Managing Mosquitoes

An Ask A Biologist activity for at home or in the classroom
By: Karla Moeller, David Roman, and Silvie Huijben

Contents

Learn More

This is a companion PDF for this online story:

https://askabiologist.asu.edu/explore/mosquitoes

Managing Mosquitoes

http://askabiologist.asu.edu/experiments/mosquitoes

About the Authors

Karla Moeller is an Executive Educational Outreach Coordinator and a children's book author, **David Roman** is an educational technologist and is earning a GIS certificate, and **Silvie Huijben** is an Assistant Professor of Evolutionary Biology; the authors created this activity at Arizona State University.

Lesson Overview

You've been playing outside for most of the day, with no issue. But as it starts to get later in the day, you hear that annoying high-pitched buzzing very close to your ear. It's a mosquito. You swat it away, but you think about going inside to avoid being bitten. While mosquitoes might only be an annoyance to you, mosquitoes are dangerous. In this lesson, you will learn about mosquitoes, what habitats they like, how to avoid being bitten, and how to help reduce their numbers.

Materials

- Slide presentation
- Computer
- Internet access
- Butcher paper or tarps
- Pencils or pens
- Pre and post lesson quizzes
- Mosquito worksheet
- Storyboard template
- Technology to record a 2 - 3 minute video (phone/tablet/Zoom/etc.)

Procedure

Before you begin: The very first thing you should do is answer all the questions on the pre-lesson quiz. This one has PRE written in the top corner. Don't worry, this first one is not for points! After you complete the quiz, make sure your name is on it and turn it in to your teacher.

ENGAGE

Step 1: Check out the first two pictures in the slide presentation. What do you think the mosquito population would be like in the Everglades in Florida, versus in the Petrified Forest in Arizona? Think about (or discuss with your classmates) why these places might be so different in the size of their mosquito populations.

Step 2: Look at the aerial view of Phoenix, Arizona. Phoenix, Arizona is a desert landscape, but it still has desert rivers and streams, and people have brought water into the urban areas. Based on your ideas or discussion from Step 1, what do you think the mosquito population might be like here? And finally, look at the picture of a cactus in the snow. How do you think seasons affect mosquito populations?

EXPLORE

Step 3: Start the water collection activity. Imagine you are looking out the back door, at the large backyard of a home where you are staying. A heavy rain is falling, lightning flashes, and thunder claps, shaking the room around you. Soon, the storm will pass, leaving the sweet smell of wet ground behind. Some water collection can be good, and can help you store water to clean for drinking, or to deeply water crops and other plants well after it rains. But if water sits uncovered for just a couple days, it can become a breeding ground for mosquitoes. Buckets, or even just small trays left outside, can gather enough water for female mosquitoes to lay their eggs. If you don't find those water stores and dry them out, soon you will have more mosquitoes than normal, and a higher risk for disease.

Now, you are going to get up quietly and pretend that this room is that backyard. There's no ceiling above you, and rain has filled anything that will hold it. Quietly, you will walk around, and take notes on places where water might collect. You have two minutes. Go.

Step 4: Make a list of the spots in the room where water might be stored if it started raining inside. With your study group or class, make a full list of all the places that were found. Discuss why you chose those items and how to move/modify objects so that water won't collect.

Step 5: Optional: Now you will "fix" these water collection locations. If in a class, get into small groups of 2 to 3 students. Modify these spots so they are not an issue any longer. There are some rules to this! For anything heavy or larger than a bucket, or anything breakable, do not move it. Instead, you can pretend pieces of butcher paper are tarps, and use them to cover anything you can't safely turn on its side. You could use a small object as a pretend mosquito "dunk" (a bacterial treatment for the water) to put into water-holding containers that can't be overturned or altered.

EXPLAIN

Step 6: If you are in a class, discuss the activity you've completed. How did you treat different types of objects and why did you make those decisions? If you aren't working with a group, take notes on the decisions that you made and why.

Step 7: Listen and learn as the teacher presents more information about mosquito life cycles, the diseases mosquitoes can carry, and more. You may also want to read the paired story, All About Mosquitoes. If working alone, you can look through the presentation and read the story.

Step 8: Discuss or take notes on what new information you learned about mosquitoes from the presentation and story. Do you have any questions about mosquitoes or how to avoid being bitten? If so, note them down to look up later, or discuss and research with your class.

Step 9: Complete the mosquito worksheet. If in a class, go over the answers as a group. If working alone, you can go back to the presentation and story to check your answers.

ELABORATE

Step 10: You are going to create a Public Service Announcement ("PSA"). The goal of this activity is to create a PSA video on how people can protect themselves against mosquitoes and their

bites. You can focus on how to control mosquito larvae, how to protect against adult female mosquitoes, options to deter mosquitoes with or without chemicals, or discuss a different approach. If in a class, you will work in groups of 2-3 students.

Step 11: Watch a few example PSA videos (links to a few examples are at the end of the slide presentation). Discuss as a class what steps might go into making a PSA video and complete the list below. (Eight steps are not required and you can add more if needed.)

1. Brainstorm subject ideas
2. Select one idea
3. Do research
4.
5.
6.
7.
8.

Step 12: Following the steps you've outlined, make a plan for your PSA. Whenever you've completed your prep work, film and edit the video and turn it in.

EVALUATE

Step 13: Using some of the knowledge you've gained throughout the lesson, you will create a story or a long poem about mosquitoes on your own. This written piece should include at the very least 3 pieces of information about mosquitoes that you think is important. Try to be creative; you could describe some part of a mosquito's life, write about mosquito-borne diseases, or a poem about what you imagine a mosquito might be thinking. The three mosquito facts should be clearly presented, even if the written piece is poetry. These pieces should be between 100 and 300 words long. Once you've completed the paragraph or poem, write an additional 2-3 sentences about what (if anything) you learned from this lesson that you hadn't already known.

Step 14: Answer the questions on the post-lesson quiz. This one has POST in the top corner.

Teaching tips

In this lesson, students will complete a variety of activities to learn about mosquitoes. Through class activities, presentations, discussions, and group and individual projects, students will learn and solidify their knowledge about mosquitoes. They will also use two different media projects to communicate what they've learned.

Time Required: 3.5 hours, can be 1 hour the first day (rain activity, presentation/discussion), 2 hours split over the second and third days (PSA activity), and 30 minutes (independent writing) the final day.

Classroom Setup: The rain activity works in almost any classroom, but it's good to check in advance to make sure there are some containers around that might collect water (even just in the lids) if it were to rain inside. Make sure you have a good presentation space and areas where students can easily work in groups. Check that students have the technology needed to create videos (i.e., personal smart phones). You can design groups around making sure every group has one. Otherwise, you will want to have

groups schedule a time for you to record their PSA with your phone or a camera.

Before you begin

- If you don't want to use up butcher paper to cover items, wooden sticks or dowels that students can place over "treated" water would be useful, or they can use sticky notes.
- Look through the mosquito presentation.

Tips

- The sound of a thunder storm is great to play during the rain activity
- The PSA activity is a great opportunity for students to think about what types of information they learn from best, and what types of messages change their minds, before they storyboard out a video plan.
- Make it clear you are looking for creativity in the PSA videos! And you can help them with this too. You might dress as a mosquito or a vector control person, or encourage them to.

Extensions

- Individually, in groups, or as a class, students can design an infographic with the most important pieces of information about staying safe from mosquitoes. They might share these around school or with other classrooms.

Objectives

- Students will learn the life cycle of mosquitoes
- Students will learn how mosquitoes are vectors of disease
- Students will learn how to control mosquitoes at various life stages
- Students will practice how to communicate important information that can affect human health