## The Onion Lab

## In part A of this activity, you explored the concept that cells are containers. You did that by putting the containers (eggs) in different solutions and observing the behavior of the cells (eggs). Scientists recognize the relationship between solutions and the internal environments of a cell. They use special terms to describe the similarities and differences between the contents of the external environment and the internal environment of a cell.

## In this part of the activity, you will observe microscopic cell responding to changes in their environment.

#### Procedure:

#### Obtain a piece of onion from Ms. Gately.

#### Remove one layer from your onion wedge.

#### Snap the layer backward, as demonstrated, to expose the edges of several thinner layers.

#### Use forceps to separate a piece of the transparent, tissue-thin layer from the outside of the original layer.

#### Lay the piece flat on a clean microscope slide.

#### NOTE: Make the piece of onion is small enough that it will fit under the cover slip. Also, be careful to keep the membrane from folding and wrinkling.

#### Use the dropping pipet to add ONE drop of water to the slide. Then, place the cover slip over the piece of onion skin.

#### Throw your left over piece of onion in the trashcan.

**Part B:** **Answer the questions in complete sentence**

1. Observe the slide with low power magnification. If you can’t locate the cell (s) ask for help.
2. Observe the slide at 10X magnification. Is the membrane (skin) composed of one cell or many cells?

**Ans:**

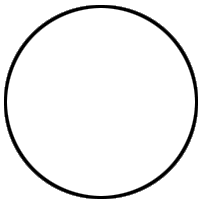
1. What is the general shape of these cells?

**Ans:**

1. Do these cells have a cell wall? Why or why not?

**Ans:**

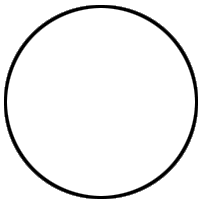
1. Make a sketch of a few of these cells as seen under the microscope at 10X magnification.



1. Observe the slide with high power (40X) magnification. Is the membrane (skin) composed of one cell or many cells?

**Ans:**

1. Make a sketch of a few of these cells as seen under the microscope at high power (40X) magnification.



1. Compare & contrast the high power magnification and the mid power magnification.

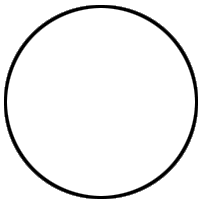
**Ans:**

# Part C

1. Place a small piece of paper towel at one edge of the cover slip.
2. While under high power magnification, place **three** drops of 5% salt solution against the edge of the cover slip opposite from the paper towel. Observe the cells for about **two minutes.**  If no change is observed keep adding more salt solution until you see changes in the cells.
3. Record your observation of the changes in the cells.

**Ans:**

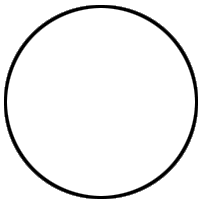
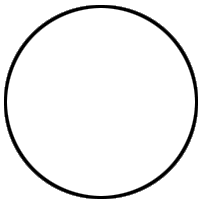
1. Make a sketch of a few of these cells as seen under the microscope at high power magnification with the 5% salt solution.



1. Dilute the salt solution on the slide by adding water. Keep adding water until the cells return to their original condition. **Keep track of how many drops of water are being added.** Describe whether your cells **fully or partially** return to their original condition.

**Ans:**

**21.** Do a side-by-side comparison of the cells on #14 & 19



#14 purified water #19 salt water

### Part D: Data analysis

1. What evidence did you collect that indicates that the external environment affects the internal environment?

**Ans: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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1. Compare and contrast the “Eggsperiment and the Onion Lab” Results in at least one paragraph.

**Ans: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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1. What are the similarities among eggs, animal cells, plant cells, and the human body?

**Ans: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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1. Based on your observations of cells, what might have been happening in Josh’s body in the story *A Pause that Refreshes*? When he
   1. first became hot and started to sweat

**Ans: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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b. became thirsty?

**Ans: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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c. went to the house for refreshment?

**Ans: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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1. returned to work?

**Ans: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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1. Explain your results from either the egg lab or onion lab (or both) using the terms isotonic, hypertonic, and hypotonic. Write at least one paragraph.

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