

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_ BIN: \_\_\_\_\_

### Osmosis Worksheet #1

When providing the best possible answer to the following questions please apply all learned scientific techniques and procedures, do not use abbreviations, use proper scientific terminology, show work for all mathematical calculations, use all significant figure and scientific notation rules, apply appropriate writing strategies, and note that at all times spelling counts. Your ability to meet these and all established classroom expectations, including labeling of BINs, providing heading information, and your ability to follow directions may be included in computation of grade.

Below are animal cells placed in beakers containing solutions of various concentrations.

- 1. Fill in any missing percentages for the water concentrations and the solute concentrations.
- 2. Draw an arrow clearly showing directional net movement of the water during osmosis.
- 3. Identify the type of solution in the beaker as isotonic, hypertonic or hypotonic.

<p>90% H<sub>2</sub>O —% solute</p> <p>85% H<sub>2</sub>O 15% solute</p>	<p>40% H<sub>2</sub>O —% solute</p> <p>90% H<sub>2</sub>O —% solute</p>	<p>75% H<sub>2</sub>O —% solute</p> <p>—% H<sub>2</sub>O 20% solute</p>
<p>—% H<sub>2</sub>O 55% solute</p> <p>—% H<sub>2</sub>O 25% solute</p>	<p>—% H<sub>2</sub>O 10% solute</p> <p>63% H<sub>2</sub>O —% solute</p>	<p>50% H<sub>2</sub>O —% solute</p> <p>—% H<sub>2</sub>O 50% solute</p>
<p>—% H<sub>2</sub>O 10% solute</p> <p>90% H<sub>2</sub>O —% solute</p>	<p>82% H<sub>2</sub>O —% solute</p> <p>—% H<sub>2</sub>O 75% solute</p>	<p>—% H<sub>2</sub>O 10% solute</p> <p>80% H<sub>2</sub>O —% solute</p>

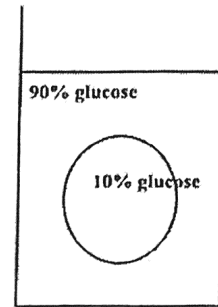
<p>—% H<sub>2</sub>O 10% solute</p> <p>—% H<sub>2</sub>O 20% solute</p>	<p>—% H<sub>2</sub>O 40% solute</p> <p>—% H<sub>2</sub>O 30% solute</p>	<p>75% H<sub>2</sub>O —% solute</p> <p>80% H<sub>2</sub>O —% solute</p>
<p>—% H<sub>2</sub>O 43% solute</p> <p>—% H<sub>2</sub>O 60% solute</p>	<p>60% H<sub>2</sub>O 40% solute</p> <p>80% H<sub>2</sub>O —% solute</p>	<p>—% H<sub>2</sub>O 10% solute</p> <p>—% H<sub>2</sub>O 10% solute</p>
<p>—% H<sub>2</sub>O 15% solute</p> <p>80% H<sub>2</sub>O —% solute</p>	<p>—% H<sub>2</sub>O 39% solute</p> <p>—% H<sub>2</sub>O 20% solute</p>	<p>90% H<sub>2</sub>O —% solute</p> <p>35% H<sub>2</sub>O —% solute</p>

## Worksheet - Osmosis & Tonicity

**READ ME!** In each diagram below, a "cell" with a semipermeable membrane has been placed in a beaker containing substances that are *dissolved in water*. The membrane is permeable to water & iodine. It is **not permeable** to glucose, sodium (Na<sup>+</sup>), or starch. *Please remember that iodine (Lugol's solution) is an indicator for starch!* Therefore, it will turn from yellow-brown to blue-black in the presence of starch. If not otherwise indicated, you may assume for each problem that the remainder of the solution is water.

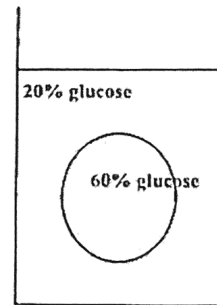
### Beaker 1

- A. What is the % of water inside the cell? \_\_\_\_\_
- B. What is the % of water outside the cell? \_\_\_\_\_
- C. Will osmosis occur? \_\_\_\_\_
- D. If so, in what direction will osmosis occur? \_\_\_\_\_
- E. Will glucose diffuse? \_\_\_\_\_
- F. Will the cell shrink or swell? \_\_\_\_\_
- G. How do you know? \_\_\_\_\_
- H. This diagram shows the cell in a(n) (circle one) hypotonic / hypertonic / isotonic solution.



### Beaker 2

- A. What is the % of water inside the cell? \_\_\_\_\_
- B. What is the % of water outside the cell? \_\_\_\_\_
- C. Will osmosis occur? \_\_\_\_\_
- D. If so, in what direction will osmosis occur? \_\_\_\_\_
- E. Will glucose diffuse? \_\_\_\_\_
- F. Will the cell shrink or swell? \_\_\_\_\_
- G. How do you know? \_\_\_\_\_
- H. This diagram shows the cell in a(n) (circle one) hypotonic / hypertonic / isotonic solution.



### Beaker 3

- A. What is the % of water inside the cell? \_\_\_\_\_
- B. What is the % of water outside the cell? \_\_\_\_\_
- C. Will there be a *net* change in these concentrations? \_\_\_\_\_
- D. Will osmosis occur? \_\_\_\_\_ Why?
- E. Will starch diffuse? \_\_\_\_\_ Will glucose diffuse? \_\_\_\_\_
- F. If iodine were placed in the beaker, what would you see *immediately*?
- G. What would you see after *several hours*? Why?
- H. This diagram shows the cell in a(n) (circle one) hypotonic / hypertonic / isotonic solution.

