



School :

Teacher's Name:

Grade: **8** (ages 13-15)

Date(s):

Subject/Topic Area: Integrated Science/ **Mosquitoes**

Benchmark: Students should be able to explain the anatomy, lifecycle and breeding patterns of mosquitoes.

Performance Standards: Students should be able to:

- Define entomology.
- Define a mosquito.
- Label the parts of a typical adult mosquito.
- List the characteristics of an Aedes Aegypti Mosquito.
- State the conditions under which the Aedes Aegypti Mosquito breeds.
- Identify the main characteristics of the Anopheles, Aedes and Culex mosquitoes.
- Illustrate the mosquito life cycle.
- Describe what happens within the mosquito life cycle.

Materials: pen, pencil, crayons, notebooks, handouts

<https://www.cdc.gov/dengue/about/index.html> (from teacher)

Development of Lesson & Learning Activities:

1. Teacher introduces the objectives to the class.
2. Each student is given a strip of paper and asked to write definitions of a mosquito and entomology. After this is done, the teacher calls upon students randomly to give their definitions. Teacher gives suitable definitions and students take notes.
3. Teacher illustrates what a typical mosquito looks like on the whiteboard (without labels). Students are called upon to guess the main parts of a mosquito. Teacher labels the mosquito and gives a brief overview of the mosquito parts.
4. A colored photograph of an Aedes Aegypti mosquito is passed around the classroom so that each student can carefully study. Each student is

asked to write two facts about what they see when they look at the photo of the mosquito. Teacher reviews answers.

Teacher lectures on the characteristics of mosquitoes and students take notes.

5. Teacher describes the conditions under which the mosquito breeds.
6. Each student is given a handout which illustrates the main characteristics of the Anopheles, Aedes and Culex mosquitoes. Students are asked to study the diagrams and be able to match each mosquito with its characteristic with reference to the eggs, larvae, pupa, typical position, and adult (female).
7. Teacher describes what happens within the mosquito life cycle with the aid of diagrams. Students take notes.
8. Conclusion :Teacher summarizes the content taught and gives students the chance to demonstrate their understanding of information by asking questions.
9. Assessment
 - o List two (2) characteristics of the Aedes Aegypti Mosquito.
 - o State one (1) condition under which the Aedes Aegypti mosquito breeds.
 - o Illustrate, using labels, the mosquito life cycle.
 - o Using no less than one hundred (100) words, describe what takes place at each stage of the mosquito life cycle.
10. Teacher's Evaluation:
11. Homework Assignment:

SUMMARY OF CONTENT

Entomology - the branch of zoology concerned with the study of insects.

Mosquito - a mosquito is a slender, long-legged fly with aquatic larvae. Mosquitoes belong to the insect group. The bodies of adult insects are divided into three main parts; a head, thorax and abdomen. Adult mosquitoes have three pairs of legs and one pair of wings that are attached to the thorax.

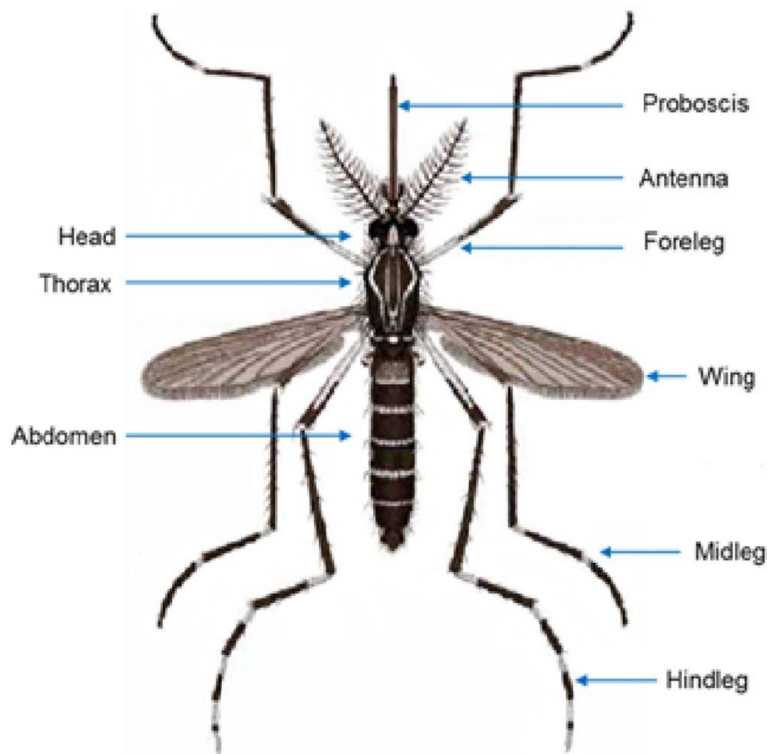


Fig 1. Dorsal view of the female mosquito

Source: Modified from Rueda, L. (2004), "Pictorial keys for the identification of mosquitoes (Diptera: Culicidae) associated with dengue virus transmission", in ZOOTAXA 589, Magnolia Press, Auckland, pp. 60.

Characteristics of an *Aedes Aegypti* Mosquito:

- Small, dark mosquito, approximately 4-7 mm.
- Noticeable black and white markings on the sides of the bodies and bold, black and white markings on the legs.

- They are active and feed during the daytime. However, due to extreme bright lighting, they may bite at night.
- Peak biting periods are early in the morning and in the evening before dusk.
- Females lay their eggs singly, just above the water line, often in man-made containers located in the home or yard (buckets, drums, tyres, and vases, etc)



Fig 2. *Aedes aegypti* mosquito.

Source: <https://www.cdc.gov/dengue/about/index.html>

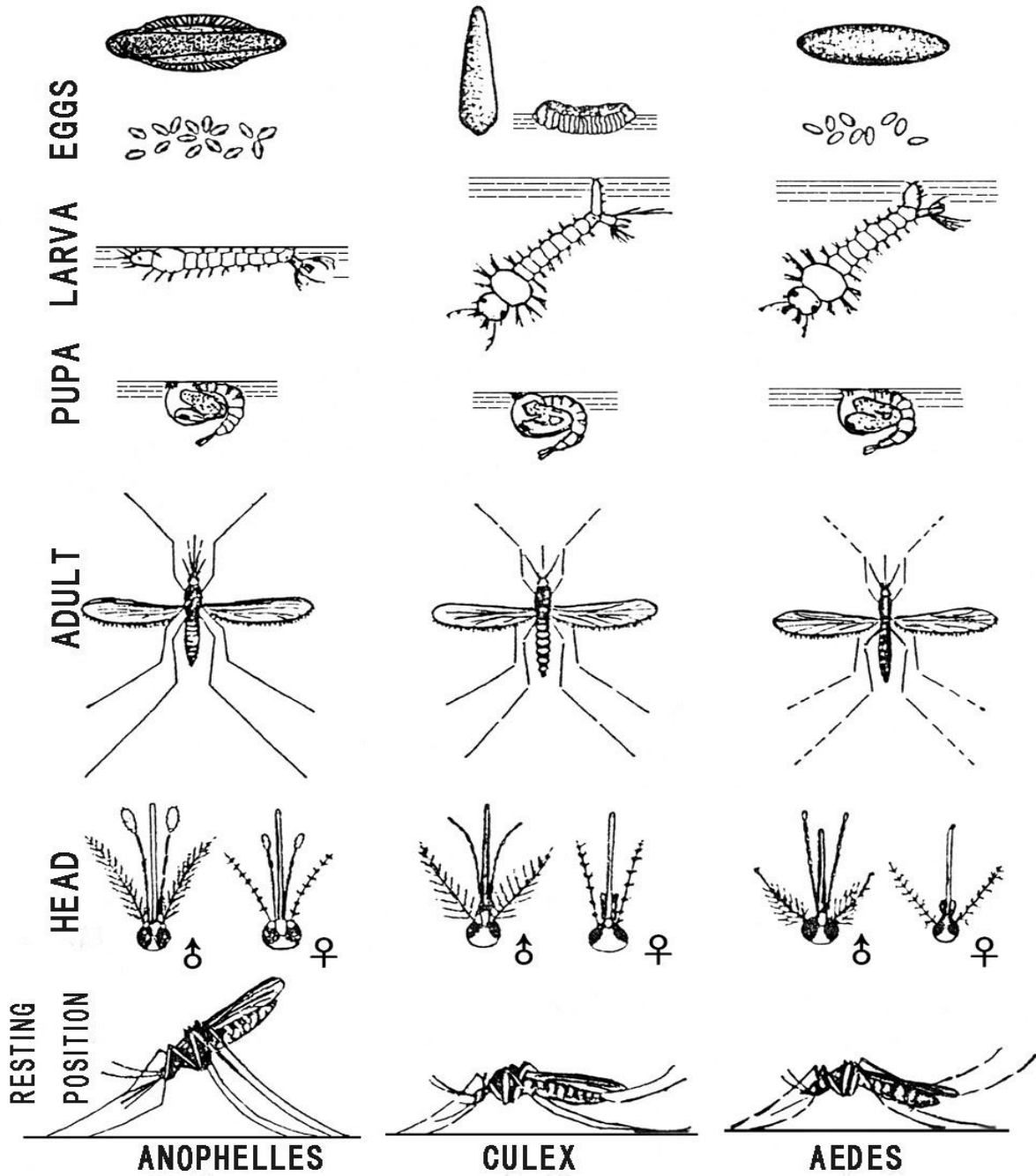


Fig 3. The main characteristics of the three common groups of mosquitoes.

Source:https://www.researchgate.net/post/How_to_identify_Culex_Anopheles_and_Aedes_mosquitoes_and_their_larvae

	Anopheles	Culex	Aedes
Eggs	Eggs are laid directly on the water, in a single file.	Eggs are laid in the form of a raft on the water.	Eggs are laid in a single file, near wet water surfaces or dry surfaces.
Larvae	Lays horizontally on the water	Rests at 45 degrees from the water surface. A long, slender siphon is present	Lays horizontally on the water. A short, thick siphon is present.
Pupae	comma-shaped	comma-shaped	comma-shaped
Adult	Brown in color (dependent on region which it is in)	Brownish-black in color (depends on region which it is in)	Black and white
Resting position	Flat on the surface	At an 45 degree angle from the surface	Flat on the surface.

Table 1: Summary of the main characteristics of the three common groups of mosquitoes.

Conditions under which mosquitoes breed

Mosquitoes lay its eggs on:

- the walls of water-filled containers.
- stagnant water in and around homes.
- dry surfaces (eg., boulders, tree holes)

E.g., *Aedes Aegypti* lay their eggs in single file on dry surfaces and prefer clean water. *Culex* lay their eggs in the form of a raft on the water surface and prefer the more contaminated water e.g., septic tanks. The *Anopheles*, though not found in The British Virgin Islands, lay eggs in single files in swampy areas (Guyana & Trinidad).

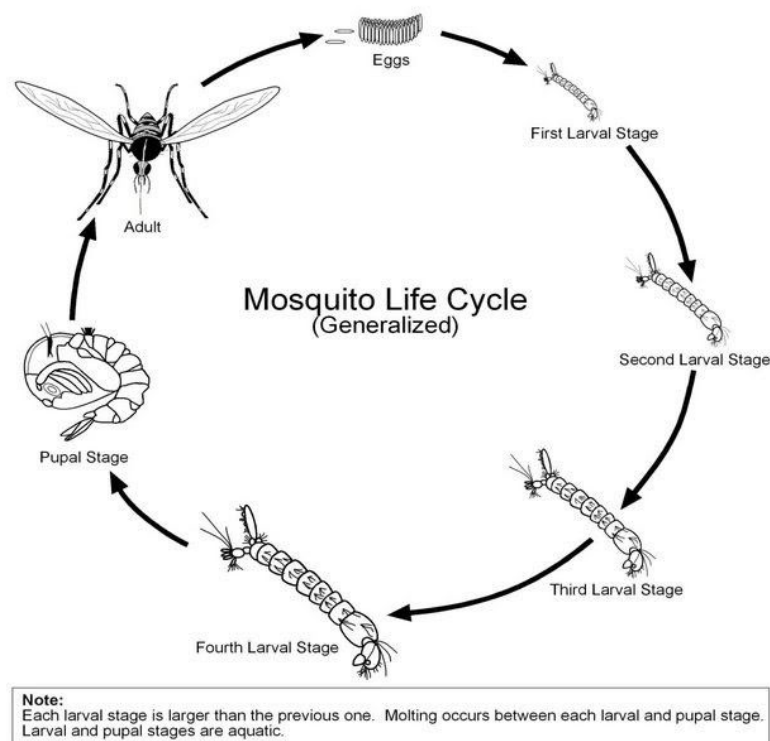


Figure 4. Mosquito Life Cycle
Source: www.mosquitoes.org/LifeCycle.html

The Mosquito Life Cycle

The mosquito goes through 4 separate and distinct stages of its life cycle: *Egg*, *Larva*, *Pupa*, and *Adult*. Each of these stages can be easily recognized by its special appearance. ... Most eggs hatch into larvae within 48 hours.

Young mosquitoes develop from eggs that are laid by the adult female on water or near to water surfaces. The eggs first hatch out in a worm-like larvae that lives in water and breathes air using a small tube called a siphon that attaches to the surface of the water.

Larvae are bottom-feeders and surface breathers that can be seen wriggling in the water when they are disturbed. Mosquito larvae feed on disintegrated organic material in the water. The larvae go through four distinct instars or stages called molting, and generally pupate within five days. However, according to the temperature, pupation could be delayed by even three months.

Pupae look like small comma-shaped creatures that breathe hanging from the surface of the water. After about 48 hrs, pupae emerges from its pupal shell, rests on the surface of the water to dry its wings, after which it flies out in search of its first blood meal.