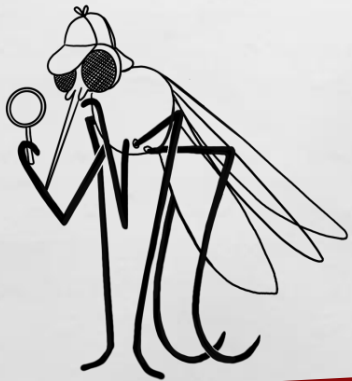


THE MIGHTY MOSQUITO MISSION!



**MOSQUITOES HAVE BEEN SPOTTED IN YOUR NEIGHBORHOOD!
LEARN HOW TO FIGHT-THE-BITE AND SAVE THE DAY!**

(FROM ITCHY MOSQUITO BITES)



What is it and why do we need it?

- **An elementary age mosquito education program.**
- **One of the cornerstones of Henrico County's IMM Process includes education and outreach**
- **Need to reinvigorate Henrico's outreach efforts in the wake of Covid**
- **Majority of outreach efforts were mainly targeted to those individuals interested in our field of interest.**

WHO TO TARGET?

Kids vs **Adults**

Inspiration from Lee County on Florida's Gulf Coast. Uses lessons aligned with state learning standards.

<https://mosquitoed.com/>

Virginia's SOLs showed a lesson geared toward K-2 could be created without much changing or adaptation between grade levels.

Goals and Development:

- **Program Goals:**
 - **Regularly scheduled presentations**
 - **Reach people outside of our regular scope of interest.**
- **Align with Virginia SOLs – grade K-2**
- **Ensure our verbiage and message is appropriate for the age level we are presenting to**
- **Create a themed presentation to increase memorability**



IMPLEMENTATION

- **Proposal**
- **Lesson plan**
- **Contact the schools – Principals and Assistant Principals**

In recent years, but it persists in our mosquito population each year. Henrico County uses an Integrated Pest Management (IPM) approach to mosquito control, meaning several different methods are used in conjunction with each other to form our program. The methods we employ are surveillance, education and treatment.

and outreach programs we speak at community events, have information tables at some area festivals as well as offer free residential mosquito inspections to all Henrico County residents. Historically, we have also facilitated age-appropriate presentations at area schools, a practice that was stopped with the pandemic. As visitors are being allowed back into our school buildings again, we hope to resume and expand our school education program. Introducing you to the SWI campaign can help progress their neighborhood communities towards better education. As a small department within Public Works, we can't be in everyone's backyard to fight mosquitoes, so our goal is to educate our neighbors so we can all work together for a more enjoyable outdoor experience.

Our lesson takes approximately 20-30 minutes. We will prepare the students for a "Mighty Mosquito Mission" to find and eliminate mosquitoes from their neighborhood. As "Mini Mosquito Agents", the first step in our quest is to know your target (mosquito anatomy). Next, our agents need to learn where the mosquitoes spend most of their time (life cycle). The students will develop a map (coloring picture of backyard egg laying habitats) and finally prepare a disguise to wear while on their mission (mosquito headband). Now our mini mosquito agents are ready to venture out on a Mighty Mosquito Mission to "Fight-the-Bite" in their own neighborhood. While our program is designed specifically for younger students in grades K-2 it can be adapted to grades 3-5 on request. Our presentation would complement an insect life cycle discussion well.

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- **19 out of 48 Elementary School scheduled presentations for the Spring of 2023**

Appendix 1

"The Mighty Mosquito Mission to Fight-The-Bite" Lesson Plan

Subject: Science (K-2)

Topic: Mosquitoes

Supports SOL Measures: Living Systems and Processes. K.7; 1.5; 2.4 and 2.5.

- K.7 and 1.5: Plants and animals have basic needs and life processes that allow them to survive.
- 2.4 and 2.5: Plants and animals undergo a series of orderly changes as they grow and develop and are part of a system.

What essential understandings, knowledge, skills and/or processes students need to have or be able to do?

- K.7 (a) If animals' needs are not met, they move to an area that does meet their life needs. If they cannot move, they will not survive.
- K.7 (b) Simple changes animals undergo during their life cycles may include changes in their body size, color, covering, or shape.
- 1.5 (a) Animals, including humans, have basic life needs, including air, food, water, shelter, and space.
- 1.5 (b) Animals, including humans, have a variety of physical characteristics that help them survive.
- 2.4 (a) Plants and animals undergo a series of orderly and identifiable changes. These may include changing form or growing.
- 2.5 (a) Organisms are dependent on other living organisms and their nonliving surroundings for survival.
- 2.5 (c) The habitats of living organisms may change due to human influences. For example, an animal may need to change behavior or leave the area if it's basic needs are not met, which may result when humans develop (build) an area.

Objective and Success Criteria:

- Students will be able to identify that there are 4 stages of the mosquito's life cycle, name the major identifying body parts and recognize egg-laying habitats.
- Students will be able to reduce habitats once identified.

Vocabulary Development:

- Introduce the scientific names for insect body parts and life cycle. Proboscis, larvae, pupae, abdomen, thorax.
- Habitat, source reduction.

Materials Needed:

- Materials from school: Power source and desk for microscope set up, power point display abilities.

- Materials from SWI: emergence chambers, microscope set up: microscope, camera, monitor, and light source; craft and coloring pages, power point presentation.

Structure/Activity:

Introduce ourselves and mosquitoes. It's time for a Mighty Mosquito Mission. The mission, should the students choose to accept, is to "Fight-the-Bite" in their neighborhood by helping us reduce mosquito populations. The first step for any mission is to know your target. We will ask the 'mini mosquito agents' what they know about mosquitoes. Show an image of an adult mosquito and talk about the basic body parts. (Vocabulary, 1.5(b), 1.5(c)) Show a mosquito specimen under a microscope, can the students point out the same body parts?

Now that we know what a mosquito looks like, the next thing we need to know is where can we find mosquitoes. Briefly discuss the mosquito life cycle. (K.7 (b)) Complete metamorphosis, like a butterfly. Egg, larva, pupae, adult. (1.5 (b), 2.4 (a)) If available, (time of year dependent) show the emergence containers with mosquito larvae. Allow the kids to hold and observe. Discuss that the first 3 stages of a mosquito's life cycle require water.

Next, what does any good mosquito agent need to find their target? A Map! Finding standing water in their backyard is easier than finding adult mosquitoes that can fly all over. Discuss where mosquitoes can lay eggs in your yard. (K.7 (a), 1.5 (a), 2.5 (a)) They need something that holds water. Dumping that water eliminates where mosquitoes can lay eggs and develop into adults. (K.7 (a), 1.5 (a), 2.5 (a)) The need to dump the water to reduce egg-laying habitats in their backyards is important to reducing mosquito populations. (2.5 (c)) Color/draw a picture of a backyard and circle the things that can hold water. How can you help reduce mosquitoes in your yard? (2.5 (c)) You can be a good neighbor by reducing the mosquitoes in your yard and teaching your neighbors to do the same.

Finally, we need a disguise. Make mosquito headbands! Now our Mosquito Agents are ready to embark on their mission to Fight-the-Bite in their neighborhood! (With the help of an adult)

Homework assignment:

Draw your own Mosquito Map to help you teach your family how to Fight-the-Bite! SWI would love to see your maps! Teachers can send map drawings to ser089@henrico.us

THE MIGHTY MOSQUITO MISSION!



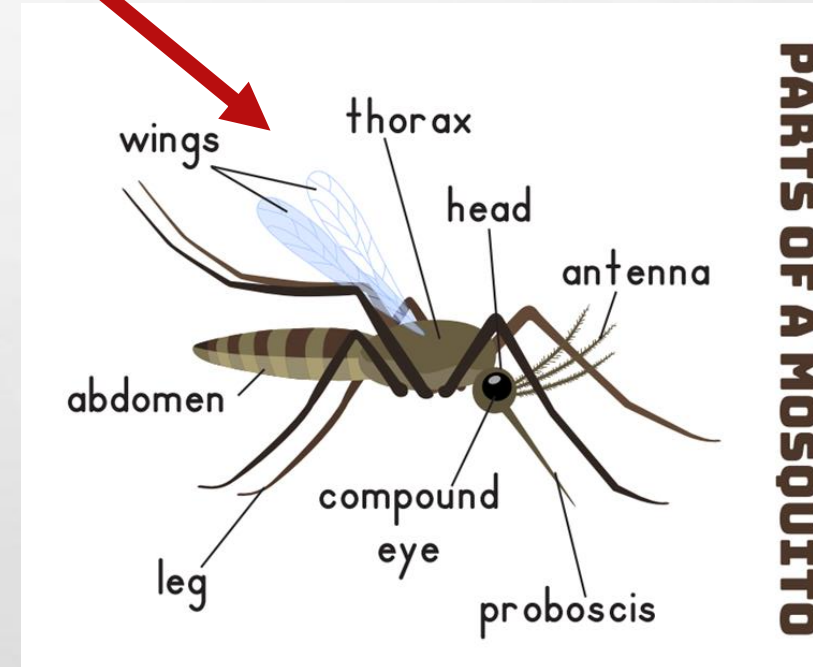
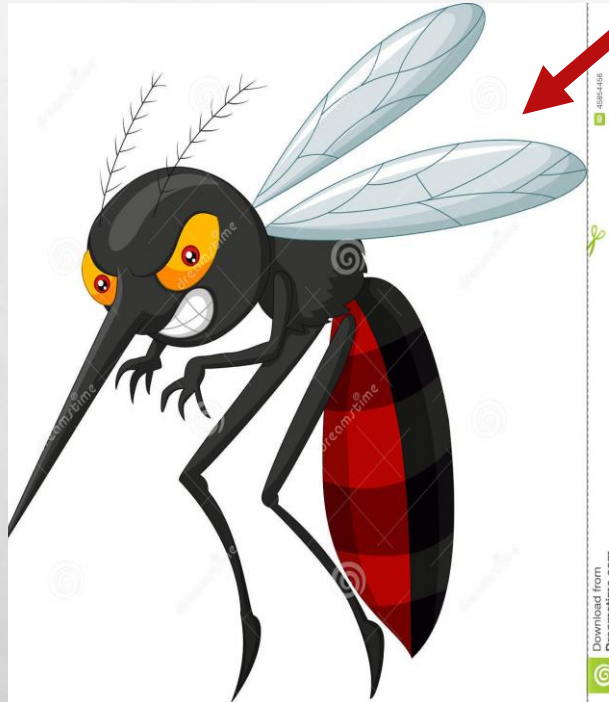
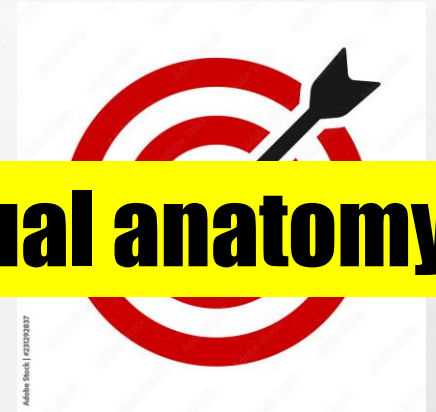
MOSQUITOES HAVE BEEN SPOTTED IN YOUR NEIGHBORHOOD!
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(FROM ITCHY MOSQUITO BITES)



STEP 1 KNOW YOUR TARGET

Discuss differences between cartoon and actual anatomy



Virginia Living Systems and Processes SOLs:

1.5(b) Animals, including humans, have a variety of physical characteristics that help them survive.

1.5(c) . Animas can be classified based on characteristics.

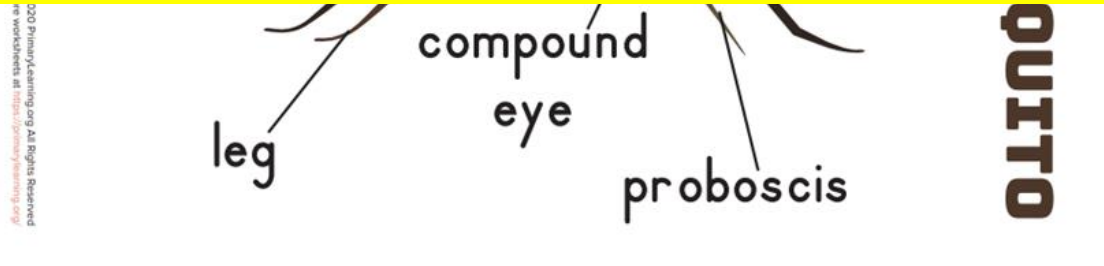
<https://www.doe.virginia.gov/teaching-learning-assessment/k-12-standards-instruction/science/standards-of-learning>

• **ANTENNA**

• **ANTENNA**

• **COMPOUND EYE**

• **PROBOSCIS**





Wings

Abdomen

Thorax

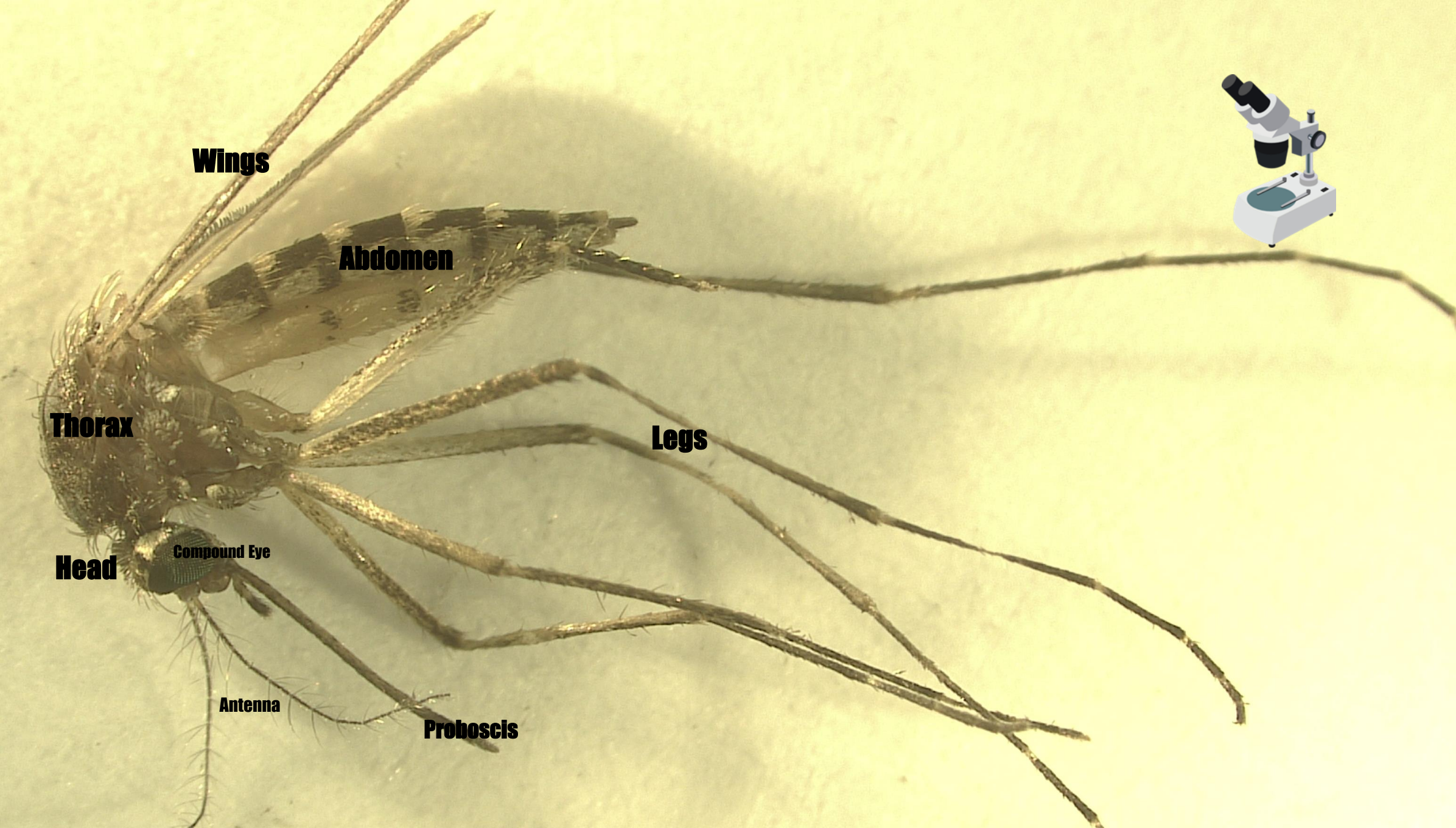
Legs

Head

Compound Eye

Antenna

Proboscis



HINT: ▲

Virginia Living Systems and Processes SOLs:

K.7 (b) Simple changes animals undergo during their life cycles may include changes in their body size, color, covering, or shape.

1.5 (a) Animals, including humans, have basic life needs, including air, food, water, shelter, and space.

2.4 (a) Throughout their lives, plants and animals undergo a series of orderly and identifiable changes. These may include changing form or growing.

2.5 (a) Organisms are dependent on other living organisms and their nonliving surroundings for survival.

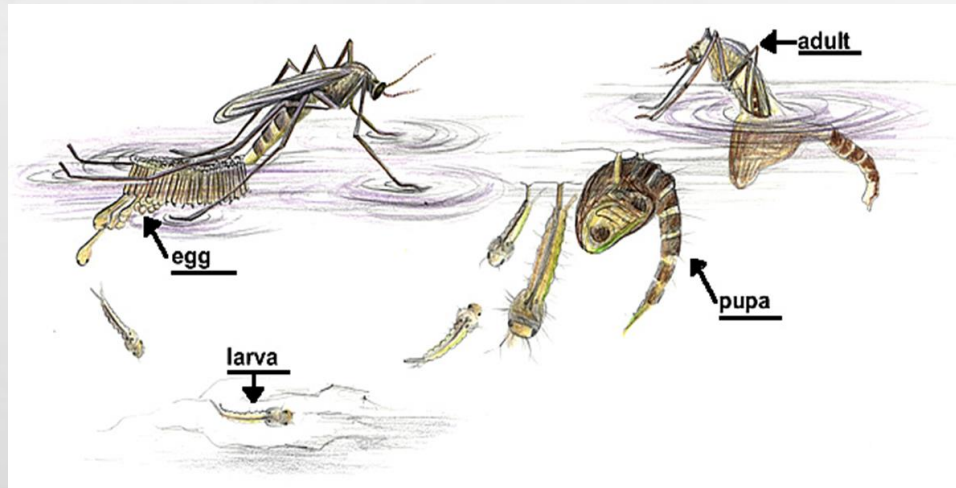
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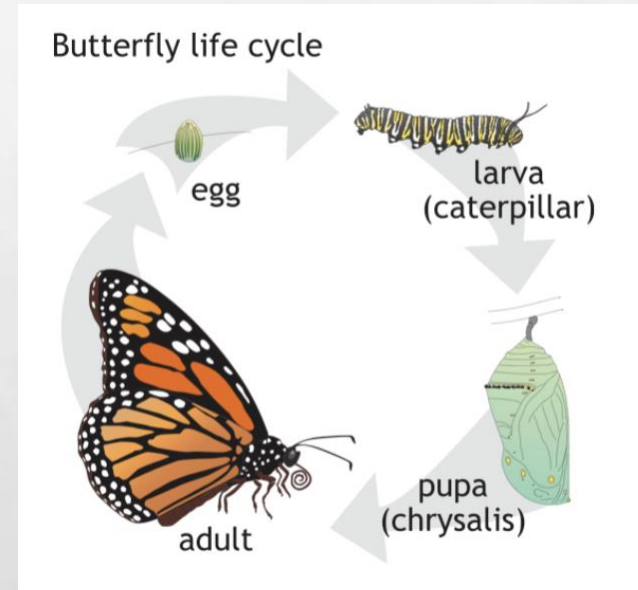
Larvae

LIFE CYCLE: COMPLETE METAMORPHOSIS

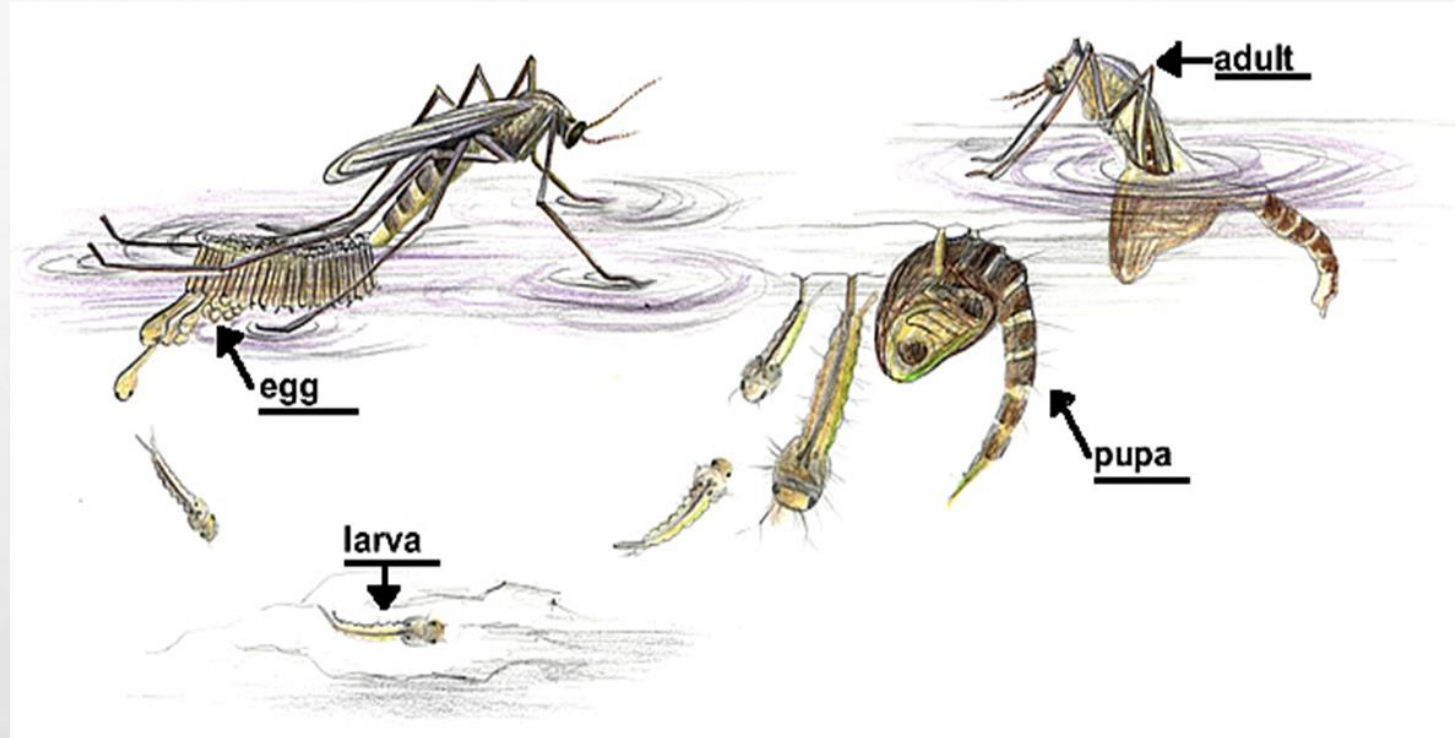
MOSQUITO



BUTTERFLY



HINT:



FIRST 3 STAGES OF A MOSQUITOES LIFE OCCUR IN WATER.



WHICH IS EASIER TO FIND?





LARVAE

PUPAE



ADULT EMERGING FROM PUPA



Virginia Living Systems and Processes SOLs:

K.7 (a) If animals' needs are not met, they move to an area that does meet their life needs. If they cannot move, they will not survive.

1.5 (a) Animals, including humans, have basic life needs, including air, food, water, shelter, and space.

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<https://www.doe.virginia.gov/teaching-learning-assessment/k-12-standards-instruction/science/standards-of-learning>

Low areas Neglected pools

Fight-the-Bite!



FIGHT-THE-BITE!

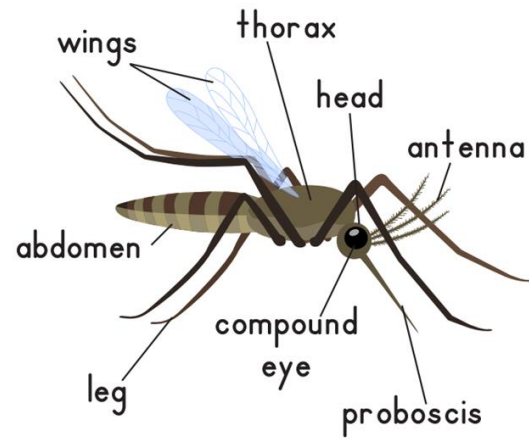
WALK YOUR YARD ONCE A WEEK AND DUMP ALL STANDING WATER!





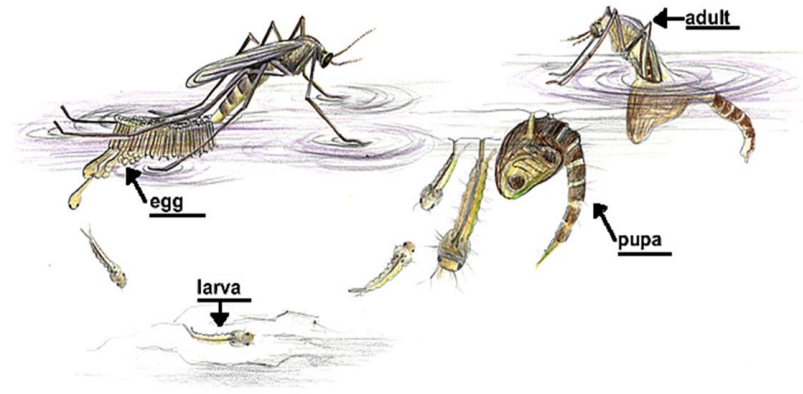
REVIEW

STEP 1

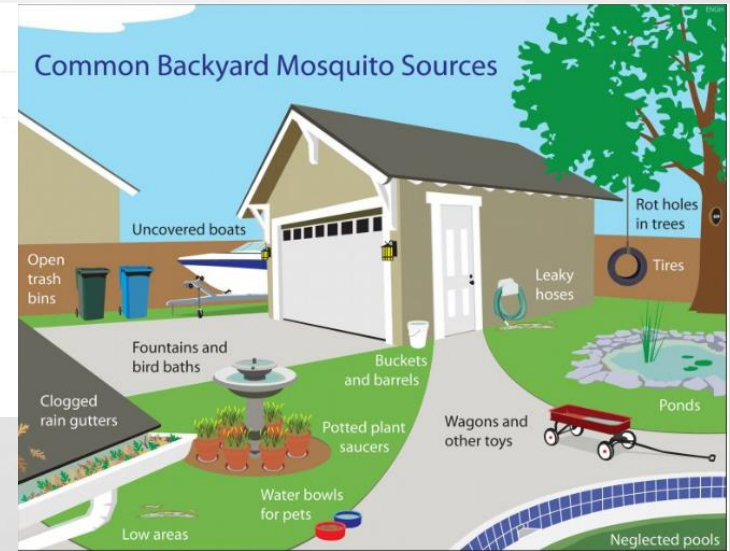


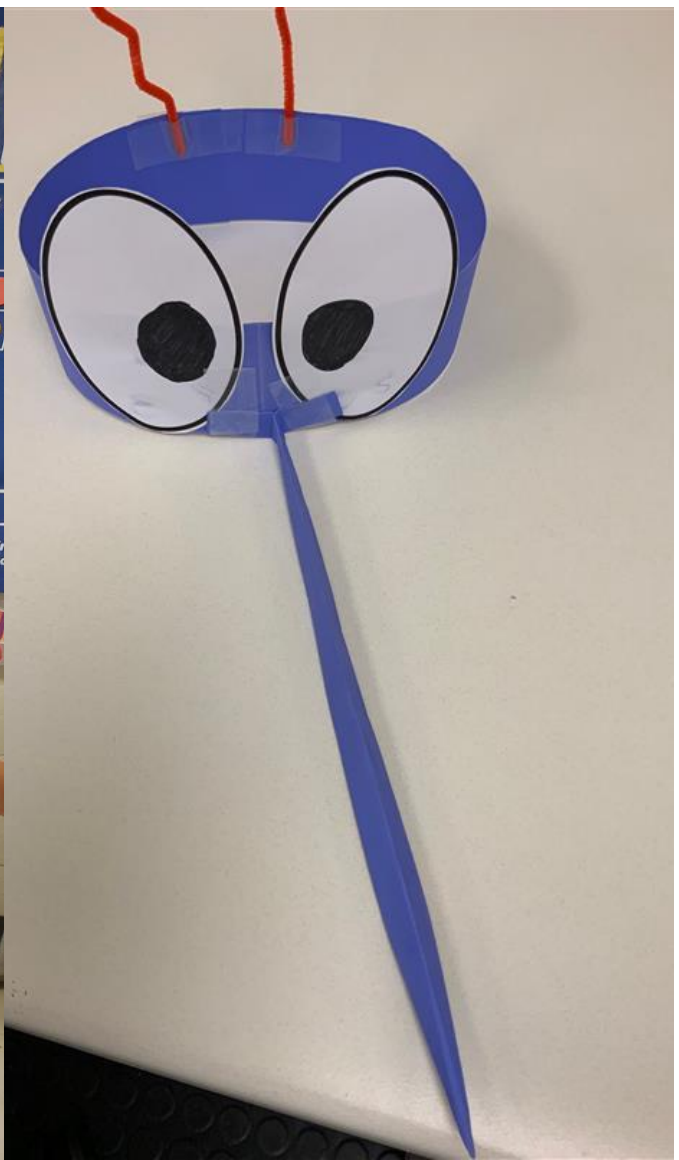
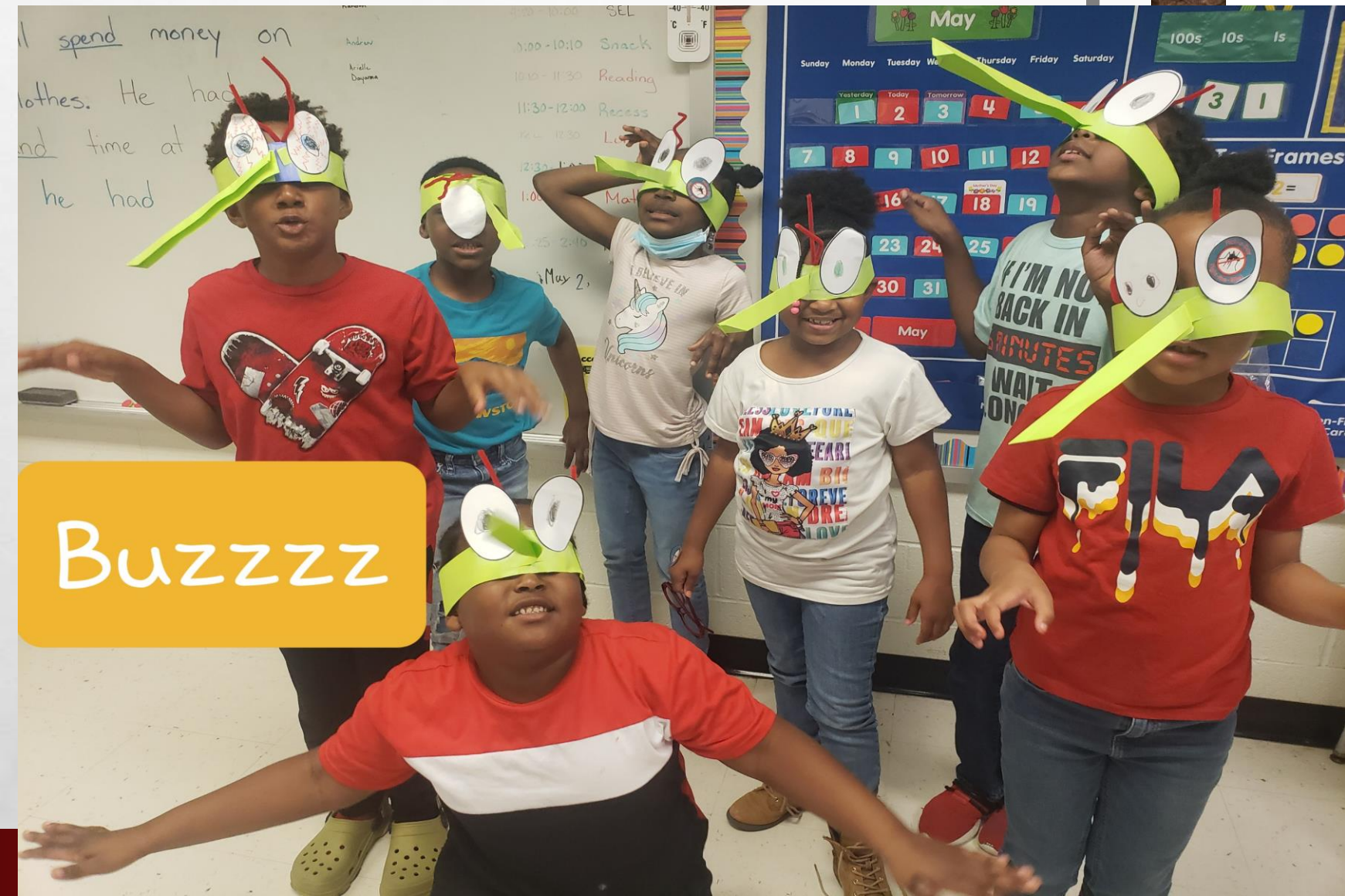
PARTS OF A MOSQUITO

STEP 2



STEP 3





Find the mosquito egg laying habitats!



Worksheet by:
Sam Haussler

STUDENT TAKE HOME FLIER

CONTAINS:

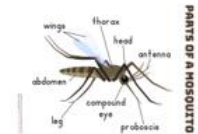
- **OVERVIEW FOR PARENTS ABOUT THE LESSON**
- **OUR CONTACT INFORMATION**

Today I went on a Mighty Mosquito Mission!!

Henrico County's Department of Public Works Standing Water Initiative came to my school and gave us a mosquito presentation!

Today I Learned:

What mosquitoes look like:
Anatomy



How they grow up:
Life Cycle



How to Fight-the-Bite!:
Dump standing water
every 7 days



Now I'm ready to Fight-the-Bite in my Backyard!



For more information about free mosquito inspections, call 226-NILE or email SWI_Info@henrico.us



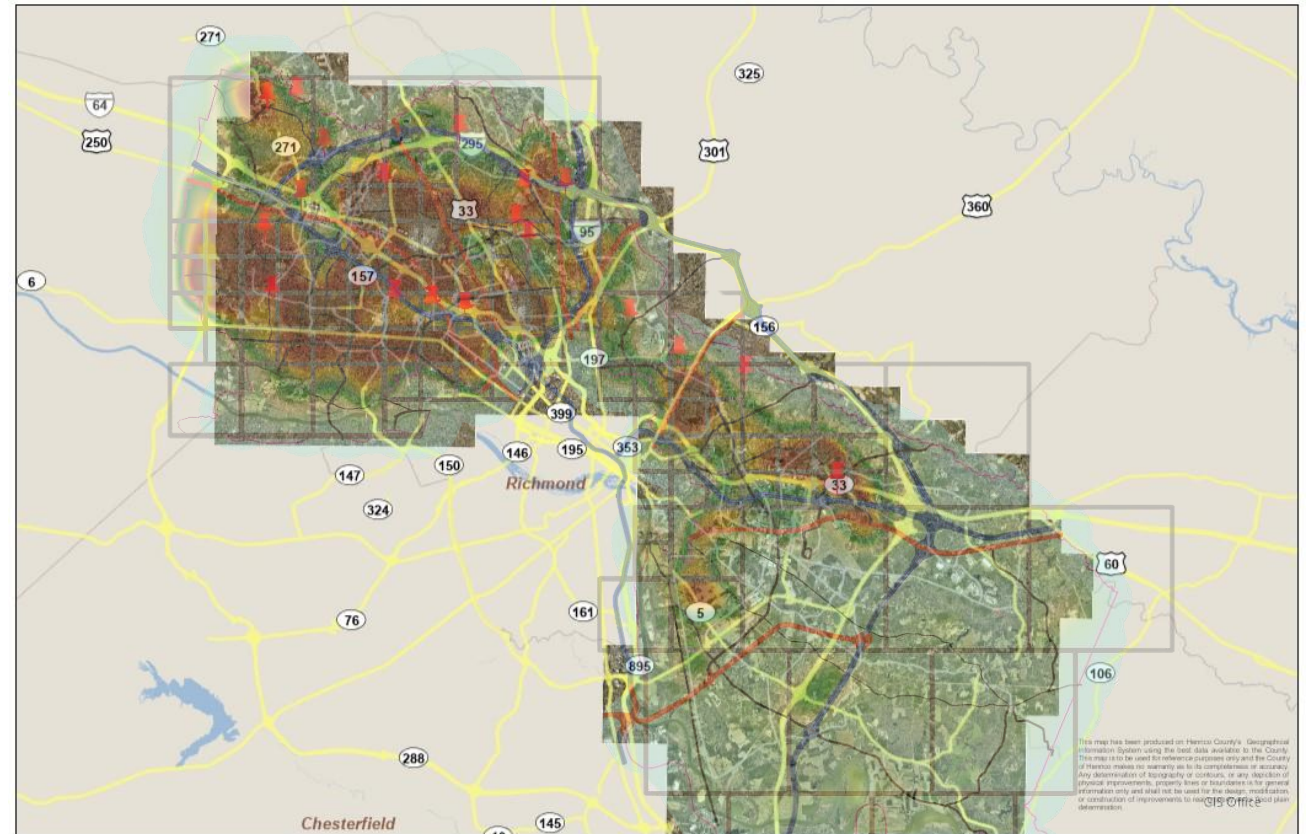
*Images sourced from Google search engine



Like us on Facebook for more fun mosquito facts!!

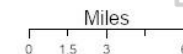
SCHOOL DISPERSAL

19 Schools SWI presented to in the Spring of 2023



Elementary Outreach Schools Spring 2023

Author: G. Serge



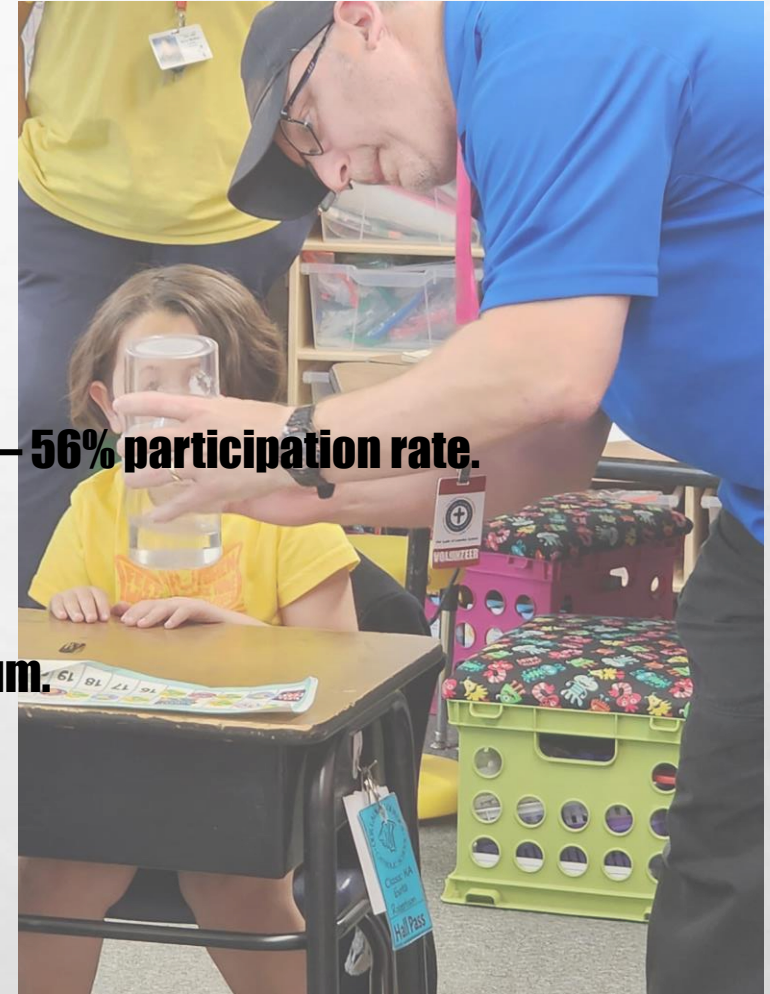
Date: 3/27/2023



FEEDBACK AND RESULTS

Thank you email and follow up survey

- **Of the 108 classes presented to, 61 educators responded to the survey – 56% participation rate.**
- **100% of respondent said the content was on target for the grade level.**
 - **54% 2nd grade, 25% 1st grade, 21% Kindergarten.**
- **98% responded said the content did or closely supported the curriculum.**
- **100% responded they will be willing to has us back again next year.**



COMMENTS FROM THE TEACHERS

The background of the slide is a faded, grayscale image of a classroom. In the foreground, a group of young children are sitting on the floor, many wearing pink headbands with large, colorful eyes. Behind them, two adults, presumably teachers, are standing and smiling. The classroom walls are decorated with educational posters, including one that says "I can..." and another with the words "Buddy Up!". There are also some educational materials on a table in front of the children.

Honestly, this program was fabulous. The teachers remarked that even we had learned a lot about mosquitoes that we didn't know before. It was delightful.

Both presenters were wonderful and knew how to talk to kids on their level!!

I was very nervous about the age appropriateness of the content and delivery, but it was perfect. The 1st graders loved it!

**Wonderful lesson! Kept the students engaged and had options when they needed to wait!
We absolutely loved it and would love to have you back to our second grade classes.**

FINAL NUMBERS FOR SPRING 2023

- **19 Schools**
- **74 separate presentations**
- **108 individual classes**
- **2132 Students**
- **4264 Mosquito Eyes cut out for headbands**



2023-2024 SCHOOL YEAR AND BEYOND

Changes:

- **No longer doubling up classes**
- **Reaching out individually to schools vs mass emailing**
- **Expanding to 3rd and 4th grade**
- **Updating worksheet and craft**



Fall Numbers

7 Schools

48 Total Presentations

980 Students

***Still scheduling for Spring 2024**



NOW YOU ARE READY FOR THE MIGHTY MOSQUITO MISSION

Mascot by: Britton Elmer

