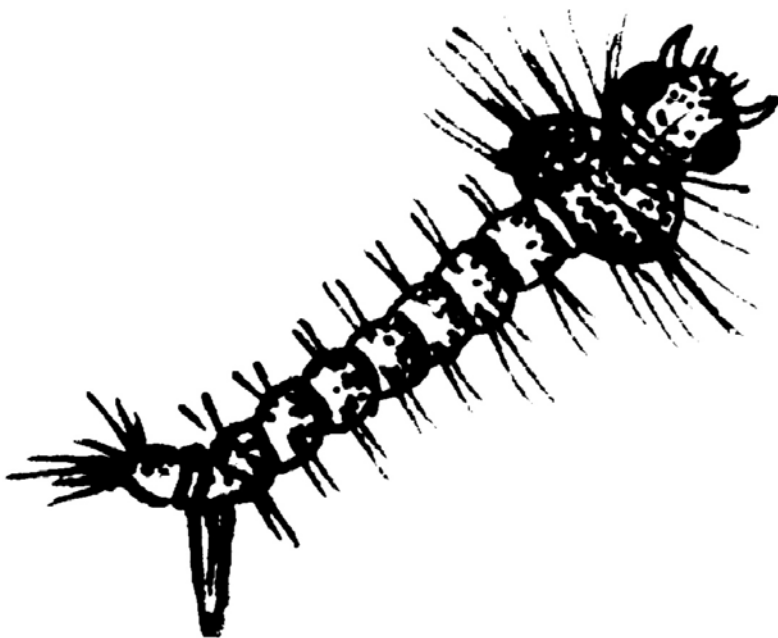


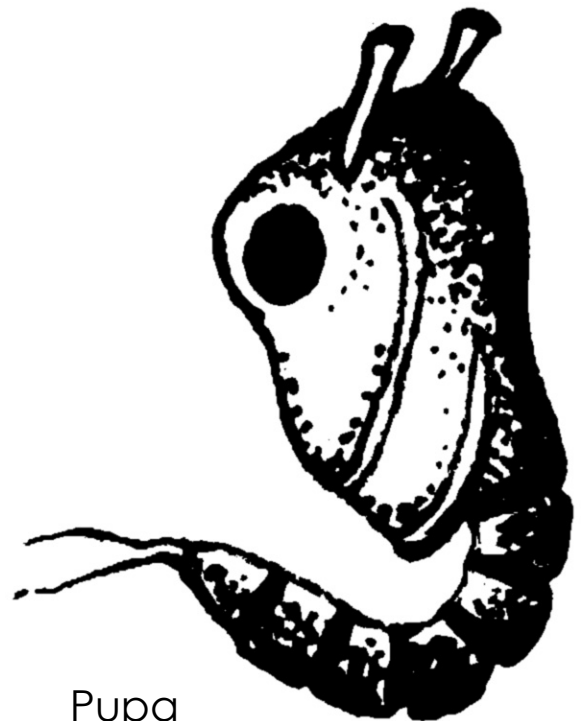
*Which came first,  
The Mosquito  
Or the Egg?*

No one really knows for sure. But what we **do** know is that mosquitoes go through four stages of growth: Eggs hatch into

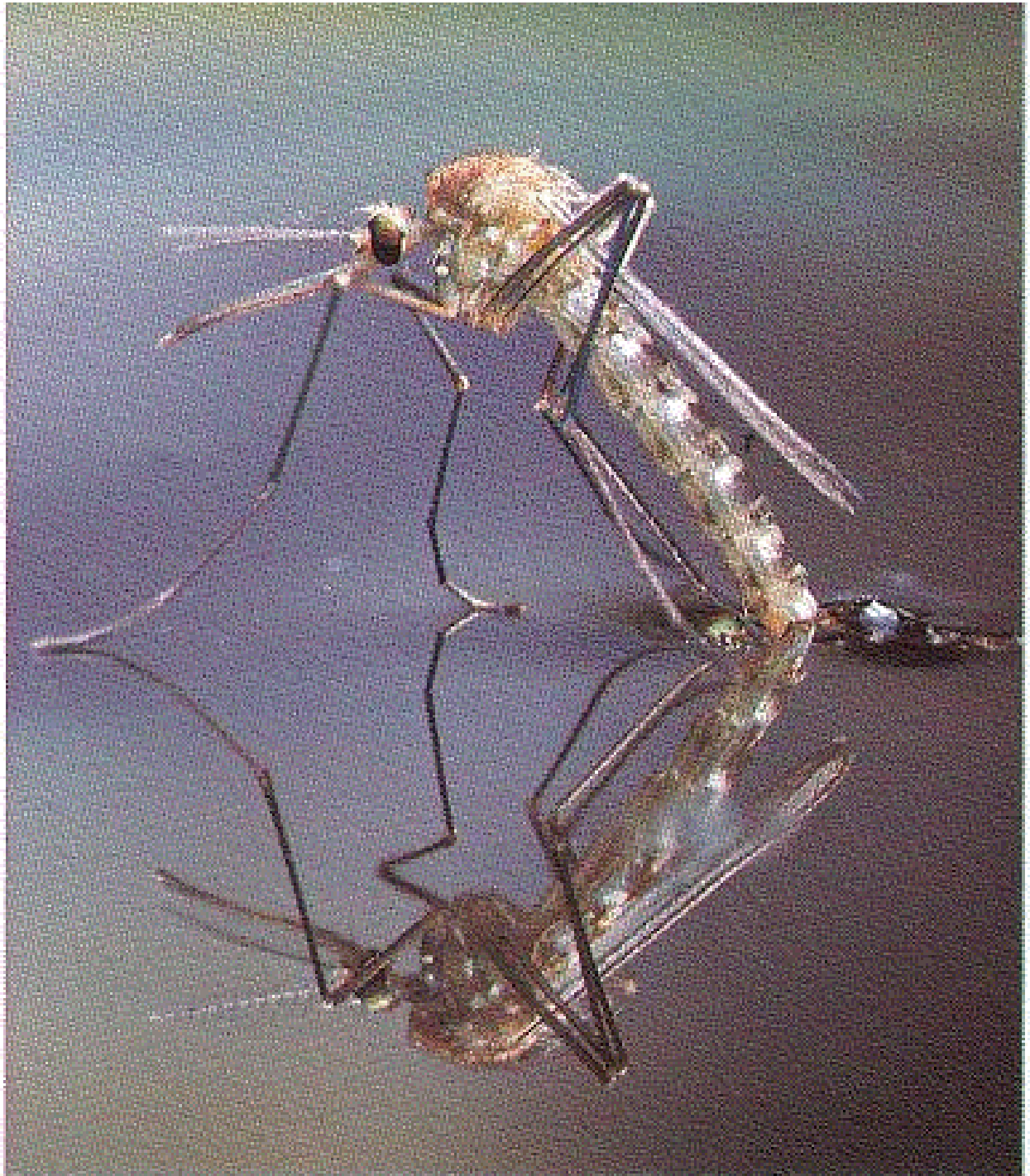
larva, which curl up into pupa, which then split open, and out climbs a full grown mosquito! This whole process takes anywhere from days to weeks, depending upon outside temperatures. The warmer it is, the faster they grow! Here are some "baby" mosquitoes for you to color.



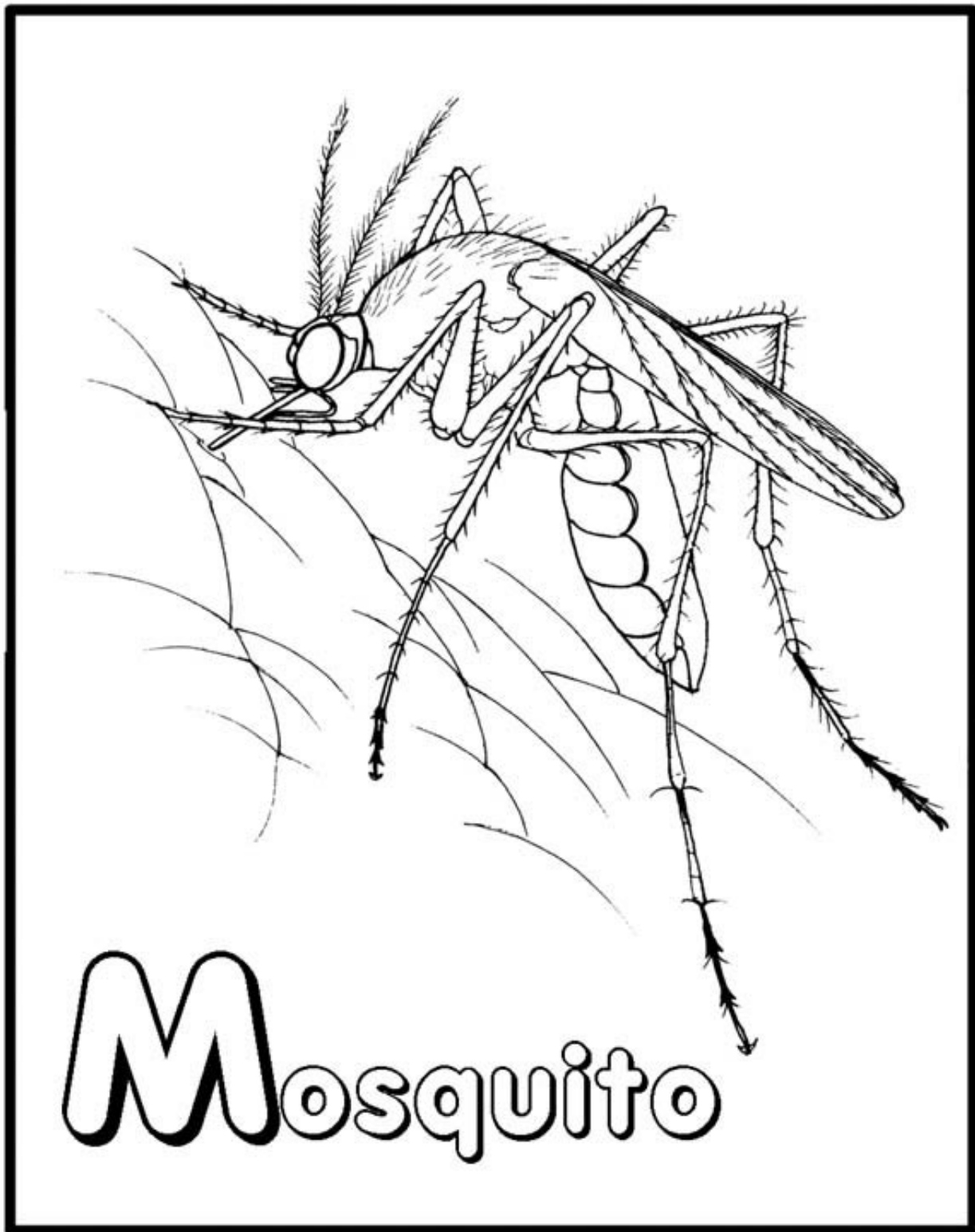
Larva



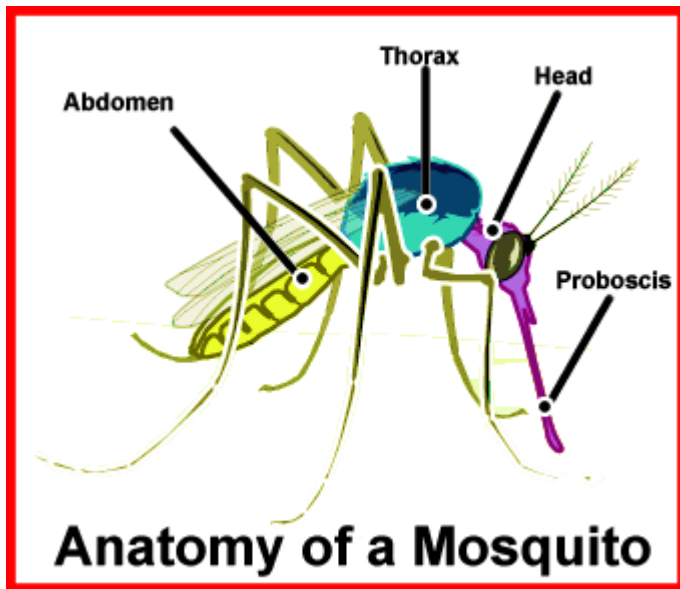
Pupa



When it's time to hatch, the pupa case splits open, and the mosquito climbs out, rests on top of the water long enough to dry its wings, and then it flies away!

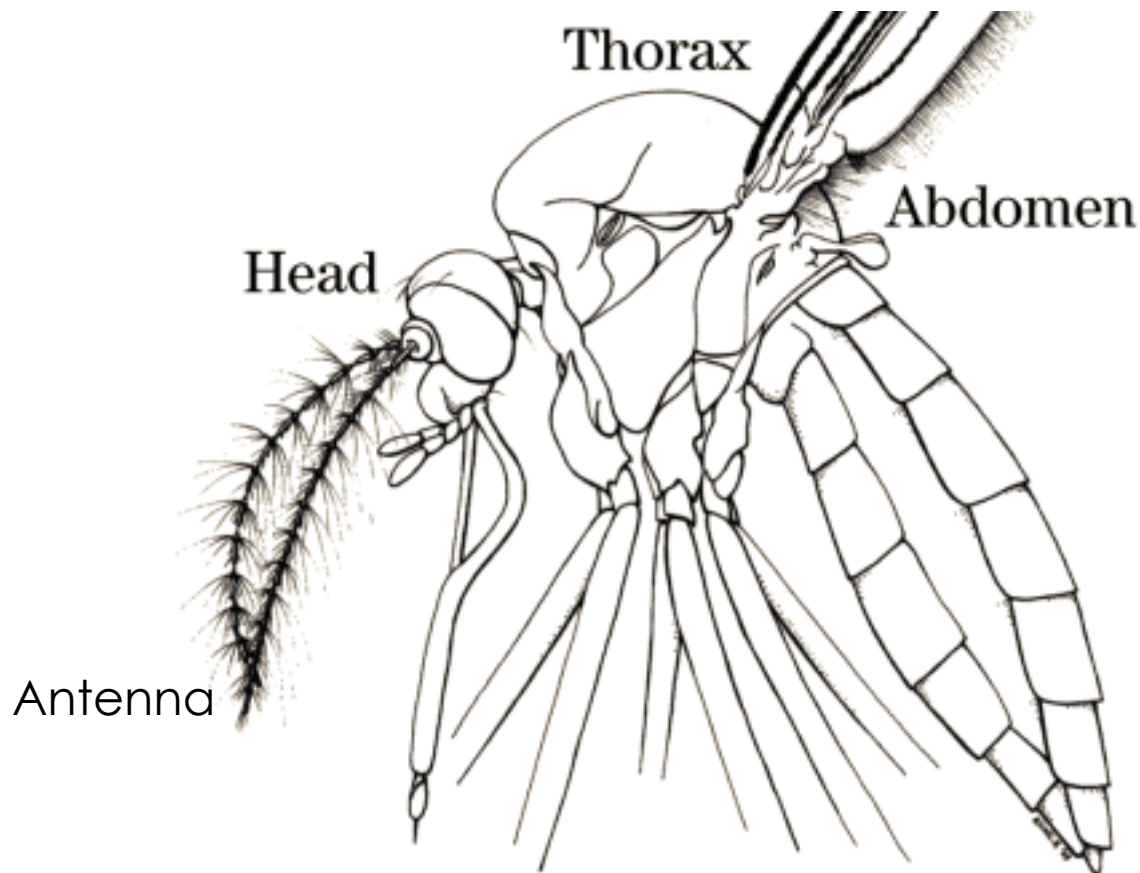


Mosquitoes actually have many different colors. What colors will you use on this one?



Mosquitoes have three main body parts: The abdomen, thorax, and head. They have one set of wings and six legs. They also have two antennae; male mosquitoes have much more hairs on

their antennae (like beards!) The proboscis is what they use to suck your blood!



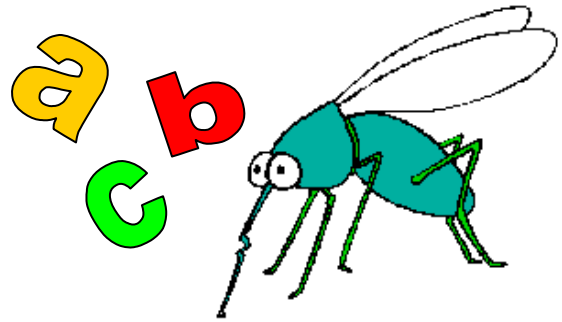
Can you tell if this mosquito is a boy or a girl?



Connect the dots and see what's waiting to bite you!

# Mosquito Scramble

*See how many of the scrambled words you can figure out!*



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

## Mosquito Control Patrol

# Vocabulary

### Lesson One: Mosquito Biology

- Anatomy – Structure and organization of living things (How we are all put together)
- Abdomen – The part of the body between the Thorax and Pelvis (belly)
- Thorax – The part of an insect between the head and the abdomen; that bears wings and legs
- Proboscis – Nose; long flexible snout (is actually mouthpart of mosquito, used for sipping nectar, sucking blood)
- Antenna – mobile appendages (body parts) sensitive to touch and taste – or – electrical device that sends or receives radio or television signals – *Male mosquito antennae sense sound waves created by beating of female's wings*
- Nectar – sweet liquid given off by flowers to attract insects
- Hemo-Sanguine – Hemo, when used as part of a word, means “blood.” Sanguine – of the color of blood; red
- Habitat – type of environment in which an organism (mosquito) normally lives

## Mosquito Control Patrol

# Vocabulary

## Lesson Two: Life Cycle of a Mosquito

- Electron Micrograph – graphic reproduction (drawing) of an object seen through a microscope
- Larvae – Newly hatched mosquitoes are called larvae, and look like worms. As they grow, they shed their skin, or molt. The fourth time they molt, they change into Pupae.
- Siphon – Air tube or snorkel that larvae use to breathe air from the surface of the water.
- Particle – A very tiny piece of anything.
- Pupae -- When mosquitoes are changing from larvae to adults, they are called pupae (more than one pupa). During this stage they are inactive, and curl up into a C shape, with a hard outer shell.
- Trumpet – Appendage (body part) of a pupa which is shaped like a trumpet; contains part of developing mosquito.

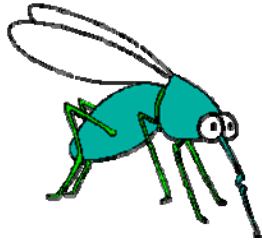


## Mosquito Control Patrol

# Vocabulary

### Lesson Four: Control of Mosquitoes

- Integrated Pest Management – A pest control strategy (plan) that uses an array of complementary methods such as natural predators and parasites, biological controls, source reduction, and uses pesticides as a last resort. (*Complementary – work well together*).
- Source Reduction: To empty out containers which hold water. Anything which holds water for more than 5 days can be a *source* of mosquitoes.
- Biological Control – Use mosquitoes' natural enemies to control them, i.e. fish, bats, purple martins. Also to feed them types of bacteria which make them sick.
- Larvicide – Kill larval mosquitoes.
- Adulticide – Kill adult mosquitoes.
- Surveillance -- Keep a close watch. In mosquito control, to monitor mosquito populations and disease potential through mosquito trapping and regular testing of sentinel chicken blood for signs of exposure.
- Sentinel – Lookout, guard, or sentry. Sentinel chicken programs provide early warning of the presence of disease-carrying mosquitoes.



# My Backyard Survey

Name:

Date:

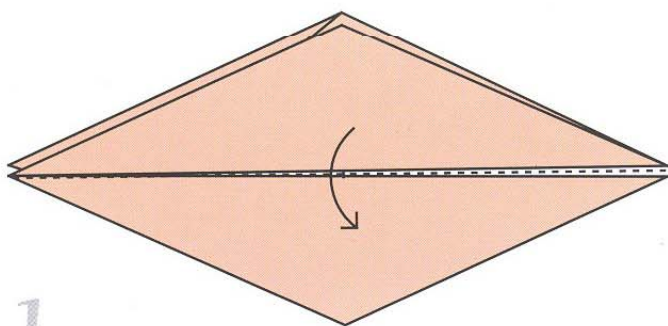
Container Type	Water (Y/N)	Larva (Y/N)	Action Taken

Container types: Treeholes, Cans, Cups, Bottles, Pet Bowls, Buckets, Tires, Barrels, Flowerpots, Toys, Wheelbarrows, Rain gutters, Sagging Poolcovers, Bird Baths and anything else capable of holding water after rainfall.

# Mosquito

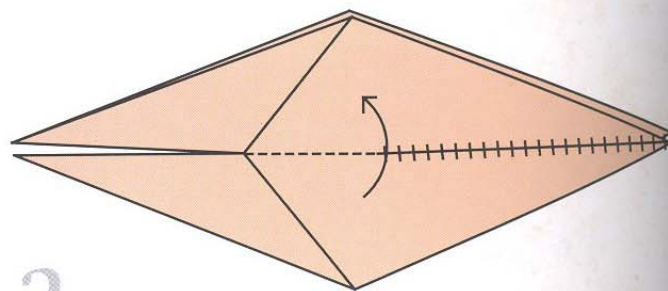


## Part 1



1

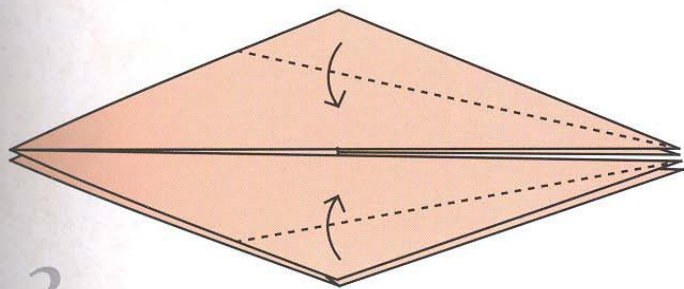
Start with Base Fold III, then valley fold both sides.



2

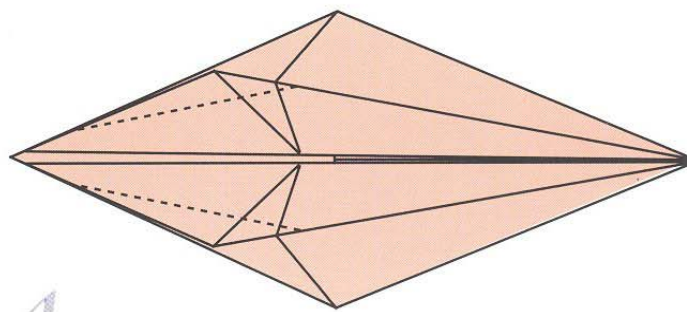
Cut through, then valley fold both sides.





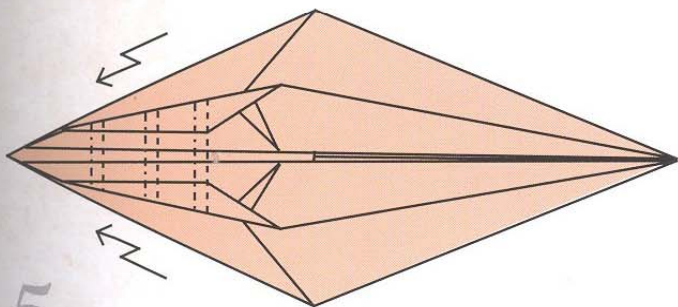
3

Valley folds to center.



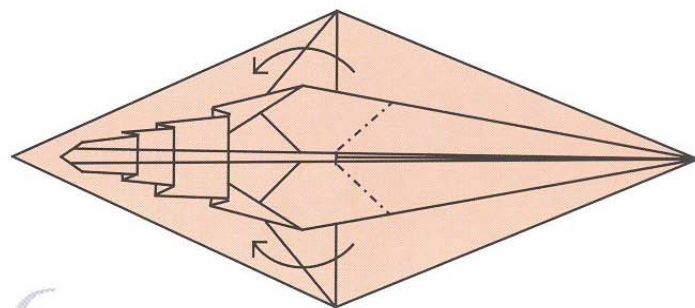
4

Valley folds.



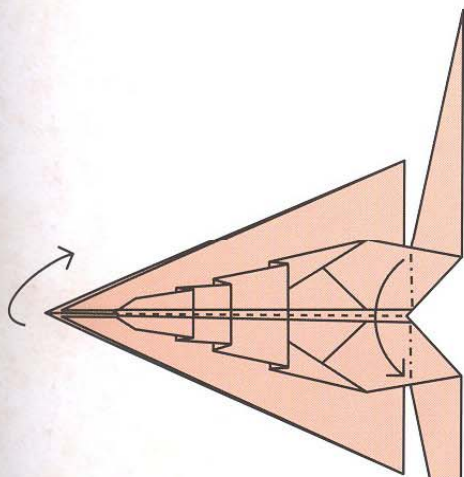
5

Pleat folds.



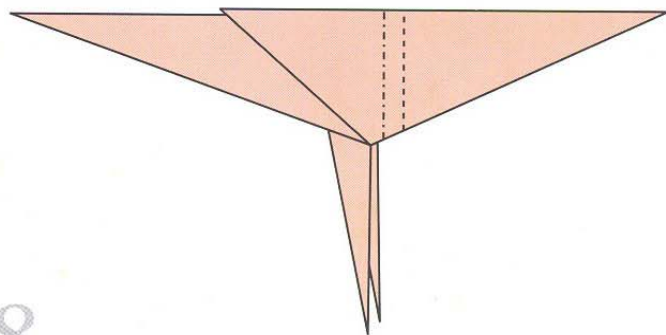
6

Mountain fold center sections out to sides.  
Valley fold outside flaps to left as shown.



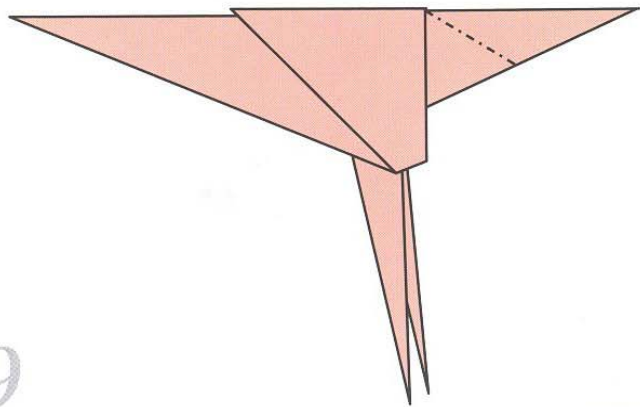
7

Mountain fold legs. Flip back flap  
to right as shown. Valley fold in half.



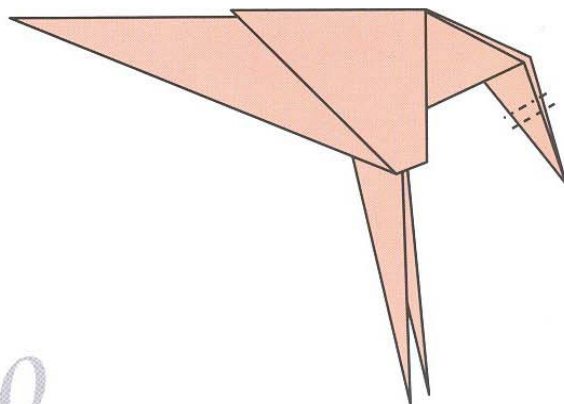
8

Pleat fold.



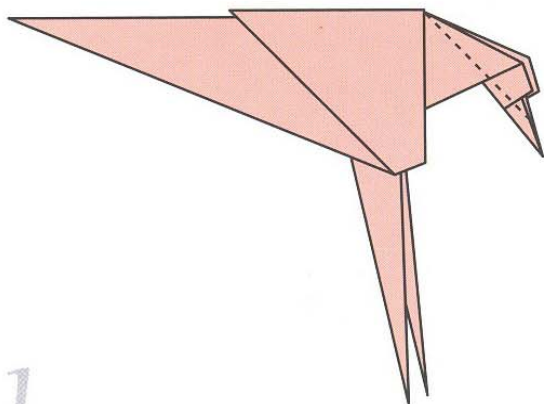
9

Inside reverse fold.



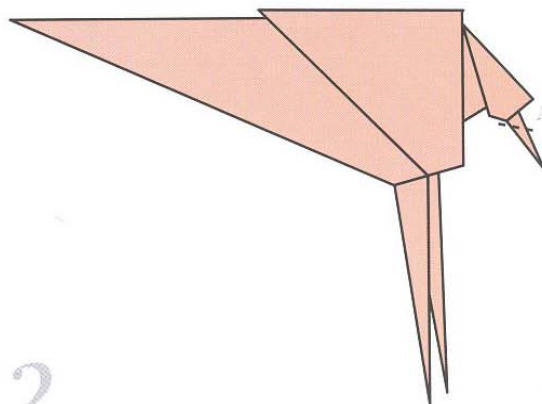
10

Pleat fold.



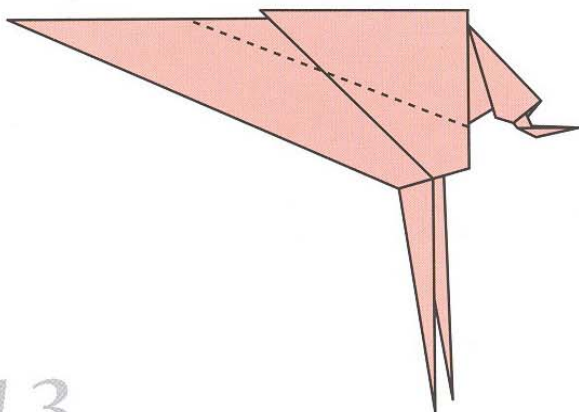
11

Valley folds both sides.



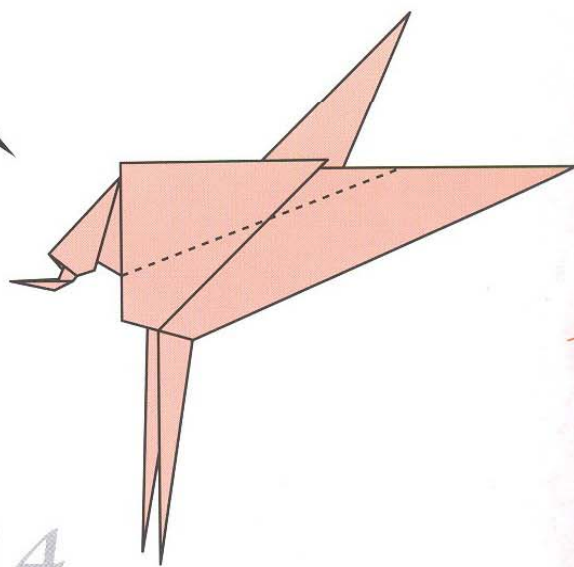
12

Outside reverse fold.



13

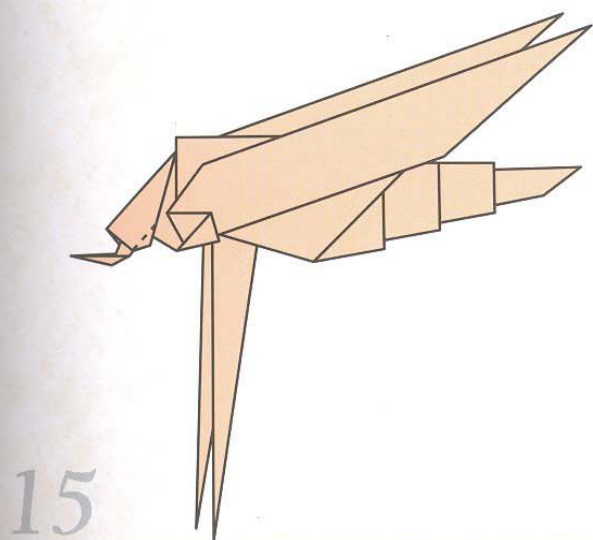
Valley fold, then turn over.



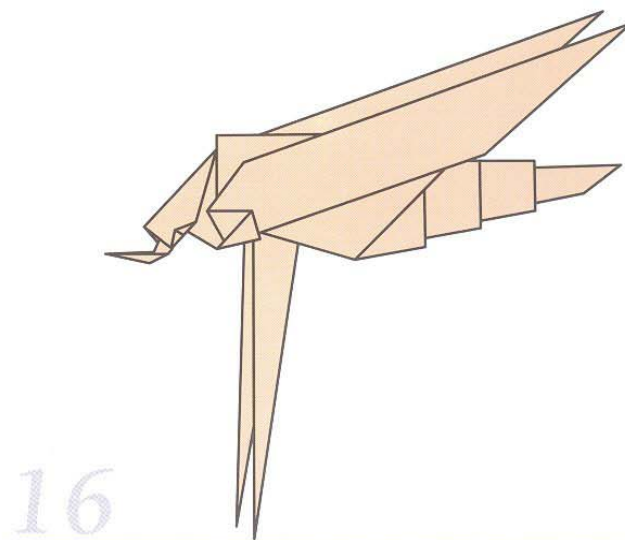
14

Valley fold.



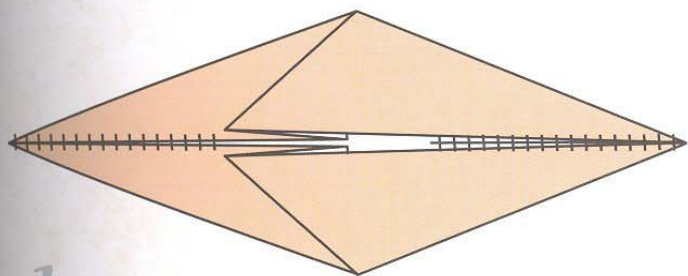


Valley folds both sides.

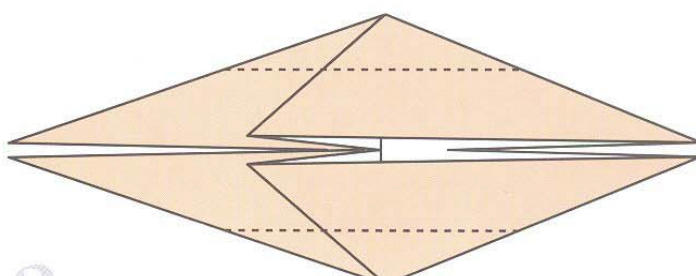


Complete part 1 (top) of mosquito.

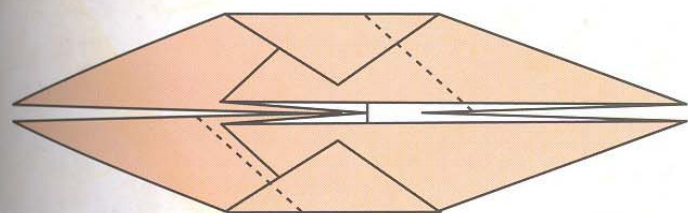
## Part 2



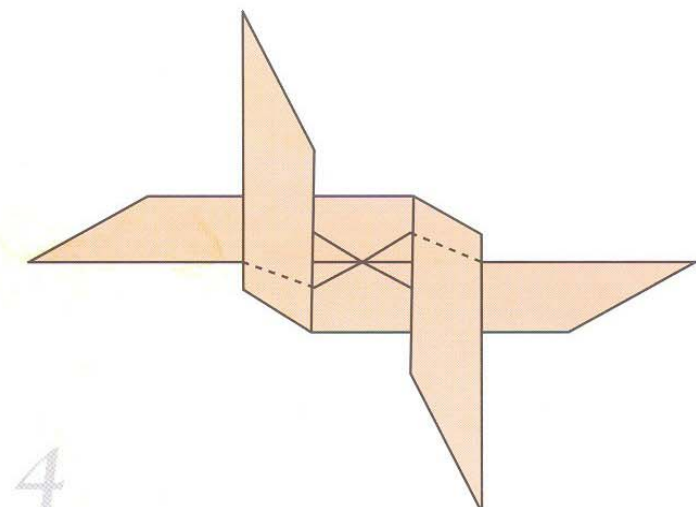
Start with Base Fold **X**, then cut as shown.  
I



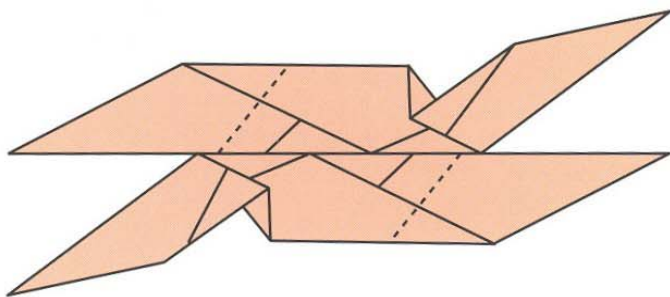
Valley folds.



Valley folds.

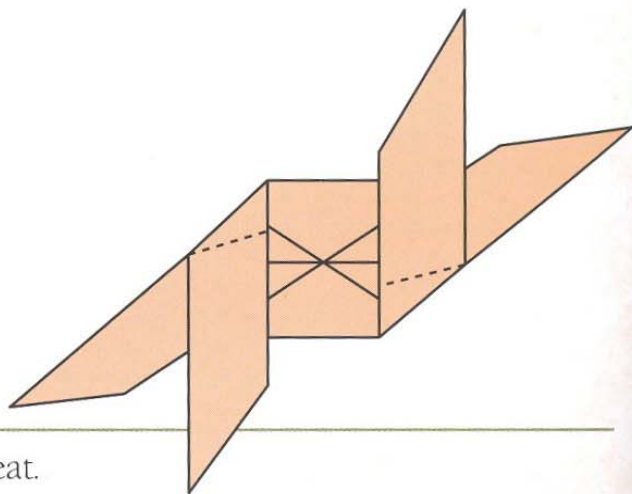


Repeat.



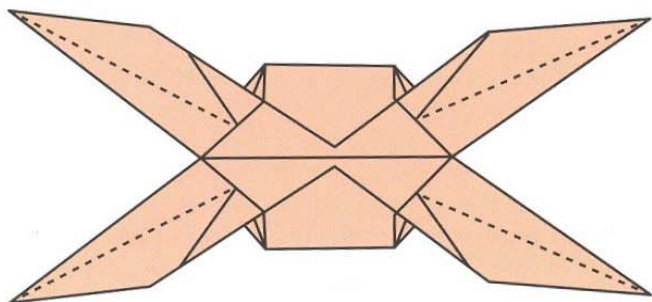
5

Valley folds.



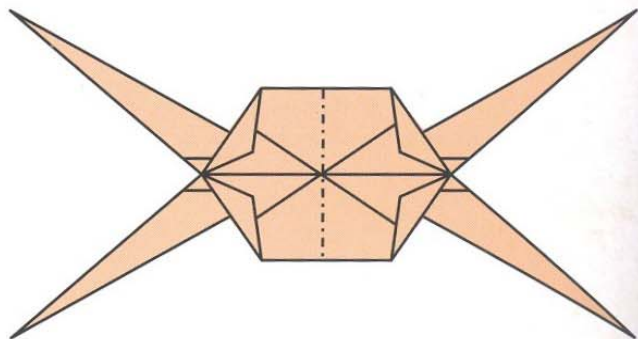
6

Repeat.



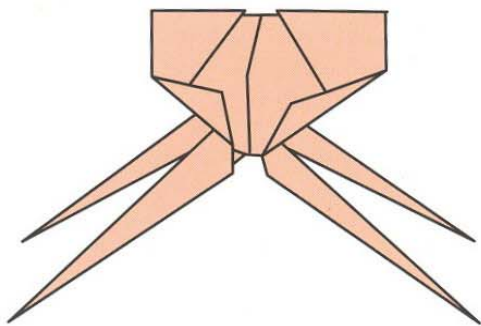
7

Squash folds.



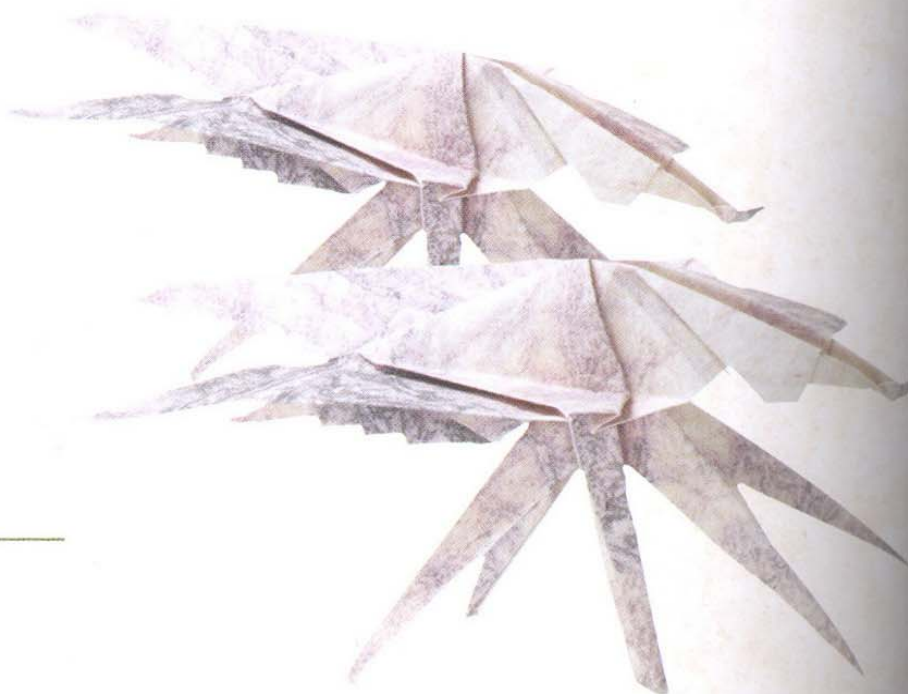
8

Mountain fold in half.

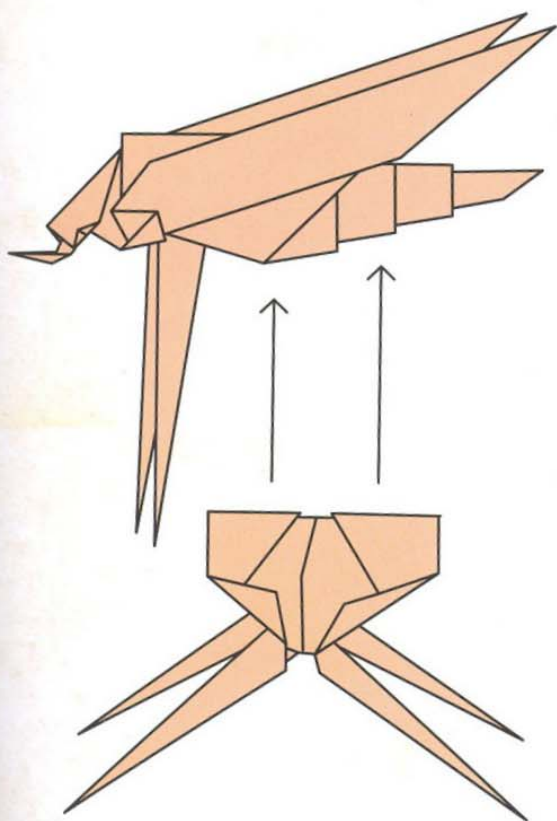


9

Completed part 2 (leg section)  
of mosquito.

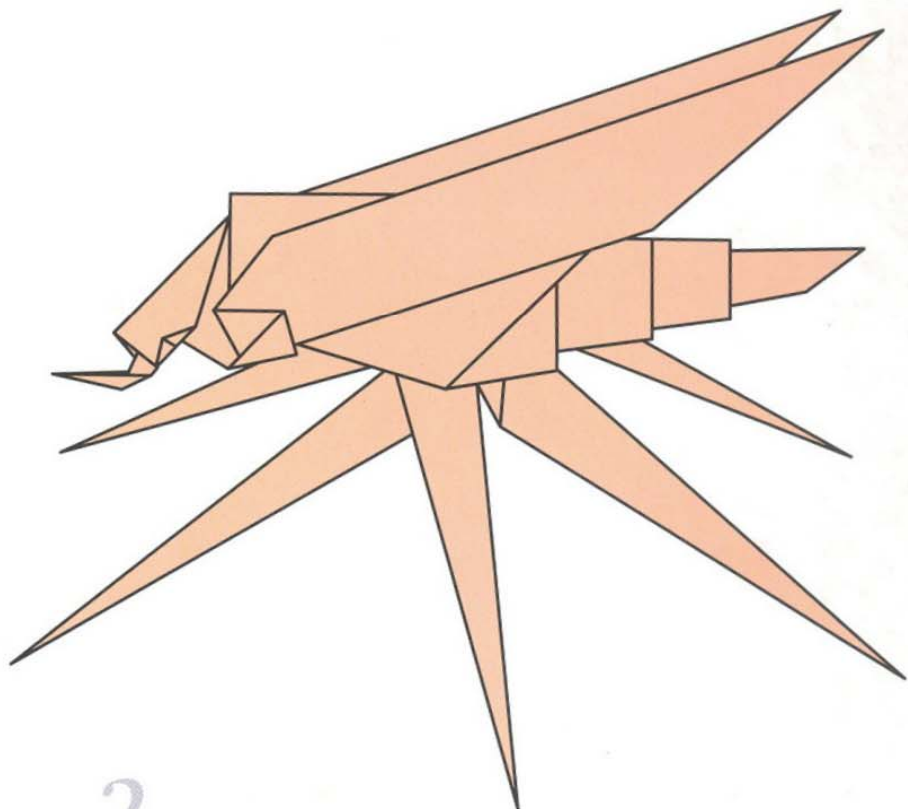


## To Attach



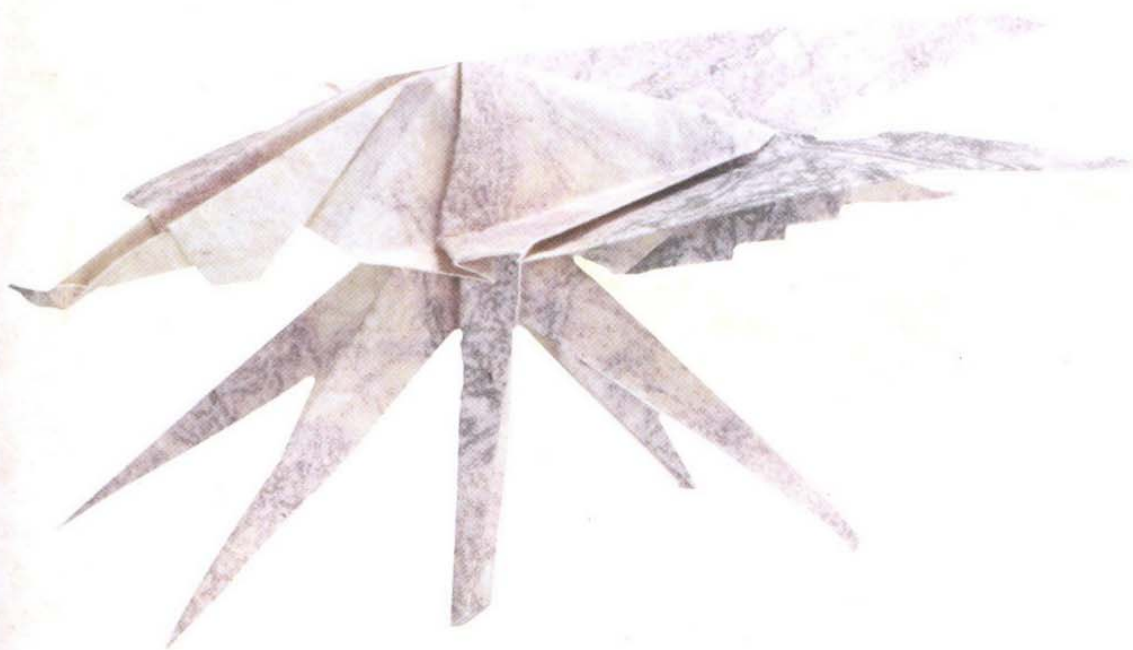
1

Join parts 1 and 2 together as shown.  
Apply glue to hold.



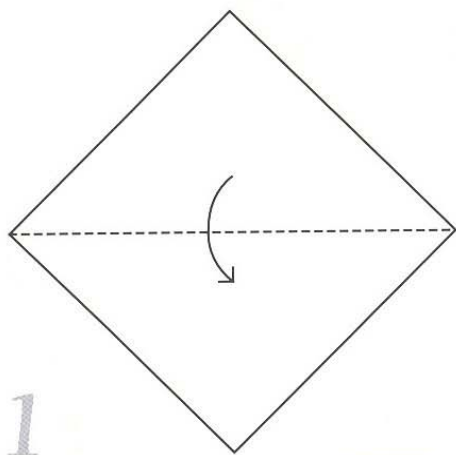
2

Completed Mosquito.

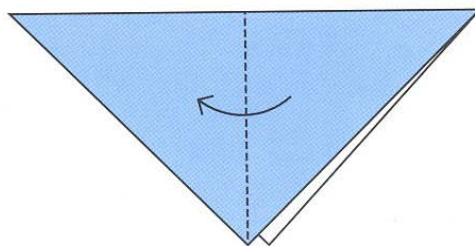




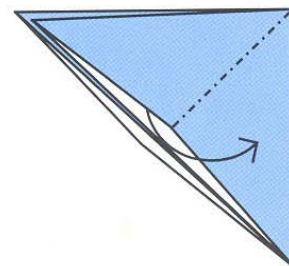
## Base Fold III



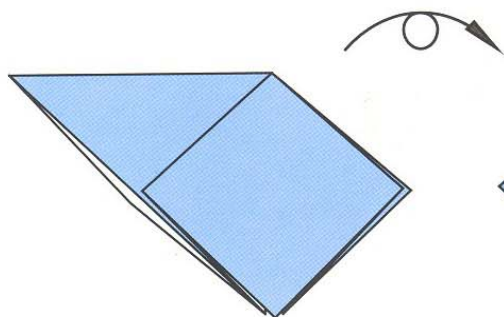
1  
Valley fold.



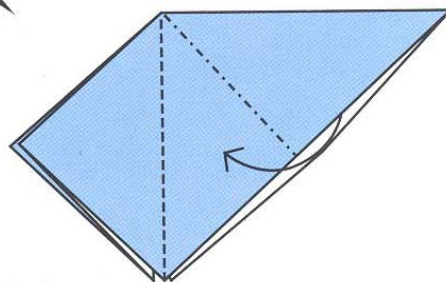
2  
Valley fold.



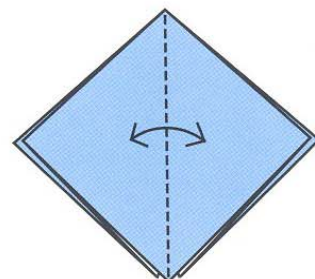
3  
Squash fold.



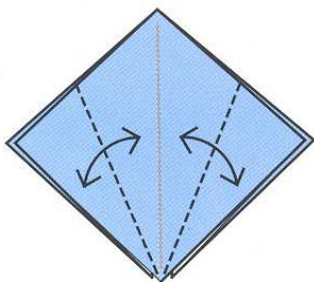
4  
Turn over.



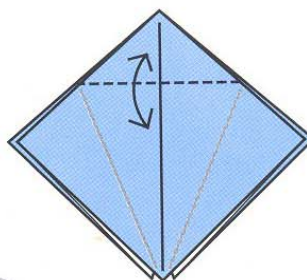
5  
Squash fold.



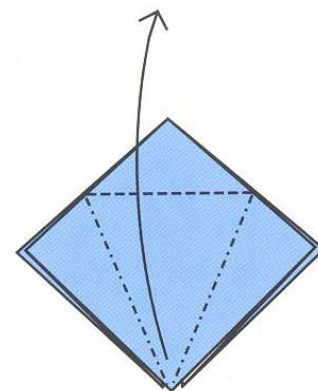
6  
Valley fold, unfold.



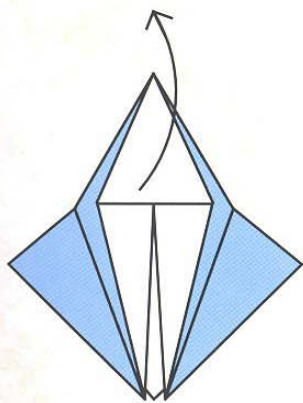
7  
Valley folds, unfold.



8  
Valley fold, unfold.

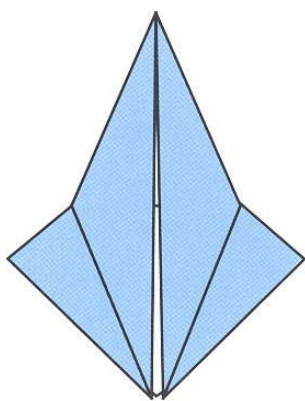


9  
Pull in direction of arrow,  
folding inward at sides.



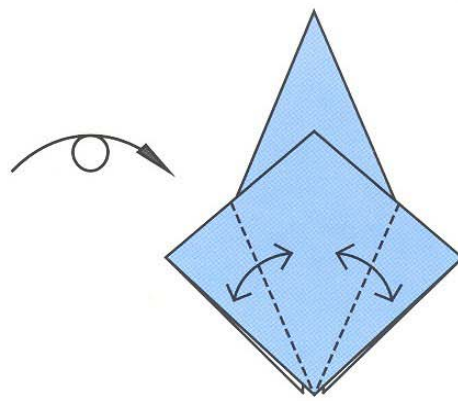
10

Appearance before completion of fold.



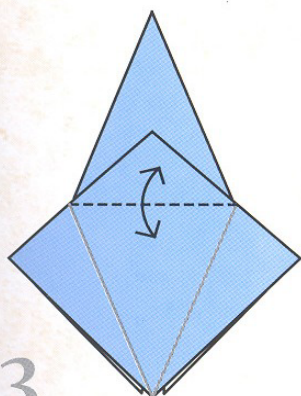
11

Fold completed. Turn over.



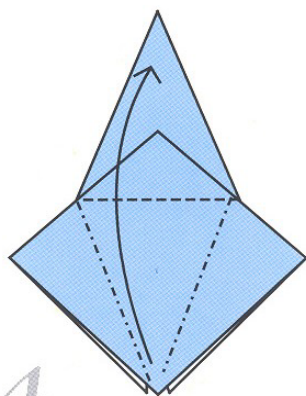
12

Valley folds, unfold.



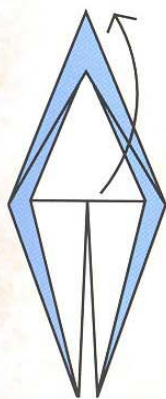
13

Valley fold, unfold.



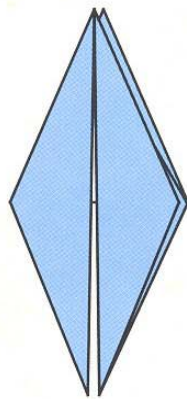
14

Repeat, again pulling in direction of arrow.



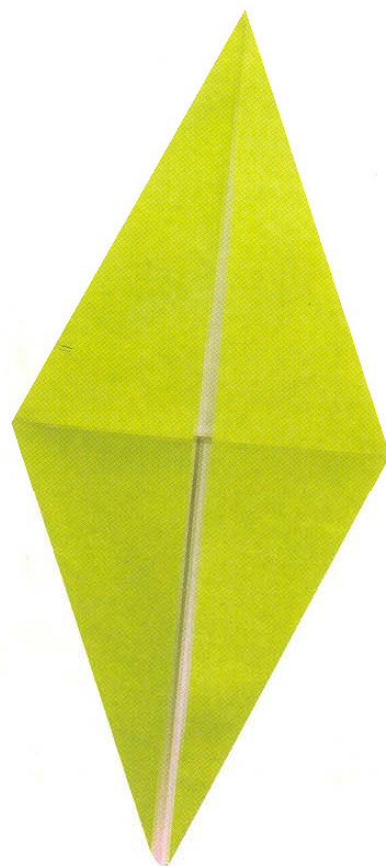
15

Appearance before completion.



16

Completed Base Fold III.

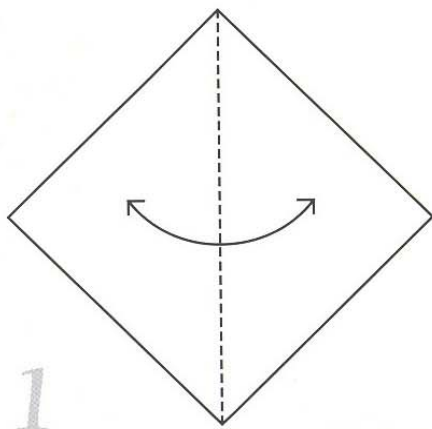




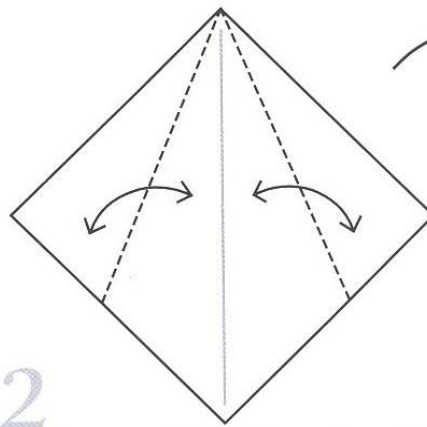
# Base Folds

Base folds are basic forms that do not in themselves produce origami, but serve as a basis, or jumping-off point, for a number of creative origami figures, some quite complex. As when beginning other crafts, learning to fold these base folds is not the most exciting part of origami. They are, however, easy to do, and will help you with your technique. They also quickly become rote, so much so that you can do many using different-colored papers while you are watching television or your mind is elsewhere. With completed base folds handy, if you want to quickly work up a form or are suddenly inspired with an idea for an original, unique figure, you can select an appropriate base fold and swiftly bring a new creation to life.

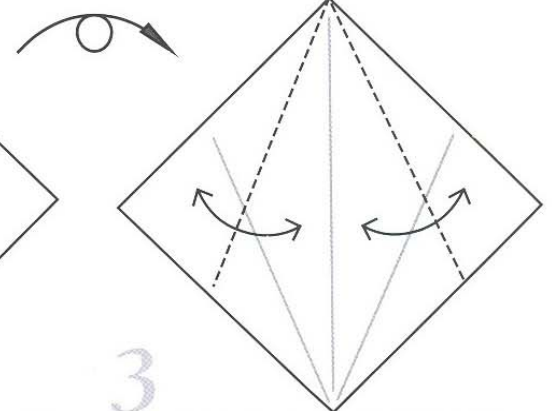
## Base Fold I



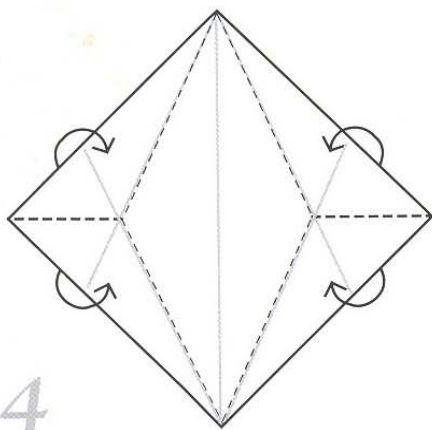
1  
Fold and unfold in direction of arrow.



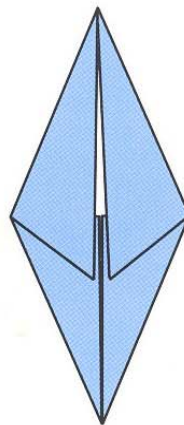
2  
Fold both sides in to center crease, then unfold. Rotate.



3  
Fold both sides in to center crease, then unfold.



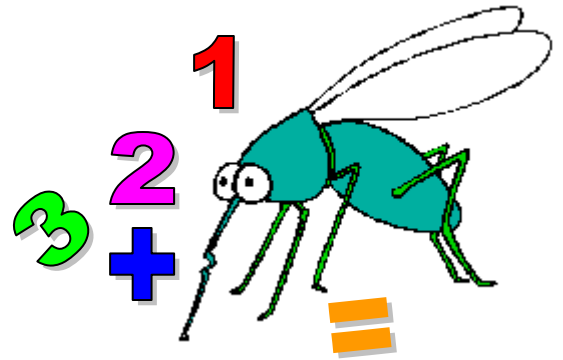
4  
Pinch corners of square together and fold inward.



5  
Completed Base Fold I.



# Mosquito Math Problems



## Problem 1:

A female mosquito lives for 150 days and lays a raft of 250 eggs every 15 days.

- A. *How many times will she take a blood meal during her lifetime?*
- B. *How many eggs will she lay in her lifetime?*

## Problem 2:

A female mosquito lays 1200 eggs in her lifetime. She lays 300 eggs in her first egg batch.

- A. *What percent of her total eggs are laid in the first egg batch?*

## Problem 3:

A mosquito lays 150 eggs in a raft. All of the eggs hatch, but 32% of the larvae are eaten by fish. The rest survive to become adults.

- A. *How many of the larvae are eaten by fish?*
- B. *How many of the larvae will survive to become adults?*

## Problem 4:

A mosquito lays 200 eggs in a raft. Ninety percent (90%) of the eggs hatch. Of the larvae that hatch, 50% are eaten by aquatic predators; the rest survive to become adults. Of the adults that emerge, 20% are eaten by dragonflies and spiders on the way to taking their first flower nectar meal.

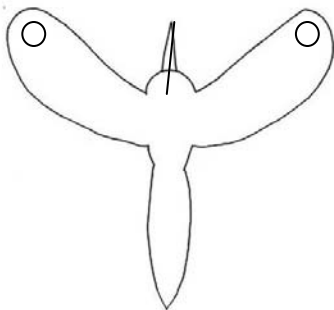
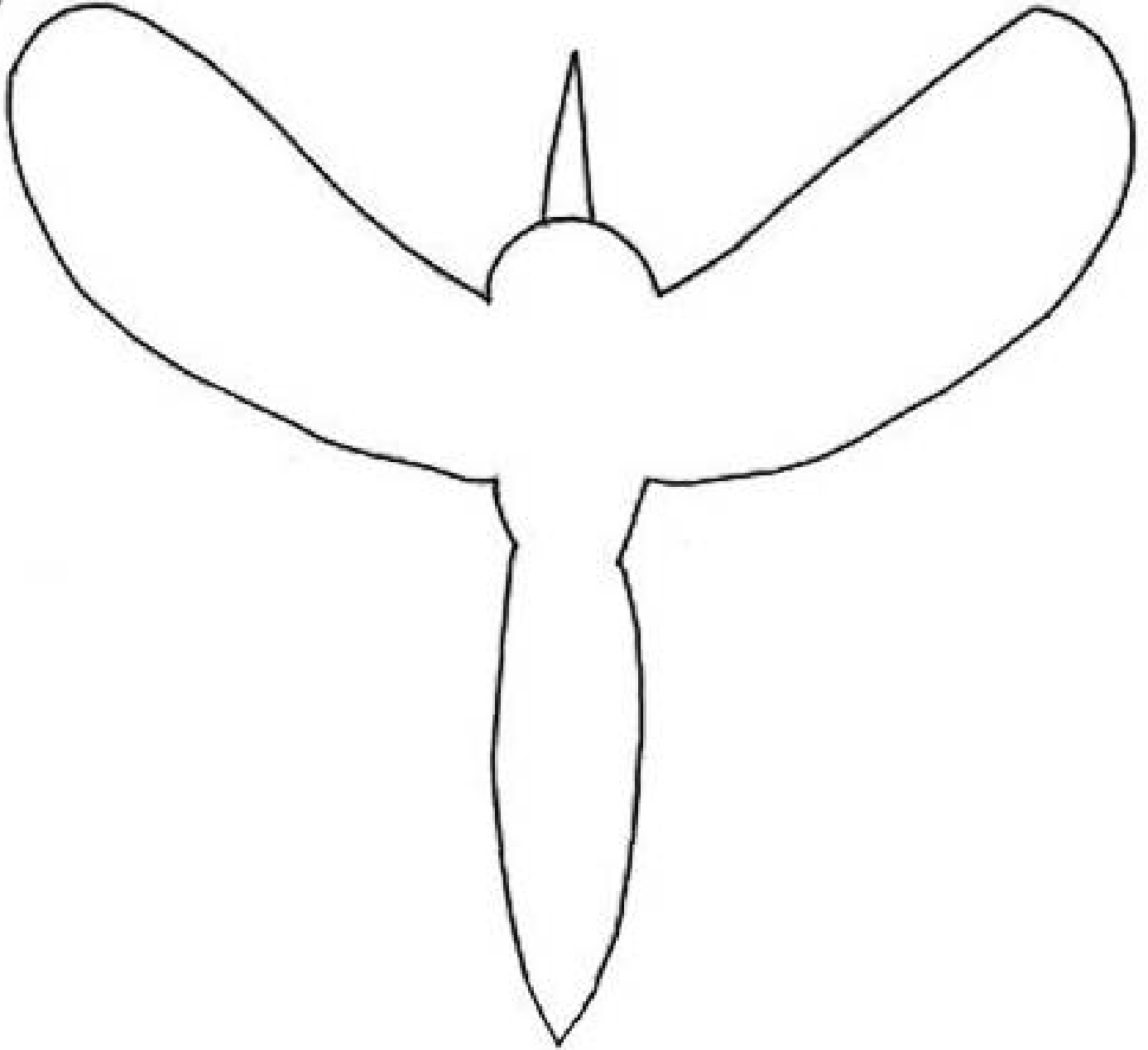
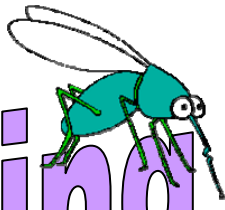
- A. *How many adults make it to the flower to take a meal?*

## Problem 5:

Two mosquitoes fly off together in search of flower nectar. The first mosquito flies 3 miles and finds a flower in a garden. The second mosquito flies 2.5 times that far, and finally finds a clover field.

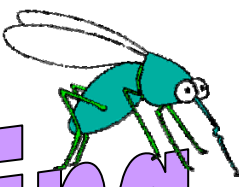
- A. *How far did the second mosquito fly?*

# Balancing Mosquito



*Back view: Place pennies at wing tips and toothpick behind proboscis.*

# Balancing Mosquito



*Make a mosquito that will balance on the tip of a finger or a pencil eraser!*

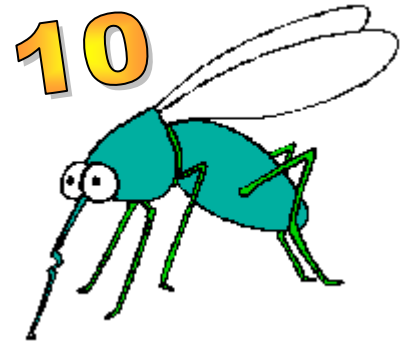
## **Materials**

Balancing mosquito template  
Heavy paper (manilla folder or cardboard)  
Crayons, colored papers, markers  
Glue  
Pennies (2 per mosquito)  
Toothpick (1 per mosquito)  
Clear tape

## **Instructions:**

- Glue the mosquito template on the heavy paper.
- Color the mosquito.
- Cut out the mosquito.
- Flip the mosquito over. Tape or glue one penny to the back of each wing as shown on the diagram. Tape or glue the toothpick behind the proboscis to reinforce the paper tip.
- Let glue dry. Then try to balance the mosquito on the tip of your finger, a pencil eraser or the corner of a desk.

# Top 10 Mosquito Fun Facts



10. An adult mosquito can live as long as 5 months. It may take several months for a larva to develop to the adult stage in cold water. Eggs of floodwater mosquitoes may remain dormant for several years, and hatch when they are covered with water.
9. An adult female mosquito weighs only about  $1/15,000^{\text{th}}$  of an ounce (about 2.0 milligrams).
8. An adult female mosquito consumes about 5-millionths of a liter in a single blood meal.
7. A mosquito wing beats from 300 to 600 times per second.
6. Male mosquitoes find female mosquitoes by listening to the sound of their wings beating. The males can actually identify the correct species by the pitch of the female's wings.
5. Mosquitoes can fly about 1 to 1.5 miles per hour.
4. Most mosquitoes do not fly very far from their larval habitat, but the salt marsh mosquito migrates 75 to 100 miles over the course of its lifetime.
3. A mosquito can smell the carbon dioxide you exhale from about 60 to 75 feet away.
2. Some people are more attractive to mosquitoes than others. It is not clear why, but probably has something to do with the 300-odd chemicals produced by the skin.
1. In the interest of science, Arctic researchers uncovered their chests, arms, and legs and reported as many as 9000 mosquito bites per person, per minute. At this rate, an unprotected human would lose one half of his blood supply in approximately 2 hours.

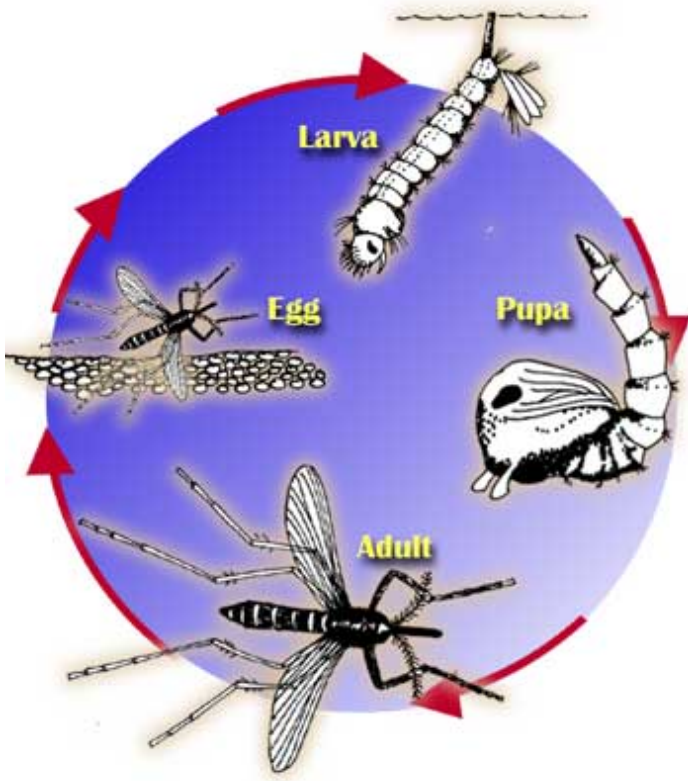
# The Mosquito's Natural Enemy



*Dragonflies are natural predators of mosquitoes, both in their larval stage and as adults. Depending on the species, a dragonfly may exist as a larva or “nymph” anywhere from several weeks to five years, during which time it feeds on other larval insects, including mosquito larvae. As an adult, a dragonfly feeds on adult mosquitoes and other small insects. Healthy wetlands keep the mosquito population down naturally due to the presence of these and other natural predators which rely on mosquitoes for food.*



# Life Cycle of a Mosquito



A mosquito goes through four stages of life. It starts out as an egg, laid in damp soil or on the surface of standing water. Once the egg hatches it goes through four growth stages as a larva, actually shedding its skin in between stages. At the end of its fourth larval growth stage, or "instar," it curls up

into a pupa, where it continues to develop its wings and body parts inside its outer protective covering. Once it is ready to "hatch out" the outer shell splits open, and out climbs a fully developed mosquito!



# ADULT MOSQUITO



**Male has bushy  
antennae**

**Female's antennae  
less hairy**

**CDC**  
U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES

A mosquito's wing beats up to 600 times per second, which is what creates the buzzing noise that we hear. Each mosquito species' wing beat has a slightly different pitch, and males sound different than females. In order to locate female mosquitoes of the same species, male mosquitoes have bushy antennae covered with finely tuned "hairs" which help them detect and differentiate the females' wing beats.