

# LIVING THINGS ARE MADE OF CELLS! (1 of 2)

## MIDDLE SCHOOL LEVEL 3

Imagine plunging to microscopic levels and playing a game in the inside of a cell to learn organelles and basic cellular structure and function! This is the goal for our students - to construct a carnival themed game to teach others about cells. The design? Of course! It is the body system. The game and rules? Those are up to our students to creatively express their knowledge of cells' structure and function.

### EDUCATIONAL STANDARDS:

#### NGSS CONNECTION:

**MS-LS1-2.** Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function.

#### COMMON CORE CONNECTION:

##### ELA/Literacy

**SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS1-2)

##### Mathematics

**6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-2)

#### DOK:

Level 3 - Strategic Thinking  
Level 4 - Extended Thinking

### MATERIALS NEEDED:

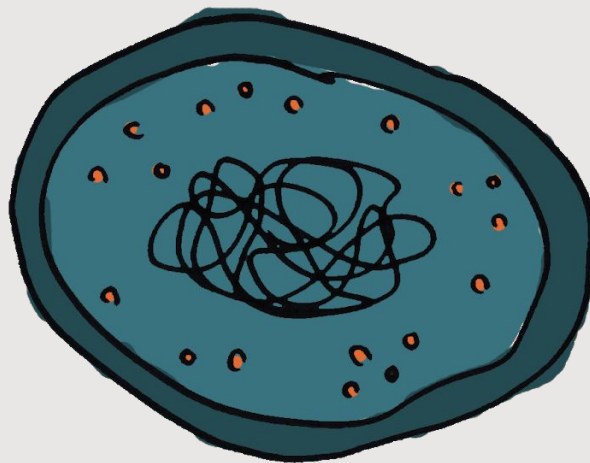
- Pen
- Paper

### OBJECTIVE:

Students will be able to develop a model of a cell and its parts to describe how it functions.

### ESSENTIAL QUESTIONS:

- What is the function of a cell?
- How do the individual parts of a cell contribute to its function?
- How do plant and animal organelles differ in function?



## ENGAGE:

1. Provide students with the following list of items or pictures of the items
  - a. sand/rocks
  - b. Distilled water
  - c. sugar
  - d. Cotton
  - e. Cork
  - f. Plant leaf (any)
  - g. Onion or celery
  - h. Strawberry or banana
  - i. Yogurt
  - j. Human hair
  - k. Inside of the cheek
2. Ask students to sort the items by living and nonliving
3. Monitor students lists and ask questions to check their reasoning
  - a. Do not tell students answers

## EXPLORE:

1. Provide students with microscopes
2. Assist students in constructing slides or have them made prior to class for each item in the list above.
3. Ask students to make observations of each slide under the microscope.
  - a. What do you see?
    - i. Draw what is visible in each slide
  - b. Do any slides have similarities/differences?
    - i. Students sort things based upon similarities
      1. Student ought to be organizing based on a visible similarities in cell structures (i.e they may place the human hair and cheek cell together, onion, cork, strawberry, they may even start grouping onion and cheek -which is ok for now)
    - ii. Teacher should facilitate students sorting.
      1. Ask guided questions
      2. Ask for reasoning/support for their decisions
4. Students may have time to compare their results with other peers in the class
5. Ask students what they noticed between living and nonliving things.
  - a. Did the microscope change their prediction about certain objects, whether they were living or not?
  - b. What is it that they saw in all living things
    - i. Students may describe the cell structure but may or may not use the word "cell"
  - c. Did non living things share similar things?
    - i. Students still may try to argue that certain living things are indeed non living
    - ii. Ask for evidence from students
    - iii. Use reasoning and pattern recognition in support that certain nonliving things may have been living at some time (i.e. cork, yogurt)
6. Evaluate students' experimental process and conclusion from evidence.