**Activity 2**

**Create a Cell**

**(a three day project)**

This is a fun learning activity to share with older students.

**Purpose:** In this project, students will create a “cell” by dissolving the shell of a chicken egg. Once the shell is dissolved, a thin membrane, permeable to water, is all that remains holding the egg intact. Since our cells are made of around 60% water, we can use this “cell” to study the effects of different types of solutions on the human body.

**Materials:** 3 eggs, 3 L of vinegar, ½ cup of table salt, 3 large containers (approx. 500 mL), scale (optional), string (30 cm), ruler, paper towel.

**Procedure:**

1. Place one egg in each of the 3 containers and completely submerge the eggs in vinegar. Bubbles will begin to form on the egg as the shell dissolves. After 24 hrs, drain the vinegar and submerge the egg in fresh vinegar. After 48 hours, the shell of the egg should be completely dissolved. Drain the vinegar, pat the eggs dry and rinse out the containers. Be very careful as the eggs will be extremely delicate. Leave the eggs sitting on paper towel until the solutions are ready.

2. Fill each of the three containers ¾ full with water. Label one container “A,” the next “B,” and the third “C”. Into container A, place ½ tsp of salt and stir until dissolved. Into container B, place the remaining salt and stir until as much dissolves as possible. Leave container C as just water. Each of the solutions will represent various types of solutions in our environment. Fill in the table below to remember which was which.

|  |  |  |
| --- | --- | --- |
| Solution | What did we put in? | Types of solutions represented |
| A |  | Blood, saline solution, milk |
| B |  | Ocean water, saturated solutions |
| C |  | Water |

3. Carefully wrap a piece of string around the widest part of the first egg. Then measure the length of string. Place the egg into solution A. Make sure to record the length in Table 2 on the next page under “Starting Distance Around (cm)”. If you have a scale, you can also measure the mass of the egg. We will use the changes in these measurements to study the effects of each solution. Repeat this process for the other two eggs. Make sure that the measurements for the second egg are recorded under solution B and the third egg for solution C.

4. Leave the eggs soaking in their solutions for 24 hours. Record your predictions in Table 1. What do you think will happen to each egg?

5. Remove the eggs from the solutions and pat dry with paper towel. Place the egg on the towel and in front of its container so that you remember where each belongs. Measure the distance around (and the mass if possible) and record under “Final Distance Around” for each egg.

6. To calculate the change in each measurement, subtract the final from the starting measurement.

7. Answer the concluding questions.

**Data:**

**Table 1: Predictions**

|  |  |
| --- | --- |
| Solution | What do you think will happen to each egg? |
| A |  |
| B |  |
| C |  |

**Table 2: Measurements**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Solution | Starting distance around (cm) | Starting mass (g) | Final distance around (cm) | Final mass (g) | Change in distance around (cm) | Change in mass (g) |
| A |  |  |  |  |  |  |
| B |  |  |  |  |  |  |
| C |  |  |  |  |  |  |

**Concluding Questions:**

1. Were your predictions correct? If yes, great job! If not, great job as well, but think about why your predictions were different from the results.

2. What substance do you think the eggs gained or lost, causing the change in their size/mass?

3. How does this activity explain why drinking ocean water can be fatal if too much is consumed?

4. Does this activity demonstrate the dangers of drinking too much water?

5. Tomorrow, write down how much water you drink thoughout the day and think about which type of solution your cells are sitting in. Too much water? Or too little?