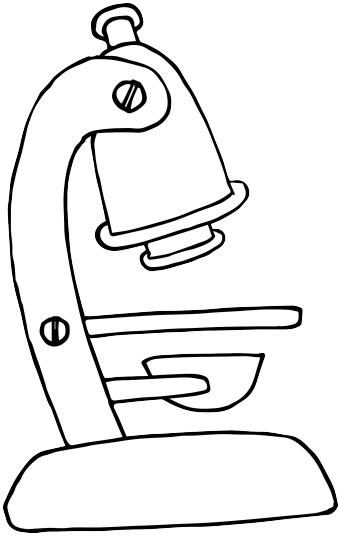


Name _____ Science Course _____

Pre Lab Due _____ Post Lab Due _____ Final Grade _____



A Biology Engineering Design Challenge

Topic: Making Duplicate Cells

Scenario:

While you were out feeding the horses in the barn, one of them got loose. You spent 45 minutes trying to corral it back into its stall. In the excitement, you cut your arm on some barbed wire. In the ER they gave you 8 stitches and told you that you have to keep the wound dry until the stitches come out in 4 weeks. During this time the damaged skin will need to be replaced by the surrounding healthy skin. Individual skin cells will spend the next few weeks making copies of themselves until the wound is completely healed.

Engineering Design Challenge:

Your challenge is to determine what structural and functional barriers (problems) a cell must overcome to divide and produce an exact replica of itself. You will also develop models that suggest possible solutions for each barrier that the cell must address.

Brainstorming Thinktank

1. List as many structures of a single cell you can remember.
2. What preparations do you think a cell must make before it can replicate and divide?

3. What are the major structural and functional barriers a cell must overcome? Then brainstorm some ways the cell might overcome the barrier.
- Structural barriers refer to the cell parts
 - Functional barriers refer to the ability of the cell to work and do its job

If you like, use the chart below to organize your thoughts. Or you might choose to design a web (mind) map or another way to get your ideas down on paper. Don't worry about what the "right" answer is. The purpose of this activity is problem-solve. Any possible solution is a good answer.

Structural	Functional	Description of Barrier (Design problem)	Possible Solutions

Playtime: Making Models

Gathering available materials

- assign objects a cell structure
- manipulate the pieces to simulate a possible solution to one design problem

Play with the pieces and "role play" possible solutions to the design challenges you came up with.

