

Mosquito Activity Book



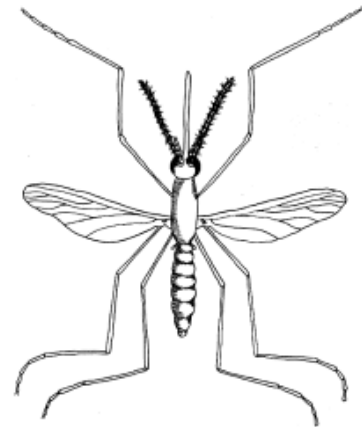
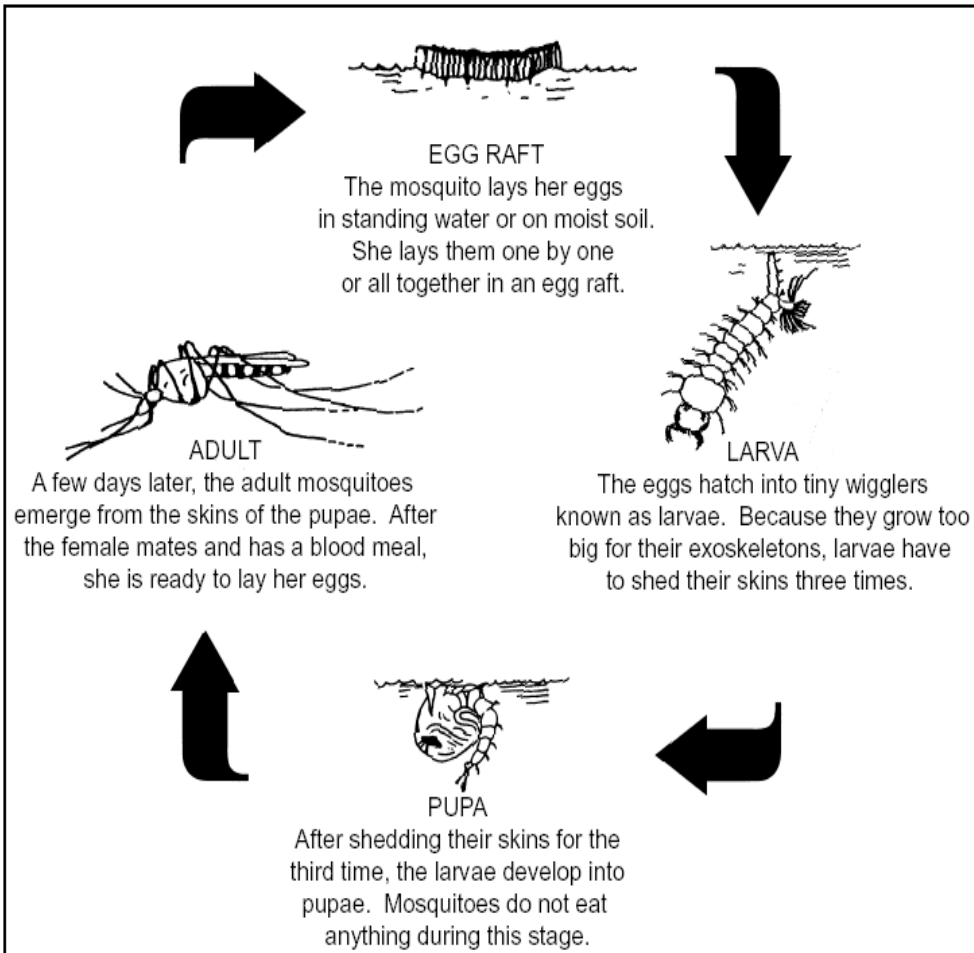
Life History of the Mosquito

Mosquitoes are arthropods that belong to a large order of insects called the Diptera, which have two wings. Like all other insects, mosquitoes go through distinct stages in their life cycle, progressing from immature to adult. The four stages in the mosquito life cycle are: egg, larva, pupa, and adult. Mosquitoes are aquatic because they lay their eggs and grow up in water although adult mosquitoes do not live in water.

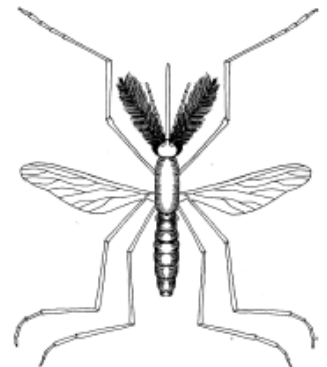
The easiest way to tell a male from a female mosquito is to look at the antennae. The male's antennae are bushy, covered with long fine hairs. The female's antennae are covered with much shorter hairs. Both male and female adults feed on plant nectar, but only the female bites humans and animals. The female needs protein in blood to develop her eggs.

Metamorphosis:

a developmental change in form or structure of an animal

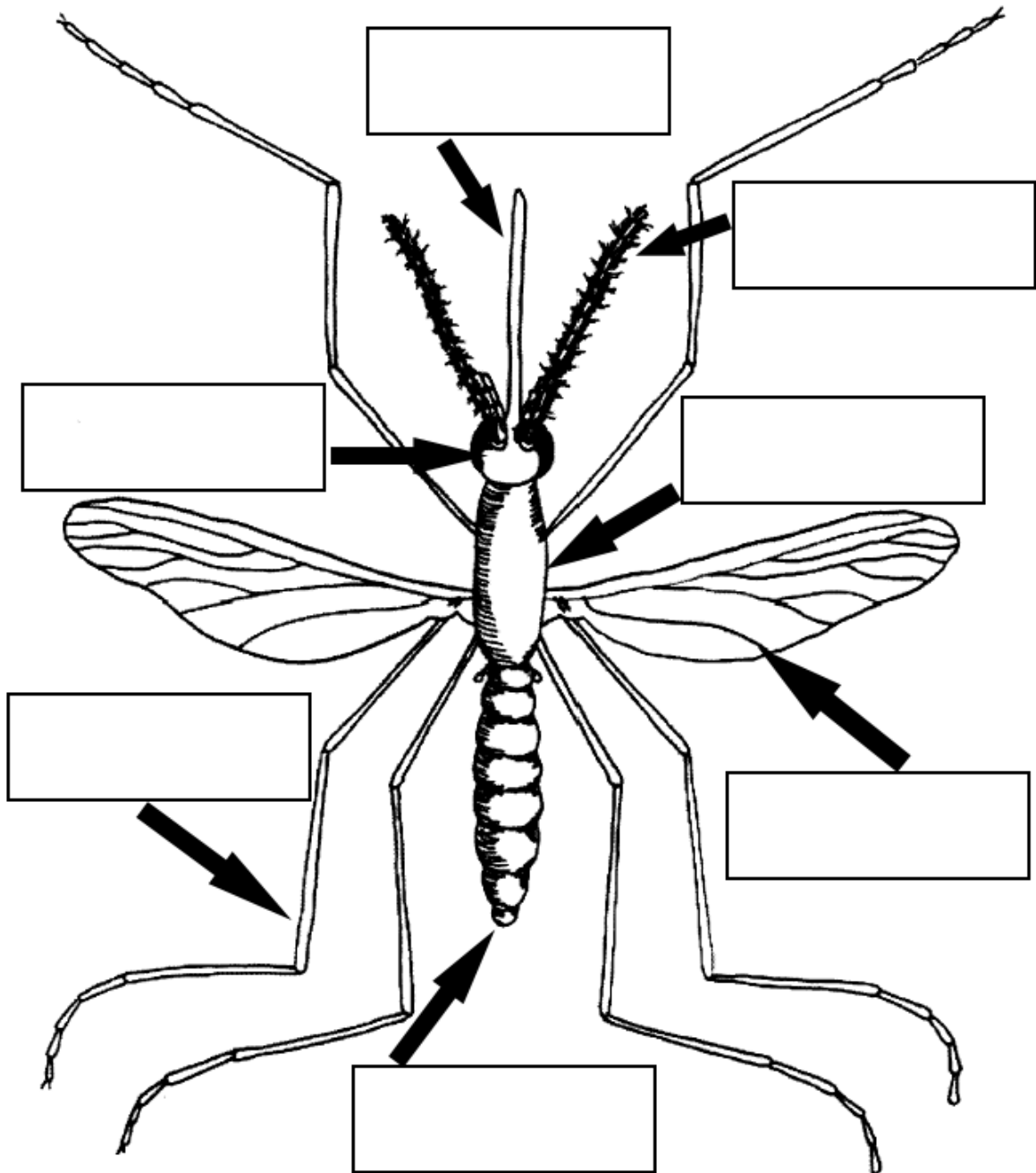


Female Mosquito



Male Mosquito

"Label the Mosquito"



abdomen

antenna

head

leg

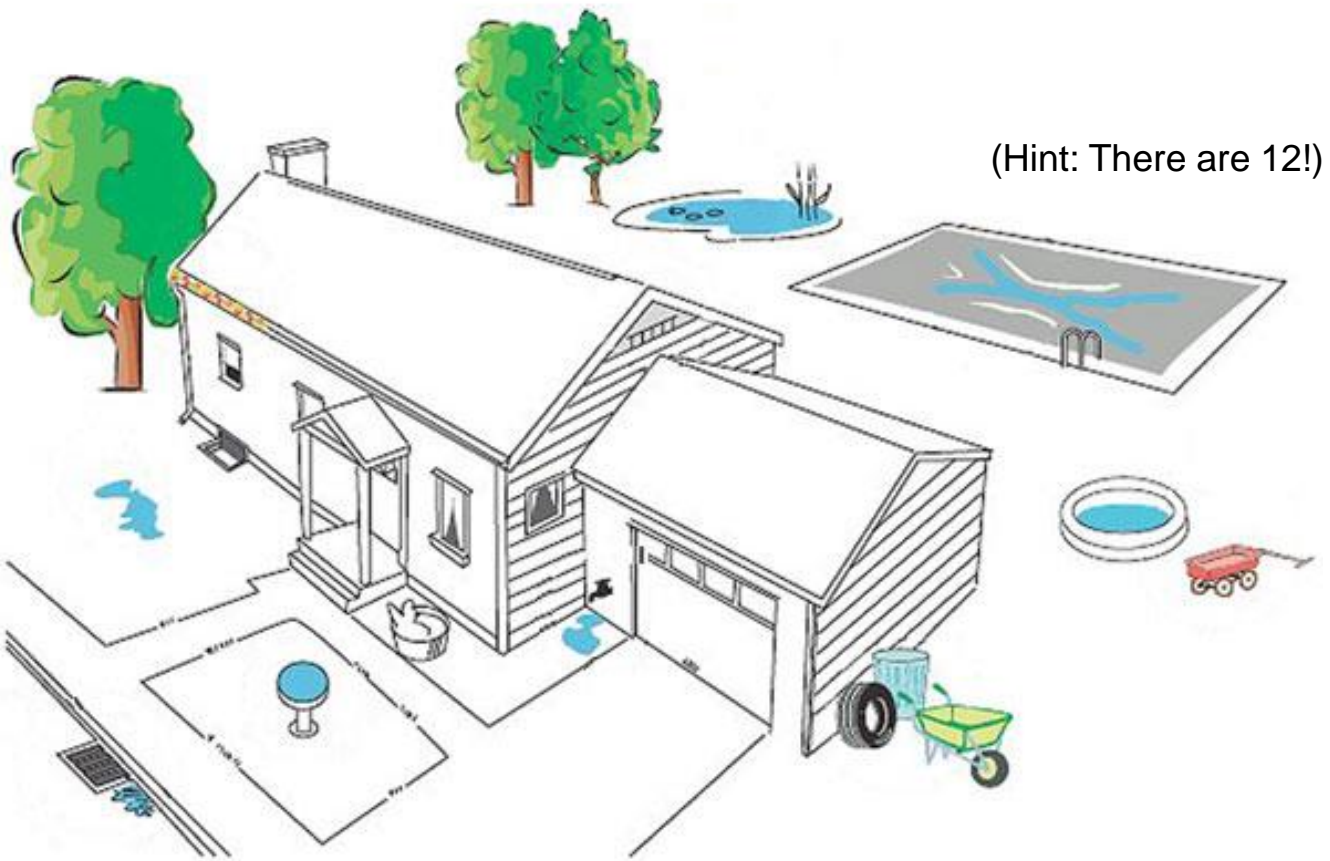
wing

proboscis

thorax

"Be Safe at Home"

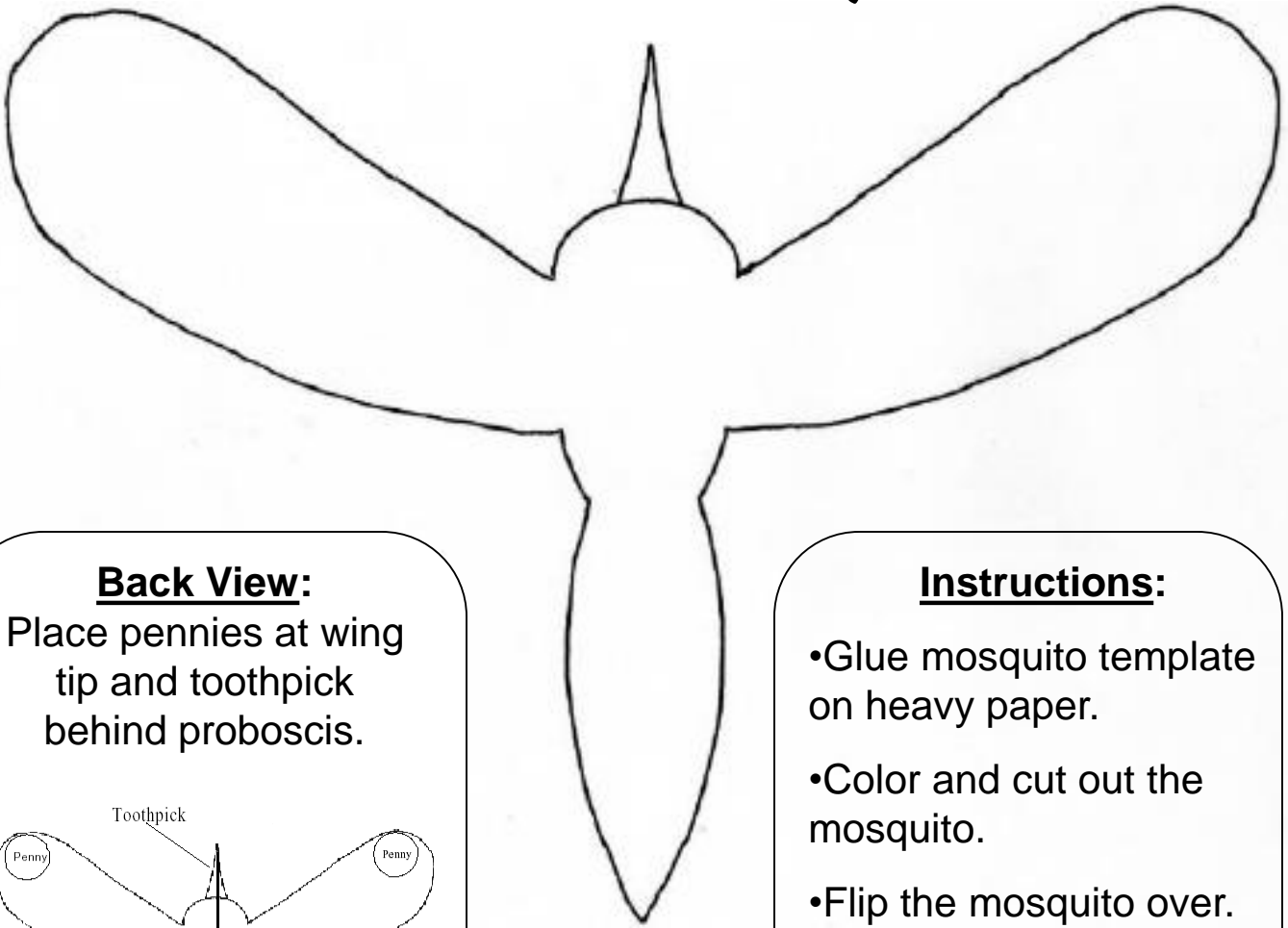
Circle the areas around this home where mosquitoes could lay their eggs in standing water.



What can you do around your home to keep safe from mosquito bites?

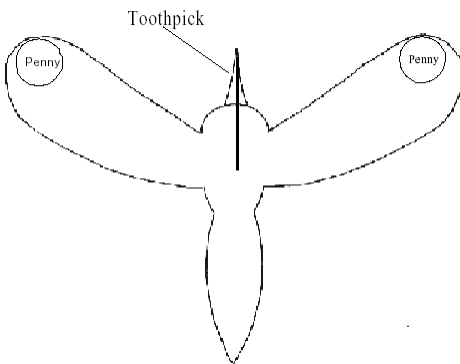
Mosquito Fun Fact:
Mosquitoes can fly about
1 to 1.5 miles per hour.

"Balancing Mosquito"



Back View:

Place pennies at wing tip and toothpick behind proboscis.

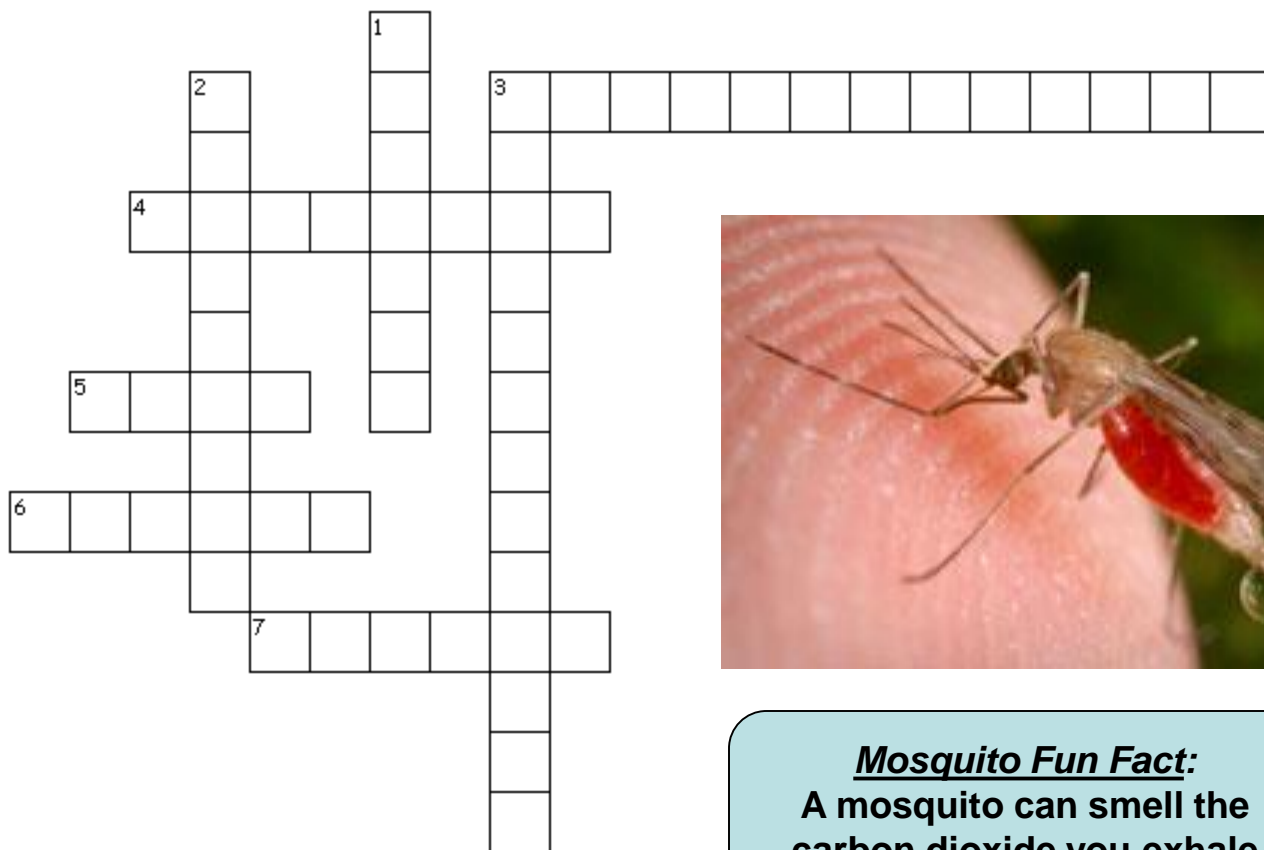


Instructions:

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

Mosquito Fun Fact: An adult female mosquito weighs only about 1/15,000 ounce (about 2.0 milligrams).

"Time to Eat!"



Mosquito Fun Fact:
A mosquito can smell the carbon dioxide you exhale from about 60 to 75 feet away.

Across

3. The chemical compound that mosquitoes are attracted to in the breath of humans and animals is called _____.
4. Female mosquitoes are attracted to heat and _____ that your body gives off.
5. A human or animal from which a mosquito takes a blood meal is called a _____.
6. Mosquitoes inject _____ into the skin so your blood will not clot while they feed.
7. Male mosquitoes feed on plant _____.

Down

1. Female mosquitoes need the _____ in your blood to develop their eggs.
2. The part of the mosquito that pokes into your skin is called the _____.
3. Plant nectar is rich in _____, a group of chemical compounds that includes sugars.

Word Bank:

proboscis, carbon dioxide, nectar, carbohydrates, saliva, moisture, protein, host



Mosquito Math Problems

Problem 1

A female mosquito lives for 30 days and lays a raft of 250 eggs every 3 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

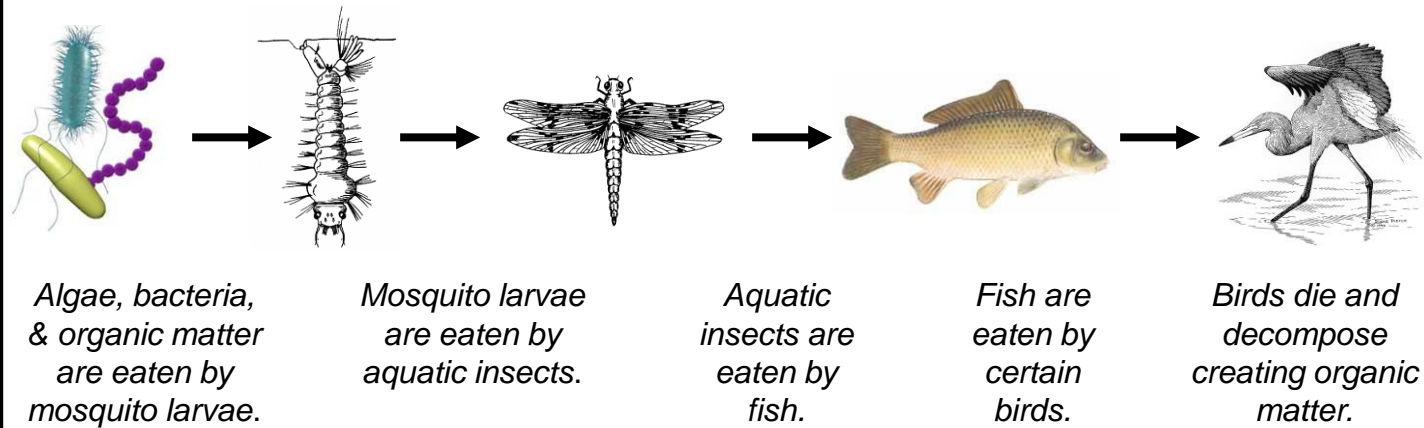
A mosquito lays 200 eggs in a raft. Ninety percent (90%) of the eggs hatch. Of the larvae that hatch, 50% are eaten by aquatic predators; the rest survive to become adults. Of the adults that emerge, 20% are eaten by dragonflies and spiders on the way to taking their first flower nectar meal. How many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

Problem 5

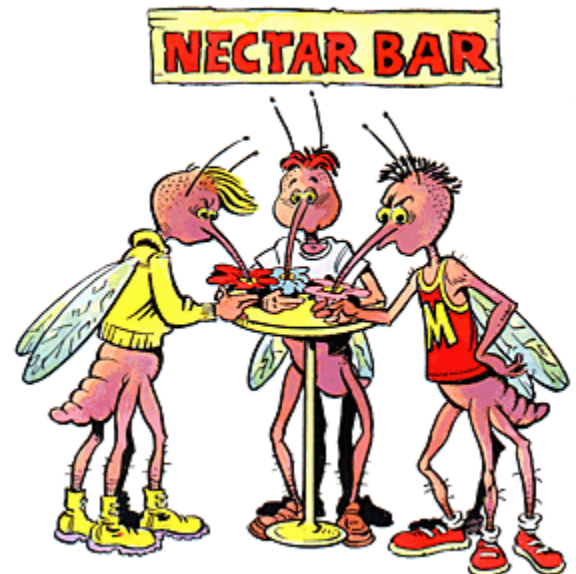
Two mosquitoes fly off together in search of flower nectar. The first mosquito flies 3 miles and finds a flower in a garden. The second mosquito flies 2.5 times that far, and finally finds a clover field. How far did the second mosquito fly?

The "Good Side" of Mosquitoes

People often assume that mosquitoes are good for nothing, *but this is not true*. Mosquitoes are an important part of the food chain in many habitats. The food chain is a transfer of energy through a sequence of organisms in which each is food for the next organism in the sequence. Mosquito larvae are food for aquatic insects and fish while adults are food for birds, bats, dragonflies, spiders, lizards, frogs, and other animals.



Adult mosquitoes are also important as pollinators of flowers. Since mosquitoes feed frequently on flower nectar, they carry pollen from flower to flower, and can pollinate flowers just as honeybees do. In fact, some mosquitoes in the Arctic are the main pollinators of Artic bog orchids.



The "Bad Side" of Mosquitoes

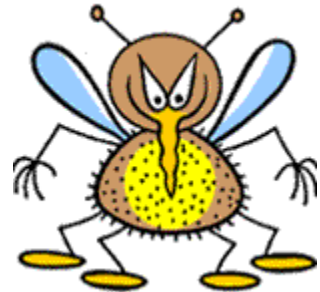
Mosquitoes are more than just a nuisance. They carry diseases as well. Some of the most common diseases spread by mosquito bites are West Nile Virus, Zika virus, Dengue, Yellow Fever, St. Louis Encephalitis and Eastern Equine Encephalitis. Encephalitis is the swelling of the brain that is caused by some of these diseases. One of the more deadly mosquito-borne diseases in the world is malaria, which kills up to three million people each year. Africa is the best place on the planet for contracting malaria. For example, people in South America receive less than one infective mosquito bite per year. In Africa, people receive 1,000 infective mosquito bites per year!

Mosquitoes can spread these diseases when they feed on an infected animal or human, and then bite a healthy animal or human. For example, when a mosquito consumes the blood of a bird infected with West Nile Virus, the virus multiplies within the mosquito's stomach and moves throughout its body. Then, when the mosquito bites another animal or human, the disease is transmitted by the saliva the mosquito injects under the victim's skin.

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

After completing the word search, place the unused letters together to form the hidden message below.

Bird	Malaria
Bite	Mosquito
Dengue	Nuisance
Disease	St. Louis
Eastern Equine	Transmission
Encephalitis	West Nile
Human	Yellow Fever
Infected	



Hidden Message:



Prevention Tip Scramble



Unscramble the following mosquito prevention tips to solve the secret code at the end.

#1

SUE

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29

SIOQOMTU

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18 19 21 6 25

NETRLEPLE

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1 13

#2

WAER

--	--	--	--

12 2

NOGL

--	--	--	--

SEVESLE

--	--	--	--	--	--	--

NAD

--	--	--

GOLN

--	--	--	--

NASPT

--	--	--	--	--

27 20

#3

TYAS

--	--	--	--

4 7

DIENIS

--	--	--	--	--	--

26

GIRDUN

--	--	--	--	--	--

22 15 23

NADW

--	--	--	--

DAN

--	--	--

KUDS

--	--	--	--

9

#4

RVEEMO

--	--	--	--	--	--

28 8 5

TAGDINNS

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11 24

RAWTE

--	--	--	--	--

10

FORM

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14 3 17

UORY

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16

DYRA

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Secret Code

					C	
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1 2 3 4 5 6

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7 8 9 10 11 12 13 14

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14 15 16 17

--	--	--	--	--	--	--	--

18 19 20 21 22 23 24 25

B				
----------	--	--	--	--

26 27 28 29

Container Habitat Survey

Listed below are some places where you might find mosquito larvae in your yard. Look for each item in the list and put a check in the correct boxes.

If you find any standing water, empty it out!!

Container Type	Found in Yard	Contained Water
Bird bath		
Boat		
Bucket, can, cup		
Flower pot		
Garbage can		
Ornamental pond		
Pet water dish		
Rain barrel		
Recycling box		
Sand box		
Tarps		
Tires		
Toys		
Treehole		
Wading pool		
Wheel barrow		
Other _____		

Put this list on your refrigerator to help you remember to check around your yard at least once a week this summer.

For Your Parents...

Five Common Myths About West Nile Virus

Myth #1: There's not much I can do about West Nile virus.

Truth: There is a lot that you, personally, can do to reduce your chance of West Nile virus infection.

Reduce the number of mosquito bites you get. Make a habit of using insect repellent with DEET when outdoors. Spray repellent on exposed skin and clothing.

Prime mosquito-biting hours are usually dusk to dawn. Pay special attention to protection during these hours, or avoid being outdoors.

You can reduce the number of mosquitoes around your home. Mosquitoes breed in standing water, so check your yard once a week: get rid of containers that aren't being used, empty water from flower pots, change water in bird baths and maintain clean gutters.

Make sure window and door screens are in good condition. Have an older neighbor or family member? See if they need help installing or repairing screens.

Myth #2: Kids are at the most danger of getting sick from West Nile virus.

Truth: People over 50 are at the highest risk for developing severe West Nile disease.

Relatively few children have been reported with severe West Nile Virus disease. By contrast, most of the deaths due to WNV during 2002 were among people over 50 years old. Half of those deaths were among people over 77 years old.

It is always a good idea for children to avoid mosquito bites, but it's also important for adults - especially older adults - to take steps to avoid mosquito bites.

Myth #3: It's only people who are already in poor health who have to worry about West Nile virus.

Truth: Healthy, active older adults who spend time working and exercising outdoors have been affected by severe West Nile virus infection.

Being over 50 is a risk factor for developing severe West Nile disease if infected with the virus. There is a risk of getting mosquito bites while leading an active life outdoors. This doesn't mean you have to stay inside - it does mean that it's important to use repellent when you go outside.

For Your Parents...

Five Common Myths About West Nile Virus

Myth #4: Repellents containing DEET are not safe.

Truth: Repellents containing DEET are very safe when used according to directions.

Because DEET is so widely used, a great deal of testing has been done. When manufacturers seek registration with the US Environmental Protection Agency (EPA) for products such as DEET, laboratory testing regarding both short-term and long-term health effects must be carried out.

There are products with different strengths (percentage of DEET) available. The longer the protection you need the higher percent of DEET needed.

Repellent with DEET can be used for both adults and children, according to directions. Other repellents with the active ingredients Picaridin, IR3535, Oil of lemon eucalyptus (OLE), para-menthane-diol (PMD) and 2-undecanone are also recommended by the Centers for Disease Control (CDC).

Myth #5: As long as my area has a mosquito control program, I don't have to worry about using repellent.

Truth: Mosquito control activities don't eliminate every mosquito, so personal protection is still important.

Public activities, such as using products to kill mosquito larvae and adult mosquitoes, are one part of control. Personal protection, such as using repellent, keeping window screens in good condition, and control of household breeding sites are other important steps.

Collaboration between the community, the family and the individual is needed to achieve the best prevention of West Nile virus infection.



Vocabulary List



Diptera-	Order of insects that has only two wings (one pair). Most other insect orders have four wings.
Arthropod-	Phylum of invertebrate animals that have segmented bodies, jointed limbs, and usually an exoskeleton that is molted periodically. Includes insects (mosquitoes), spiders, crustaceans, scorpions, centipedes, and millipedes.
Species-	A unique group of animals, different from other groups.
Metamorphosis-	The maturing process that involves changes in shape between hatching and becoming an adult.
Molt-	To shed the skin in order to grow.
Egg-	The first stage in the life cycle.
Larva-	The immature, wingless form that hatches from an egg. Purpose is to eat and grow.
Pupa-	The non-feeding stage in the life cycle during which the larva changes to the adult form.
Adult-	The fully developed mature form.
Embryo-	The developmental stage found inside the egg.
Raft-	Cluster of eggs laid on the surface of permanent water.
"Wiggler"-	Common name for the mosquito larva.
Aquatic-	Living in water.
Siphon-	Tube used by the larva to breathe air.
Trumpet-	Tube used by the pupa to breathe air.
"Tumbler"-	Common name for the mosquito pupa.
Head-	Part of the body that contains the eyes and mouth.
Thorax-	Part of the body that contains the legs and wings.
Abdomen-	Part of the body that contains the digestive and reproductive organs.
Eyes-	Visual organs on the head, composed of numerous separate lenses.
Antenna-	Sensory organs on the head for hearing and smell.
Proboscis-	Elongated mouth of the mosquito, adapted for feeding on liquid (from Greek: "pro"=in front, "boskein"=to feed)
Reproduction-	The making of offspring.
Permanent water-	Aquatic habitat that is relatively stable. The water level does not fluctuate.
Floodwater-	Aquatic habitat characterized by fluctuating water levels.
Container (natural)-	Specialized floodwater habitat used by some mosquitoes. Treehole is primary example.
Container (man-made)-	Specialized floodwater habitat used by some mosquitoes. Buckets, cans, and discarded tires are examples.

Vocabulary List – Continued

<i>Aedes triseriatus</i> -	The genus and species name for the treehole mosquito, the vector of LaCrosse encephalitis virus.
<i>Genus species</i> -	Conventional way scientists name a type of animal or plant. The proper scientific name always consists of the two names.
Carbohydrates-	A group of chemical compounds that includes sugars.
Host-	The animal from which the mosquito takes a blood meal.
Carbon dioxide-	Chemical compound that all animals exhale.
Labium-	Sheath that covers the stylets, part of the proboscis.
Stylets-	Thin, sharp, tooth-like structures that penetrate the skin. Part of the proboscis.
Food canal-	Tube within the stylets that conducts blood from the skin to the mosquito's stomach.
Saliva-	Secretion injected into the skin when the mosquito bites. Contains anesthetics and anticoagulants to make blood feeding easier.
Salivary canal-	Tube within the stylets that conducts the saliva from the salivary gland into the skin.
Vector-	Animal, such as a mosquito, which transmits a virus or parasite to another animal.
Disease-	Ill health as a result of being infected with a pathogen.
Pathogen-	Any microorganism or virus that can cause disease.
Malaria-	Mosquito-transmitted parasite that attacks blood cells in humans. Found in tropical Africa, South America, and the South Pacific regions.
Yellow fever-	Mosquito-transmitted virus that attacks the liver and other organs in humans. Found in tropical Africa and South America.
Dengue fever-	Mosquito-transmitted virus that causes severe fever and joint pains. Found in tropical Africa, South America, and the South Pacific regions.
Encephalitis-	The results of a virus attacking the brain of humans.
LaCrosse encephalitis-	A type of encephalitis caused by the LaCrosse virus. The virus is normally transmitted between the treehole mosquito and chipmunks and squirrels. It is found in the Upper Midwest, mid-Atlantic, and southeastern states.
West Nile encephalitis-	A type of encephalitis caused by the West Nile virus. The virus is normally transmitted when mosquitoes feed on infected birds and then bite animals or humans. It is found all across the United States.
St. Louis encephalitis-	A type of encephalitis caused by the St. Louis encephalitis virus. The virus is normally transmitted when mosquitoes feed on infected birds and then bite animals or humans. It is found less frequently across the United States.
Eastern Equine encephalitis-	A type of encephalitis caused by the Eastern Equine encephalitis virus. The virus is normally transmitted when mosquitoes feed on infected birds and then bite humans, horses, and other animals. Found in the eastern half of the United States.
Transmission cycle-	The cycle in which a disease is passed along. For example, a mosquito becomes infected with West Nile virus by feeding on an infected bird. A human then becomes infected by being bitten by an infected mosquito.

Certificate of Award

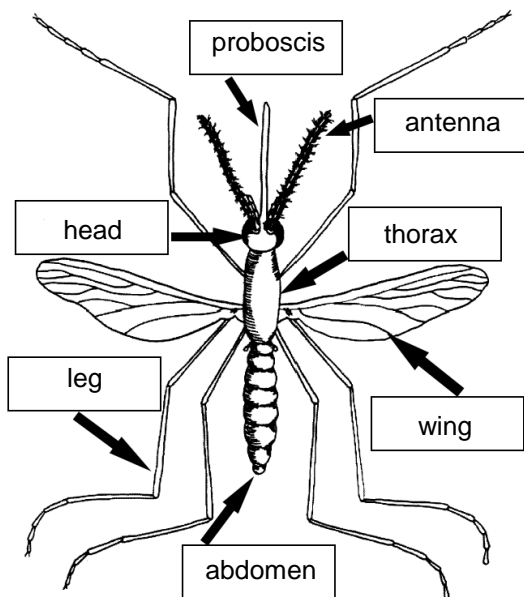
is presented to

for helping to control the mosquito!

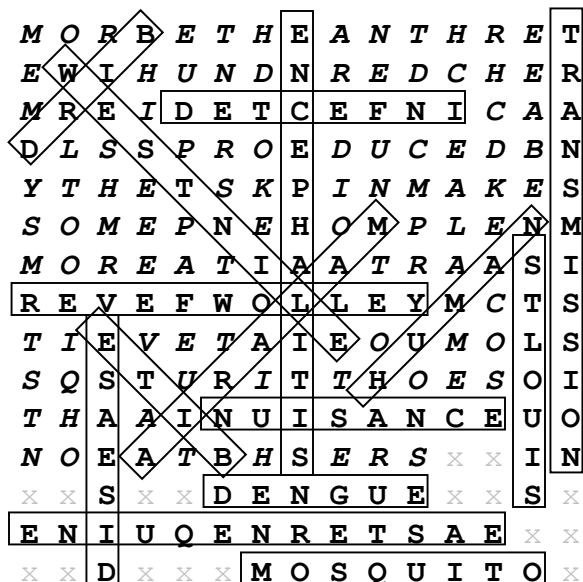


Answer Sheet

"Label the Mosquito"



"Hidden Message Word Search"



Hidden Message: More than three hundred chemicals produced by the skin make some people more attractive to mosquitoes than others.

Activity book created by: Leah Lamonte, MS
March 2007

"Be Safe at Home"

- | | |
|-----------------|-----------------------------|
| 1) Pond | 8) Leaky faucet |
| 2) Pool | 9) Bird bath |
| 3) Baby pool | 10) Catch basin |
| 4) Wagon | 11) Water in middle of yard |
| 5) Wheel barrow | 12) Gutter |
| 6) Garbage Can | |
| 7) Tire | |

"Time to Eat Crossword"

ACROSS:

DOWN:

- | | |
|-------------------|------------------|
| 3) Carbon Dioxide | 1) Protein |
| 4) Moisture | 2) Proboscis |
| 5) Host | 3) Carbohydrates |
| 6) Saliva | |
| 7) Nectar | |

"Mosquito Math Problems"

(1A) 30 days/3 days = **10**

She needs a blood meal every time she lays eggs.

(1B) 250 eggs x 10 rafts = **2500 eggs**

(2A) 300 eggs/1200 eggs = **0.25 or 25%**

(3A) 0.32 x 150 larvae = **48 larvae**

(3B) 150 larvae – 48 larvae = **102 larvae**

(4) 200 eggs x 0.9 = 180 hatch x 0.5 = 90 survive to become adults x 0.8 =

72 make it to the flower

(5) 3 miles x 2.5 = **7.5 miles**

"Prevention Tip Scramble"

- 1) Use mosquito repellent.
- 2) Wear long sleeves and long pants.
- 3) Stay inside during dawn and dusk.
- 4) Remove standing water from your yard.

Secret Code: Protect yourself from mosquito bites.