



Cells Lesson 3: “The Engineer”

Student Handout

Directions:

1. Brainstorm unique cell ideas based on your acquired knowledge of cell parts and functions.
 - a. Remember: parts and functions must also include how molecules (such as food, energy, and “products”) travel in, out, and through the unique cell.
2. Create a prototype drawing of your unique cell and identify the function of the specialized parts with labels.
 - a. Add any further details that explain how the cell parts, as well as the molecules involved, accomplish the specialized function of your cell.
3. When you have finalized your design, transfer your final design to the poster paper and complete with details in color.
4. Presentation (1 - 1.5 minutes per learner)
 - a. Prepare to present your Design to the class, highlighting how you connected your understanding of structure and function for the services that your unique cell provides.



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Planning Organizer

Prior Knowledge: What do you know our cells need to do in order to function? What cell parts do they have to accomplish these functions?	
Functions	Cell Parts



Brainstorm ideas in the box below: What do you want your specialized cell to do?



Now that you have decided on your cell, match up its functions with the cell parts needed (and how many of those cell parts)	
Functions	Cell Parts





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What type of molecules will need to travel in, out, and throughout the cell to make these functions happen?



Sketch out your cell below. Include labels of all the specialized parts and their functions as well as labels of all of the molecules involved.



Transfer your design to a poster board and complete with details in color. Prepare your presentation to potential patients with the checklist below.



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Assessment: Final Presentation to Patients

You used all your knowledge about cell parts and their function to design a unique cell. In a poster or powerpoint presentation, display and explain your never-before-seen cell, focusing on how you connected your understanding of structure and function for the services that your unique cell provides. Use the checklist and cognitive skills rubric to ensure you have addressed all aspects of the “Engineer” with quality work.

Cells Engineer Checklist: Content Concepts and Practices

- Poster title reflects the unique name or type of cell created
- Cell design is unique (never-before seen) and performs a specific service needed by an organism
- Shows how the parts (organelles) of the unique cell work together to help the cell survive and do its job
 - Labels each cell part and accurately connects its form to its function
 - Describes how other molecules, such as food, energy, and “products” are connected with these cell parts

Cognitive Skills Assessed

	Emerging (1)	Developing (2)	Proficient (3)	Advanced (4)
Designing Solutions	Applies no scientific principles and/or data to design, construct, and/or test a design of an object, tool, process or system.	Applies minimal scientific principles and/or data to design, construct, and/or test a design of an object, tool, process or system.	Applies adequate scientific principles and/or data to design, construct, and/or test a design of an object, tool, process or system.	Applies complete scientific principles and/or data to design, construct, and/or test a design of an object, tool, process or system.
Communicating Findings/Design (Oral Presentation)	Findings/Design are incompletely and inaccurately communicated. Or no evidence of using appropriate eye contact, adequate volume, or clear pronunciation.	Findings/Design are completely communicated with some misconceptions. Or Uses minimal eye contact, inappropriate volume, or inconsistent pronunciation.	Findings/Design are completely communicated but lacking depth and complexity. Or often uses eye contact and engaging and appropriate volume and pronunciation, but is inconsistent.	Findings/Design are completely communicated with depth and complexity. Or mostly uses eye contact and engaging and appropriate volume and pronunciation.