## Mosquito Tag: Mosquitoes as a Vector for Disease

### Activity Guide



#### **Overview:**

This variation of the game of tag demonstrates how mosquitos can spread disease between different animals. An "infected" player passes their infection to other players through being tagged (bitten) by mosquitos that then go on to tag (bite) other players.

#### Time Needed:

20-30 minutes

#### Audience:

This activity is recommended for groups of 10 or more and ages 8 and older.

#### **Objectives:** Participants will...

- Recognize how mosquitoes can spread disease.
- Discuss how different scenarios may affect the spread of mosquito-borne disease.
- Recognize the connected nature of the health and well-being of humans, animals and the environment.

#### Materials:

- Clothespins 1 per player
- *Optional:* red and black clothespins
- Red and black paint or markers (if not using red and black clothespins)
- Optional: 3 Ways to Reduce Mosquito Bites in Your Yard handout

#### **Preparation:**

- Paint or color 1 clothespin red for an initially "infected" player (or use a red clothespin)
- Paint or color 2 clothespins black (or use black clothespins). These will be for the 2 "mosquitoes". For larger groups, you may need to add more mosquitoes.
- Review the Mosquito Tag Rules (see Page 2).
- Review the **3** Ways to Reduce Mosquito Bites in Your Yard handout for background knowledge.

#### **Mosquito Tag Rules**

Clothespin Color	Player's Role	Clothespin Location	Player's Infection Status
Black	Mosquito	Hidden	Not infected
Red	Secretly "infected" player	Visible	Infected
Plain	Not "infected" player	<b>Exception:</b> the person with the <b>red</b> clothespin is always	

Everyone will have a clothespin. The color and location of their clothespin will determine their role.

**Exception:** the person with the **red** clothespin is always infected, but their clothespin is **hidden until they are tagged**.

- The mosquitoes (black clothespins) will be "it" and will tag ("bite") the other players (plain clothespins). One player is secretly "infected" with a mosquito-borne disease (red clothespin). If the mosquitoes tag the secretly infected player, they will spread the disease to the other players.
- At the start of the game only one player is "infected" (red clothespin), and it is a secret who it is. All other players and mosquitoes start the game NOT infected. Everyone should keep their clothespin hidden, in their hand or pocket.
- As the game is played, the location of the clothespin will show if players are infected or not. It should be kept hidden until the player is infected. Once they are infected, they will clip the clothespin somewhere visible on their clothes. The only exception is the person with the red clothespin, who should keep it hidden until they are first tagged by a mosquito, even though they are already "infected."
- When the game begins, the mosquitoes will chase and tag players. Players should run away from the mosquitoes.
- When a mosquito tags someone, they should pause and ask if the player is infected. If the player is not infected, then both the player and the mosquito continue on.
- When the secretly "infected" person is tagged for the first time, they will show the mosquito their red clothespin. The mosquito is now infected! Both the player and the mosquito who tagged them will then take their clothespins and clip them somewhere on their clothes where the clothespins will be visible to other players.
- Now when the mosquito tags other players, the mosquito can "infect" them! The mosquito should show their clothespin and tell the tagged player they are now "infected". The tagged player will then pause and clip their clothespin visibly on their clothes. The player can now infect any other mosquitoes that tag them.
- Mosquitoes can become infected by tagging any infected player. Make sure to explain that once the secretly infected player (red clothespin) has been tagged and one mosquito has started spreading the disease, tagging any infected player (anyone with their clothespin clipped to their clothes) will infect any other mosquitoes.
- Players may be tagged more than once. If an infected mosquito tags an infected player, nothing happens and the game continues on.
- The game continues until everyone is infected or time is up!

Copyright  $\textcircled{\mbox{\scriptsize opt}}$  2025 by University of Rochester. All rights reserved. May be copied for educational use.

#### **Optional assessment opportunity:**

The <u>One Health as a Tool for Informal Assessment</u> activity is recommended for use along with this activity to provide an informal assessment opportunity. Check out the "One Health Connection" boxes throughout for related discussion prompts.

#### Description of Activity and Suggested Procedure:

 Ask participants what they know about mosquitos. If it has not come up after some time for sharing, ask participants if they know that mosquitos can spread disease between different animals, and even different species of animals. Some examples of mosquito-borne diseases are heartworm, West Nile virus, Zika virus, and malaria. West Nile virus, encephalitis, and heartworm are the most common types of <u>mosquito-borne</u> <u>disease in the United States</u>, but outbreaks of other diseases have also occurred.

One Health Connection: What role do mosquitoes play in the environment, other than spreading disease?

- 2. Explain that you will be playing a game called Mosquito Tag. In this game, some participants will be mosquitos, and some will be animals (including humans).
  - One player will start the game "infected" with a mosquito-borne disease. In real life, they may not even know they are infected. While the person will know they are infected for the Mosquito Tag game, it will be a secret to everyone else playing!
  - Two participants will start the game as mosquitos. The two mosquitos are "it" and will tag ("bite") others. If they tag an infected player, the mosquitoes will become infected. The mosquitoes will then "infect" any player they tag. In this way, mosquitoes spread disease from one sick animal to other animals.
- 3. Explain the Mosquito Tag game rules (see Page 2).

#### Notes:

- The mosquitoes do <u>not</u> start the game infected they must pick up the disease from an infected player before they can start infecting others.
- Being tagged does not turn someone into "it" the same people (the mosquitos) will remain "it" for the entire game. If a player is tagged, they just keep playing! The mosquitoes are the only players who can tag ("bite") others and spread the infection.
- It may take a while for the infection to start spreading if it takes a while for a mosquito to tag the secretly infected player. Once one mosquito is infected, they can spread the disease to other players. Any other mosquitoes may then become infected by tagging any infected player. That is, once the disease has started

spreading, mosquitoes do not have to tag the player with the red clothespin to become infected.

- 4. Instruct everyone to close their eyes and hold out their hands. Pass out the clothespins. Have everyone open their eyes and look at their clothespin, without showing it to anyone else. If they have a **red** clothespin, they are infected! If they have a **black** clothespin, they are a mosquito. Tell everyone to put their clothespin in their pocket. If they don't have a pocket, they should keep it in their hand out of sight. Remind them not to tell anyone if they are infected or not!
- 5. Ask the two mosquitos (**black** clothespins) to raise their hands. Make sure all participants know who the mosquitos are.
- 6. Remind participants that if the secretly "infected" person (red clothespin) is tagged ("bitten") by a mosquito, they must remember to tell the mosquito that they are infected. Both the secretly "infected" player and the mosquito who tagged them will then clip their clothespins to their clothing, so they are visible to the other players to show that they are infected. This is important, as the game will not work otherwise!

One Health Connection: How can you protect yourself from mosquito bites?

- 7. Play the game a few times, allowing different people a chance to be mosquitos or to start the game infected. The game ends when everyone is infected, or you can play for a certain amount of time.
- 8. Some questions to ask your group to prompt discussion: How long did it take before everyone was infected? Did any mosquitos end the game not infected? Would that be possible, and why or why not? What do you think would happen if there were more mosquitos? What do you think would happen if more than one player was "infected" at the start of the game? What about if there were more or less space to play in or we played for more or less time?
- 9. If there is time, try some of these optional variations and then discuss:
  - Vary the number of mosquitos (representing mosquito population levels). How does this change the game? You should find that with more mosquitos everyone becomes infected quicker.
  - Vary the length of time played (representing the length of mosquito season). How does this change the game? You should find that more people will become infected in longer games than shorter games.

One Health Connection: What real-life scenarios might these game variations represent?

- Vary the amount of space available to play in (representing the amount of available mosquito habitat). How does this change the game? You should find that everyone becomes infected quicker in a smaller space than a larger one.
- For older participants, you may consider recording data as you try the above variations. For example: If you vary the amount of the time that the game is played, you should record the time of play and the final number of infected players.
- Have participants work together to create new rules for a game version where players can become uninfected. Some things to consider might be vaccines for mosquito-borne illness, access to medication/treatment for the illness, or mosquito control methods like removing mosquito habitat.
- 10. **Wrap-up:** Discuss with participants what we can do to protect ourselves from mosquitoes. We can take three simple steps to protect ourselves from mosquitoes! Explain the three steps below (interrupt, attract, protect).
  - Interrupt the mosquito life cycle by removing standing water.
  - Attract mosquito predators by providing habitat for bats, birds, and other insects.
  - **Protect** yourself by covering your skin, using insect repellant, and avoiding peak mosquito times to avoid bites.
- 11. *Optional:* Send participants home with the *3 Ways to Reduce Mosquito Bites in Your Yard* handout.

# **3 Ways to Reduce Mosquito Bites in Your Yard**

## 1. Interrupt the Mosquito Life Cycle

The mosquito life cycle takes about 8-10 days and requires standing water. Eggs are laid near standing water, and mosquito larvae and pupae live in water.

- Empty, clean, and change water in bird baths, fountains, and wading pools weekly.
- Look for standing water. Check items like buckets, toys, plastic covers, tires, plant saucers or planters. Turn over weekly, cover, or throw away these items.
- **Cover water storage containers** such as rain barrels with tightly fitting lids or fine wire mesh.



https://www.epa.gov/mosquitocontrol/ mosquito-life-cycle

- Keep water circulating in ponds or pools.
- Keep gutters and drainpipes clean and check for clogs and pooling water.
- Discuss concerns with neighbors and work together to reduce habitat.



## 2. Attract Mosquito Predators

Birds, bats, fish, and other insects are known to eat mosquitos!

- Turn off **outdoor lights**, build a **bat house**, or plant native, **night-blooming plants** to attract bats.
- Provide a **water feature** such as a circulating pond to attract dragonflies and damselflies.
- Provide a **nesting box**, **mealworm feeder**, or **bird bath** to attract insect-eating birds (such as bluebirds).
- Plant **native**, **pollinator-friendly species**. Find native plants for your region at <u>https://www.audubon.org/native-plants</u>.

## 3. Protect Yourself

- Wear long sleeves and pants to prevent bites.
- Avoid being outside at the times mosquitos are most active (dawn and dusk)
- Choose insect repellents with **lemon eucalyptus** oil (OLE) as the active ingredient. If you do use DEET, use products with 20-30% DEET. **Read** the label and follow instructions.



## Did you karow?

August 20th is World Mosquito Day!

It marks the discovery that mosquitos spread malaria. Understanding that malaria is spread by mosquitos allowed people to know how to control the disease effectively.