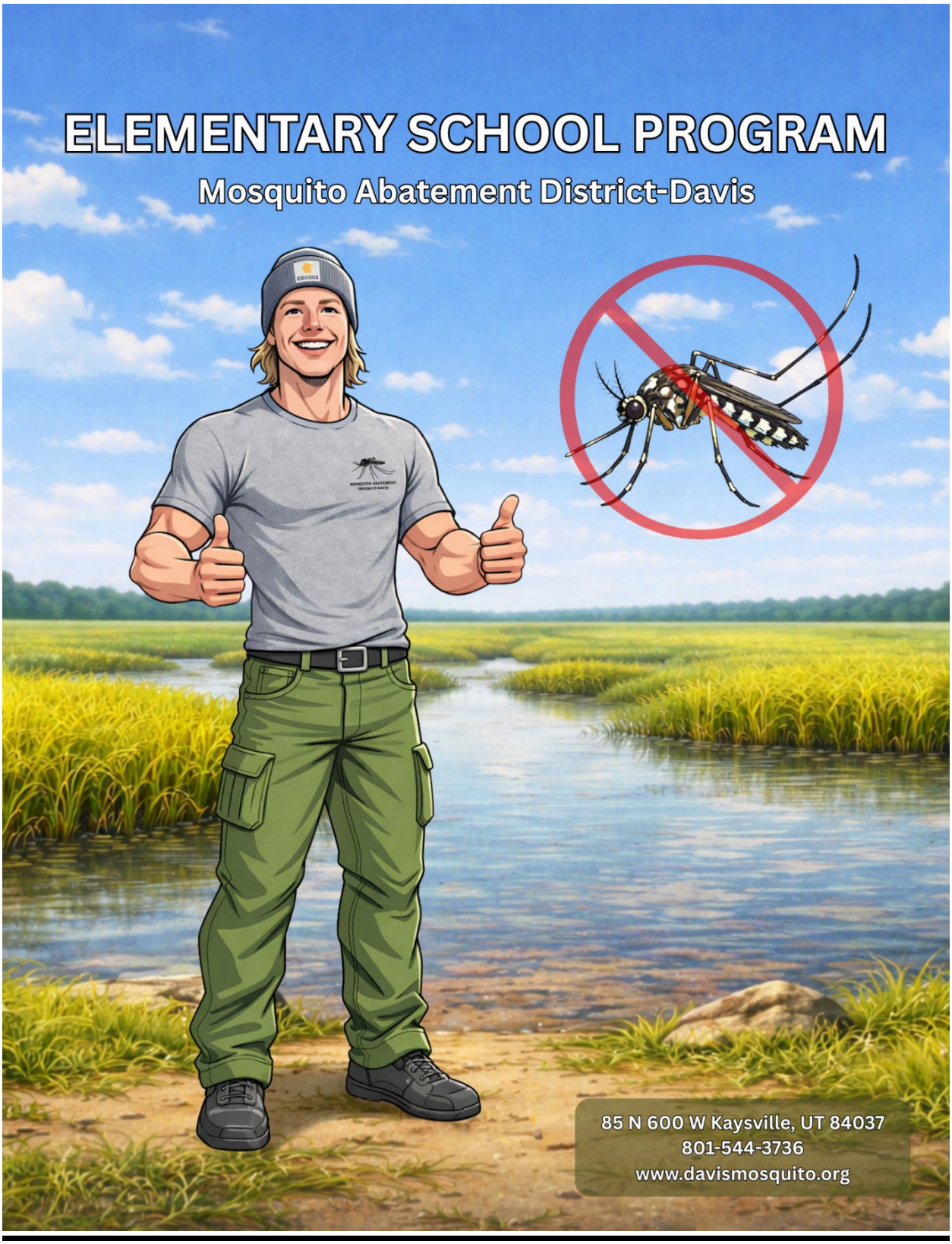
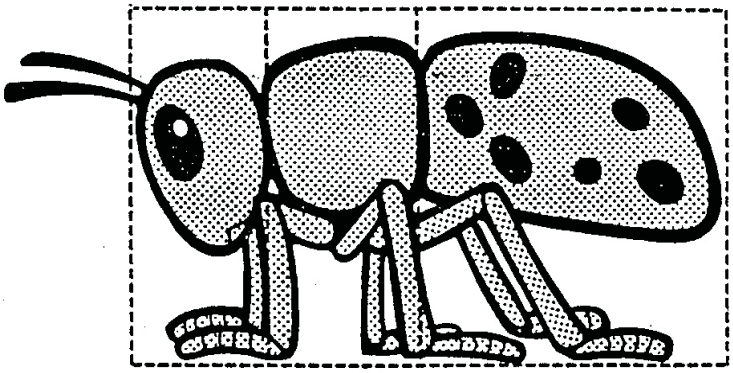

ELEMENTARY SCHOOL PROGRAM
Mosquito Abatement District-Davis
85 N 600 W Kaysville, UT 84037
801-544-3736
www.davismosquito.org

Name _____

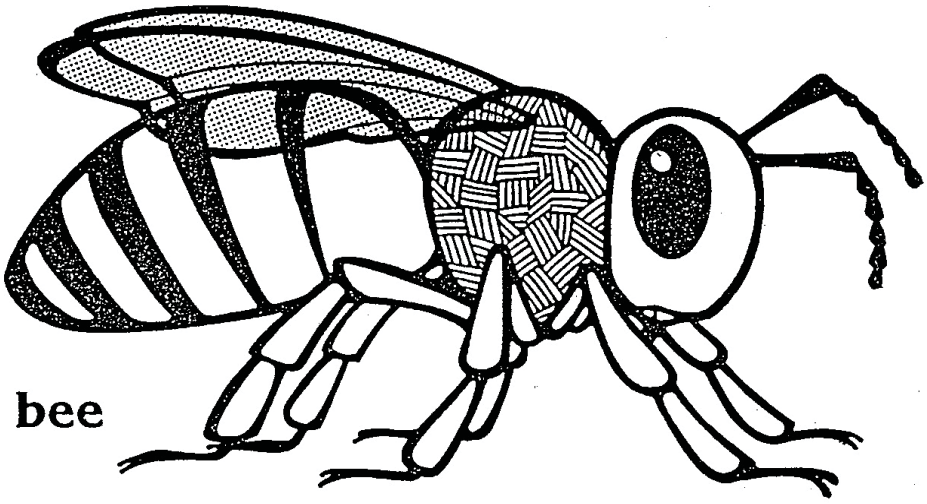
What Is an Insect?

An **insect** is a small animal.
Its body is divided into three parts.

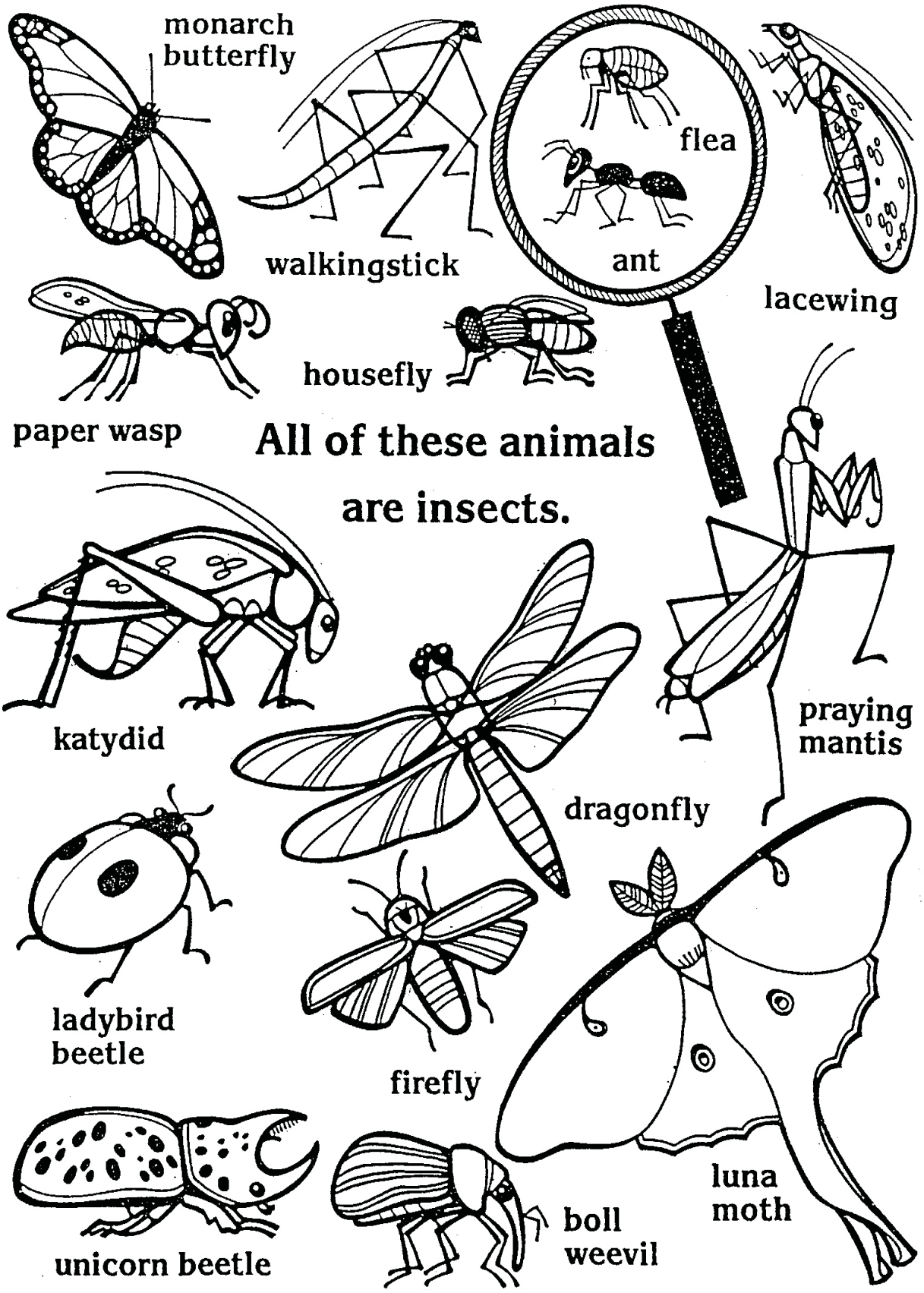


1 2 3

Insects have six legs. Most insects have wings
and feelers, or **antennae**.



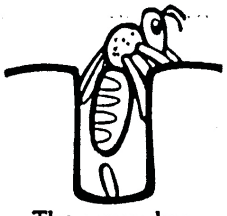
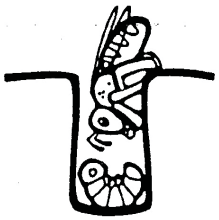
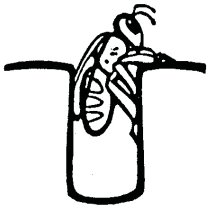
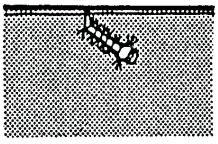
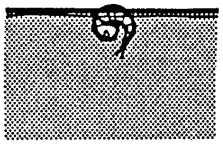
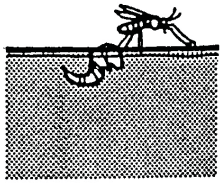
bee


monarch butterfly
walkingstick
flea
ant
lacewing
paper wasp
housefly
All of these animals are insects.
katydid
praying mantis
dragonfly
ladybird beetle
firefly
luna moth
unicorn beetle
boll weevil

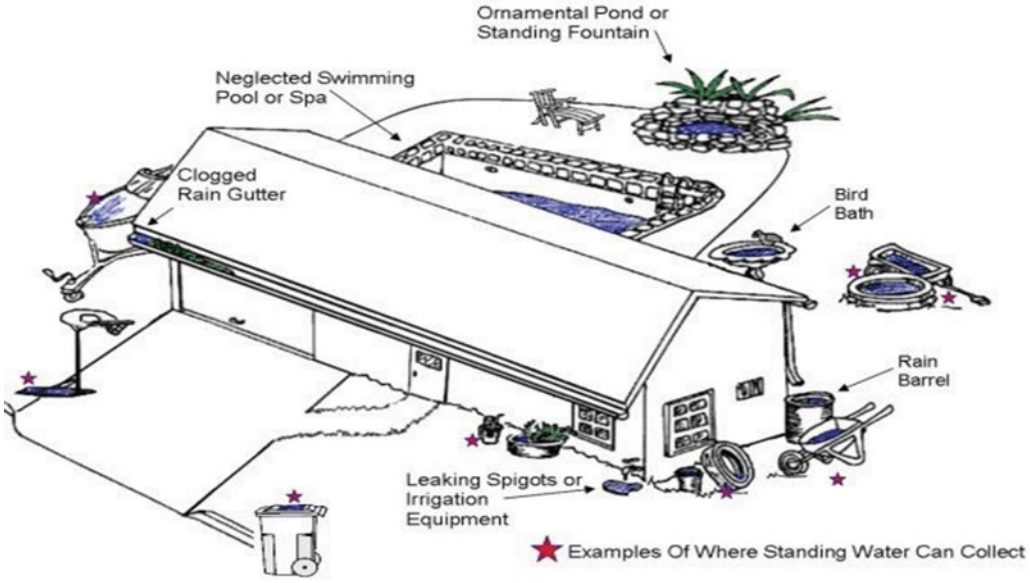
Name _____

More Metamorphosis

Bees, beetles, and mosquitoes go through the four stages of **complete metamorphosis**.

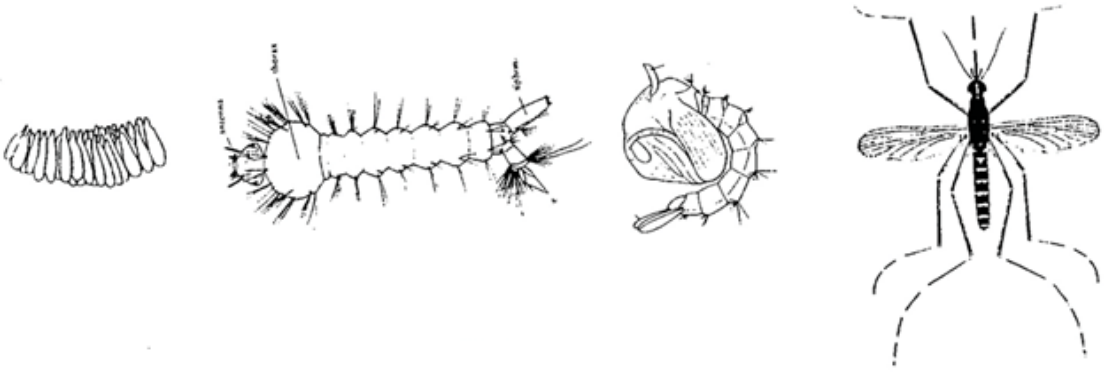
	egg	larva	pupa	adult
bees	 The queen bee lays an **egg** in the honeycomb.	 The **larva** is fed by worker bees.	 Worker bees seal the **pupa** in its hole.	 A new **adult** bee crawls out of the hole.
beetles	 Some beetles lay **eggs** in cereal, flour, or grain.	 The beetle **larva** eats the food around it and grows.	 The **pupa** does not eat.	 The pupa becomes an **adult** beetle.
mosquitoes	 Mosquito **eggs** float in water like a tiny boat.	 The mosquito **larva** breathes through an air tube.	 The **pupa** rests near the surface of the water.	 The pupa's skin splits, and an **adult** mosquito comes out.

COMMON BACKYARD MOSQUITO BREEDING SOURCES



Remember, anything that can hold water for more than a few days can become a Mosquito breeding source. Be sure to check your home for all of the following:

- ✓ Neglected pools and hot tubs
- ✓ Clogged rain gutters and street gutters
- ✓ Open containers such as buckets, yard equipment, old tires, open boats etc.
- ✓ Be sure to change the water in bird baths frequently
- ✓ Inspect your yard for tree holes
- ✓ Leaky faucets
- ✓ Call the mosquito district for fish or for the treatment of ornamental ponds



WORD SEARCH

A	P	A	N	T	E	N	N	A	A	X	E
T	H	B	T	E	P	M	U	R	T	N	R
Y	E	D	P	H	X	E	L	U	C	L	O
T	H	O	R	A	X	B	A	E	A	Q	T
P	U	M	O	L	T	S	P	I	B	O	I
N	R	E	N	S	L	H	E	A	D	M	U
N	A	N	O	T	A	D	G	P	O	T	Q
O	T	I	C	L	R	P	G	U	M	S	S
H	S	G	I	U	V	A	U	V	E	G	O
P	N	T	S	D	A	T	L	P	N	E	M
I	I	H	I	A	B	D	A	I	N	L	W
S	E	D	E	A	X	S	W	S	E	Y	E

Can you find all the words listed below? Circle them as you find them!

- Abdomen
- Adult
- Aedes
- Antenna
- Culex
- Egg
- Encephalitis
- Eye
- Head
- Instar
- Larva
- Legs
- Molt
- Mosquito
- Proboscis
- Pupa
- Siphon
- Thorax
- Trumpet
- Wings

Wings

Antenna

Eyes

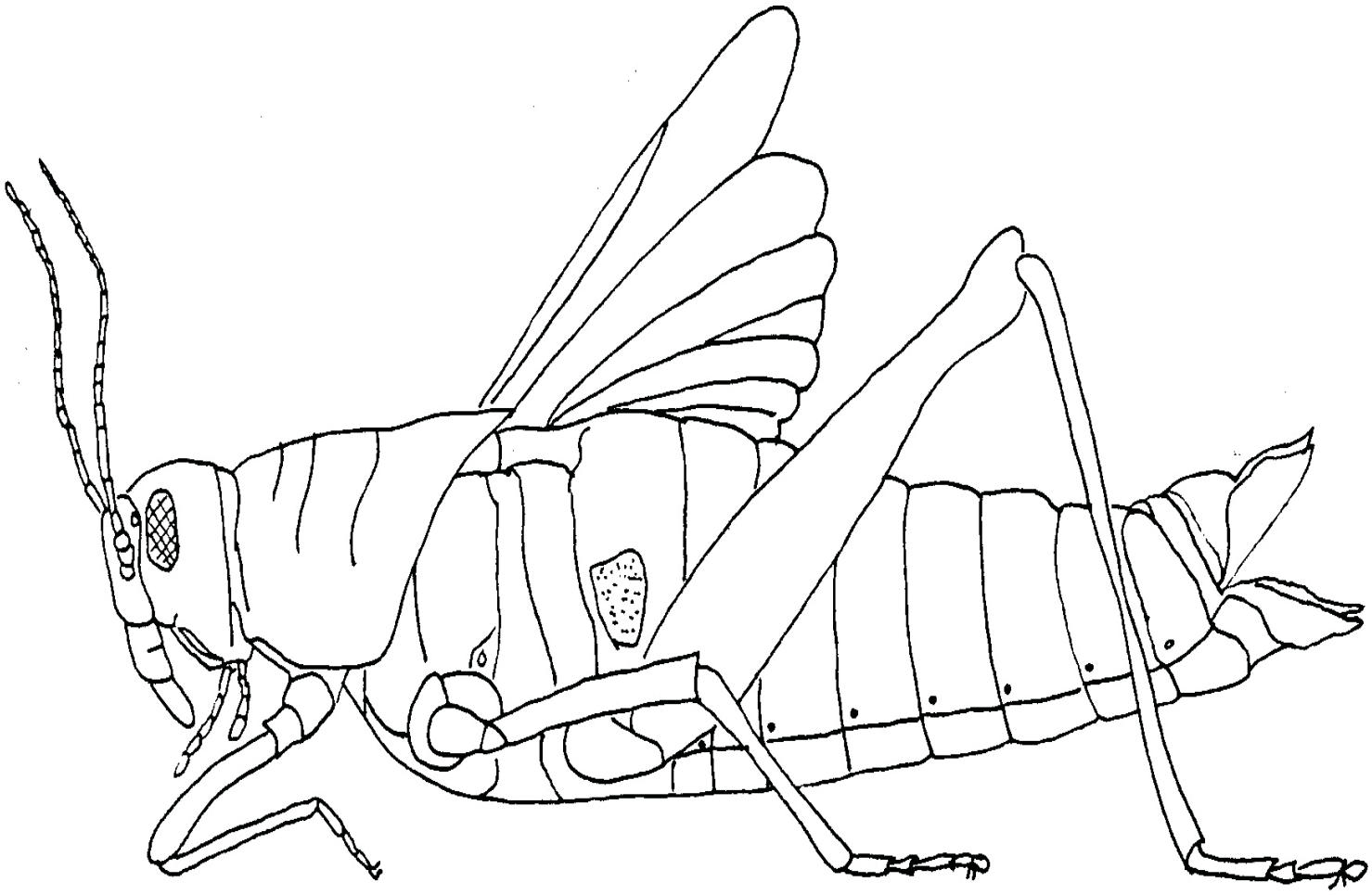
Palps

Mouth parts

Head

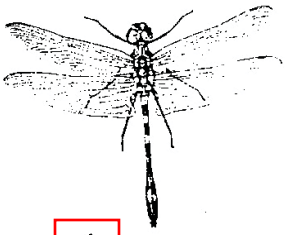
Thorax

Abdomen



Find The Insects

Circle only the Insects



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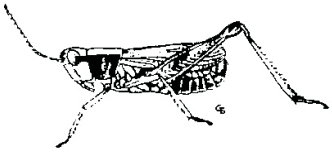

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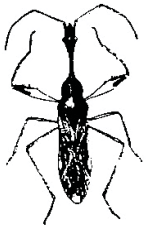

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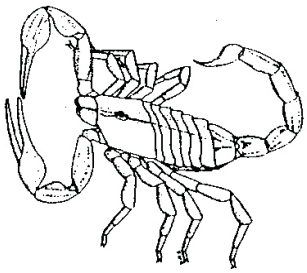

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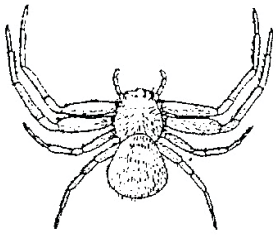

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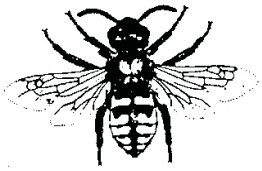

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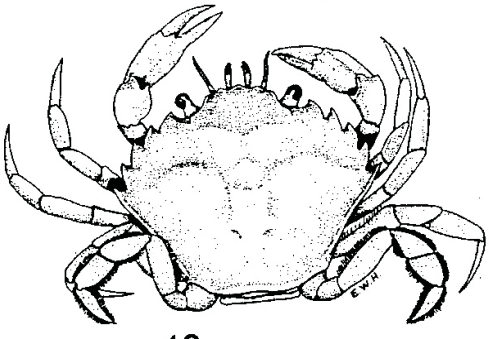


13

THE BUTTERFLY CURRICULUM

SUGGESTED ACTIVITIES FOR GRADES THREE THROUGH SIX USING THE BUTTERFLY GARDEN SCHOOL KIT

NAME _____ LESSON 1

LET'S RAISE BUTTERFLIES!

Each Butterfly Garden School Kit will have at least 30 caterpillars (larvae), with enough cups and lids for each student to have their own.

INSTRUCTIONS:

1. Each cup should be filled one third of the way with the caterpillar food.
2. The food should be pressed to the bottom of the cup.
3. The caterpillars should be placed on top of the food in the cups **Carefully**.
4. The lid must remain on the cup. Your caterpillar's cup does not need any holes for air.
5. Put your name on the lid to help you remember which caterpillar is yours.

REMEMBER these things:

◊ Keep the caterpillar cups upright

◊ Do not drop the cups

◊ Do not keep the caterpillars too hot or too cold

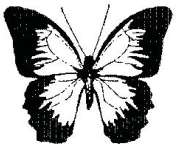
NAME _____ Lesson 2

HOW LONG DOES IT TAKE
FOR A CATERPILLAR TO BECOME A BUTTERFLY?

Write the date you received your caterpillars here. _____

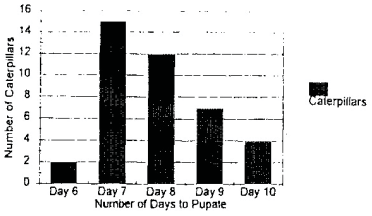
Write the date your caterpillar changed into a chrysalis (pupa) here. _____

Write the date your butterfly emerged from the chrysalis here. _____



Questions:

1. How many days did it take for the caterpillar to become a chrysalis? _____
2. How many days did it take before the chrysalis became a butterfly? _____
3. How many days did it take for the caterpillar to become a butterfly? _____
4. Did all the caterpillars take the same number of days to become butterflies? _____
5. What was the longest time? _____
6. What was the shortest time? _____
7. Draw a graph showing the difference in amount of time it takes the caterpillars to develop.



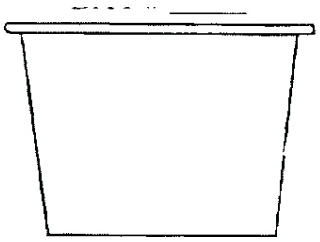
NAME _____ Lesson 3

DOES YOUR CATERPILLAR GROW?

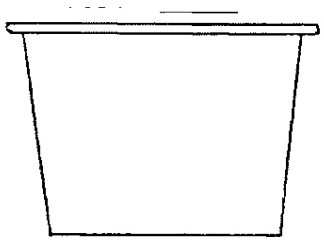
Write the date you received your caterpillar here. _____

Watch your caterpillar each day. Does it change? _____

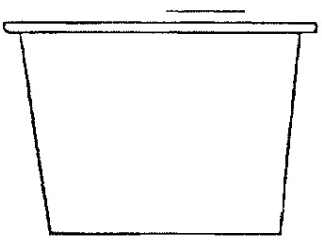
A caterpillar sheds its skin 5 times before it becomes a chrysalis. Keep a record of the changes in the caterpillar. Draw some pictures of your caterpillar as it grows. Be sure to write the day number under each picture.



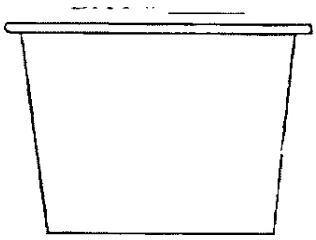
DAY # _____



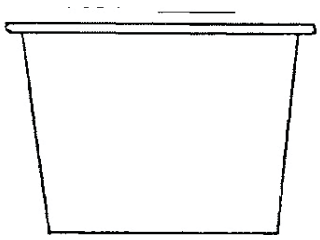
DAY #_____



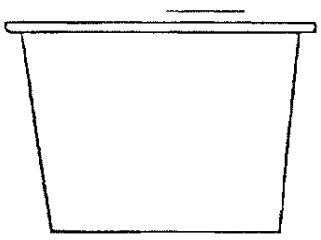
DAY #_____



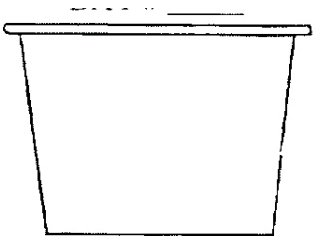
DAY # _____



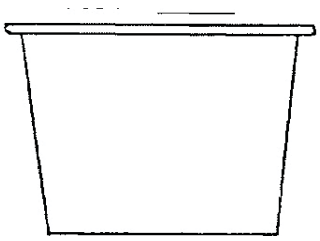
DAY #_____



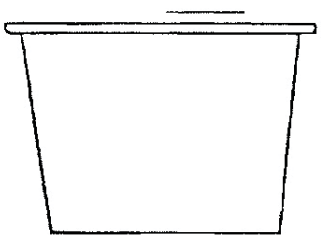
DAY #_____



DAY # _____



DAY #_____



DAY #_____

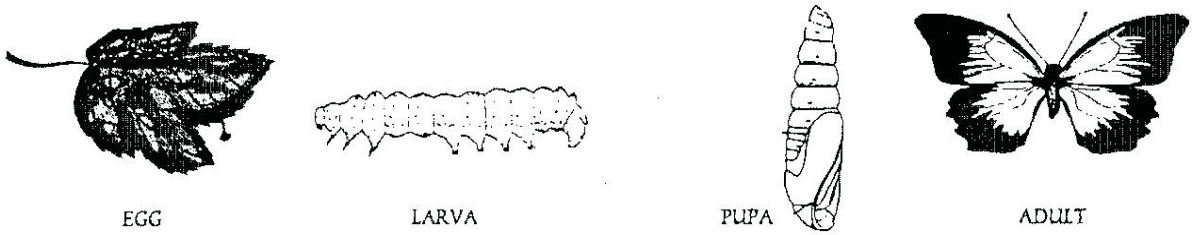
As the caterpillar grew, could you see more caterpillar parts? _____

What parts could you see best? _____

NAME _____ Lesson 4

HOW DO INSECTS GROW?

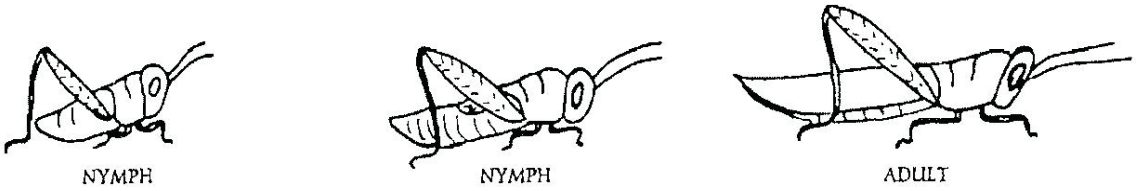
The caterpillar becomes a butterfly by going through these steps (stages):



This is called complete metamorphosis (complete change).

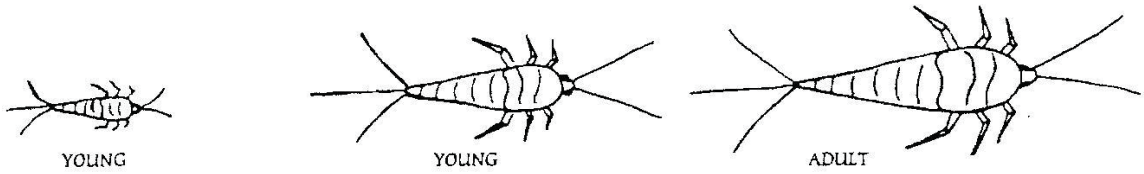
Each stage looks much different than the other stages. Other insects that develop in this way are beetles, flies, bees and ants.

Some other insects, like grasshoppers, do not change this much as they grow. A little grasshopper looks much like a big grasshopper.



About the only difference between a young grasshopper and a fully grown (adult) grasshopper is the size and the growth of wings. This is called incomplete metamorphosis (partially changed). Other insects that develop in this way are crickets, praying mantids, and katydids.

Still other insects are even more simple when they grow. Here is how the insects are even more simple when they grow.



The only difference between the young silverfish and the adult is size. This is called direct development (grows but does not change). Very few insects have this simple way of growing.

How is Complete Metamorphosis better? Larvae and adults do not compete for food

_____

How is Complete Metamorphosis less beneficial? Pupal stage does not move in most insects

NAME _____ Lesson 4

HOW DO INSECTS GROW? (Continued)

How do these insects grow?
Complete Metamorphosis? Incomplete Metamorphosis? Direct Development?

Lady bug beetle Complete Metamorphosis

Painted lady butterfly Complete Metamorphosis

Silverfish Direct Development

Housefly Complete Metamorphosis

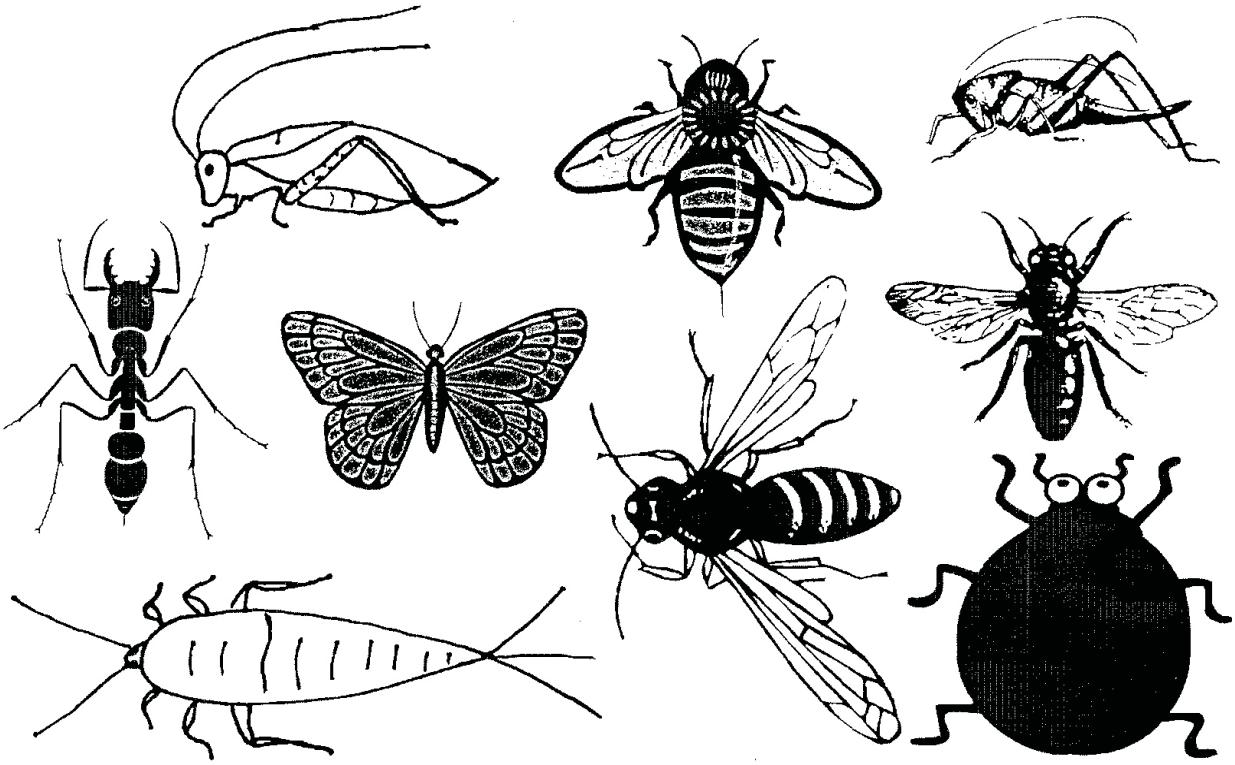
Wasp Complete Metamorphosis

Red ant Complete Metamorphosis

Honeybee Complete Metamorphosis

Grasshopper Incomplete Metamorphosis

Green katydid Incomplete Metamorphosis



NAME _____ Lesson 5

DO CATERPILLARS GROW BEST WHEN IT'S COLD OR WARM?

Let's Try an Experiment

* Place 3 cups containing caterpillars and their food on a high shelf in your room.
* Place 3 other cups in a cooler place in your room, maybe near the floor.
* After 3 or 4 days compare the size of the 2 sets of caterpillars.

Questions:

1. Did the caterpillars grow the same in both places? _____
2. At which temperature did the caterpillars grow best? _____
3. Can you think of any reason why it would be helpful to the caterpillars to grow best at this temperature? _____

Did you know that insects are cold-blooded? The body of a cold-blooded animal is just as cold or warm as its environment. Other cold-blooded animals are snakes, lizards, frogs, and snails. Cold-blooded animals eat, grow, and are active only during the warmer part of the year. The plants which caterpillars and other insects use for food also grow only during the warmer part of the year.

Birds and mammals, (dogs, cats, horses, and people) are warm-blooded. Because their bodies stay warm, they can grow, eat, and be active in Winter as well as Summer. Warm-blooded animals must find food in Winter as well as Summer.

Why do many birds fly South in the Winter?

_____

_____

NAME _____ Lesson 6

MAGNIFYING GLASS INVESTIGATION: BRISTLES AND LEGS

With a magnifying glass, look carefully at your caterpillar.

1. Look at the bristles (setae) on the caterpillar (larva).

   What color are they? _____

   Are there little setae coming out of big setae? _____

   Draw a picture of setae here:

   Could the setae help the caterpillar in any way? _____

   How? _____

   _____

   (Hint)- If you were a bird, how would it feel to swallow a round brush?

2. Look at the legs of your caterpillar. Do the first 3 pairs of legs (true legs) look different than the other stumpy legs (false legs)? _____

   In what way? _____

   _____

   How many pairs of legs can you count? _____

   Draw the legs in the right places on the caterpillar below:

   With a strong magnifying glass, look carefully at the end of a false leg. Can you see a circle of tiny hooks? _____

   These are called crochets!

NAME _____ Lesson 6

MAGNIFYING GLASS INVESTIGATION: SILK AND SPIRACLES (Continued)

Look at the silken threads your caterpillar has spun in the cup.

1. The caterpillar spins silk from spineretts (small pegs) near its mouth. Can you find these spineretts? _____

2. How does the caterpillar fasten each false leg to the silken threads?
   Look closely! Tarsal Claws

3. How would this be helpful to the caterpillar? Helps them move and helps protect them.

4. In Nature, the caterpillar also uses the silk to pull the edges of a leaf together around itself. Would this be helpful to the caterpillar? Yes, it would.

   Why? It helps protect the caterpillar.

_____

Look carefully along the side of the caterpillar.

The caterpillar's body is made up of **segments** (like the beads in a necklace). There is a small, dark hole (spiracle) ringed in white on the sides of each segment. What is the purpose of the spiracles?
Circle the answer you think is right:

To smell food | *To breath air* | *To see things* | *To blow bubbles*

How do we get air into our bodies? _____

How is the oxygen from the air carried to all parts of our bodies? _____

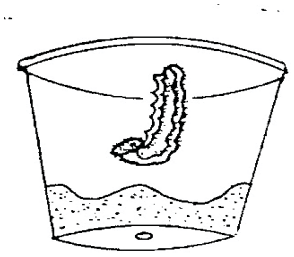
_____

NAME _____ Lesson 7

THE BIG CHANGE

When your caterpillar gets big, watch him carefully. Your caterpillar will crawl to the top of his cup and hang down.

Like this:



After hanging for about one day, the skin splits along it's back. Under the skin is the chrysalis. The chrysalis soon becomes hard and changes into a pretty golden color. Take the chrysalis out of the cup and very carefully place it in the box. This will be a waiting time for you, but the chrysalis is very busy! The new butterfly comes out of the chrysalis, what parts will it have?

Circle them:

EYES	ANTENNAE
MOUTH	LEGS
WINGS	HEAD

Did the caterpillars have all of these parts? _____
(Place an "X" beside each part which the caterpillar had.)

NAME _____ Lesson 7

MAGNIFYING GLASS INVESTIATIONS: THE CHRYSALIS (Continued)

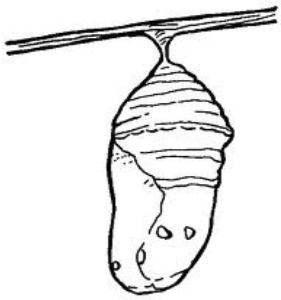
With the magnifying glass, look carefully at your chrysalis.

When your caterpillar has finished growing, it will become a chrysalis.

Look at the chrysalis and answer these questions.

1. Where are the antennae being formed? _____
2. The eyes? _____
3. The wings? _____
4. The abdomen? _____

Using your pencil, draw these parts on the drawing of the chrysalis below. When you have finished, color the chrysalis as it looks to you.



5. When the chrysalis is about 7 days old, it will turn dark. What do you suppose this means? _____

   _____

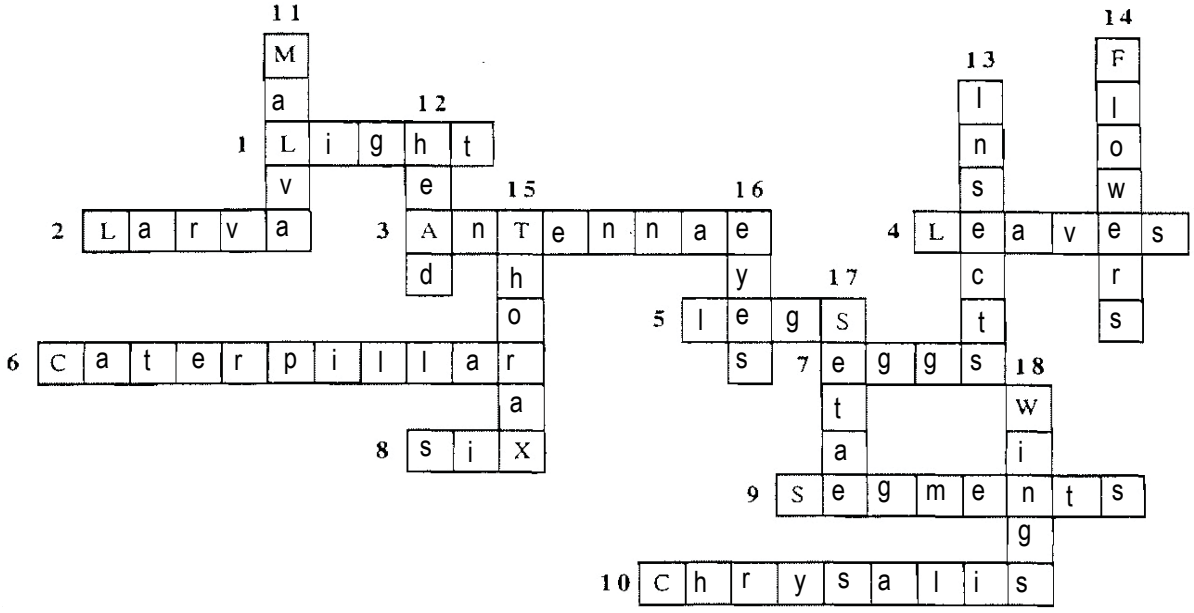
6. When the chrysalis turns dark, can you see the colors of the wings through the thin shell? _____

---

* Did you know that the caterpillars of butterflies form chrysalides, while the caterpillars of moths spin cocoons?

NAME _____ Lesson 8

Butterfly Crossword Puzzle



UP:

1. Butterflies like the _____ not the dark.
2. A caterpillar is sometimes called a _____.
3. The feeler of a butterfly are called _____.
4. The caterpillar eats the _____ of a plant.
5. The caterpillar uses its _____ to walk about.
6. A butterfly's egg hatches into a _____.
7. Caterpillars hatch from _____ which the butterfly lays.
8. How many legs does a butterfly have?
9. The caterpillar's body is made up of small _____.
10. The caterpillar becomes a _____ before it becomes a butterfly.

DOWN:

11. Painted Lady caterpillars like to eat the leaves of this plant.
12. The eyes of a butterfly are found on her _____.
13. Butterflies are from a group of animals called _____.
14. Butterflies drink the sweet nectar from _____.
15. The middle part of the butterfly's body, where the legs and wings are found, is called the _____.
16. The butterfly has very good _____ to see flowers and leaves.
17. The bristles on a caterpillar are called _____.
18. The insects which have these always have four. What are they?

NAME _____ Lesson 9

GOOD AND BAD INSECTS

Some insects we call good, and some we call bad.

Some insects do good things like making honey, pollinating flowers (helps plants make seeds), and eating bad insects.

Other insects do bad things like eating crops the farmers grow, biting us, and sometimes making us sick.

Here are some insects. Tell whether they are good or bad and why.

	Good or Bad?	Why?
* Lady bugs	Good	Eats aphids
* Ants	Good and Bad	Helps with decomposition, Bad in your house
* Cockroaches	Bad	Eat your food, can spread disease
* Honeybees	Good can be Bad	Great pollinator, bad if it stings you
* Mosquitoes	Bad	Carry diseases and make you itch
* Grasshoppers	Bad	Eats our food crops
* Termites	Bad and Good	Helps with decomposition, Bad in your house
* Butterflies	Good	Good pollinator

Story Time….

Here are two stories. One story is about ants and the other is about termites.

THE ANT STORY….

Once upon a time a grasshopper grew old and died. Along came an ant and found the grasshopper. The other ants followed the little ant to where the grasshopper lay. Together, they picked up the grasshopper and carried it to their nest which was not far away. For many days the ants ate the grasshopper and fed their little ants from the grasshopper too. As they ate the grasshopper, they changed it into nice rich soil. The very next Spring new plants grew on this new soil. The plants that grew were good food for rabbits, deer, and even grasshoppers. (Questions for ant story on next page.)

NAME _____ Lesson 9

GOOD AND BAD INSECTS (Continued)

ANT STORY QUESTIONS

1. Was the work of the ants good when they ate the grasshopper? _____
2. Why? _____
3. Are ants good when they get into your kitchen? _____

THE TERMITE STORY….

Are termites good or bad? _____You probably said bad. To see if you are right, read this story.

Once upon a time a very big old tree died in the deep forest. The old dead tree stood until the wind from a big storm blew it over. A mother termite found the old tree the next Spring and laid her eggs on it. The eggs hatched and soon the little termites were busy eating the old tree. After a few years, the old tree was almost gone and all that remained was a long mound of soil where the old tree had once lain. The new soil from the old tree was rich and after a few years little trees and other good plants were growing there.

Was the work of these termites good? _____

Why? _____

Sometimes termites get into our houses and begin eating the wood like they eat the old dead trees. Termites cannot tell the difference between the dead wood in our houses and the dead wood in the forest!

NAME _____ Lesson 10

THE NEW BUTTERFLY!

In seven to ten days after the chrysalis forms your new butterfly should emerge. Just before the butterfly emerges the chrysalis will turn a dark color and you can see the colors of the wings through the chrysalis.

FEED ME!!

* Your butterfly will not be hungry for one day after it emerges.
* Put the cotton wick in the paper flower in your Butterfly Garden box.
* Make some sugar water by putting two teaspoons of sugar in a cup of water.
* Soak the cotton wick with sugar water, using your eyedropper.
* For more food, fill an empty jar lid with sugar water. Fold a paper towel and place it in the lid.
* Change the sugar water every two or three days.

1. How does the butterfly eat? It feeds on flowers and gets the nectar with it's proboscis.

   _____

2. Does the butterfly have a long tube (proboscis)? Yes

3. What does the butterfly do with the long tube when she is not drinking? It curls up.

   _____

4. Can a butterfly eat the same food a caterpillar eats? No

5. Can a caterpillar eat the same food a butterfly eats? No

6. Why or why not? Butterflies feed on nectar from flowers while caterpillars feed on leaves from specific plants they feed on.

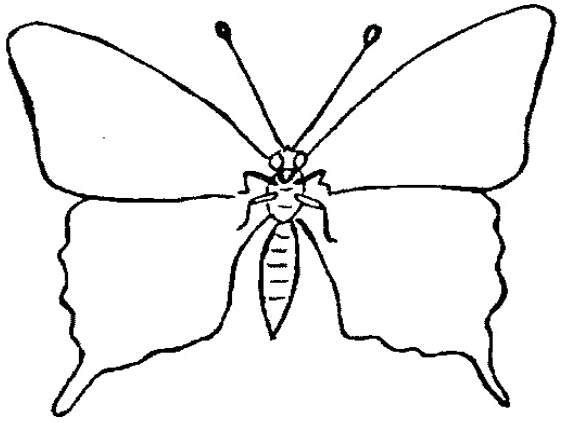
   _____

NAME _____ Lesson 10

FIND THE BUTTERFLY PARTS (Continued)

Look carefully at your butterfly. Can you find the following parts?

ANTENNAE EYES HEAD LEGS WINGS THORAX ABDOMEN



Draw a line from the name to the part on the butterfly.

What do the butterfly parts do?

Antennae _____

Eyes _____

Legs _____

Wings _____

Do you see any other parts on your butterfly? _____

Describe them if you do. _____

_____

_____

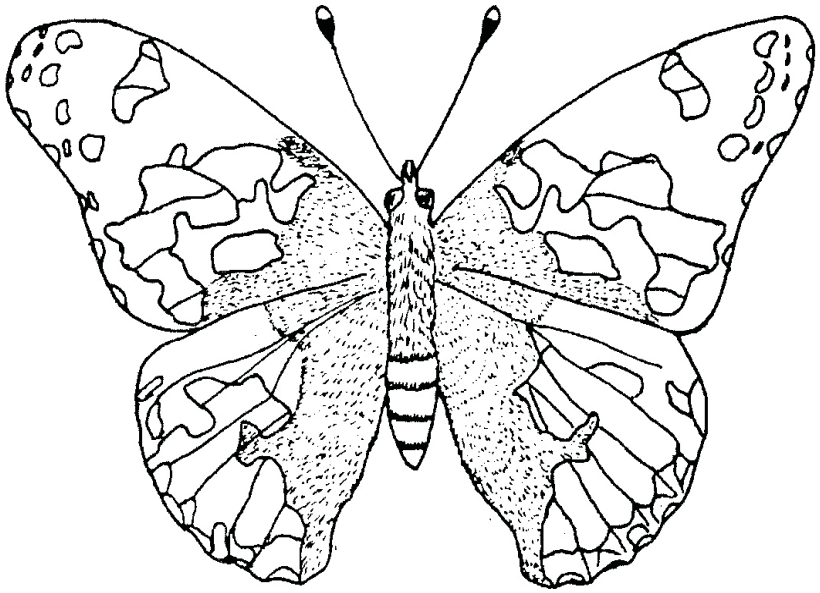
NAME _____ Lesson 10

COLOR YOUR BUTTERFLY(Continued)

The picture below is an outline of the Painted Lady Butterfly.

Look very carefully at the wing colors on your live Painted Lady Butterfly.

Can you match those colors with crayons to make this paper butterfly look like your live one?



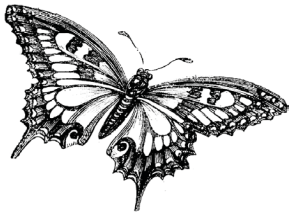
1. How many different colors did you see? _____
2. What were the colors you used? _____
3. Are these the same colors you would need to color the underside of your butterfly's wings?

   _____
4. What are the colors you would need for the underside of the wings? _____

   _____

NAME _____ Extra Credit

A MOTH OR A BUTTERFLY?



Which is it? A moth, butterfly, or both?!

Flies in the daytime Butterfly

Flies at night Moth

Has feathery antennae Moth

Has knobbed antennae Butterfly

Holds its wings upright Butterfly

Folds its wings flat over its body Moth

Has a fat body Moth

Has a thin body Butterfly

Emerges from a chrysalis Butterfly

Emerges from a cocoon Moth

Likes pretty flowers Butterfly

Carries pollen from flower-to-flower Butterfly

Has four wings Both

Its larvae sometimes eat our farm crops Moth

Is beautiful to look at Mostly butterflies, but both can be beautiful.

How are moths and butterflies alike? They fly, have 4 wings, complete metamorphosis, feed on nectar as an adult.

How are they different? Active at different times of the day, some moth caterpillars feed on crops. Moths are more active in cooler temperatures.

NAME _____ Extra Credit

DIFFERENT KINDS OF BUTTERFLIES

Check out a book from your library with pictures of butterflies.

Is it easy to see the difference between each kind of butterfly? Some are different but others look alike.

Each kind of butterfly must find its own kind before the mother butterfly can lay her eggs.

How does a butterfly find its own kind of butterfly? They give off scents or pheromones.

Butterflies use their wings for other things too.

Try to find a picture of a butterfly whose wings would make the butterfly resemble something else. A leaf perhaps or the bark on a tree.

How would this be helpful to the butterfly? Camouflage, hide from predators.

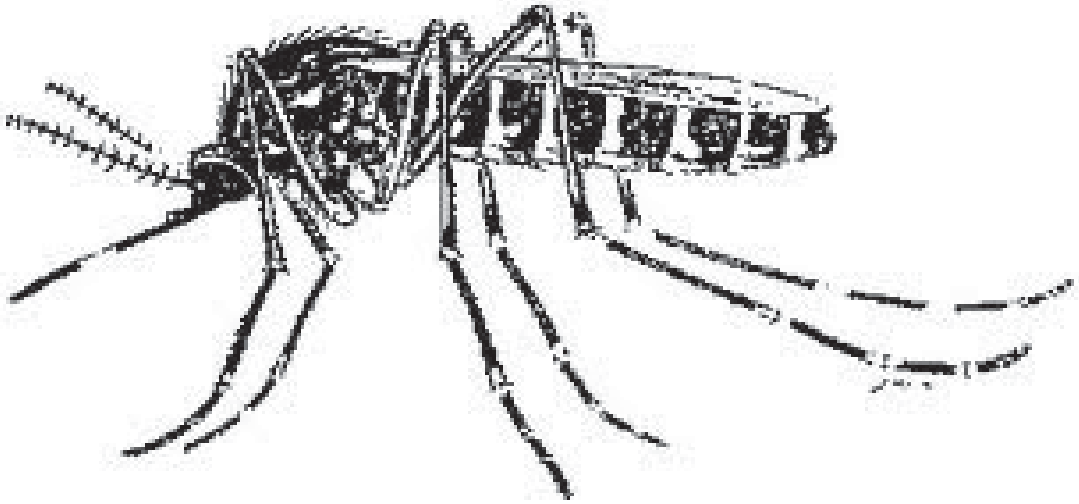
A butterfly might use her wings for which of the following?

Circle the right answers.

To help the butterfly find flowers	To drink the nectar from flowers
To walk about	To fool her enemies
To escape from enemies	To help her find another butterfly

Write your favorite kinds of butterflies below.

MOSQUTIO FACTS AND INFORMATION



MOSQUTIO FACTS AND INFORMATION

* There are 51 species of mosquitoes in Utah, with 15 species found along the Wasatch Front.

* Only the female mosquito bites.

* Mosquitoes feed on plant nectar for their energy source to live. The blood meal is for protein to develop the eggs.

* A female mosquito will lay between 100 and 250 eggs. They will be laid on the water by some species or in a flood plane to be covered with water at a later date. These eggs can sit for years waiting to be flooded before they hatch.

* The mosquitoes in warm temperatures will grow from egg to adult in 7 – 10 days.

* Many species are very strong fliers and will migrate up to 20 miles.

* The average mosquito will live about 10-30 days, but many will live long enough to lay multiple batches off eggs. Many species will over winter as adults and lay eggs in the spring.

* Mosquitoes do not hatch out of moving water. The adults will often use canals and streams to migrate along because of the high humidity levels and the availability of nectar sources.

* Mosquitoes are attracted by the carbon dioxide we breathe out. They are attracted to light from a distance, however, once they sense the CO2 it is a much stronger attraction to them.

* Place your Bug Zapper as far away from your home as possible, and do not have it on while you are outside.

* DEET containing products (OFF, Cutter, Picaridin, etc.) are the best mosquito repellents. You should avoid using the high concentrate DEET products on children.

* Some species of mosquitoes will bite all day long, however, all mosquitoes are more actively biting just after the sun goes down. During heavy mosquito infestations precautions should be taken to avoid extra mosquito bites. Head indoors at dusk, wear mosquito repellents, wear long sleeved shirts and long pants, and do not overwater your lawn.

* The most common house mosquito is known as the *culex pipiens* because of its close relationship with man's environment. It is a light brown medium-sized mosquito. It is the most common species in the world.

* The female lays her eggs in standing, somewhat polluted water. Typical sources around your home are gutters, unused swimming or wading pools, tires, buckets, rain barrels, ornamental ponds, etc.

* Mosquitoes may live for two or three weeks in the summer, but under cooler conditions, the females may live for several months.

* Female "house mosquitoes" readily bite people, but birds and other mammals are considered the preferred blood hosts.

* "House Mosquitoes" tend to remain within a block or two of where they hatch. However, when breeding sources are large and go untreated, females may cause complaints several miles away.

* Only the female mosquito bites, but both male and female mosquitoes feed on nectar and plant juices. The female mosquito needs the blood meal to develop her eggs.

Mosquito Borne Diseases Fact Sheet

1. Three forms of mosquito transmitted encephalitis which occur in Utah are: Western Equine Encephalitis (WEE), St. Louis Encephalitis (SLE), and West Nile Virus (WNV). WEE affects both humans and horses; SLE affects only humans and some birds (emu's); WNV affects humans, horses, birds, alligators and even squirrels.

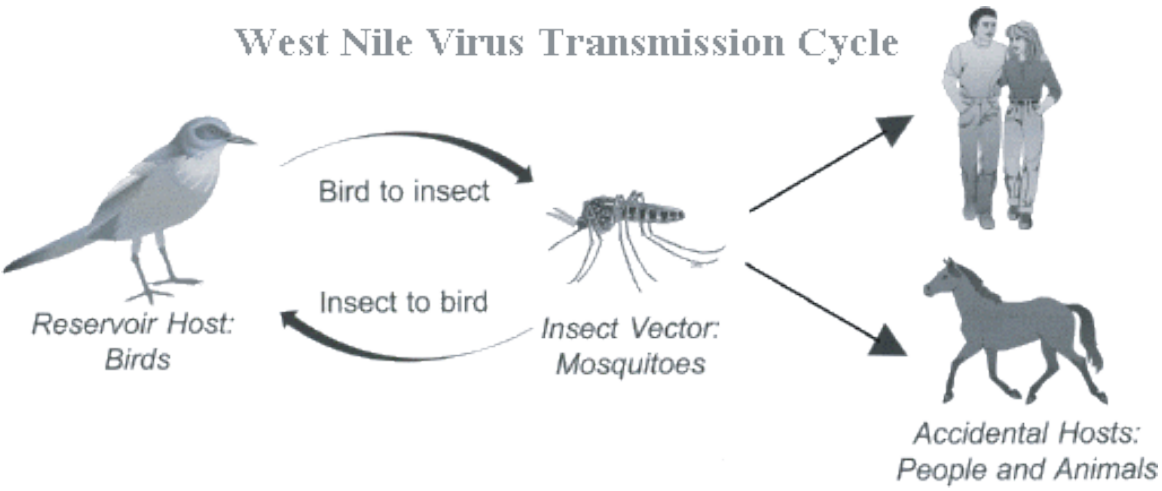
2. The last outbreak of WEE in humans in Utah was in 1958. There has never been a human outbreak of SLE in Utah. WNV was first found in the United States in 1999. It was found in Utah in 2004, and has been active since.

3. In their most severe forms, all can be characterized by signs and symptoms of neurological damage, which may include paralysis and memory loss, and flu like symptoms ranging from very mild to severe.

4. The viruses that cause WEE, SLE and WNV are naturally found in wild bird populations, multiplying in their blood. If a *Culex tarsalis* or Culex pipiens female mosquito (only the females bite) takes a blood-meal from an infected bird and later takes a blood-meal from a human or horse then those animals may become infected. The *Culex tarsalis* bite only at dusk and dawn. If you are outside at that time precautions can be taken to minimize the risk.

5. During the summer MAD-D places flocks of chickens throughout the county and tests them weekly for the presence of antibodies to the viruses. Mosquito pools are also collected and tested for the viruses.

6. Early detection of encephalitis viral activity will hopefully give the mosquito abatement district a chance to concentrate their efforts in reducing the populations of the mosquito species *Culex tarsalis* and *Culex pipiens* which transmit the virus.



Canine Heartworm Disease

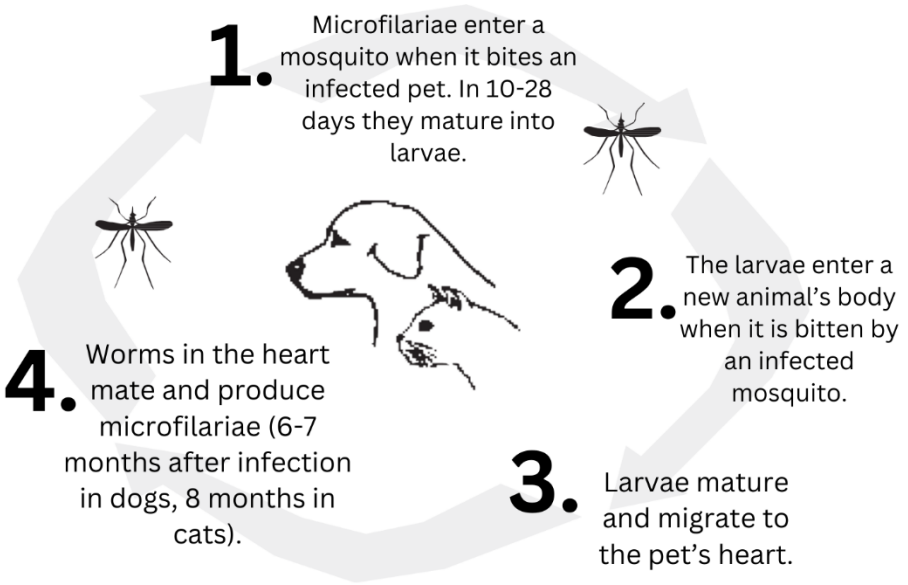
Canine Heartworm Disease (CHD), commonly called dog heartworm, is caused by a filarial worm, *Dirofilaria immitis*, being transmitted to dogs while being bitten by a mosquito. There are 3 stages in the heartworm life cycle:

1. The adult female heartworm lives in the heart of the dog and produces live immature worms which are released into the dogs bloodstream.

2. When a mosquito bites an infected dog, the immature worms are ingested with the blood. The immature worms develop into infective larvae in the mosquito in 2 to 4 weeks.

3. When the infected mosquito bites another dog, the larvae are passed into the dog's tissues. The larvae move to the dog's heart where they grow into adults, reaching a length of 6 to 12 inches. After mating the female begins to produce immature larvae, and the cycle repeats.

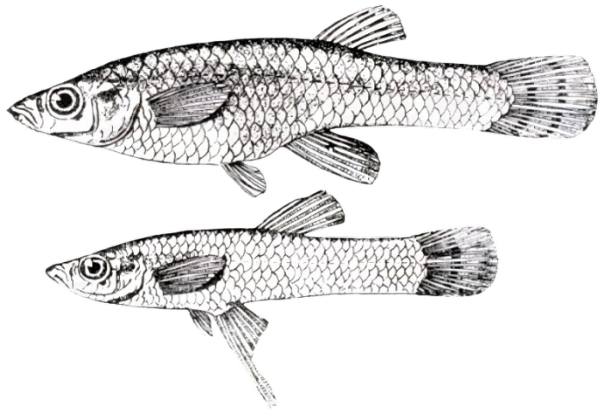
Preventative drugs are available. Please contact your veterinarian for more information regarding prevention, treatment and cure.



Tree Holes

Example the trees on your property for rot holes or cavities which can hold or contain water. If found, contact your local mosquito abatement district so a trained technician can come by and treat the rot hole. The spread of Canine Heartworm Disease can be controlled through the use of preventative drugs and the elimination of tree hole mosquito larval habits.

MOSQUITO FISH



IMPORTANCE

Gambusia affinis (mosquito fish) have been stocked throughout the world for mosquito control. Its appetite for mosquito larvae is well known.

GENERAL INFORMATION

Mosquito fish are primarily used to control mosquito larvae in small ornamental pools and fish ponds. The mosquito fish is a comparatively small species; the full- grown females are usually under 2.5 inches in total length, while males are typically under 1.5 inches. The muted silver and light green body color is common in both sexes. In addition, they are able to lighten or darken to the immediate environment.

LIFE CYCLE

Mosquito fish are ovoviviparous: that is the female is fertilized internally, the eggs hatch within her body and are delivered as free-swimming independent juveniles.

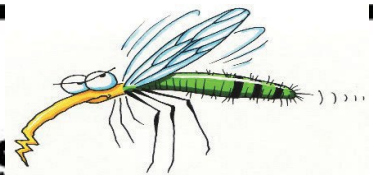
APPLICATIONS

The Mosquito Abatement District- Davis (MAD-D) provides mosquito fish to any Davis County resident for placement in ornamental pools at their residence. The MAD-D maintains a file of all known ornamental pools. A trained inspector will deliver the mosquito fish to all pools on file. In general mosquito fish are stocked in very small numbers because they quickly reproduce to the maximum population levels that a particular habitat may sustain. In small, confined mosquito sources, such as ornamental pools, small fishpond, bird baths, and cattle/horse water troughs, 5-15 adult fish will provide rapid mosquito control and soon reproduce and increase in numbers.

TIPS FOR CARE

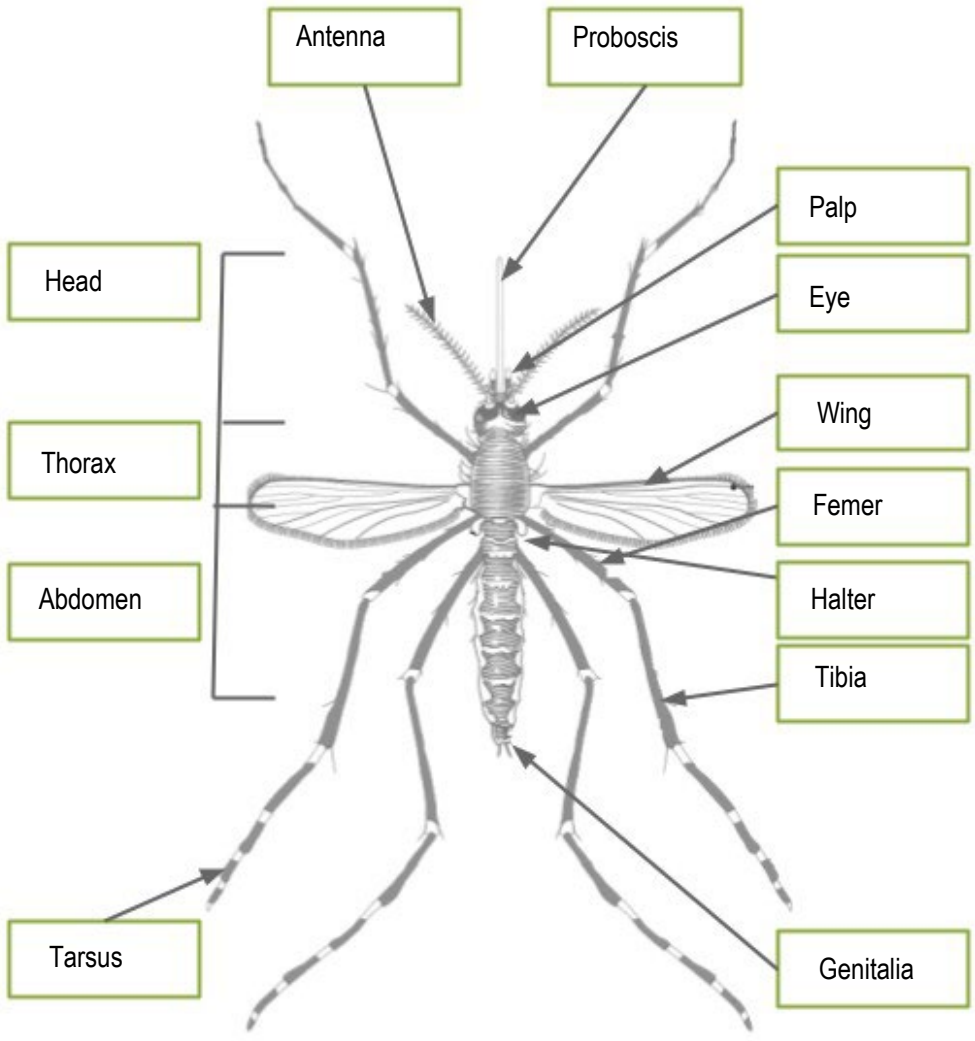
1. Keep the water level at one foot or more
2. Provide the mosquito fish with some shade or shelter, such as an overhead sunscreen or even aquatic plants. (Aquatic plants may be purchased at large nurseries.)
3. Do not apply chlorine to pond.
4. Read labels carefully when using Algaesides to control algae growth in your ponds. Make sure it is compatible with your fish.
5. Fish will overwinter in pond if the pond doesn’t completely freeze over.

Name: _____



Parts of a Mosquito

Understanding the anatomy of a mosquito provides significant insights into their behaviors. Identify and write the parts of a mosquito on the box provided.



Wing
Abdomen
Femur
Genitalia
Antenna
Proboscis
Eye
Halter
Thorax
Tarsus
Head
Tibia
Palp

Mosquito Habitat Checklist

Common Household Items:

- Buckets, garbage cans and recycling bins

  Problem: Buckets, cans and bins are the most common mosquito habitats found at homes, and all can hold water.
  Solution: Empty buckets and turn them over. Drill drainage holes in the bottoms of garbage cans and bins, keep covered and dispose of recycling weekly.

- Tarps, plastic bags and sheets

  Problem: When tarps are not fitted tightly, multiple pockets form and collect water.
  Solution: Keep tarps tight and refit them if water collects.

Building structures:

- Gutters and flexible downspout

  Problem: Gutters hold water when clogged with leaves or improperly pitched and the leaf debris provides food for the larvae. Improper pitch and ridges can also cause these pipes to hold water.
  Solution: Keep gutters clean and properly pitched. Pitch downspout extensions so water drains completely after it rains or replace with a non-flexible extension that is pitched to drain fully. Keep the inside free of debris.

- Leaky hose

  Problem: Water can accumulate below the faucet. Solution: Fix leak or call a professional plumber.

- Decks & porches

  Make sure to check under decks and porches for containers that may hold water and drain them.

Around the Garden:

- Planter saucers, planters without drainage holes, self-watering planters and watering cans

  Problem: If a plant saucer holds water or doesn't drain properly for 5-7 days it will support mosquito larvae. The holes used to water plants can also be used by the female mosquito to access the water and lay eggs.
  Solution: Dump the water out every 3-5 days or don't use a saucer at all. Drill holes in the bottom of your planters; tightly seal watering holes after adding water or treat the reservoir water with product to get rid of mosquito larvae etc.

- Wheelbarrows

  Problem: water collects in the main tub or small crevices inherent in their construction. Solution: Turn wheelbarrows over to store them on end.

- Bird Baths and ornamental ponds

  Problem: Unless water is changed regularly, mosquito larvae flourish. Ornamental ponds without fish provide a great home for mosquitoes.
  Solution: Change water in bird baths at least once a week. If possible, get fish from your local mosquito abatement for your pond that eat mosquito larvae and pupae. If that is not an option, the abatement can perform other treatments to curb the problem.

- Behind the shed & under the shrubs

  Problem: Discarded and unattended items in hard-to-reach spaces can collect water.
  Solution: Look under bushes and in overlooked spots in the yard and remove debris that can hold water.

- Tree Holes

  Problem: Cavities in trees can collect and hold water which can breed mosquitoes.
  Solution: Use waterproof foam to fill the void or have them treated by the mosquito abatement.

RECREATION:

- Boats and Jet skis

  Problem: There are many compartments on boats that can collect water. Even when a boat itself doesn't hold water there can be containers left on a boat that do. Foot depressions on Jet skis tend to hold water and provide a mosquito breeding ground.
  Solution: Empty all the water possible. If there is water that can't be emptied, you can treat it with a BTI product. Cover boats in storage with taut tarps or use boat shrink wrap. Rinse out the foot depressions with a hose every week. Jet skis can be tightly tarped or stored indoors.

CHILDREN'S TOYS:

- Portable basketball hoops

  Problem: The fill holes in the base of a portable basketball hoop allow mosquitoes to reach the water and lay eggs.
  Solution: Make sure caps for fill holes are in place; replace if lost.

- Kiddie pools and sand boxes

  Problem: Kiddie pools can become mosquito habitat if the water is not changed often. Water can also accumulate in some plastic sand boxes whether covered or not.
  Solution: Empty or change water in kiddie pools every 5-7 days. Be sure to store indoors or turn it over when not in use. Drill small drainage holes in the bottom of your sand box.

- Big plastic toys, wagons, etc.

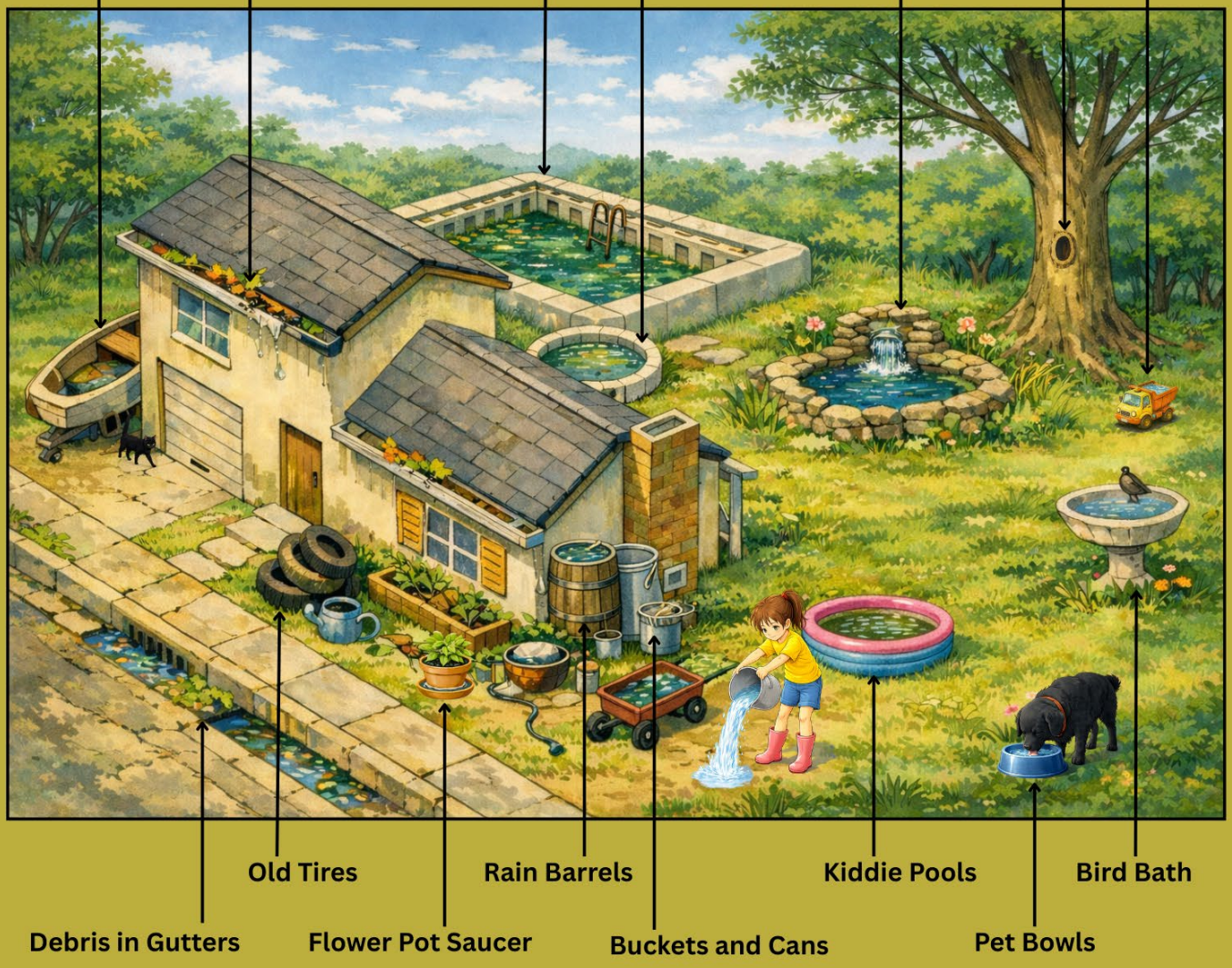
  Problem: Wagons, dump trucks, cars, kitchen sets, and playhouses all fill with rainwater when left outside and, if left unchecked, will breed mosquitoes.
  Solution: Keep toys turned over or inside when not in use. If water can get inside the plastic toy so can a mosquito- drill drainage holes in the bottom.

- Deflated toys

  Problem: Like a tarp, a deflated toy (kiddie pool, bounce house, etc.) will create multiple small pockets that fill with water and provide habitat for larvae.
  Solution: Drain off water, dry out, and store indoors when not in use.

You can help reduce mosquito breeding around your home!

Anything that can hold a teaspoon of water can become a mosquito breeding site. Pet dishes, yard toys, and wheelbarrows are common problem spots. Dump standing water every 5 days to help reduce mosquitoes around your home.



We're here to help!

Contact our office with questions or concerns about mosquitoes in your neighborhood. These services have been funded through property taxes and are available to residents of Davis County.