the seeds for new flowers. Without insects, to help in this process, there would be no apples, clover or grapes. The number of cotton plants, orange trees and garden vegetables would also drop. There would also be no honey because there would be no bees to make it. Insects also help with the decay, or break down of dead animal or plant matter. To help control the insect population, birds, fish, bats and some insects eat insects. Insects also gives us silk, honey and beeswax.

## Are spiders insects?

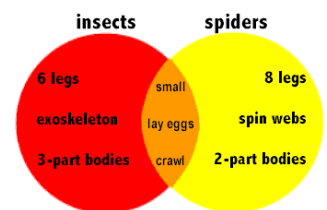


Spiders are very similar to insects, but they are not insects. Spiders and insects both belong to an animal group called arthropods. Spiders belong to a group of arthropods called arachnids. Ticks, mites and scorpions are other types of arachnids.

Insects have bodies that are divided into 3 segments: the head, the thorax (which usually has the wings and legs) and the abdomen. Spiders' bodies only have 2 segments: the head and the abdomen. Spiders do not have wings or antennae and also have eight legs while insects only have six.

All spiders are hunters, and will eat other tiny animals. Insects, on the other hand, will eat a whole bunch of different things depending on what type of insect they are.

There are over 30,000 different species of spiders, more than 2,000 of these live in the United States. Of these, only two are harmful to humans: the brown recluse and the black widow. All spiders are very timid, helpful and the remainder are harmless. The most important role of spiders is to eat insects.



## Why do bugs have more than two eyes?

Most insects have two 'compound' eyes. These are big eyes that are divided into 100 tiny eyes. So a house fly, for example, has eyes all across the top of its head. This lets the fly see all around rather than just straight ahead.

But a house fly's eyes are not like human eyes. They are much simpler. Each eye sees only a small part of an image. These eyes don't move at all. (Flies can't look to the right or left the way you can.) and flies don't see clearly. They can see shades of light and dark and they can spot motion. So when you try to swat them, they can get away.

Spiders have eight eyes. But they are not compound eyes. Because spiders hunt for food, their vision needs to be sharper. The jumping spider has eight eyes arranged in three rows. It can see all around at once, which of course, makes catching flies a lot easier. But eight eyes? Imagine if the spider needed glasses!

## How do insects breathe?

Unlike humans or other animals, insects don't have lungs. Instead, they get oxygen into their body's through breathing holes called 'spiracles.' The spiracles are located on the middle or end part of an insect. These holes lead to air tubes that travel through the body. The air tubes deliver oxygen directly to all of the insect's cells. Insects use oxygen to help change food into energy. An insect can have one to 10 spiracles on each side of its body. A flea, for example, usually has six.

Insects that live in the water also have spiracles. But they have special ways to get air while keeping the water out. A whirligig traps air under its wings. This creates a watertight pocket between its spiracles and its wings. The insect can breathe oxygen from this protected 'bubble' of air. When the oxygen supply runs out, the whirligig returns to the surface to get a new air bubble. So what does a busy bug need? A breather!

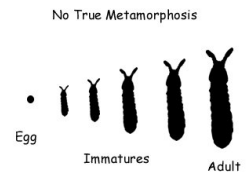
## Types of Insect Metamorphosis

With a few odd exceptions, all insect life begins as an egg. After leaving the egg, insects must grow and transform until reaching adulthood. The physical transformation of an insect from one stage of its life cycle to another is called metamorphosis.

Insects may undergo gradual metamorphosis, where transformation is subtle, or complete metamorphosis, where each stage of the life cycle appears quite different from the others. In some insects, there may be no true metamorphosis at all. With regard to metamorphosis, entomologists divide insects into three groups – ametabolous, hemimetabolous, and holometabolous.

### Little or No Metamorphosis

The most primitive insects, such as springtails, undergo little or no true metamorphosis during their life cycles. Entomologists refer to these insects as ametabolous, from the Greek for "having no metamorphosis." In ametabolous insects, the immature which emerges from the egg looks like a tiny version of the adult. It will molt and grow until it reaches sexual maturity. Ametabolous insects include silverfish, firebrats, and springtails.

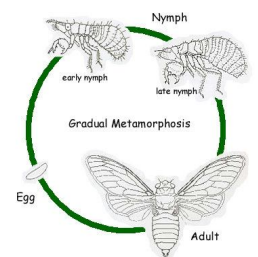


### Simple or Gradual Metamorphosis

In gradual metamorphosis, three life stages occur: egg, nymph and adult. Insects with gradual metamorphosis are said to be hemimetabolous (hemi = part). Some entomologists refer to this type of transformation as incomplete metamorphosis.

Growth happens during the nymph stage. The nymph resembles the adult in most ways, particularly in appearance. Usually, the nymph also shares the same habitat and food as the adults, and will exhibit similar behaviors. In winged insects, the nymph develops wings externally as it molts and grows. Functional and fully-formed wings mark the adult stage.

Some hemimetabolous insects include grasshoppers, mantids, cockroaches, termites, dragonflies and all true insects.



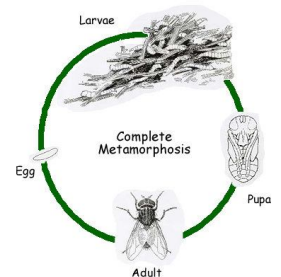
### Complete Metamorphosis

Most insects undergo complete metamorphosis. Each stage of the life cycle – egg, larva, pupa and adult – looks different from the others. Entomologists call these insects holometabolous (holo = total).

The larvae of holometabolous insects bear no resemblance to their adult parents. Their habitats and food sources may be entirely different from the adults as well. Larvae grow and molt, usually multiple times. Some insect orders have a unique name for their larval forms: butterfly and moth larvae are caterpillars; fly larvae are maggots; and beetle larvae are grubs.

When the larva molts for the final time, it transforms itself into a pupa. The pupal stage is usually considered a resting stage, although much activity occurs internally, hidden from view. The larval tissues and organs break down entirely, then reorganize into the adult form. After the reorganization is complete, the pupa molts to reveal the mature adult with functional wings.

Most of the world's insect species are holometabolous, including: butterflies, moths, flies, ants, bees and beetles.



## Crickets Chirp out the Heat

A cricket chirps depending on the heat, it chirps more when it's hotter. You can tell the temperature by counting the number of chirps heard. All that's needed is a watch and a chirping cricket. Here's what to do:

Count the number of cricket chirps heard in fifteen seconds.

Add forty to this number. The answer is the temperature in degrees Fahrenheit. Suppose it's hot outside and there are forty chirps in fifteen seconds.

$40 + 40 = 80$  degrees Fahrenheit

## **Insect Facts**

Bees can pull loads 300 times their own weight.

Insects do not live in salt water.

Fairyflies are so tiny that 2 of them can fit on a period.

There are more insects than all other kinds of animals put together.

Insects never close their eyes because they have no eyelids.

Most people would consider the largest insect to be the bulkiest, in this case the Acteon Beetle (*Megasoma acteon*) from South America the males of which can be 9cms long by 5cms wide by 4cms thick.

A one-day old baby cockroach, about the size of a spec of dust, can run almost as fast as its parents.

Bees must collect the nectar from two thousand flowers to make one tablespoonful of honey.

A dragonfly has a lifespan of 24 hours.

Ants cannot chew their food, they move their jaws sideways, like scissors, to obtain the juices from the food.

An ant's compound eye is made of 50 small eyes.

Crickets hear through their knees.

Dragonflies are one of the fastest insects, flying 50 to 60 mph.

*Megaphragma caribea* from Guadeloupe, measuring out at a huge 0.17 mm long, is now probably the smallest known insect in the world.

The highest sustained ground speed recorded is that of the black cutworm (*Agrotis ipsilon*) which flies at speeds of between 60-70 mph.

The "long-tailed" South African scorpion (*Hadogenes troglodytes*) reaches a length of over 8 inches, and is probably the longest scorpion in the world.

The average scorpion probably lives three to five years, but some species undoubtedly live at least 10-15 years.

The world's largest roach (which lives in South America) is six inches long with a one-foot wingspan.

Roaches can live without food for a month, but will only survive a week without water.

The complete life-cycle of a house fly takes from 10 to 21 days.

Some female Giant Water bugs will "glue" over one hundred eggs to the back of the male. He carries the eggs around for a week or so until they hatch.

Beetles make up the largest order of living things with about 290,000 species known worldwide. Approximately 27,000 can be found in North America.

Insects such as cockroaches and honeybees make collective decisions and use voting and quorums to help decide where to make their next home

Ants are social insects, living in colonies over 2,000 species exist. They have highly developed senses of smell and touch. The antennae are used for communication. The mandibles or jaws are used for digging, biting, gathering and carrying. An ant can lift twenty times its own weight.

Many of the fruits and flower that we enjoy could not exist if there were no bees to pollinate them. As honeybees grow up in their hives, they are assigned to a series of jobs: cleaning, feeding the larvae and queen, receiving food, building and repairing the hive, guarding the hive and finally, gathering nectar. A honeybee lives 5 weeks in adult form.

Sowbugs and pillbugs breathe with gills and must stay in damp places. The tiny babies emerge from a triangular pouch and ride for a while under their mother's tail. These animals are not insects, but crustaceans. Sometimes they are bright purple.

Ladybugs are valuable insects – they eat aphids which would otherwise cause great damage to plants. Cellophane like wings under their shells enable them to fly. The 350 species in this country have varying patterns of spots.

## Types of Insect Migration

Some insects migrate predictably, while others do so occasionally in response to an environmental change or other variables. The following terms are sometimes used to describe different types of migration.

**seasonal migration** - migration that occurs with the change of seasons. Monarch butterflies in eastern North America migrate seasonally.

**reproductive migration** - migration to or from a separate breeding location. Salt marsh mosquitoes migrate from their breeding grounds after emergence as adults.

**irruptive migration** - migration that occurs unpredictably, and may not involve the entire population. Painted lady butterflies are irruptive migrants. Their migration is often associated with El Niño weather patterns.

**nomadic migration** - migration that involves progressive movement away from the home range, but not to a specific alternate location. Locust migration tends to be nomadic.

When we think of migration, we often assume it involves animals moving north and south. Some insects, however, migrate to different altitudes rather than changing latitudes. By migrating to a mountaintop during summer months, for example, insects can take advantage of the ephemeral resources in an alpine environment.

## Careers

Men and women who have chosen to study insects as a career are called entomologists. Entomologists study a variety of insects. Some entomologists specialize within their profession. There are over one and a half million insects in the world. Economic entomologists study insect pests that damage crops, ornamental plants, stored products and buildings. Agricultural entomologists study insect pests that affect fiber and food. Medical and veterinary entomologists study and try to decrease the population of insects that cause death or injury to human beings and animals. As a career, entomology became popular after the discovery of the microscope in the seventeenth century. The creation by Carolus Linnaeus of a useful system for classifying and naming plants and animals in the 1750's also had its influence.

Encourage girls to become entomologists and study ants or other insects, using magnifying glasses, magnifying bug boxes and microscopes.

Entomologists often like to collect insects as a hobby. If you know a local entomologist with an insect collection, invite him or her as a guest speaker to share career information as well as to display an insect collection.

This could lead to investigating 'collecting' as a hobby. Point out that people collect all different kinds of things, not just insects: Stamps, records, buttons or coins. Have the girls find out what their family and friends like to collect. Ask some of the family members and/or friends to bring in their special collections to share with the girls.

## **Glossary**

### **Abdomen: (noun)**

The hind portion of the body behind the thorax in an arthropod

### **Arthropod: (noun)**

Any of a phylum of animals without backbones (insects, arachnids and crustaceans) having a segmented body, jointed limbs and a shell of chitin that is shed periodically.

### **Decay: (verb)**

The breakdown of animal and plant matter

### **Exoskeleton: (noun)**

A hard supporting or protective structure (as of an insect spider or crustacean) on the outside of the body

A skeleton that is outside of the insects body

### **Head: (noun)**

The upper or front part of the body (as of a human being or an insect) that contains the brain, the chief sense organs, and the mouth

### **Insect: (noun)**

Any of numerous small invertebrate animals (as spiders or centipedes) that are more or less obviously made up of segments

Any of a class of arthropods (as butterflies, true bugs, two-winged flies, bees and grasshoppers) with the body clearly divided into a head, thorax and abdomen, with three pairs of jointed legs, and usually with one or two pairs of wings

### **Invertebrate: (adjective)**

Lacking a backbone

### **Metamorphosis: (noun)**

The process of basic and usually rather sudden change in the form and habits of some animals during transformation from an immature stage (as a tadpole or a caterpillar) to an adult stage (as a frog or a butterfly)

### **Nectar: (noun)**

A sweet liquid given off by plants and used by bees in making honey

### **Phylum: (noun)**

A group of animals or in some classifications plants sharing one or more major characteristics that set them apart from all other animals or plants and forming one of the important groups into which the animal or plant kingdom is divided

### **Pistil: (noun)**

The seed-producing part of a flower

### **Pollen: (noun)**

A mass of tiny particles in a flower that fertilize the seeds and usually appear as fine yellow dust

### **Pollinate: (verb)**

To place pollen on the stigma of

-pollination (noun)

### **Species:**

A class of things of the same kind and with the same name: KIND, SORT

A category of living things that ranks below a genus, is made up of related individuals able to produce fertile offspring, and is identified by a two-part scientific name

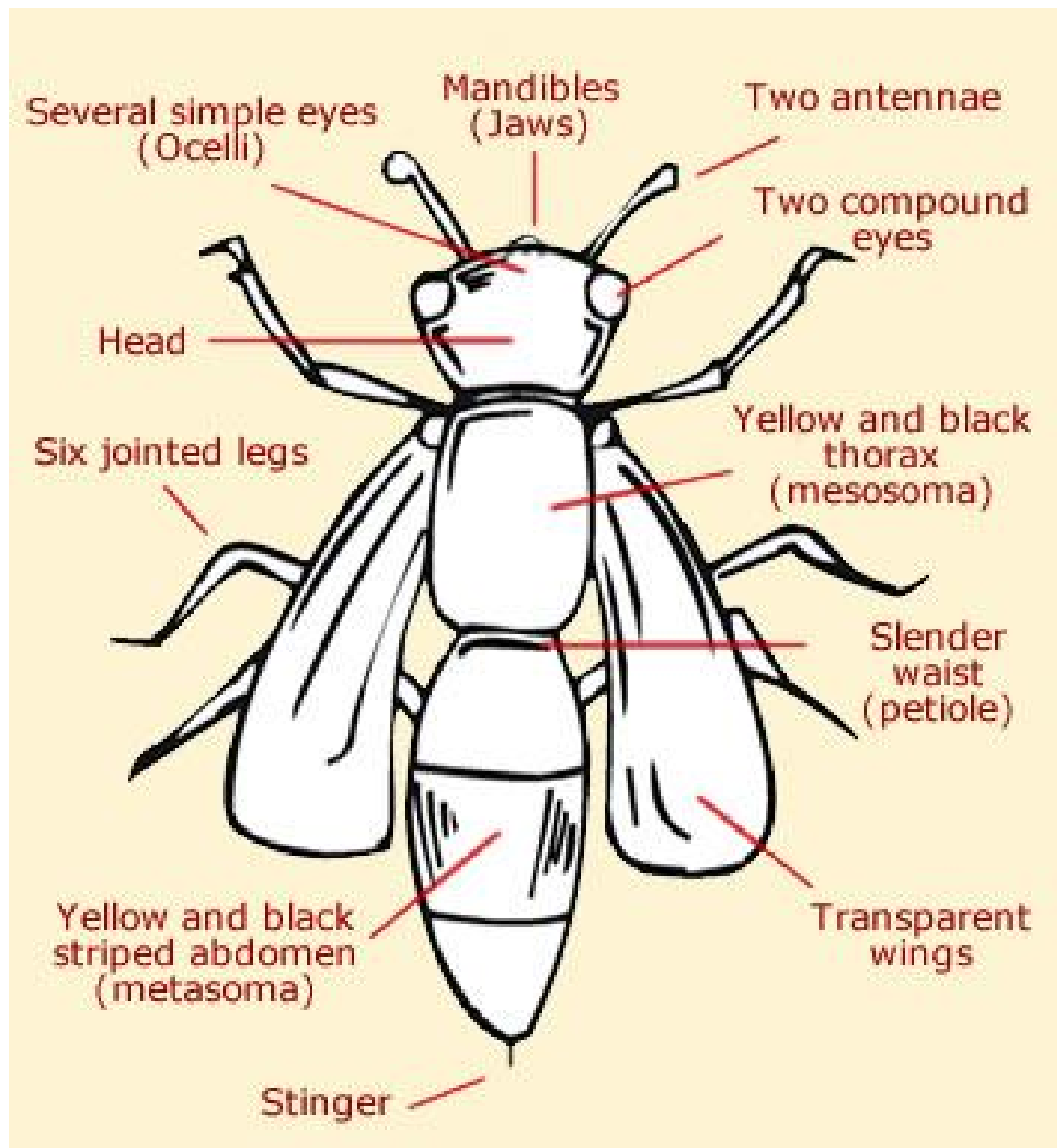
### **Stamen: (noun)**

Part of the flower that produces pollen

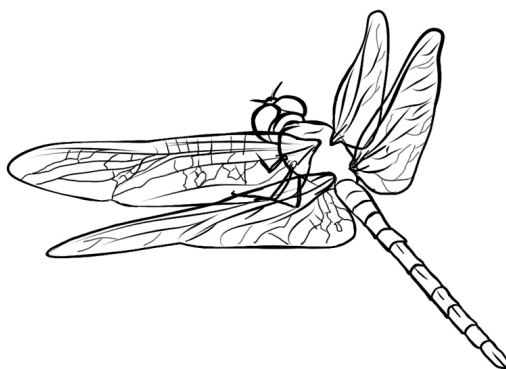
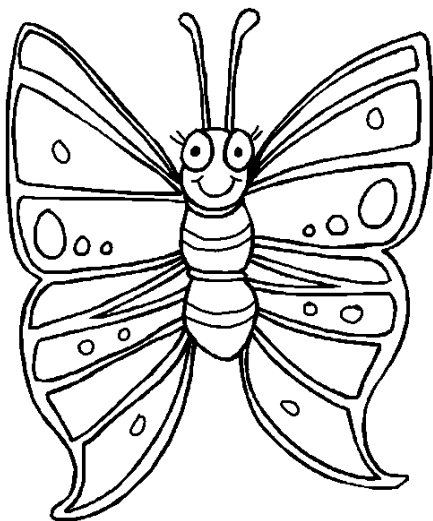
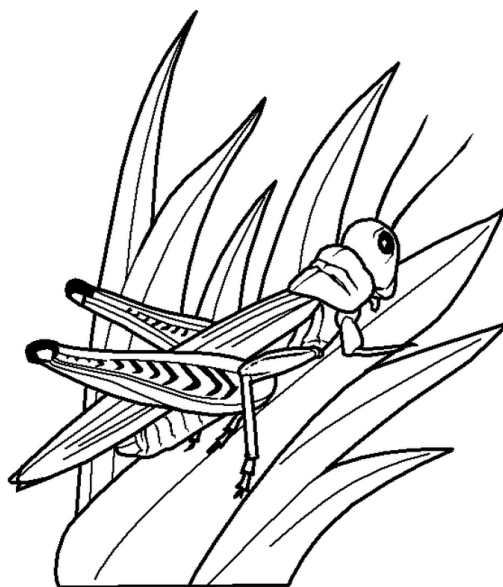
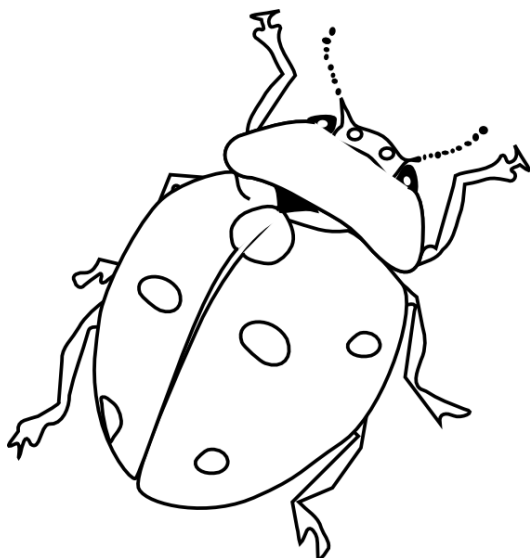
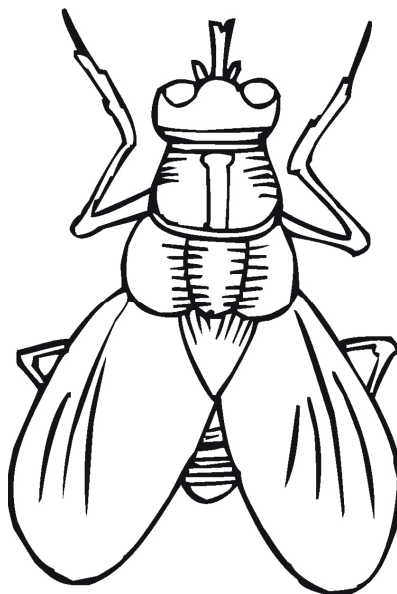
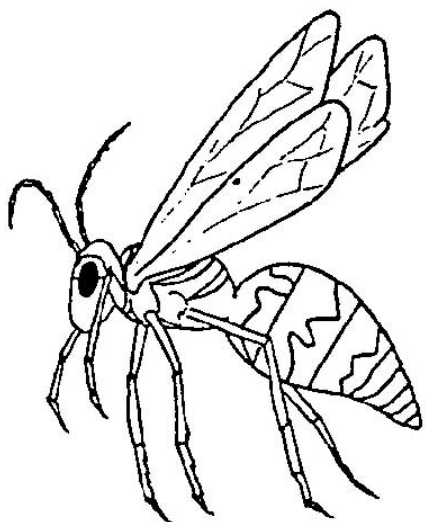
### **Thorax: (noun)**

The middle of the three main divisions of the body of an insect

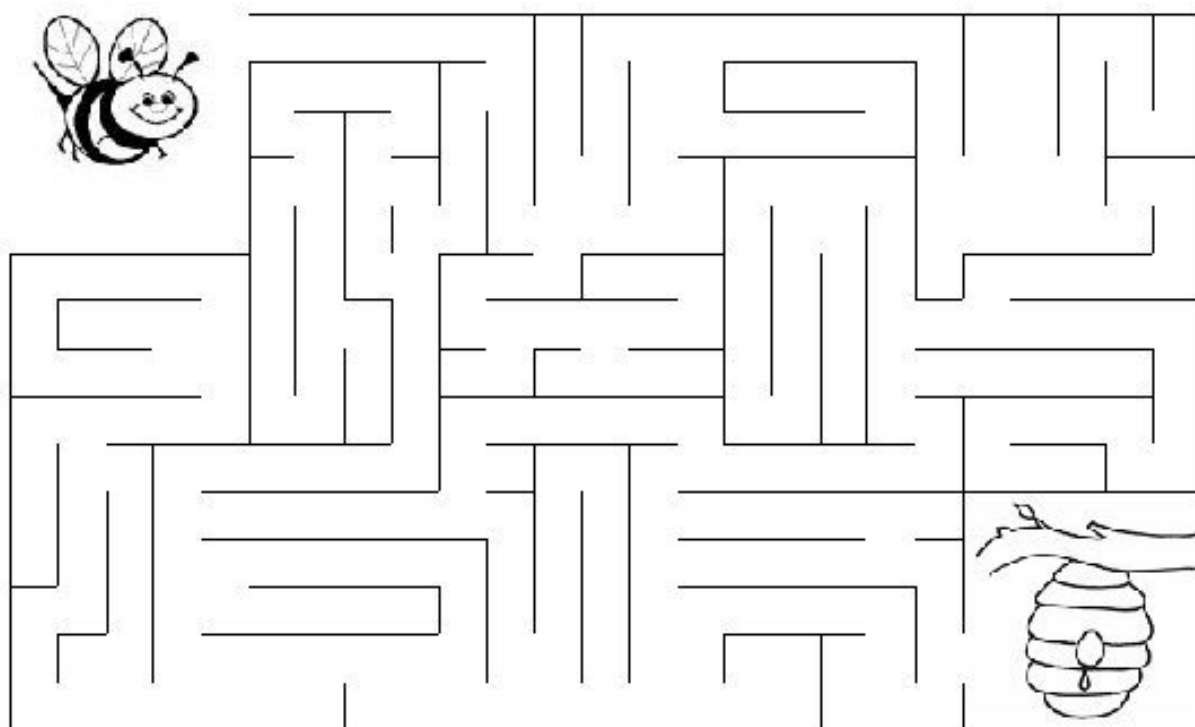
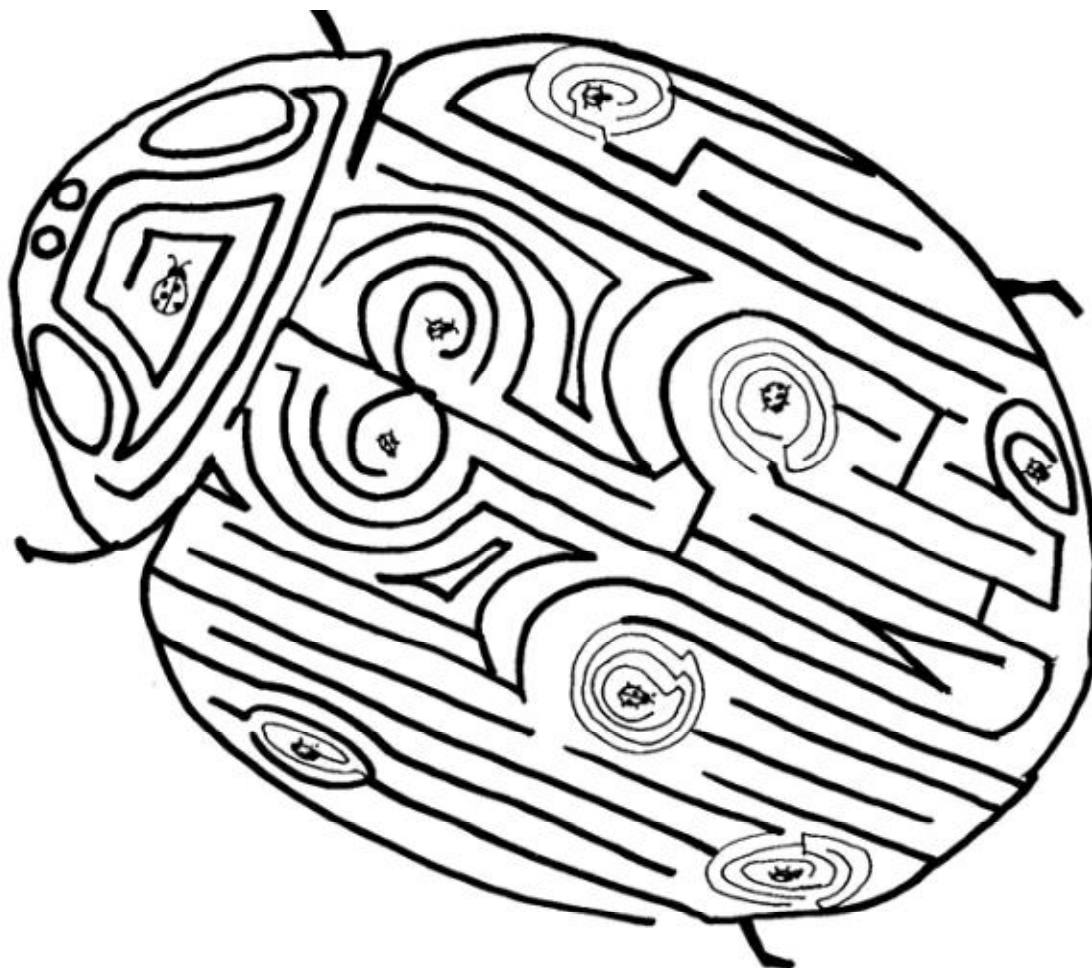
## Insect Body Parts



## Insects



## Insect Maze



## Insect Word Search

ant  
aphid  
backswimmer  
beetle  
bug  
butterfly  
caterpillar  
centipede  
cicada  
cricket  
dragonfly

earwig  
firefly  
flea  
gnat  
grasshopper  
honey bee  
hornet  
house fly  
insect  
katydid

ladybug  
larva  
louse  
midges  
millipede  
mite  
mosquito  
moth  
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water bug  
water strider  
weevil

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## Go on a Insect Safari

### Getting ready

In order to observe the insects, you'll need:

magnifying glass

insect net

clear plastic container

water

Once you have what you need, go outside and start your search. Be sure to bring lots of water if it's a hot day and wear comfortable clothes to get close to the bugs.

### Where to look

Be sure to look up, down and all around because insects are always on the move. Something that wasn't there the first time you looked might be there upon second glance.

To help, these are some of the common places to look for bugs: on top of leaves, near flowers, under rocks, near water, under logs, on the grass and in the air. If you've got your bug eyes on, you'll be sure to track one down.

### What you'll find

Depending on where you live and time of day, you might find spiders, ants, beetles, ladybugs, crickets, grasshoppers, earwigs, centipedes and a few surprises. Most insects have a favorite habitat they tend to stick to – whether it's in the desert, the mountains, the city or the swamp.

### How to observe

When you find an insect you want to observe, you can safely do so by using an insect net or a plastic container. If the insect is flying around, gently place the net over the insect and slowly bring it down to the ground for a closer look. (Note: parental supervision for this is advised.) Don't be alarmed if the insect is buzzing and flying around – that's normal.

If the insect you find is on the floor, gently cover it with the plastic container to get a closer look. Be sure to keep the bottle out of direct sunlight to prevent the heat from hurting your bug. After you observe the insect for a few minutes, set it free or put it back where you found it.

If you don't feel comfortable catching bugs, use your magnifying glass instead. Odds are you'll see lots of insects up close and have just as good a view.

### Count your findings

Whether it's with a net, a container, or a magnifying glass, looking for bugs is always fun. The key is to always be on the lookout for the tiny little critters that live among us. How many insects can you find in your backyard?

Can you find an insect that is:

**Living**

|              |                          |
|--------------|--------------------------|
| Under a Rock | <input type="checkbox"/> |
| On a Plant   | <input type="checkbox"/> |
| In Water     | <input type="checkbox"/> |

**Eating**

|               |                          |
|---------------|--------------------------|
| Plant Matter  | <input type="checkbox"/> |
| Animal Matter | <input type="checkbox"/> |

**Going**

|          |                          |
|----------|--------------------------|
| Walking  | <input type="checkbox"/> |
| Climbing | <input type="checkbox"/> |
| Swimming | <input type="checkbox"/> |
| Flying   | <input type="checkbox"/> |

**About**

|               |                          |
|---------------|--------------------------|
| ___ This Long | <input type="checkbox"/> |
| ___ This Long | <input type="checkbox"/> |
| ___ This Long | <input type="checkbox"/> |
| ___ This Long | <input type="checkbox"/> |

**Colored**

|       |                          |
|-------|--------------------------|
| Green | <input type="checkbox"/> |
| Red   | <input type="checkbox"/> |
| Black | <input type="checkbox"/> |
| White | <input type="checkbox"/> |

## How to make your own Sweep Net

### Supplies

1 Pillow Case

2 Wire Hangers

Duct Tape

1 piece of wood about 3 feet long for the handle

Scissors for cutting the pillow case

Pliers

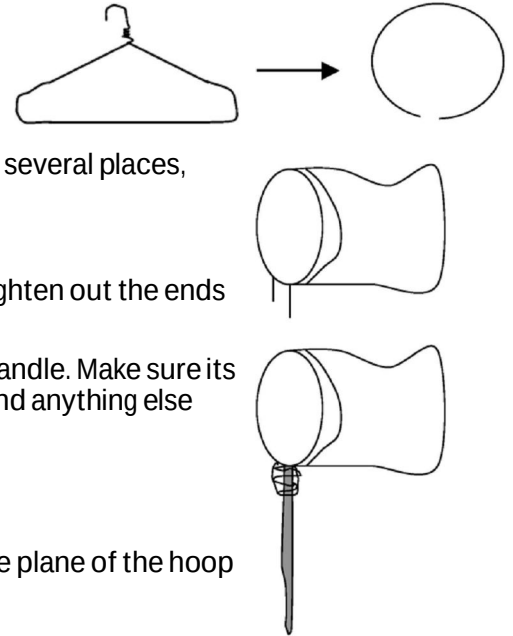
### Directions

Turn your 2 wire hangers into similar circles. Then tape them together in several places, leaving the open end opened.

Now cut two holes on either side of the seam were

there are two layers of pillow. Then put the wire through the pillow. Straighten out the ends sticking out for the handle.

Now heavily tape the four wire pieces hanging out of the pillow to your handle. Make sure its sturdy because it's used to sweep through high grasses, alfalfa, clover and anything else that aphids eat (ladybugs eat aphids).



### How to Sweep Net

Hold the net with the hoop end nearest to the ground in front of you. The plane of the hoop should be perpendicular to you.

Swing the net from side to side in a full 180 degree arc. Sweep one stroke per step as you casually walk through the field or down the row.

Tilt the net opening so the lower edge of the rim is slightly ahead of the upper rim.

In short vegetation, swing the net as deeply as possible. In taller vegetation, sweep only deeply enough to keep the upper edge of the sweep net opening even with the top of the plants. In general, don't let the net go more than 10 inches below the top of the plants.

## How To Make A Bug & Butterfly Net

### Supplies

Wire coat hanger

Nylon stockings

Scissors

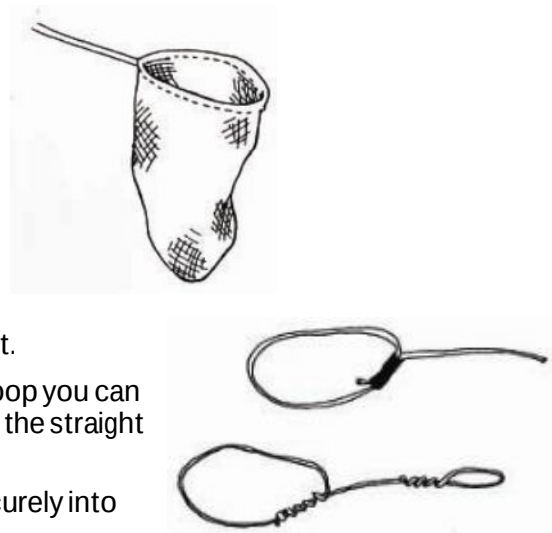
Needle and thread

### Directions

Cut the nylons off at the knee. Use the front part to make your net.

Straighten out the wire coat hanger. Bend one end of it to make a loop you can fit the stocking section around. Twist the end of the circle around the straight part of the wire until it is secure.

Fold the stocking section over the whole wire circle and sew it securely into place.



## Bug Catcher

### Materials needed for Bug Catcher:

2 clear plastic cups (10-12 oz) Solo brand works well

Fine netting

Craft glue

Razor knife (adults only)

Paper plate

Scissors

Directions for Bug Catcher:

For adults – With the razor knife, cut all the way around one of the cups, about one inch from the bottom. Can use a fine emery board on rough edges – making as smooth as possible. When working with a group it is best to do the cutting before hand.

Cut a square of net, a little larger than the opening of the cup – about 4"x4".

Place about 2 Tbs. of glue on a paper plate.

Taking the cut cup, rub the mouth of the cup in the glue until the entire rim has glue on it.

Gently stack the cut cup with the glue – inside the clean uncut cup.

Lay the square of net on top of the cup with the glue – gently press the net into the glue. If gaps appear between the net and the cup, additional drops of glue may be needed.

Allow this to dry for about 1/2 hour.

Cut around the cup to trim off the excess net.

The outside cup can be decorated with puff paints or permanent markers.

Separate the cups to catch your bugs, then re-stack.



## Take a Hike

What a better way to find out about insects in your neighborhood than by going on a insect hike? You can find out where laceworms live, how caterpillars crawl or what earwigs eat. So, get dresses for bug watching and lets go hike

### Theme Hikes

How about a dragonfly hike or a grasshopper hike? If you have favorite insects, focus an outing on them. Find out what habit they prefer and head for it. For example, dragonflies dance along the edges of ponds and streams, but grasshoppers go for long grass and wildflower meadows. When you're concentrating on only one or two kinds of insects at a time, you will be able to spend more time learning how to identify them. You can watch for features such as color, size and wing shape and begin to recognize different species.

### Mini Hikes

Who said hikes have to be long or even on foot? Take a mini-hike and give your feet a rest. Try crawling around on your hands and knees, taking time to really look at the ground for those well-hidden bugs. Or, let your fingers do the walking. Find a rotting log and probe and poke your way through it with your hands and a pair of tweezers. Take a mini-hike on a tree. Start at ground level and work your way up, checking in the grooves of bark, under loose bark, in holes, in buds, on and under leaves and in blossoms, seed, cones or nuts.

## **Insect Bingo**

### **Inside Version**

For each player, print out one insect bingo game card and page of Bug bingo game pictures. The player should choose 25 of the pictures and then cut them out. Glue the 25 pictures, in any order they like, onto the 25 squares on the game card. If desired, you can make the center square on the bingo game card a free space.

You should print out one extra page of bug bingo pictures to be the call sheet. Cut them out and place them in a bucket.

To play the game, one person should be the caller. The caller pulls one picture at a time out of the bucket and explains it and shows it to everyone.

Any players who have that picture on their card should cover it with a scrap of paper, bean, or other small item.

The caller should continue pulling pictures out of the bucket and showing them to everyone until someone gets BINGO (5 in a row).

### **Outside Version**

For each player, print out one insect bingo game card and page of Bug bingo game pictures. The player should choose 25 of the pictures and then cut them out. Glue the 25 pictures, in any order they like, onto the 25 squares on the game card. If desired, you can make the center square on the bingo game card a free space.

Take a walk outside. Have the girls look for different insects that are shown on their sheets. The girls should put an X over the things on her boards as they are spotted.

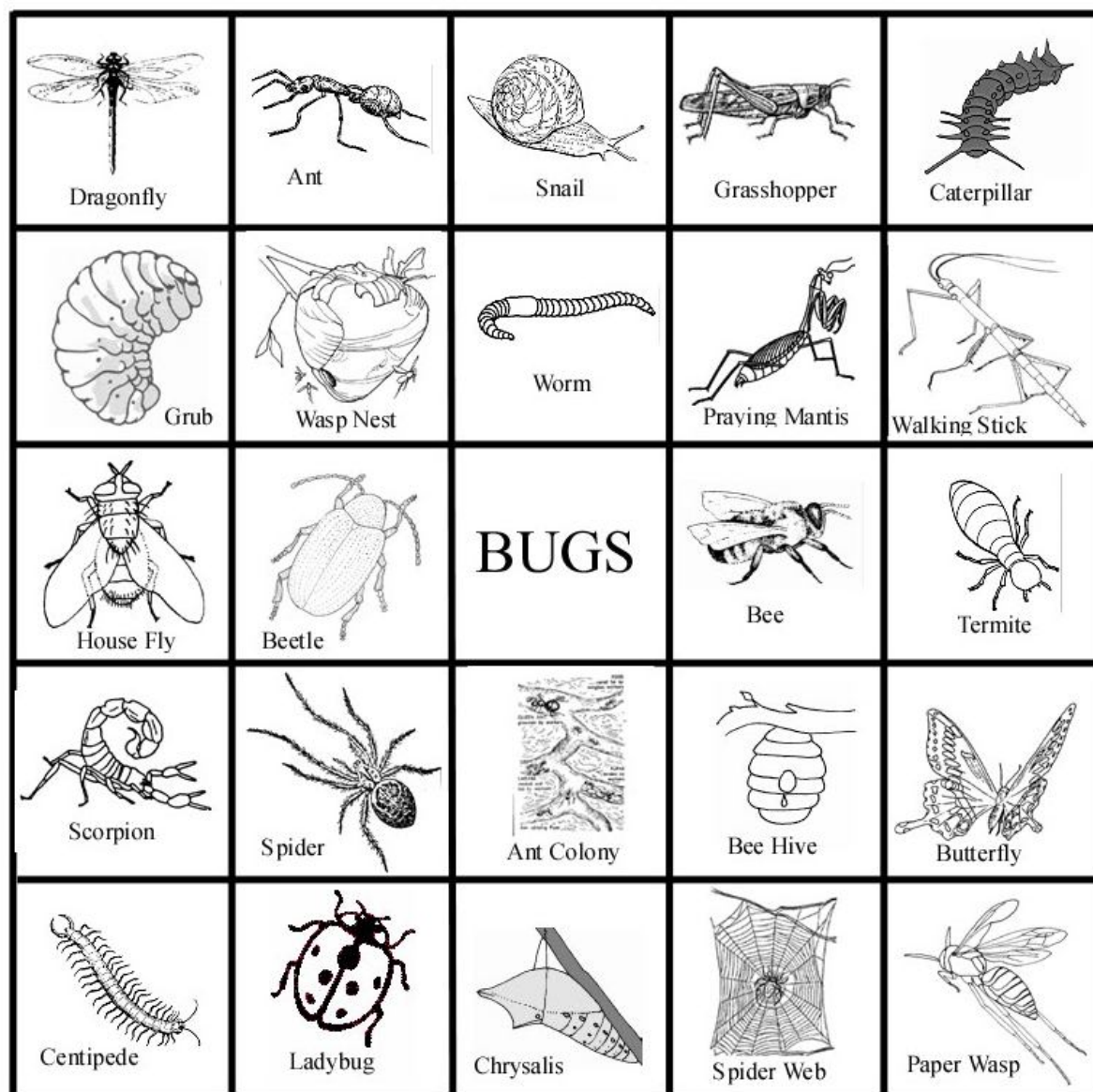
To make the cards permanent and reusable have the girls glue the squares onto heavy cardboard. Laminate the cards or cover them with clear contact paper.

**Insect Bingo Board**

**B I N G O**

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

## Insect Bingo Cards



## **Insect Dance Along**

### **Supplies**

Pictures of insects

### **Directions**

Have kids sing and dance along with each verse of the insect songs that follow. Show them pictures of each insect before you begin.

To the tune of "Frere Jacques"

#### **Beetle**

Crawling beetle, crawling beetle,  
On the ground, on the ground,  
Crawling, crawling, crawling,  
Crawling, crawling, crawling  
All around, all around

#### **Cricket**

Hopping Cricket,  
Hopping Cricket  
In the grass, in the grass  
Hopping, hopping, hopping  
Hopping, hopping, hopping  
Very fast, very fast

#### **Bumble Bee**

Busy bumble bee, busy bumble bee  
In the air, in the air  
Flying, flying, flying  
Flying, flying, flying  
Buzzing here, buzzing there

To the tune of "You Are My Sunshine"

#### **Cricket**

I am a cricket  
A big black cricket  
I have six legs and two pairs of wings  
My body's covered  
With an exoskeleton,  
And I rub my wings to sing

## **Insect Relay Race**

**Supplies** Insect cards

### **Directions**

Find pictures of the insects you want to imitate in the relay race. Glue these pictures to cardboard or index cards.

Grasshoppers (make short hops)

Flea (makes long jumps)

Cockroach (scurries quickly)

Bee (flies vigorously)

Caterpillar (crawls slowly)

Butterflies (flies with graceful wings)

Ant (runs on all fours quickly)

Water Strider (skates on the surface of the water)

Divide the girls into two teams. At the start of the game, discuss how various insects move differently depending on their body shape, wings and feet. Show the children the pictures you selected and talk about how each insect moves and demonstrate.

Girls will run to the pile of pictures, pick up the top card and return to the line up by moving like the insect on the card. Which ever team has all their member sitting down first wins.

## **Caterpillar in the Garden**

Divide your guests into two teams.

Line the children up in two columns, one child behind the other, at the start line.

Have each child put his or her hands on the waist of the child in front of them, forming a "caterpillar."

When you say, "Wiggle!" each team must run, staying connected, to the finish line.

If a team becomes disconnected, they must stop and reconnect before continuing.

The first team to the finish line wins.

## **Bees in the Garden**

### **Supplies**

A Large Piece of White Poster Board

A Black Marker

Scissors or an X-Acto Knife

At Least 3 Plastic Yellow Easter Eggs

### **Directions**

Draw a flower shape on the large piece of poster board.

If this game is being played by younger children, make sure the center of the flower is about 7" - 8" in diameter. If youth are older, make the center smaller (i.e. no smaller than 5" in diameter).

Cut the center out of the flower.

Color or paint the flower petals.

Attach the flower to a stake or stick that can be placed in the ground.

Make the three "bees" by drawing black stripes and antennae on plastic yellow Easter eggs.

**To Play:** Place your flower in the ground, and draw a line about 6 feet in front of it. Line children up behind the line. Let each child try to toss each "bee" through the center of the flower.

## Hunting Bugs

Sung to: A- Hunting we will go

A-hunting we will go

A -hunting we will go

We'll catch a \_\_\_\_\_ (insert any insect here)  
and put it in a box...

(loudly) and then we'll let it go!

## We're Going on a Bug Hunt

Rhymed to: "We're Going on a Bear Hunt"

We're going on a bug hunt!

We're going to catch some big ones.

What a sunny day!

Are you ready? OK!

Oh my! A bee!

A black & yellow bee,

Flying over the flowers.

BUZZ.....

We're going on a bug hunt!

We're going to catch some big ones.

What a sunny day!

Are you ready? OK!

Oh, my! An ant!

A tiny, black ant,

Crawling through the grass.

Shh...

We're going on a bug hunt!

We're going to catch some big ones.

What a sunny day!

Are you ready? OK!

Oh, my! A grasshopper!

A big, green grasshopper,

Hopping around the tree.

Boing, boing...

We're going on a bug hunt!

We're going to catch some big ones.

What a sunny day!

Are you ready? OK!

Oh, my! A butterfly!

A pretty, orange butterfly,

Floating in the sky.

Whoosh, whoosh...

We're going on bug hunt!

We're going to catch some big ones.

What a sunny day!

Are you ready? OK!

Oh my! A spider!

A big black spider,

Creeping on the tree. Creep, creep...

## Bugs

June bug, stink bug,

Ladybug, chinch bug,

Water bug, pink bug,

Please-don't-pinch bug!

Horsefly, housefly,

Dragonfly, deer fly,

Firefly, fruit fly,

Buzzing-in-your-ear fly!

Honeybee, bumblebee,

Queen bee, drone bee,

Worker bee, nurse bee,

Leave-me-alone bee!

Gypsy moth, luna moth,

Beetle and mosquito,

Bugs and insects

Really are neat-o!

Cockroach, katydid,

Cricket and cicada,

Grasshopper, mantis,

Catch you all later!

Author Unknown

## It's an Insect

To tune of: My Darling Clementine

It's an insect

Not a spider

it has six legs--instead of eight.

3 on this side

3 on that side...and it's crawling on my plate!

## Buggy Anatomy

To tune of: London Bridge is Falling Down

Head and thorax, abdomen, abdomen, abdomen.

Head and thorax, abdomen, That's an insect.

Every insect has six legs, has six legs, has six legs.

Every insect has six legs, that's an insect.

Antennae to feel their way, feel their way, feel their way.

Antennae to feel their way, that's an insect.

## Caterpillar Chant

A caterpillar looks so small.

It is hardly there at all.

It munches on green leafy treats,

And it gets bigger as it eats.

It eats and eats, 'til pretty soon,

It wraps up tight in a cocoon.

When it wakes up it blinks its eyes

And says, "I'm now a butterfly!"

## Finger Print Bugs

Dip thumbs in washable paint to make 'thumbprint' bodies on paper. Have children decorate insect bodies by drawing in legs and antennae.



## Beetle Baby

### Supplies

Wire (20 gauge)

Ruler

Wire cutters

Multifaceted plastic beads  
(with diameters of 12 mm, 8 mm, 6 mm, and 4 mm)

Needle-nose pliers



### Directions:

Cut two 4-inch lengths and two 2-1/2-inch lengths from the wire (a parent's job). Thread all 4 through a 12 mm bead (this will be the bug's body).

Bend 2 ends of the 2 long wires upward and slide on an 8 mm bead for a head, as shown. Bend the remaining 6 ends down to form legs.

Thread a 4 mm bead onto the tip of each antenna. Then use the pliers to bend the tips (to keep the beads from sliding off) and curl the tops of the antennae. Finally, curl the ends of the legs to form feet.

## Dazzling Dragonfly

### Supplies

Wire (20 gauge)

Ruler

Wire cutters

Multifaceted plastic beads  
(with diameters of 12 mm, 8 mm, 6 mm, and 4 mm)

Needle-nose pliers



### Directions:

Start by creating a long straight body. Bend an 18-inch length of wire in half. Use the pliers to curl up a 3/4-inch section near the bend to create the tip of the tail. From the other end, slide nine 6 mm beads onto the doubled wire. Next, add two 8 mm beads followed by one 12 mm bead.

Make the wings by threading eighty 6 mm beads onto a 20-inch length of wire. Bend the tips to keep the beads from sliding off. Shape the upper two thirds of the strand into a figure 8 for the top set of wings; then shape the lower third into a smaller set of wings.

Set the body on top of the wings and attach the two by wrapping the trailing wire ends of the wings around the body wire between the 8 mm beads.

## Frightened Fly

### Supplies

Polymer clay in yellow or orange, white, and black  
22-gauge, permanent-colored copper wire  
Toothpicks

### Directions:

Roll and shape all the clay parts shown.

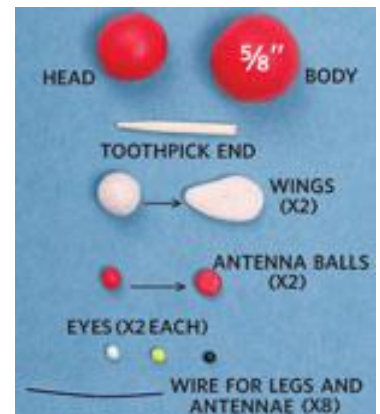
Cut the end off a toothpick and use it to fasten the head to the body.

Press the fly's wings onto its back.

Bend 6 pieces of wire into leg shapes and insert 3 into each side of the fly's body. Insert the wire antennae into the head and add the clay antennae balls to the other ends of the wire.

Make eyes by pressing the small white balls onto the head, adding the yellow balls on top, and finally press the black balls on for pupils.

Shape the mouth with a toothpick.



## Make a Swarm of Tumblebugs

### Supplies

Scissors  
Card stock  
2 nickels  
Tacky glue  
Toothpick  
Marble (1 for each bug)  
Black marker  
Colored tissue paper  
Glue stick

### Directions:

For each bug, cut a 5-1/2- by 3/4-inch strip of card stock and two 1 3/4- by 7/8-inch card stock ovals.

To make an oval, lay 2 nickels side by side on the card stock and trace around them, connecting the top and bottom.

Glue the strip into a loop, overlapping the ends by an inch. Pinch it or use a paper clip to hold it together while the glue dries. Next, use a toothpick to line one edge of the loop with glue, then set the loop on top of an oval.

When the glue dries, place a marble inside. Line the edge of the loop with glue and press the other oval on top.

Once all the glue is dry, use a marker to add a face and other features. Cut out a couple of 2-inch-long wings from tissue paper and use the glue stick to attach them to the top of your bug.



## Plant Stakes

### Supplies

Black pipe cleaner, cut in half

Black pompon

Large red pompon

Red pipe cleaner, cut in thirds

Multicolored spiraled pipe cleaner

Craft glue

Googly eyes

Mini red pompon

Thin craft foam ( in red and black)

Red and white spiraled pipe cleaner

¼-inch wooden dowel, 1 foot long



### Directions:

Create the ladybug's head and body by wrapping one half of the black pipe cleaner around the black and large red pompons. Twist the ends of the pipe cleaner together under the bug's body .

Slip the three pieces of red pipe cleaner between the black pipe cleaner and pompons on the underside of the bug. Bend to form legs.

For the antennae, slip the multicolored pipe cleaner under the black pipe cleaner on the top-side of the bug, just behind the black pom-pom . Twist and shape it, trim the ends if necessary.

Glue on googly eyes and a red mini pompon nose. Cut a red mouth and black spots out of foam and glue them onto the bug.

To attach the bug to the dowel stake, tightly wrap the red and white pipe cleaner around the top of the dowel and hook the end to the underside of the bug.



## Rock Bugs

### Supplies

Smooth pebbles in different shapes, colors, and sizes (for the body)

Tacky glue

Small twigs, blades of grass, and pine needles (for the legs and antennae)

Leaves in different shapes, colors, and sizes (optional, for the wings)

Flower petals (optional, for the wings)

### Directions

First, build a body from the pebbles. For example, make a dragonfly by gluing a small rock (the head) on top of a long skinny rock (the body). Or glue three small pebbles end to end to make an ant.

Add appendages by putting a drop of glue on the end of each leg, then pressing it to the rock. Finally, glue on wings and antennae, if you like. "Rock Bugs" from the book, "Camp Out! The Ultimate Kids' Guide" Workman Publishing)



## Belle the Dragonfly

### Supplies

Toilet paper tube

Acrylic paint: yellow, pink, turquoise

1-3/4 inch round white plastic Christmas ornament

2 yards narrow yellow rickrack

1 yard narrow pink rickrack

12x16-inch piece purple netting

12x16-inch piece yellow netting

6 inches string

Large jingle bell

Paintbrush

Black fine-point permanent marker

Scissors

Tape measure

### Directions:

Paint yellow, pink, and turquoise stripes around the tube. Let dry, then draw thin black lines to separate the stripes.

Draw 2 eyes and a smile on the bottom of the ornament, opposite its hanger.

Cut the yellow rickrack into two 36-inch pieces. Thread one piece through the ornament hanger. To attach the head to the body, pull one end of the rickrack through the tube and the other end around the outside of the tube. Tie the ends together tightly against the bottom of the tube. Leave the loose ends hanging at the bottom.

Gather both pieces of netting in the middle, and tie them together with string. Slip the netting between the rickrack and the tube on the back of the body, and tie both pieces securely to the rickrack with the same piece of string. Pull the purple netting up and the yellow netting down, forming wings.

Slip the bell onto the second piece of yellow rickrack. Tie it around the top of the wings, and then tie just the ends of the rickrack together to form a large loop.

Fold the pink rickrack in half, slip it around the yellow rickrack at the end of the tube, and tie to secure.



## **Butterfly Stained Glass Craft**

### **Supplies**

Waxed paper

Wax crayons

Manual pencil sharpener (with a fairly large hole)

Iron, ironing board and white computer paper or brown paper bag

Construction paper

Scissors

Glue stick or white glue

### **Directions:**

Plug in the iron and cover the ironing board with scrap paper. Set the iron to medium (no steam).

Tear a piece of waxed paper that's square (or a bit longer than it is wide) and fold it in half. Then unfold.

Take the paper off some crayons and 'sharpen' them in the pencil sharpener. Let the shavings drop onto 1/2 the waxed paper. You don't have to completely fill the space, it will spread about a bit when you use the iron. When you have a nice pile of shavings refold the waxed paper.

Fold about 1/2 inch around all the edges so none of the wax leaks out when you iron.

Place the waxed paper containing the shavings down on the ironing board and cover with more scrap paper.

Iron for a few seconds. Peek and iron a bit more if necessary. All the wax should melt. If you used multiple colors the longer you iron, the more your colors will mix.

You'll find that nothing happens and then BAM it's totally melted, so just keep waiting a few seconds at a time and peeking so you don't burn anything

Let it sit about a minute to cool.

Fold a piece of construction paper in half and then in half again.

Cut out the half butterfly shape template.

Line up the flat edge of the half butterfly shape with the folded edge of the construction paper. Trace the half butterfly shape onto the construction paper. Cut out the half butterfly.

Unfold the last fold of the construction paper and you'll see the butterfly in the middle.

Unfold the construction paper again and put glue around the cut out butterfly. Put your waxed paper ("stained glass") onto the glue and cover the cut out letters.

Put glue around the cut out butterfly on the other half of the construction paper and fold it over so the "stained glass" is sandwiched between the construction paper.

## Yarn Bug

### Supplies

Aqua Yarn

Pink, Yellow, Black and Orange Foam Scrap

Two 3/4" White Pompoms

Two 1/2" Pink Pompoms

Three Green Pipe Cleaners

2-1/2" Styrofoam Balls

5" Square of Cardboard

Tacky Glue

Scissors

### Directions

Make a pompon by wrapping yarn around floppy disk (or heavy cardboard) as least 100 times. Cut a 6" piece of yarn and slide it under wrapped yarn. Tie tightly into a double knot. Turn floppy over and cut completely through yarn on this side. Turn yarn blob sideways and smooth down strands.

Ask an adult to slice off the bottom of the Styrofoam ball so it stands on end. Cover the top and sides of the ball with tacky glue. Separate the strands of the pompon to fit the Styrofoam egg up inside. Press pompon into place. Arrange yarn.

Cut pipe cleaners in half. Poke through yarn and into Styrofoam ball. Bend four for legs. Gently curl the two for antennae. Glue two white pompoms for eyes, and two pink pompoms for antennae tips. Punch holes out of craft foam and glue on all around bug. Glue two black holes on pompom for pupils on the eyes.



## Firefly Flashlight

### Supplies

3" Flashlight

Low Temp Glue Gun or Ultimate Craft Glue

Two Wiggle Eyes -- 10mm

"AA" Battery

One Yard Cord

Glow-in-the-Dark Pony Beads

Permanent Marker

Yellow Craft Foam

Scissors

### Directions

Remove key ring from flashlight and string cord in its place. String glow-in-the-dark pony beads to each side. Double knot ends. Glue on wiggle eyes. Cut wings from yellow foam and glue to back of flashlight. Draw on a mouth.



## Melted Crayon Beetle Window Hanger

### Supplies

Waxed Paper

Bits of crayon

Warm iron (under adult supervision)

Scissors

Fishing line

Tacky glue (optional)

Wiggle eyes (optional)

### Directions:

Cut out bug pattern or create your own.

Place a piece of wax paper over bug pattern. Sprinkle crayon shavings (sparingly!) on wax paper following the design on the download.

Place another piece of wax paper on top of shavings and a blank sheet of paper or a cloth over that. Gently press down with a warm iron. Crayon will melt quickly.

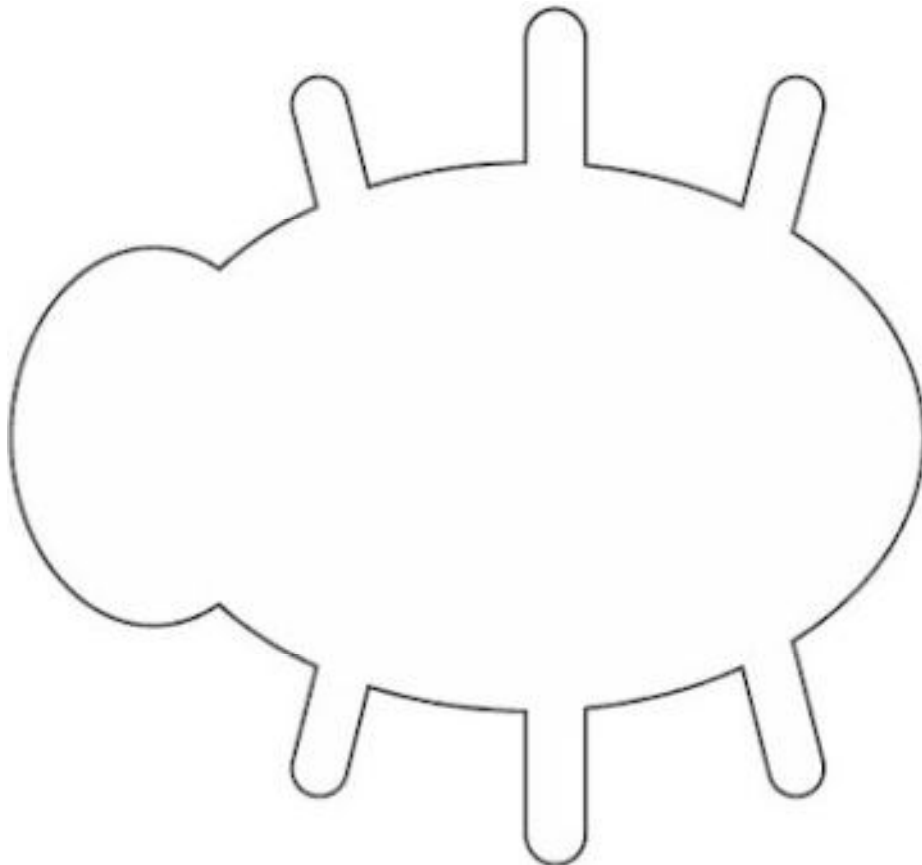
Staple pattern to the crayon melted wax paper outside of the design area and cut out. This may be enough for the littlest crafters.

We decided to go the next step to make it even more dramatic and a little more challenging for the older kids.

We outlined the wax bug with a fat black permanent marker. We had to go over it twice to make it show up on the waxed paper.

Then we glued on two wiggle eyes with tacky glue.

Finally we punch a hole in it and strung it up with filament or fishing line so you can hang it in the window and let the sun shine through.



## **Insect Foods and Snacks**

### **Ants on a Log**

#### **Supplies**

Celery cut in 2 inch segments

Peanut butter, cream cheese and/or pimento cheese

Raisins

Knives or other spreading implements

#### **Directions**

Clean and cut celery in 2 inch pieces.

With knife or spreader, fill celery with desired filling.

Place 4 or 5 raisins on top of the filling in a straight row as if they were ants marching along the filling.

### **Chocolate Covered Anthills**

#### **Supplies**

1 box of raisins

1 bag of chocolate chips

Wax paper covered cookie sheet

#### **Directions**

In a double boiler, melt the chocolate chips.

Stir the raisins into the melted chocolate.

Remove from heat.

Drop by spoonful onto the wax paper.

Place in the refrigerator or leave on the counter until completely cooled.

### **Ant Trails on a Raft**

#### **Supplies**

Graham crackers

Peanut butter or cream cheese

Chocolate jimmies or sprinkles

Knives

Drinking straws

#### **Directions**

Spread peanut butter or cream cheese on a graham cracker and smooth top.

Take one end of the drinking straw and touch it to the peanut butter or cream cheese and move it around in the peanut butter to make a trail.

Carefully add the chocolate sprinkles (ants) in the trail you created.

## **Pudding Cup Anthill**

### **Supplies**

Vanilla or chocolate pudding mix and milk

Graham cracker crumbs

Chocolate jimmies or sprinkles

Clear plastic cups

Spoons

### **Directions**

Make the pudding according to the directions on the box.

Cool pudding until it is firm.

In a cup, put a layer of pudding, then a layer of graham cracker crumbs.

Put another layer of pudding.

Top the layers with a mound of graham cracker crumbs to form a hill.

Add chocolate jimmies or sprinkles to represent ants.

Chill the filled cups until you are ready to serve them.

## **Ants on a Raft**

### **Supplies**

Slices of wheat bread

Peanut butter or cream cheese

Jelly

Raisins

Knives

### **Directions**

Spread desired filling on a slice of bread.

Spread jelly on if desired.

Sprinkle raisins on top.

## **Ants on a Life Preserver**

### **Supplies**

Apples

Cream cheese and/or peanut butter

Raisins

Knives and apple corer

### **Directions**

Core apples

Cut "round" slices of apple

Spread desired filling on apple slice

Top with several raisins

## **Peanut Butter Caterpillars**

### **Supplies**

Bananas

Peanut butter

Grapes

Chow Mein noodles

### **Directions**

Peel and slice a banana. Join the slices together by "gluing" them with peanut butter. Carefully poke two Chow Mein noodles (or break a pretzel stick in half to make two pieces) through the top of the grape. Use more peanut butter to attach the head (grape) to the front of the body, with antennae (Chow Mein noodles) pointing up.

## **Muenster Cheese Beetles**

### **Supplies**

Crunchy Chow Mein noodles

Muenster cheese (or other soft block cheese)

### **Directions**

Cut the cheese into 2" x 1" rectangular blocks. Gently insert three Chow Mein noodles on each side of the cheese blocks for legs. Using two broken Chow Mein noodles, insert into the "head" as antennae.

Tip: Use softer cheese such as gouda, Havarti, Monterey jack, or mozzarella so cheese does not crumble Chow Mein noodle are inserted.

## **Honey Treats**

### **Supplies**

1 cup peanut butter

½ cup honey

½ cup raisins

1 cup powdered milk

1 teaspoon vanilla

### **Directions**

Mix all the ingredients in a large bowl.

Roll the dough into 1 inch bark.

With the bottom of a drinking glass, flatten each ball slightly.

Place on wax paper on a cookie sheet.

Chill. Store covered in fridge.

Makes about 4 dozen.

## **Honey Shake it up**

### **Supplies**

1 ½ cups milk  
1 cup vanilla yogurt  
5 ice cubes  
1 ½ cups strawberries, sliced  
¼ cup honey

### **Directions**

Combine all ingredients except ice cubes in a blender and blend until thick and creamy.  
Add ice cubes one at a time and blend until smooth.  
makes 4 servings.

## **Super Fast Honey Snack**

### **Supplies**

½ cup peanut butter  
Carrots, celery, pears and/or apples  
¼ cup honey

### **Directions**

Mix peanut butter and honey.  
Use as a dip for vegetables and fruits.

## **Honey Make My Morning Muffins**

### **Supplies**

½ cup milk  
1 egg, beaten  
¼ cup honey  
1 ½ cups buttermilk baking mix

### **Directions**

In medium bowl, combine milk, honey and beaten egg and mix well.  
Add baking mix and stir until moistened.  
Spoon into greased muffin tins.  
Bake at 400 degrees Fahrenheit for 18 to 20 minutes.  
Makes 10 – 12 muffins