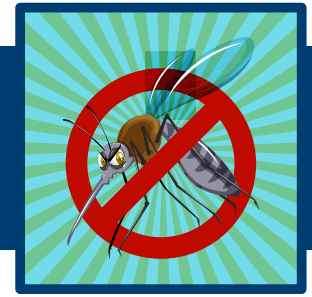


## Teacher Directions

### UNIT: CHIKUNGUNYA

#### LESSON 2: IMMUNITY IN MOTION!

##### *Activity 2A: Infection at the Door*



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## Educational Objectives

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- › Evaluate immune system responses to a viral infection.

## Instructional Objectives

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1. Compare patterns of immune system responses to Chikungunya virus (CHIKV).
2. Explain similarities and differences in host defense mechanisms

## Materials

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- › Envelopes
- › Infection response cards with appropriate shape plot point for each student (cut out and stuff envelopes before class)
- › Tape or post it notes:
  - Tape for plot response cards plot point OR
  - Students draw their plot coordinates and plot point shape to a post it note.
- › One sticky Easel Pad/Wall post it or project an image of the graph (Hours post-infection vs. RNA copies/mL)
- › For Part 2: make copies of the Data Table: RNA Copies Over Time.
- › Student worksheet with blank graph, data table, and reflection (to record class graph after plotting activity)  
Student Handouts
- › Optional: Species reveal cards (to be given at the end)
- › Optional: Purple and Yellow markers for students to record data on individual graphing worksheet



## Teacher Directions

# UNIT: CHIKUNGUNYA

## LESSON 2: IMMUNITY IN MOTION!

### Activity 2A: Infection at the Door



## Education Standards

**TEKS: Processing:** (MS) 1.F, 1.G (HS) 1.A, 1.F, 1.G, 2.B, 3.A, 3.B, 3.C, 4.A, 4.B, 4.C

**Content:** (MS) 7.13.A, 5.13.A (HS) B.5.D, B.7.D, B.12.A, E.8.D

**ELPS:** C.1.B, C.1.E, C.2.H, C.2.G, C.3.D, C.3.E, C.3.G, C.4.D, C.4.F, C.4.H, C.4.K, C.5.F

## Directions: What's the Plot?

### 1. Infection at the Door:

- As students walk into class, the teacher ("the mosquito") gives each student a sealed envelope/card marked "INFECTION RESPONSE."

Inside each envelope is a random infection response that includes a viral load (RNA copies/mL) and a corresponding post-infection hour (0h, 8h, 16h, 24h, 36h, and 48h) to be plotted by students individually.

### 2. Students Track Their Immune Response:

Without knowing their specific identity, students plot the viral RNA copy levels on a pre-made blank graph for the entire class, marking hours post-infection vs. RNA copies/mL level.

**Note:** To adhere plot points and coordinates, students can use **purple or yellow stickers**, purple or yellow markers, or copy their coordinates onto a post it note and tape their dot or triangle to the post it note and stick that to the class graph.

## Part 2: Sharing the Viral Load!

Once all students have plotted their values on the class chart paper, they will receive data only for their species and plot this data.

- All students with solid purple circles receive only that data and record it on their graph.
- All students with open purple circles receive only that data and record it on their graph.
- ▲ All students with solid yellow triangle receive only that data and record it on their graph.
- △ All students with open yellow triangles receive only that data and record it on their graph.

In small groups, students will discuss any patterns or observations noticed in their individual graphs and class graph.

## MIDDLE & HIGH SCHOOL LEVEL

Teacher Enrichment Initiatives (TEI) | NIH SEPA | ©2026 | [TxBiomed.org](https://TxBiomed.org)  
NIH SEPA Project #1R25GM142021-01A1 | Some graphic elements courtesy of [Freepik](https://www.freepik.com)

## Teacher Directions

# UNIT: CHIKUNGUNYA

## LESSON 2: IMMUNITY IN MOTION!



### Activity 2A: Infection at the Door







### 3. Species Reveal:

After group discussion, the teacher reveals the species identities to students.

**Note:** Consider giving students species identity cards (mouse or human) based on the species in their envelop.

→ Students label their graphs with their species.  

**Data Table: RNA Copies Over Time (master copy)**

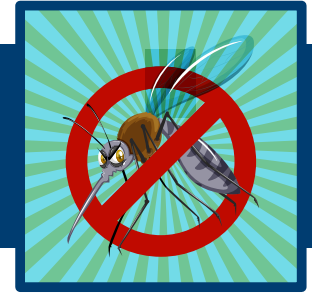
Time (hours post-infection)	U937 MOI=5 	U937 MOI=0.1 	RAW MOI=5 	RAW MOI=0.1 
0	107.4	105.8	107.4	105.8
8	106.9	103.3	104.7	101.8
16	107.6	105.1	105.5	103.3
24	107.9	105.7	106.1	103.6
36	107.8	106.2	106.4	104.8
48	107.7	106.5	106.6	106.0

## Teacher Directions

### UNIT: CHIKUNGUNYA

#### LESSON 2: IMMUNITY IN MOTION!

##### *Activity 2A: Infection at the Door*



#### 4. Debrief & Further Pattern Recognition:

→ Students will create a T-chart in their groups comparing humans vs. murine (mice) data.

#### 5. Student discussion questions:

1. Which species responded more aggressively to the CHIKV infection? Explain.

2. What might be the benefits/risks of the different immune responses of human and mice

3. Explain why the murine models may produce fewer CHIKV RNA copies than humans?