

G.I.R.L.S.

GIRLS INSPIRING RISING LADIES IN STEM

Name: _____ Date: _____

TOPIC #1: CELL TRANSPORT

GUMMY BEAR OSMOSIS & MASON JAR DIFFUSION

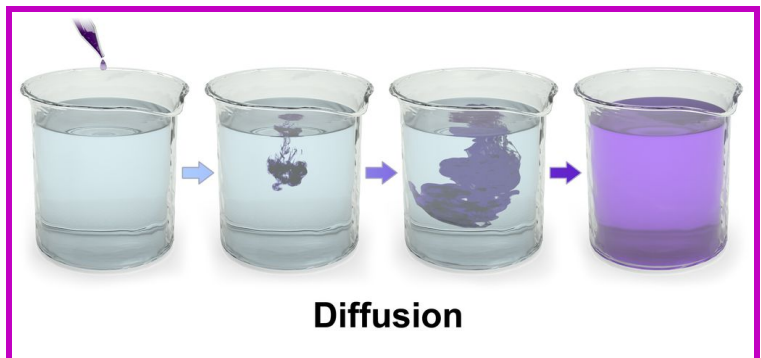
SCIENTIST OF THE DAY: GERTRUDE ELION

Gertrude Elion was born in 1918 and grew up in NYC. She always enjoyed learning, but found a passion for science after her grandfather passed away from cancer. She lived during the Great Depression and fought tirelessly to obtain an education during a time in which money was scarce and universities did not provide financial aid for women. She eventually succeeded and graduated from NYU. She then found work researching cancer treatment and therapy. She was eventually successful in creating medicines that could target unhealthy cells while keeping healthy cells alive and unharmed. Her work saved thousands of lives and paved the way for more groundbreaking research.



BACKGROUND

Cell transport is movement of materials across cell membranes. Cell transport is incredibly important for the function of the cell. There are two main types of cell transport: passive transport and active transport. Active transport requires energy while passive transport does not. There are three types of passive transport: diffusion, facilitated diffusion, and osmosis. While these processes are important for cells, we can also witness their effects in our everyday lives. For example, if you have ever experienced the aroma of freshly baked cookies coming from a kitchen, you were experiencing the process of diffusion.



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NEW WORDS

- **Diffusion:** _____

- **Facilitated Diffusion:** _____

- **Osmosis:** _____

- **Solute:** _____

- **Solvent:** _____

- **Concentration:** _____

- **Cell Membrane:** _____

- **Permeable:** _____

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TODAY'S EXPERIMENT

In this experiment, we will explore osmosis and diffusion in depth and see how different factors like temperature and concentration can impact these processes. We will be performing two experiments: the first one uses mason jars and will allow us to look at the topic of diffusion. The second experiment uses gummy bears and will allow us to study osmosis!

SCIENCE CONCEPT: LAB SAFETY

Before we begin doing these experiments, it is important to talk about laboratory safety! Anytime you are in a laboratory, there are lots of rules that should be followed to make sure that you, or any of your friends, don't get injured or break any lab equipment.

Write down three rules you think are important to follow in a lab:

1. _____

2. _____

3. _____

MATERIALS LIST

- | | |
|--|---|
| ☐ Gummy Bears | ☐ Microwave or Hot Plate |
| ☐ Mason Jars | ☐ Salt |
| ☐ Food Coloring | ☐ Water |

PROCEDURE: MASON JAR DIFFUSION

1. Get three mason jars and fill them with room temperature water.
2. In one jar, place 1 drop of food coloring. In the second jar, place 5 drops of food coloring. In the third jar, place 10 drops of food coloring.
3. Record the time it takes for the color to fully diffuse throughout the two jars.

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DATA

Experimental Condition	Time Needed for Full Diffusion
1 Drop of Food Coloring	
5 Drops of Food Coloring	
10 Drops of Food Coloring	

PROCEDURE: GUMMY BEAR OSMOSIS

1. Obtain several gummy bears. Record their height, width, and depth.
2. Place half of the gummy bears in cups containing regular tap water and the other half in cups containing salt water. Soak them overnight.
3. The next day, measure the bears again and use their before-and-after data to calculate the change in their growth.
4. Finally, soak the gummy bears from the regular water condition in salt water overnight. Given what we discussed from the first part of this experiment, what do you think will happen to the bears now?

QUESTIONS

1. In your group, discuss your findings from the diffusion experiment. What could cause the differences in the observed times for 1 drop of food coloring, 5 drops, or 10 drops?

2. In the osmosis experiment, what caused the gummy bear to swell? What type of solution was it in?

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3. In the osmosis experiment, what caused the gummy bear to shrivel? What type of solution was it in?

4. What is one thing you learned today?

EXIT PASS

T S O L V E N T S I S O M S O
D I K Z P E R M E A B L E F Y
F P R Y A P T P E I B Y G Z D
W A D X P P L Y E K Z H I J T
N S C E J V I W W T X U V G U
C P L I M X N A V F U S V L X
R B Y N L N V R C E L L R D Z
V M P T W I Z M X R T D O Q D
N O I T A R T N E C N O C S T
T X H L F L B A O M X S M U E
N C W Q X K G M T M B W C A M
N V M V V Z I R E E J R D F W
X L N D L X B O X T D S A P J
O T B D I F F U S I O N G N X
K K J C O D X O U T Q R F R E

DIFFUSION
FACILITATED
OSMOSIS
SOLUTE
SOLVENT
CONCENTRATION
CELL
MEMBRANE
PERMEABLE

EXPERIMENT LINKS

- <http://astrocampschool.org/diy-diffusion/>
- <https://sciencing.com/osmosis-experiments-gummy-bears-10042742.html>