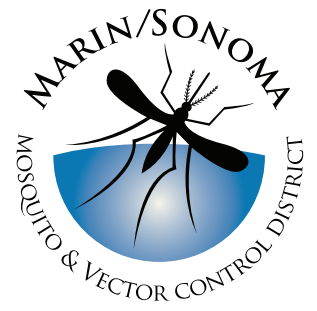


How should we deal with Mosquitoes?



Draw what you see in the mosquito or mosquitofish habitat

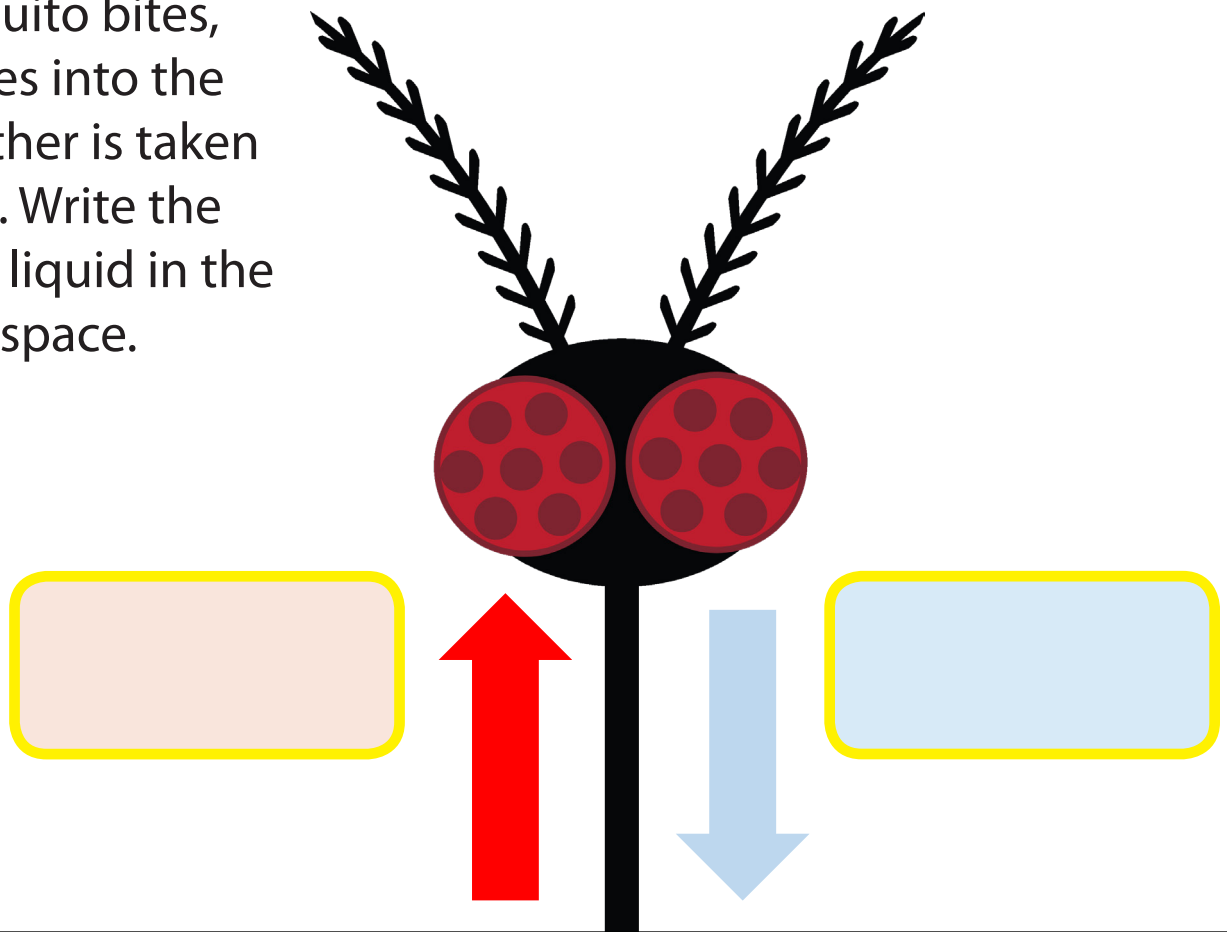
Name: _____

Mosquitoes are **Vectors**

Unfortunately, certain kinds of mosquitoes can spread diseases to people, pets and wild animals. Here are a few important diseases that mosquitoes can spread:

- West Nile virus
- Dog heartworm
- Malaria
- Zika virus
- Yellow fever
- Dengue fever
- Chikungunya fever

When a mosquito bites, one liquid goes into the **host** and another is taken from the host. Write the name of each liquid in the correct blank space.



How many places can you find where mosquitoes could grow?



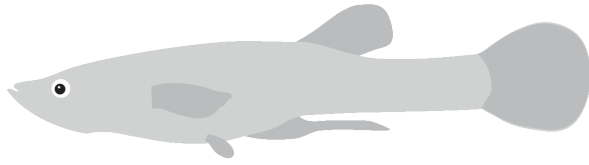


Preventing Mosquito Problems

Look at the chart below to learn about some of the ways we stop mosquitoes from causing problems. Unfortunately, each solution has limitations. You will need this information for the activity on pages 7 and 8.

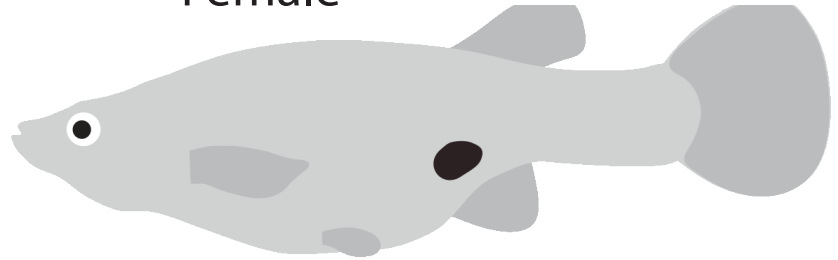
Solution	How it works
Change the habitat (physical control)	If the water in a habitat can be drained or is moving, then mosquitoes will not be able to grow there.
Use a predator (biological control)	Ideally, a predator could eat all the mosquitoes in a habitat without harming other creatures.
Use bacteria	A bacterium called <i>Bti</i> is found in the soil and is deadly to mosquito larvae, but not harmful to most other aquatic organisms.
Protect yourself from mosquitoes	Wearing protective clothing and using mosquito repellent are ways to prevent mosquito bites.

Mosquitofish are a form of biological control



Male

Female



Limitations

Draining small amounts of water (like a bucket) is practical, but draining large amounts (like a marsh) is not practical.

Pumps can be used in small ponds or fountains to circulate the water, but are not practical in larger aquatic habitats.

Mosquitofish are the only predator we are currently able to use for mosquito control. They are not native to California and can only be used in human-made bodies of water that are at least a foot deep.

This bacterium only works on mosquito larvae (not pupae), does not work very well in highly polluted habitats, and is expensive (but mosquito control districts will provide it when necessary).

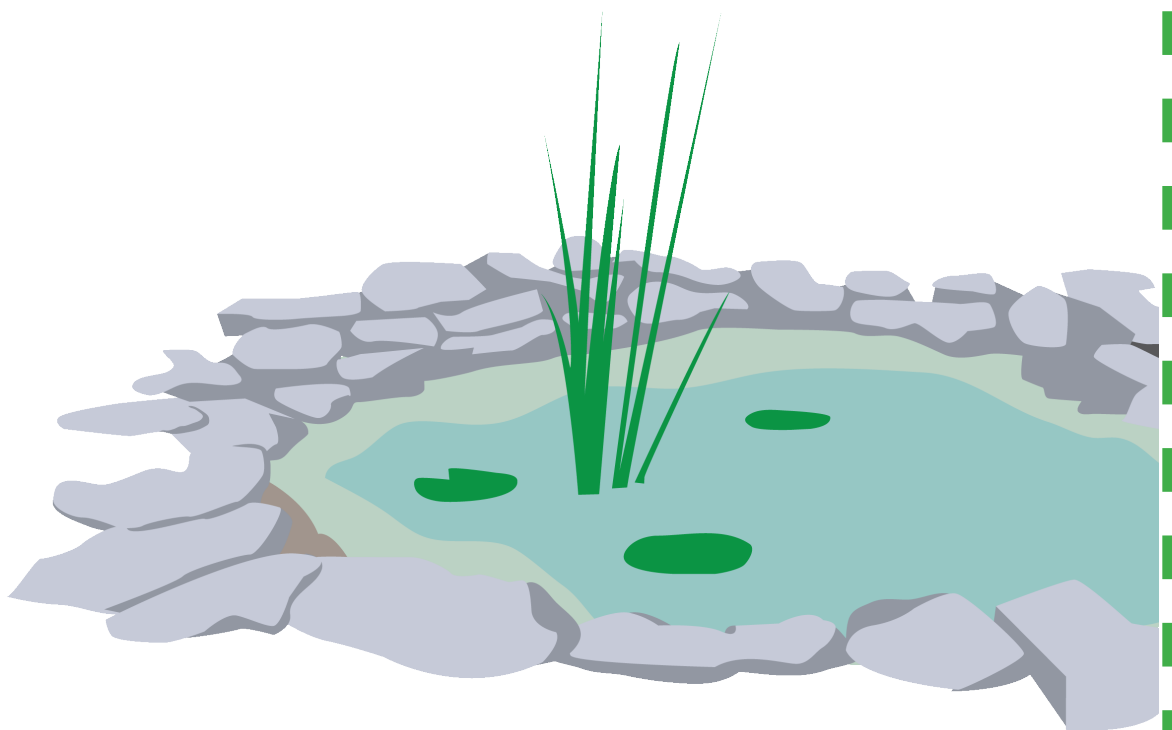
Many people simply forget to protect themselves from mosquitoes unless there are lots of mosquitoes around.

Mosquito Scenarios (work with a partner)

For each of the following scenarios, write a solution that would prevent mosquitoes from causing problems in that situation. Make sure to check the chart on pages 5-6 for clues.

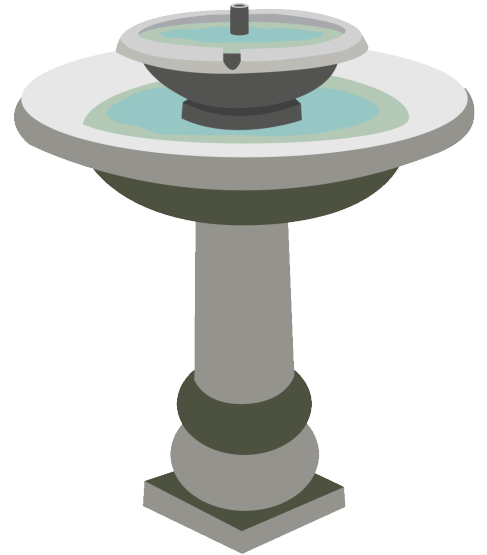
Scenario #1: Backyard Pond

You look into a large backyard pond and see hundreds of mosquito larvae and pupae. The pond has some tadpoles and frogs, but they don't seem to be eating the mosquito larvae. What is the most practical solution and why? Write your explanation below.



Scenario #2: Fountain

The fountain is only a few inches deep and has lots of tiny mosquito larvae growing in it. There is a pump, but it doesn't seem to be working. What could you do?



Scenario #3: Tropical Vacation

Your family is planning a vacation to a tropical country. You know that the weather there is warm. What should you do to prevent getting bitten by mosquitoes on the trip?

Researching and Finding Solutions

Choose one of the diseases on page 2 to research and fill in the information you find below.

The Centers for Disease Control has accurate information about many of these diseases on the website www.cdc.gov.

Name of disease:

In what part(s) of the world is this disease a problem?

How can people protect themselves from this disease?

Imagine that it is your job to figure out a way to stop mosquitoes from spreading this disease. How would you do it? Try to think of a solution that we have not discussed. Be creative!

Glossary

Bacterium

(pl: bacteria) a member of a large group of unicellular microorganisms that have cell walls but lack a nucleus

Biological Control

the control of a pest by the introduction of a natural enemy or predator

Circulate

to cause to move

Host

an animal or plant from which a parasite gains nutrition

Parasite

an organism that lives on or in another organism (the host) from which it obtains nourishment

Pathogen

a bacterium, virus, or other microorganism that can cause disease

Physical Control

Eliminating or significantly reducing mosquito breeding sites

Vector

an animal capable of transmitting disease to humans

Dear Parents,

This program aims to teach students useful information about the biology, ecology and control of mosquitoes. Students also learn to identify potential mosquito habitats and are made aware of free services that are available to all residents of Marin and Sonoma counties.

Mosquitofish are an important component of our mosquito control program and are used in certain situations such as abandoned swimming pools, backyard (man-made) ponds, and water troughs. In these situations, mosquitofish can often effectively control mosquitoes without the use of chemical insecticides. The District provides mosquitofish free of charge to residents of Marin and Sonoma counties (during the warmer months). Please visit www.ms mosquito.org to learn about mosquitofish (including availability) and much more, including:

- Free services available to residents of Marin and Sonoma counties
- Information about ticks, fleas, rats and yellowjackets
- Information about vector-borne diseases (such as West Nile virus, Lyme disease, dog heartworm, and others)

Thank you,

Casey Richter
Education Specialist
Marin/Sonoma Mosquito & Vector Control District
caseyr@msmosquito.org



Marin/Sonoma Mosquito & Vector Control District
call **707.285.2200**
or visit us online at www.ms mosquito.org



facebook.com/MSMVCD



twitter.com/MSMVCD