Teacher Directions

UNIT: EBOLA LESSON 1: ACTIVATING ANTIBODY WARRIORS TO FIGHT THE EBOLA VIRUS!

ACTIVITY 1A: IT'S CONTAGIOUS! THE SPREAD OF INFECTIOUS DISEASE





The Ebola virus is a highly contagious infectious disease that is easily transmitted to others. One of the main forms of transmission is bodily fluids. In this activity students will each have a cup of 'water' that represents their bodily fluids. One of the student cups will have the EBOV, but the students will not be aware which cup contains the virus. Students will "swap" bodily fluids with three other classmates, recording the other students' names to be used in the contact tracing portion of the activity. Some students will become "infected" with EBOV, while others will not. At the completion of the activity, the class will work backwards to uncover "patient zero".

Lab Materials:

- > Basic solution (such as a .5M NaOH solution or baking soda solution)
 - \rightarrow .5 M baking soda solution:
 - » Add 42 g baking soda to 1 L water.
- > Indicator (Phenolphthalein or red cabbage indicator)
 - → Red cabbage indicator:
 - » Slice up red cabbage and cover with warm water.
 - » After 30 minutes remove the cabbage.
 - » The water is the indicator.
- > Acidic solution (use white vinegar which is a .85 M acetic acid solution)
- > ****Teacher cup** will be **immunized** (won't be able to get "sick"- protected from addition of a chemical to prevent color change) The teacher demo is the control.
- > Small disposable white cups (1 per student, numbered)
- > Bottled water (to prepare the sample cups)

Directions

- 1. Teacher will have a tray filled with cups of your choice filled halfway with distilled water. These cups are to be numbered using a black sharpie beginning with number 1. This tray will be set in the lab at a table where they cannot be tainted, but reachable when the educator alerts the students to go and pick up their sample cup.
- 2. Aside from the student cups, please prepare the "educator cup". Label it "teacher" and prepare accordingly (teacher choice of scenario below).

Teacher Directions

UNIT: EBOLA LESSON 1: ACTIVATING ANTIBODY WARRIORS TO FIGHT THE EBOLA VIRUS!

ACTIVITY 1A: IT'S CONTAGIOUS! THE SPREAD OF INFECTIOUS DISEASE



- → Scenario 1: teacher has distilled water in cup and does get infected, the teacher then uses a pipette with vinegar to "reverse" the color from pink back to clear to show how being immunized protects you from disease. NOTE: At the time the article was published, there was not an approved EBOV vaccine. The first approved vaccine was discovered in December 2019.
- → Scenario 2: The educator shows their cup with the distilled water and explains that they were contaminated by a person with EBOV, but the cup remained clear because they had their immunization shot for protection from the virus. This can tie into a discussion about vaccines and preventative measures.

Pre-Lab (Before lab thinking questions with Students)

Teacher Suggestion: Students can create a K-W-L.

- → K: What does the student "know"?
 - » Possible questions may include: What do you already know about infectious diseases? What is an infection? What does the word contagion make you think of?
- → W: What does the student "want to know or wonder?"
- → L: What did the student "learn"? *This can be completed at the end of the unit as a summary or reflective piece.

Pre-Lab:

How many classmates do you think will become infected by the end of this lab?

Before Testing:

- 1. You need to pick up a sample cup with liquid inside that represents your bodily fluids.
- 2. One of the cups will contain the Ebola virus. This represents an infected person who has the potential to infect others. You will not know if you already have the virus or not!
- 3. Next, you will need to swap bodily fluids with three people in your community.
 - → To do this, choose one partner. Pour your bodily fluids into their cup. They will then pour all the contents back into your cup. After two pours, half will be returned to the empty cup. Your fluids have been mixed. You should both now have an equal amount of bodily fluids.
- 4. Record your partner's name in the following data table.
- 5. Repeat it for TWO more people ONLY!

UNIT: EBOLA LESSON 1: ACTIVATING ANTIBODY WARRIORS TO FIGHT THE EBOLA VIRUS!

ACTIVITY 1A: IT'S CONTAGIOUS! THE SPREAD OF INFECTIOUS DISEASE



| Pour # | Classmates Name |
|--------|-----------------|
| 1 | |
| 2 | |
| 3 | |

Time to Get Tested!

Now that you have swapped bodily fluids with others, your teacher will take on the role of infectious disease researcher and test your sample. This will be done using an indicator. If you are infected, the liquid will have a color change which differs from the norm.

If you tested positive (+) for the EBOV report to the Quarantine side of the classroom. If clear, you tested negative (-) for the EBOV. Indicate you results below:



Contact Tracing

As a professional contact tracer, we will work backwards to identify our "patient zero".

> To do this, let's look at our infected individuals and see if they swapped with anyone on the "noninfected" side. If so, they were not our original source of disease.



Who was our "patient zero"? _____

MIDDLE & HIGH SCHOOL LEVEL ©2025 | Teacher Enrichment Initiatives (TEI) | NIH SEPA | <u>TxBiomed.org</u> NIH SEPA Project #1R25GM142021-01A1 | Based on designs by freepik.com