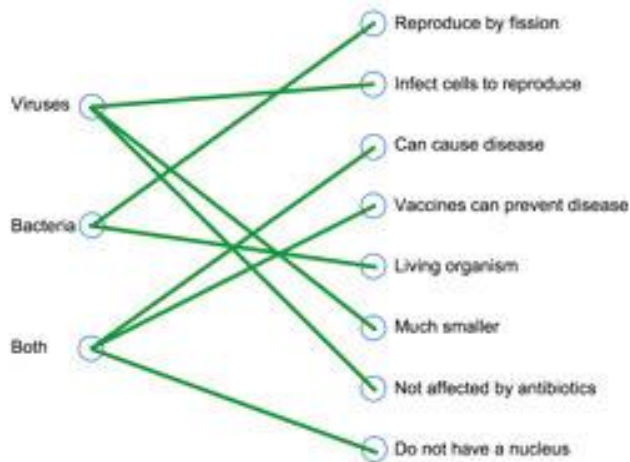


- d. Test the hypothesis with an experiment: e.g., *Filter a mixture of viruses and bacteria and expose plant to the filtrate (part without the bacteria)*. [Note: Ensure that students understand this step would be repeated several times.]
- e. Analyze data and draw a conclusion: e.g., *Plants get disease from filtered solution, so they can get diseases from something other than bacteria*.
- f. Communicate results: *Publish a paper with results*.

RUBRIC: QUIZ QUESTIONS

1. What was Beijerinck's major insight regarding how to identify viruses?
 - a. A filter can be used to separate viruses from bacteria because of their different sizes.
2. What did Beijerinck conclude from his study of viruses?
 - b. Viruses could only replicate in cells.
3. Draw a line to connect each concept comparing viruses and bacteria. Choose all that apply.



TEACHER LESSON PLAN

4. Viruses and bacteria have differences in structure.

Write Y (yes) or N (no) to indicate which structures can be found in each.

Structure	Virus	Bacteria
Protein coat (also called capsid)	Y	N
Sugar coat (also called capsule)	N	Y
Cell wall	N	Y
Cell membrane	N	Y
Genetic material	Y	Y

5. What is the main difference between how viruses and bacteria reproduce?

- a. Viruses must infect a living cell. Bacteria can reproduce without being in a cell.

6. Write a short passage to explain why many scientists consider viruses to be non-living.

- Answers may vary. Sample answer: Scientists consider viruses to be non-living because they can reproduce only by using structures inside a living cell. Also, viruses can be crystallized, unlike living cells. Viruses do not have chemical reactions inside them like living cells.

7. Indicate which of the following statements are true or false.

- a. All viruses have the same shape. **F**
- b. Viruses can be bigger than bacteria. **T**
- c. Viruses reproduce by taking over cells. **T**
- d. All viruses cause disease. **F**
- e. All viruses are comprised of protein molecules. **T**

8. If a virus is 200 nanometers long and a bacterium is 10 microns long what is the ratio of their lengths? Show your work.

- b. 1:50

TEACHER LESSON PLAN

9. Order the events in the life-cycle of a virus by writing the letters from the list into the correct box.

C	E	B	D	A
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- a. The new virus is released
- b. The cell makes copies of viral proteins
- c. Virus particle attaches to host cell
- d. Virus particle assembles
- e. Genetic material is inserted

10. Classify the diseases according to whether they are caused by a virus or bacteria.

Disease	Virus	Bacteria
Influenza	✓	
Common cold	✓	
Zika	✓	
Pertussis		✓
Smallpox	✓	
Hepatitis B	✓	
Tetanus		✓
Measles	✓	
Mumps	✓	