



School:

Teacher's Name:

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

Date(s):

Subject/Topic Area:

Integrated Science/ Relationship between mosquitoes and diseases.

Benchmark: Students should be able to explain the relationship between mosquitoes and the diseases that they carry.

Performance Standards: Students should be able to:

- Name **three (3)** diseases associated with the Aedes Aegypti Mosquito: Dengue Fever, Zika and Chikungunya.
- List **four (4)** symptoms associated with each of the above-named diseases.
- Describe **two (2)** methods of transmission for each of the following diseases: Dengue Fever, Zika and Chikungunya.
- Suggest **three (3)** ways by which persons can prevent themselves from contracting mosquito-borne (arboviral) diseases.

Materials: notebook, pen, handouts (zika fact sheet

<http://www.bugoutbvi.org/wp-content/uploads/2016/08/AMCA-Zika-Fact-Sheet.pdf> & mosquito-borne virus fact sheet

http://www.bugoutbvi.org/wp-content/uploads/2016/08/control_mosquitoes_c_hikv_denv_zika.pdf, video clip (Zika Virus education 411)

<https://www.youtube.com/watch?v=v8Py4TCf8hQ#action=share>

BugOut PSA

Development of Lesson & Learning Activities:

1. Teacher introduces the objectives to the class.
2. Teacher asks students to name three diseases associated with the Aedes Aegypti Mosquito.
3. Students are asked to list symptoms of each disease. Teacher lectures on diseases and students take notes.
4. Each student is given two handouts to read and review (zika fact sheet & mosquito-borne virus fact sheet). Teacher asks questions based on what the students have read.



5. Students are placed in groups of 3. Each group brainstorms and describes two methods of transmission of any one (1) of the diseases.
A representative of each group presents their answers to the class.
6. Students view the clip on zika-411. Each student makes his/her own notes on ways by which persons can prevent themselves from contracting mosquito-borne diseases. Teacher reviews answers.
7. **Conclusion:** Each student is given an index card. Students are instructed to write 3 points they learned, 2 points they have questions on or want clarified and 1 feedback for the teacher.
8. **Assessment:** Choose one of the following mosquito-borne diseases: Dengue, Chikungunya or Zika. Write a descriptive paragraph, in no less than 500 words. Include symptoms, methods of transmission and preventive measures of that disease.
9. **Teacher's Evaluation:**
10. **Homework Assignment:**

SUMMARY OF CONTENT

DENGUE FEVER

Dengue fever is a viral disease, which is usually an acute non-fatal disease. It is transmitted from person to person via the bite of an infected female Aedes Aegypti mosquito.

Symptoms

The most common symptom of dengue is fever with any of the following:

- Nausea, vomiting
- Rash
- Aches and pains (eye pain, typically behind the eyes, muscle, joint, or bone pain).

Symptoms of dengue typically last 2–7 days. Most people will recover after about a week. Dengue fever is characterized by the sudden onset of fever,

headache, backache, loss of appetite, rash, muscle and joint pains. The incubation period (the period between exposure to the virus and the onset of



the first symptoms) is about 3-15 days, usually 3-5 days. There are four (4) serotypes of the Dengue virus - types 1,2,3 and 4.

Symptoms of dengue can be confused with other illnesses that cause fever, aches and pains, or a rash.

Sometimes, dengue fever can progress into a more severe condition, giving rise to more severe symptoms which can result in death. This is called Dengue Haemorrhagic Fever/ Shock Syndrome.

Dengue Haemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) are the severe forms of Dengue Fever that are characterized by bleeding under the skin and internal bleeding, which may lead to shock and death as a result of circulatory failure and depletion of blood platelets. It is important to note that to contract severe dengue, one must have had at least one strain/ stereotypic of dengue and/or have several complicated health conditions.

Dengue Shock Syndrome (DSS) can be fatal if not properly monitored under ICU (Intensive Care Unit) setting.

Transmission of Dengue

1. Through Mosquito Bites

Dengue viruses are spread to people through the bites of infected *Aedes* species mosquitoes (*Ae. aegypti* or *Ae. albopictus*). These are the same types of mosquitoes that spread Zika and Chikungunya viruses.

- These mosquitoes typically lay eggs near standing water in containers that hold water, like buckets, bowls, animal dishes, flower pots, and vases.
- These mosquitoes prefer to bite people, and live both indoors and outdoors near people.
- Mosquitoes that spread dengue, chikungunya, and Zika bite during the day and night.
- Mosquitoes become infected when they bite a person infected with the virus. Infected mosquitoes can then spread the virus to other people through bites.

2. From mother to child

- A pregnant woman already infected with dengue can pass the virus to her fetus during pregnancy or around the time of birth.

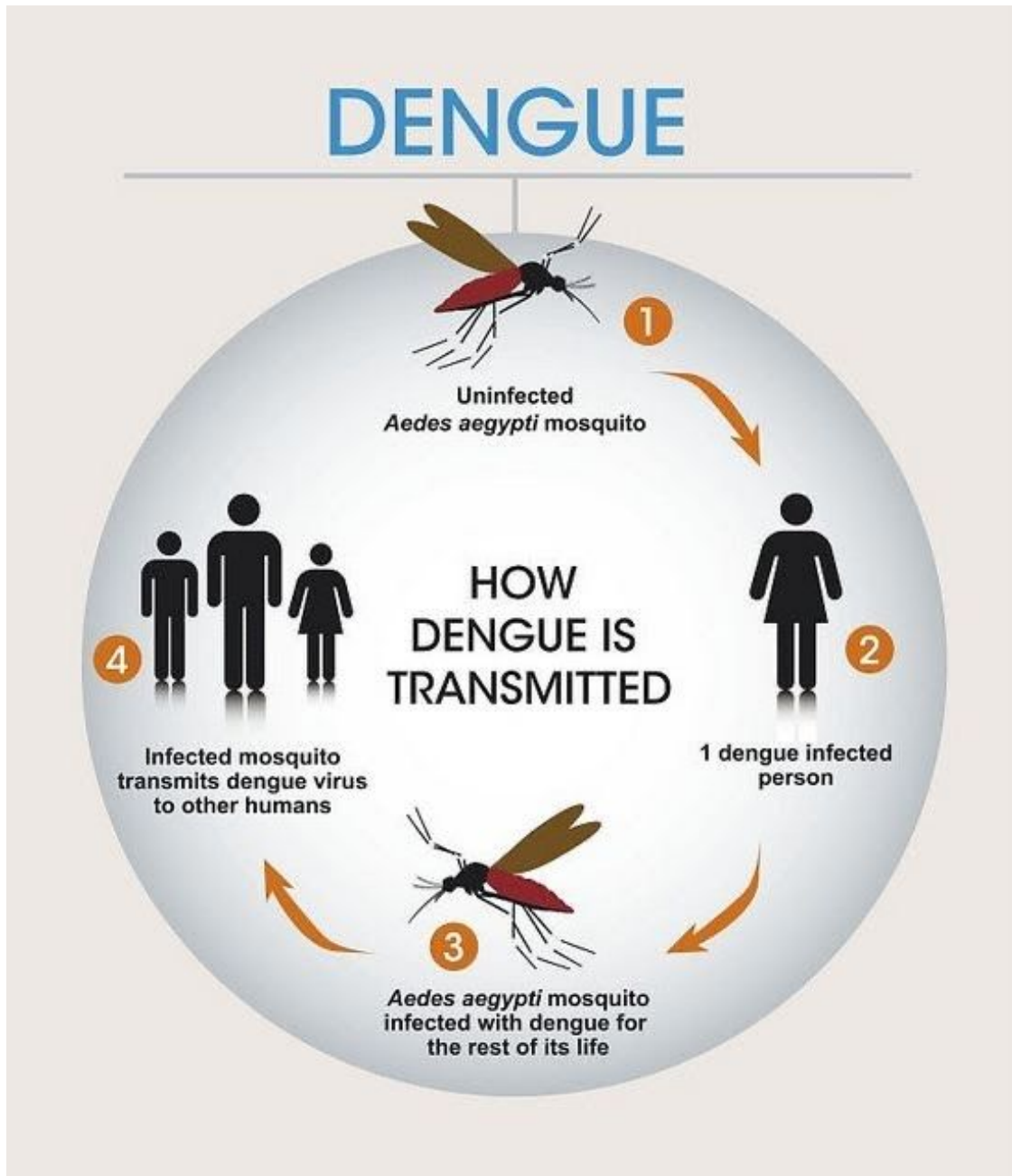


Fig 1 . Dengue Fever - transmission cycle

Source:

<https://www.thequoteunquote.com/quickdope/270/Dengue-Malaria,-Two-Dangerous-Maladies>

ZIKA

Zika virus disease is caused by a **virus** transmitted primarily by Aedes mosquitoes, which bite during the day. Many people infected with Zika virus won't have symptoms or will only have mild symptoms. The most common symptoms of Zika are:

- Fever
- Rash
- Headache
- Joint pain
- Conjunctivitis (red eyes)
- Muscle pain

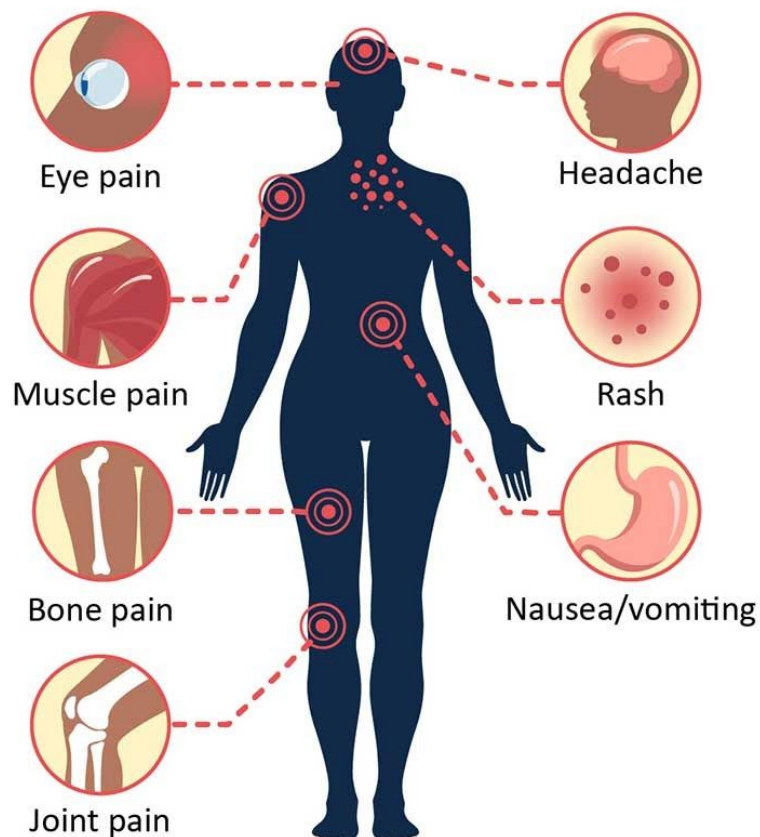


Fig. 2. Common Symptoms of Zika
Source: www.cdc.gov/zika/about/overview.html



The incubation period for the zika virus is 3-5 days after the bite of an infected mosquito.

Transmission of Zika

1. Through mosquito bites

- Mosquitoes that spread chikungunya, dengue, and Zika bite during the day and night.
- A mosquito gets infected with a virus when it bites an infected person during the period of time when the virus can be found in the person's blood, typically the first week of infection.
- Infected mosquitoes can then spread the virus to other people through bites.

2. From mother to child

- A pregnant woman can pass Zika virus to her fetus during pregnancy. Zika is a cause of microcephaly and other severe fetal brain defects. We are studying the full range of other potential health problems that Zika virus infection during pregnancy may cause.
- A pregnant woman already infected with Zika virus can pass the virus to her fetus during the pregnancy or around the time of birth.

3. Through sex

- Zika can be passed through sex from a person who has Zika to his or her partners even if the infected person does not have symptoms at the time.
- It can be passed from a person with Zika before their symptoms start, while they have symptoms, and after their symptoms end.



CHIKUNGUNYA

Chikungunya is an infection caused by the chikungunya virus (CHIKV) spread through the *Aedes* species mosquitoes (*Ae. aegypti* or *Ae. albopictus*).

Symptoms

- Most people infected with chikungunya virus will develop some symptoms
- Symptoms usually begin 3–7 days after being bitten by an infected mosquito.
- The most common symptoms are fever and joint pain.
- Other symptoms may include headache, muscle pain, joint swelling, or rash.
- Chikungunya disease does not often result in death, but the symptoms can be severe and disabling.
- Most patients feel better within a week. In some people, the joint pain may persist for months.
- People at risk for more severe disease include newborns infected around the time of birth, older adults (≥ 65 years), and people with medical conditions such as high blood pressure, diabetes, or heart disease.
- Once a person has been infected, he or she is likely to be protected from future infections.

Transmission of Chikungunya

1. Through mosquito bites

- Chikungunya virus is most often spread to people by *Aedes aegypti* and *Aedes albopictus* mosquitoes. These are the same mosquitoes that transmit dengue virus. They bite during the day and at night and are found throughout the world.
- Mosquitoes become infected when they feed on a person already infected with the virus. Infected mosquitoes can then spread the virus to other people through bites.

2. Rarely, from mother to child

- Chikungunya virus is rarely transmitted from a mother to a newborn.



Preventative measures

- **3 C's - Clean up, cover up & communicate**
- Prevent mosquito bites
- Wear long-sleeved shirts and long pants
- Use screens in windows and doors
- When traveling overseas, choose a hotel or lodging with air conditioning or screens on windows and doors.