

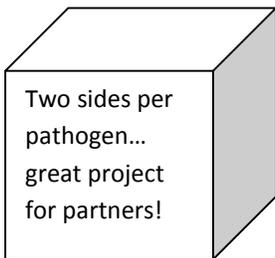
Big, Bigger, Biggest Size and Scale Comparison Scale Models of Viruses, Bacteria and Protozoa

Carl Zimmer writes in *A Planet of Viruses*:

- 10 skin cells could line up along the side of a grain of salt.
- 100 bacteria would fit along that same salt grain.
- It would take 1,000 viruses to fill that same space!

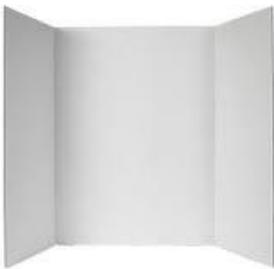
Create models of a virus, a bacterium and a protozoan to illustrate the size and scale comparison. (Assume that the average protozoan is approximately the same size as a skin cell.) Topics covered include microorganisms, pathogens, characteristics of life, prokaryotes and eukaryotes, the nature of a cell, and cellular organelles.

Salt Crystal Cube:



Create a six-sided paper or cardboard salt crystal (cube) with information about pathogens. Cut out six 20 cm x 20 cm squares, glue them together into a cube, and assign two sides to each pathogen. One could be a description of the pathogen with a labeled drawing and the other a size comparison between the three pathogens.

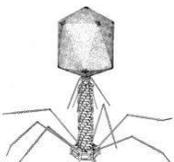
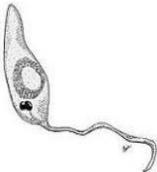
Tabletop Display



Make a tabletop display (trifold board or diorama) with drawings or 2D models of each pathogen. Include descriptions and size comparisons. Show measurements and appropriate ratios. Use standard art supplies and any additional materials.

Classroom Models

Construct 3D models of each pathogen using art supplies, toys or common household objects. Show correct size comparison ratios. Hang these in the classroom.

<p>Virus (noncellular)</p>  <p>Paper cut-out models; nuts and bolts</p>	<p>Bacterium (cellular, prokaryotic)</p>  <p>Small box; 2 liter bottles; circle of felt</p>	<p>Protozoan (cellular, eukaryotic)</p>  <p>2D drawing on wall; trash bag filled with water bottles; large box</p>
---	---	--



Suggested Scoring Rubric

	Met or Exceeded Objectives	Met Objectives	Did Not Meet Objectives
Size and Scale	Models are to scale. The 1:10:100 ratio for virus, bacterium and protozoan is accurate.	Models are close to scale. The 1:10:100 ratio for virus, bacterium and protozoan is close to accurate.	Models are not to scale. The 1:10:100 ratio for virus, bacterium and protozoan is inaccurate.
Units of Measure	Units used to measure models were appropriate. Scale comparison was accurate.	Units used to measure models were close to appropriate. Scale comparison was close to accurate.	Units used to measure models were inappropriate. Scale comparison was inaccurate.
Structures	All structures are present.	Most structures are present.	Few or no structures are present.
Labels	Structure labels are clear and appropriate.	Structure labels are somewhat clear and close to appropriate.	Structure labels are unclear and inappropriate or missing.
Creativity	Structures are shown very creatively.	Structures are shown clearly but basically.	Structures are not shown clearly or are missing.



Samples of Student Work

