

# HIV/AIDS Simulation Activity

**Purpose:** To measure the rate at which the Human Immunodeficiency Virus (HIV) may spread through a community.

## **Materials:**

- 1 small test tube, about ½ full of “body fluid”
- 1 dropper inserted into test tube
- 2 clean, dry glass slides
- handouts and writing utensil

## **Procedures for spreading the virus:**

1. Each student should have the materials listed above.
2. Each student will place one drop of their body fluid on their slide marked "O." You will not test for HIV yet. Set the slide aside and be careful NOT to disturb it, this is your control. What is the purpose of a control?
3. Each student will find a partner, either the same or opposite sex, to exchange their body fluids with. To do this, you will each draw a dropper full of your fluid and carefully squirt it into your partner's test tube. Go back to your seats.
4. Carefully "mix" the fluid in your test tube by placing your finger over the opening and turning it over a few times. BE CAREFULL NOT TO SPILL THE FLUIDS IN YOUR TEST TUBE!
5. Using your dropper, place one drop of your new body fluid onto your slide at site #1. You will set this drop aside for testing later (as above).
6. Write down the name of the person you exchanged fluids with in the space provided!
7. Repeat steps 3-6 above when instructed by your teacher to do so.

## **How to test for the virus:**

1. Place one drop of phenol red on each slide, directly on top of your body fluid. Be careful NOT to touch the phenol dropper to the body fluid.
  2. If your solution remains clear or turns yellow... you are NOT infected. Phew.
  3. If your solution turns red or pink ... sorry ... you have HIV! ☹
- NOTE: If you are not sure of your reaction results, carefully mix the solution with you pencil tip. Be careful not to spread to other drops. Ask your teacher for help.

## **Clean up and final work:**

1. Complete your data sheets.
2. Rinse well and dry your slides. Return slides to designated area.
3. Answer all questions neatly on separate piece of paper, and keep for class discussion.

### **Additional Instruction Notes for Teacher:**

1. Each student should have at least 3 paper towels, one page handout, two slides, and something to write with.
2. Each table group of 2-4 should have a dropper bottle with phenol red or phenolphthalein.
3. Each student will be issued a test tube with dropper in it. Each test tube will contain their personal body fluid. Only one student will have the HIV/AIDS virus in theirs.
4. Students will exchange body fluids three separate times, to be coordinated by teacher. Be sure the group exchanges are well divided, so that same students don't exchange with each other more than once!
5. Every test tube, except one, will have distilled water with a touch of vinegar in it. One test tube will contain the "contaminated" body fluids. This tube will contain the .1M solution of NaOH.
6. Make sure the NaOH is well mixed before you add it to the test tube. Store the NaOH very well. You can mix up a batch that will last for several years -just be sure to mix it well before each use!
7. The water is best if distilled, as then you know it won't react with out cause. Also, by adding a tiny bit of vinegar, make the reaction more pronounced. **HOWEVER**, you will need to test it prior to distribution. Too much over reacts and too little won't work. Take the half hour it takes to prep and the lab should work great!
8. How to add the vinegar:
  - a) In a large beaker, enough water for all the tubes you need (which depends on YOUR class size, size of test tubes, and number of classes you do this with) mix your-water and vinegar.
  - b) For example, in a 1000 mL beaker, use only about a capful of vinegar. **BUT** -you will need to play with actual amount yourself and there is no actual formula that always works!?
  - c) Do a few sample tests with the vinegar solution and the phenol to see if you get a color change or not. Remember, you want a color change from red to y~low for the healthy kids, but it should get bright pink for HIV.
9. If I think of more stuff - take notes! ☺

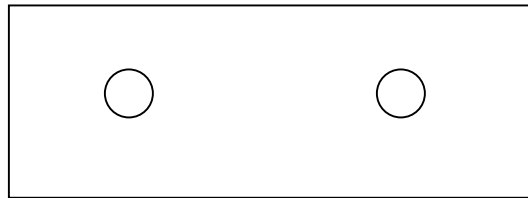
HIV/AIDS Student Worksheet

Place slides here:



0. Control: \_\_\_\_\_  
\_\_\_\_\_

1. \_\_\_\_\_  
\_\_\_\_\_



2. \_\_\_\_\_  
\_\_\_\_\_

3. \_\_\_\_\_  
\_\_\_\_\_

Answer the following questions on a separate piece of paper:

1. Did every person in the room become infected? Why/why not?
2. If we continued to do this activity, would everyone eventually get HIV? Explain.
3. During the spread of a real viral infection not everyone in the community will get the disease no matter how long it lasts. What might be some explanations for this? Include the word immunity in your answer.
4. Name at least two other viral diseases besides HIV/AIDS.
5. IF you did get infected during the activity you should be able to figure out who gave you the virus. Find their name on your data sheet and fill in the following information:

I caught the virus in round # \_\_\_\_\_. The person who gave it to me was \_\_\_\_\_.

6. Discuss at least two ways the spread of HIV/AIDS can be prevented.
7. What is the difference between HIV and AIDS?
8. What does a person with HIV look like? Can you recognize someone with this virus?

Name \_\_\_\_\_

Date \_\_\_\_\_

Period \_\_\_\_\_

## Data Sheet

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0. Slide #0 Pretest for HIV. Place the slide to the right. \*slide with one drop of body fluid *before* having sex
- A) Results of testing: Final color after adding phenol red? \_\_\_\_\_ infected? \_\_\_\_\_
- B) If you were infected at this stage you were the original carrier. Please place your name on the board.
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1. Slide #1 First round of contact. Place the slide to the right. \*slide with one drop of body fluid after having sex with one person
- Name of contact: \_\_\_\_\_
- A) Results of testing: Final color after adding phenol red? \_\_\_\_\_ infected? \_\_\_\_\_
- 

2. Slide #2. Second round of contact. Place the slide to the right. \*slide with one drop of body fluid after having sex with two people
- Name of contact: \_\_\_\_\_
- A) Results of testing: Final color after adding phenol red? \_\_\_\_\_ infected? \_\_\_\_\_
- 

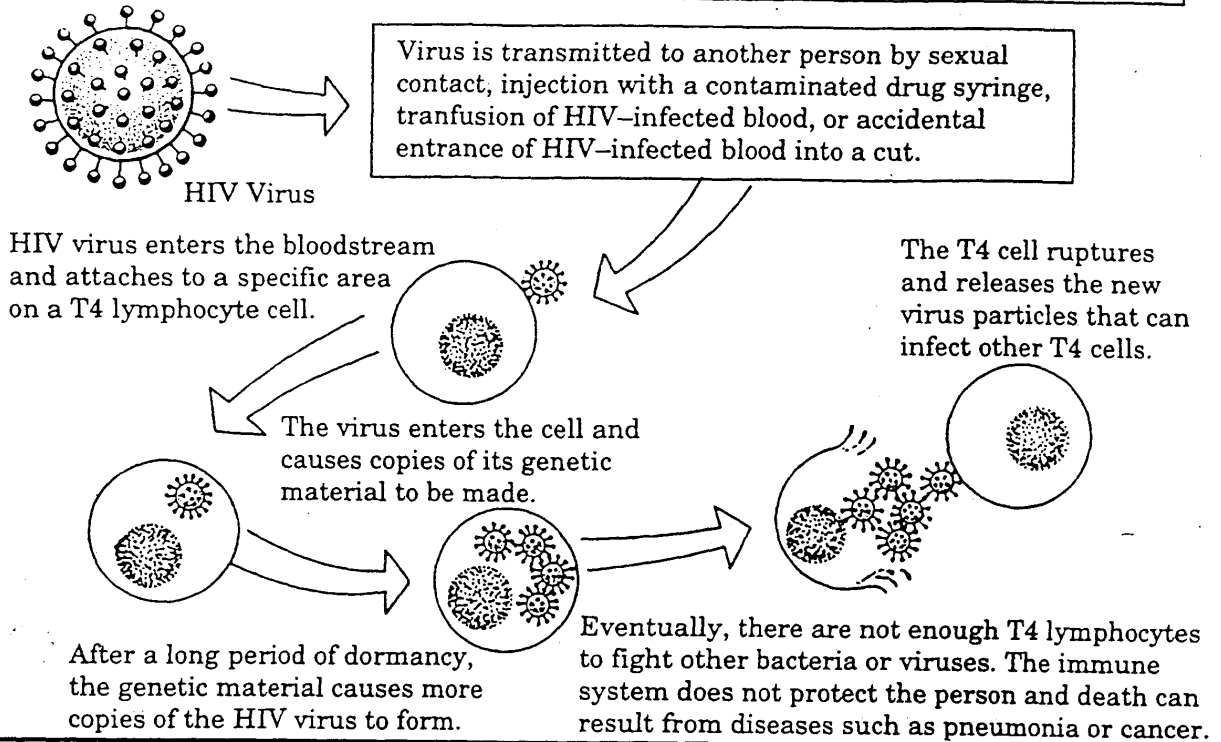
3. Slide #3. Third round of contact. Place the slide to the right. \*slide with one drop of body fluid after having sex with three people
- Name of contact: \_\_\_\_\_
- A) Final color after adding phenol red? \_\_\_\_\_ infected? \_\_\_\_\_
- 

**Class Data Table:** please put your data on the board, complete table when all students have reported.

	Starting Round #0	First Round #1	Second Round #2	Third Round #3
Number of persons infected				
Total persons in room				
Theoretical number of infections	1	2	?	?

# HWIV/AIDS

The Human Immunodeficiency Virus (HIV) causes the disease called Acquired Immune Deficiency Syndrome (AIDS).



1. Why is the transmission of HW by blood transfusions now very rare?  
\_\_\_\_\_
2. What happens when the HIV virus enters the bloodstream?  
\_\_\_\_\_
3. a. what is the usual function of a lymphocyte?  
\_\_\_\_\_  
b. What happens when the lymphocyte attacks the HW virus?  
\_\_\_\_\_
4. Describe what occurs within the T4 cell.  
\_\_\_\_\_
5. why might a person think that they did not get infected with the HIV virus?  
\_\_\_\_\_
6. How does the name AIDS describe the action of the disease?  
\_\_\_\_\_

7. Why do people who inject drugs have a high risk of acquiring AIDS?

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# HIV INFECTION LAB

This lab will measure the rate at which a simulated Human Immunodeficiency Virus is spread around the class. Each person will receive a vial representing his or her "body fluid". One of the vials will be "infected" with HIV (not the real virus!) and the class will engage in "test tube sex". The spread of the virus will be measured after sex.

## Materials

- A. Teacher Prepared:
1. Distilled Water = normal body fluid.
  2. NaOH (0.1 M) = HIV infected body fluid.
  3. Dropper bottles of phenol red or phenolphthalein test solution (two or three to share).
- B. Students: (each)
1. One small test tube 1/2 full of a "body fluid" solution from above.
  2. One dropper.
  3. Two to four glass slides (clean and dry).
  4. One pair of goggles.

## Procedure

1. Each student should obtain their materials and set their slides on the spaces provided on the data sheet (NOTE: Some of the "body fluid" solutions will contain a strong base, NaOH. Do not squirt fluids at other students. Please report all spills).

2. **Pretest for HIV:** Place one drop of your "body fluid" solution on slide #0. Place the slide on the data sheet to the right of item #0 for later testing.

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3. Spreading the infection: Each person will exchange body fluid with a total of three other people. We will test the body fluid for HIV after each sexual contact. *Do steps A, B and C below to complete round #1.*

A) Find a student (of either sex) to "exchange" body fluid with. Do this by having you and your partner each suck up a dropper full of fluid with your dropper. Place this dropper amount from your test tube into your partner's test tube at the same time your partner puts their dropper full of fluid into your test tube. We will call this "test tube sex".

B) Put your thumb over the top of the test tube and invert it twice to mix the contents. Place ONE DROP of fluid from your test tube onto slide #1. Place the slide on the data sheet for later testing.

C) Write down the name of the person you had "sex" with on item #1 of your data sheet.

4. Have test tube sex" with two new people. After person #2, place one drop of your test tube contents on slide #2. Place slide #2 on the data sheet for later testing. After person #3, place one drop of your test tube contents on slide #3. Place slide #3 on the data sheet for later testing. Be sure to write down the names of each person you had sex with!

5. Testing for Infection: Place one drop of phenol red on each slide, right on top of your body fluid samples.

Solution remains clear or turns yellow = not infected

Solution turns red or pink = infected (sorry!)

6. Complete your data sheet. Answer questions 1-7, and the back of the data sheet. Clean, dry, and return slides and other materials when done.

### **HIV Lab: Questions Sheet**

1. Did every person in the room become infected?
2. If we did this experiment long enough, would everyone become infected?
3. In a real virus infection, not every person in the city comes down with the disease. no matter how long it lasts. Why is this? Try to use the word "immunity" in your answer.
4. Name two other virus caused diseases besides AIDS.
5. If you were infected, you should be able to figure out which contact gave you the virus. Check back with your contact during the round you got the virus. Complete the appropriate items below.
  - A. I caught the virus in round #\_\_\_\_\_. The person who gave me the virus was\_\_\_\_\_.
  - B. I was lucky and never got the virus!\_\_\_\_\_
6. Discuss two ways that the spread of HIV can be prevented.
7. What does a person with HIV look like?

## WHAT EVERYONE SHOULD KNOW REGARDING AIDS

### WHAT IS AIDS?

AIDS (Acquired-Immune Deficiency Syndrome) is a disease triggered by the Human Immunodeficiency Virus (HIV) which weakens the immune system and attacks cells of the brain.

### BODY FLUIDS THAT MAY TRANSMIT HIV IF INFECTED

1. Blood
2. Breast Milk
3. Semen
4. Vaginal Secretions

### TRANSMISSION CAN OCCUR WHEN THESE FLUIDS ARE EXCHANGED. THESE ARE THE RISKY BEHAVIORS AS FOLLOWS:

1. Having sex with an infected individual (either vaginal, anal or oral intercourse).
2. Sharing IV drug needles or uncleaned needles (tattoo, ear piercing, etc.)
3. An infected mother can pass the virus on to her baby during pregnancy or while nursing.

-Anyone engaging in risky behaviors can become infected regardless of gender, sexual orientation, age or race.

AIDS IS FATAL, but preventable because HIV IS HARD TO GET!

- SAFE BEHAVIORS include casual contact such as hugging, sneezing or sharing bathrooms.
- TRANSFUSIONS are VERY SAFE because the blood is screened.
- DONATING blood is and always has been SAFE.

### PREVENTION FROM BECOMING INFECTED SEXUAL TRANSMISSION

- Abstinence is one way to absolutely avoid HIV.

REMEMBER most people infected with HIV have no symptoms – they look healthy, so you cannot tell by just looking.

- Condoms used properly from beginning to end of all sexual activity, will reduce the risk of passing HIV.

## INJECTABLE DRUGS

- Not using injectable drugs will prevent the spread of HIV.