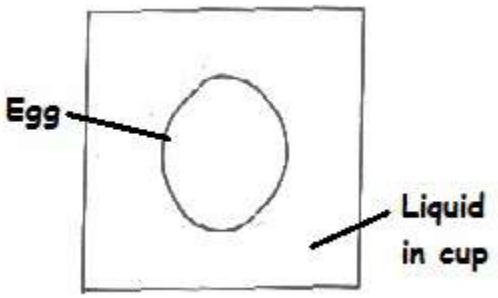
EGG OSMOSIS LAB **Name _____**

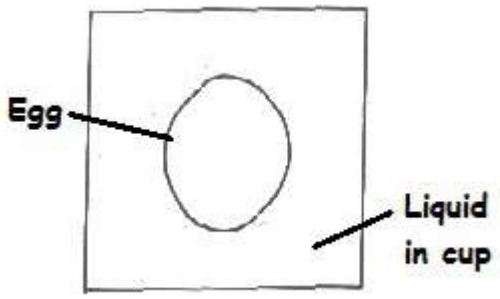
INTRODUCTION

Soaking eggs in vinegar removes the calcium from the eggshells, making them soft and exposing the chorionic membrane which surrounds the developing chicken embryo and the food molecules stored in the egg to help the embryo grow.

MODELING OSMOSIS:

ADD DOTS representing solute molecules to the diagrams provided below to show where solute molecules could be found AT THE START of this experiment when you put the eggs in the cups and covered them with liquid. If solute molecules are unable to pass through a cell membrane water will move to try and equalize the concentration. ADD ARROWS to the diagrams to show how you think the water will move.





EGG IN SUGAR WATER **EGG IN DISTILLED WATER**

MAKE A HYPOTHESIS:

What do you think will happen to the eggs in this experiment? EXPLAIN WHY you think so.

_____

_____

.

Tell 2 ways the membrane surrounding the egg is like the plasma membrane in a cell.

1. _____

_____

2. _____

_____

Tell a molecule in the egg that might not be able to cross the membrane and explain WHY?

_____

COLLECT DATA:

	Egg in sugar water	Egg in distilled water
Mass of egg (g) at the start		
Mass of egg (g) after 24 hours		
Total change in mass (g) from Day 1 to Day 3 Use + if it got bigger Use – if it got smaller		

ANALYZE THE DATA:

What happened to the egg in the sugar water? Grew bigger Shrank smaller Stayed same size

What happened to the egg in the distilled water? Grew bigger Shrank smaller Stayed same size

Which molecule was moving to make the egg change size? _____

The movement of WATER ACROSS A SEMI-PERMEABLE MEMBRANE from a region of HIGHER concentration to a region of LOWER concentration is called _____.

The sugar water solution in the beaker was _____ compared to the egg? (CIRCLE ONE)

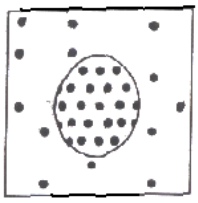
hypotonic hypertonic isotonic

The distilled water in the beaker was _____ compared to the egg? (CIRCLE ONE)

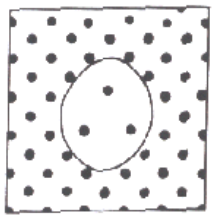
hypotonic hypertonic isotonic

****

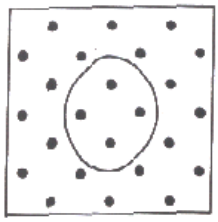
Solute is represented by black dots in the diagrams below.



A



B



C

WHICH DIAGRAM REPRESENTS THE EGG PLACED IN THE SUGAR WATER? A B C

WHICH DIAGRAM REPRESENTS THE EGG PLACED IN THE DISTILLED WATER? A B C

MODELING AN AQUATIC ORGANISM:

Homeostasis is critical for maintaining conditions for life. Animals that live in aqueous environments must maintain the balance of water and ions in their bodies (osmoregulation). You will use dialysis tubing (artificial membrane) to MODEL what happens to "fish" in different environments.

CHECK THE "DIALYSIS TUBE FISH"

What happened to the dialysis tube "fish" placed in the salt water?

Grew bigger Shrank smaller Stayed same size

What happened to the dialysis tube "fish" placed in the fresh (distilled) water?

Grew bigger Shrank smaller Stayed same size

****

The salt water solution in the beaker was _____ compared to the "fish". (CIRCLE ONE)

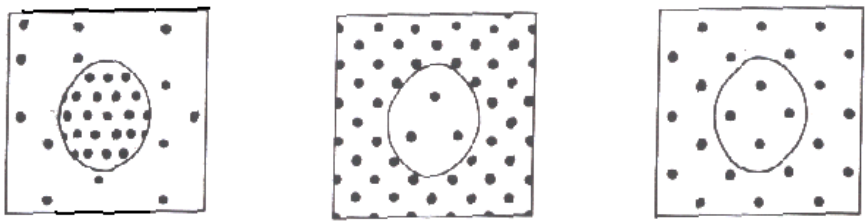
hypotonic hypertonic isotonic

The fresh water solution in the beaker was _____ compared to the "fish". (CIRCLE ONE)

hypotonic hypertonic isotonic

****

Solute is represented by black dots in the diagrams below.



A B C

WHICH DIAGRAM REPRESENTS THE "FISH" PLACED IN THE SALT WATER? A B C

WHICH DIAGRAM REPRESENTS THE "FISH" PLACED IN THE FRESH WATER? A B C

Science and Engineering Practices	Cross Cutting Concepts
A. Developing and Using Models	A. Patterns
B. Planning and Carrying Out Investigations	B. Energy and Matter
C. Using Mathematical and Computational Thinking	C. Structure and Function
D. Constructing Explanations and Designing Solutions	D. Stability and Change
E. Obtaining, Evaluating, and Communicating Information	E. Cause and Effect
F. Asking Questions and Defining Problems	F. Systems and System Models
G. Engaging in Argument from Evidence	G. Scale, Proportion, and Quantity

A. Developing and Using Models:

• **Physical model** is a smaller/larger simpler **physical representation** of the thing being studied. The object being modelled may be small (an atom) or large (the Solar System). Example: Model airplane

• **Conceptual models** is a representation of a system, made of the composition of concepts which are used to help people know, understand, or simulate a subject the **model** represents. Diagrams, word webs, or concept maps can be used to explain a phenomenon or event.

• **Mathematical models** are sets of equations that take into account many factors to represent a phenomenon. For example: meteorologists use computer models to make predictions about weather patterns.

IDENTIFY 2 KINDS OF MODELS you used in this lab, explain what was being modeled, and which science concepts the models represented.

MODEL 1: _____

_____

MODEL 2: _____

_____

Tell how the molecules are moving in the examples below:

OSMOSIS	DIFFUSION

A student passes gas that can be smelled across the room _____

After sitting in the bathtub for hours water enters your skin causing it to wrinkle up _____

The girl sitting two rows ahead of you in class put on too much perfume this morning. _____

One way to get rid of slugs in your garden is to sprinkle salt on them so they shrivel up and die. _____

Yum! Something smells good. The neighbors are cooking on the grill. _____

Gargling with salt water when you have a sore throat causes water in your swollen throat cells to leave the cell so the cells shrink and hurt less. _____

Oxygen molecules move from the air sacs in the lungs across the cell membranes into the blood _____

The Hy-Vee sprays water on the veggies in the produce isle to "plump them up" _____