

**What happens to cells when the cell is placed into a MORE salty environment?**

**What happens to cells when the cell is placed into a LESS salty environment?**

(put in grade for homework)

**The diffusion of water from high to low concentration through a membrane is.....**

**Is salt always bad for an ecosystem?**

(turn in warm up)

Warning Bell 7:40 a.m

Period 1 7:45 - 8:30 (45) - Announcements

Period 2 8:35 - 9:15 (40)

Period 3 9:20 - 10:00 (40)

Period 4 10:05 - 10:45 (40)

LUNCH 10:50 - 11:30 (40)

Period 5 11:35 - 12:15 (40)

Period 6 12:20 - 1:00 (40)

Period 7 1:05-1:45 (40)

Pep Rally 1:45 - 2:25 (40) – Return to 7<sup>th</sup> period to retrieve binders/bags

The Effects of Salt on Plant Cells.

To pick up: Lab packet

To get out: Blue Warm up Paper  
Ecology case study (pg 5-6 for stamp)

Homework: Make flashcards or quizlet from vocab in pink packet (pg 1)...also on weebly

Independent variable      Experimental group

Dependent variable      Constants

Control Group

Parts of a well designed investigation

## A SALT CONCENTRATION GUIDE in mg/L:

[Table of Contents](#)

67.5	Harms forest pine trees
100	Maximum allowed in NYC drinking water
226	Kills tiny freshwater plants and animals
250	Tastes salty. Maximum allowed in drinking water by the Environmental Protection Agency
400	Will kill some freshwater frogs
1,000	Will kill some freshwater fish like trout. Considered to be brackish or salty water
3,000	Lowest salt level found in the New York/New Jersey estuary
30,000	Highest level in the New York/New Jersey estuary
32,000	Average in ocean off of Long Island and New Jersey

**Reviewing homework pg 5 and 6**

Reflect on what you have learned

1. At what level does salt start to affect non-saltwater organisms in the forest? Is it a small or large amount and which organism is most affected?

**100 mg/L- small amount can affect root growth and seed sprouting**

2. At what level does salt start to affect non-saltwater organisms in a freshwater pond? Is it a small or large amount and which organism is most affected?

**226 mg/L Small amount- affects small freshwater plants and animals**

3. Pine trees are hurt by salt levels as low as 67.5 mg/L, but people are allowed to drink water with more salt than that level. Why is that?

**Salt affects growth of trees. People have kidneys which can regulate salt/water balance in the body maintaining homeostasis.**

4. Why is it okay for people to drink water with some salt, but bad for people if they drink water that is too salty?

**The kidneys can help to regulate the amount of salt in the blood, but if there is too much salt the body cells will lose water through osmosis.**



5. Some of the organisms that are most affected by salt are the small plants and animals that are lowest on the food chain. How will their death affect other biotic factors in a freshwater ecosystem?

**When organisms at the bottom of the food chain are killed it can cause other organisms to not have food.**

6 How is it possible for a freshwater swamp to turn into a salt marsh without trees? What happened to the trees? How can this occur?

**If the source of freshwater (river) is blocked to the swamp it may turn into a marsh. Putting a dam on a river can cause this.**





Wrapping it all together

1. Support the statement that the *salt level* isn't the problem for ecosystems; the *problem is changing the amount of salt* in an ecosystem. Give a specific example.

**Marshes, Estuaries and the Ocean are all ecosystems that should have salt. Plants and animals adapt to the amount of salt in the water and do not do well with big changes in their environment.**

2. List three ways that salt can negatively affect organisms in a freshwater. forest or swamp ecosystem.

i.

**Freshwater- kill off microorganisms in the water**

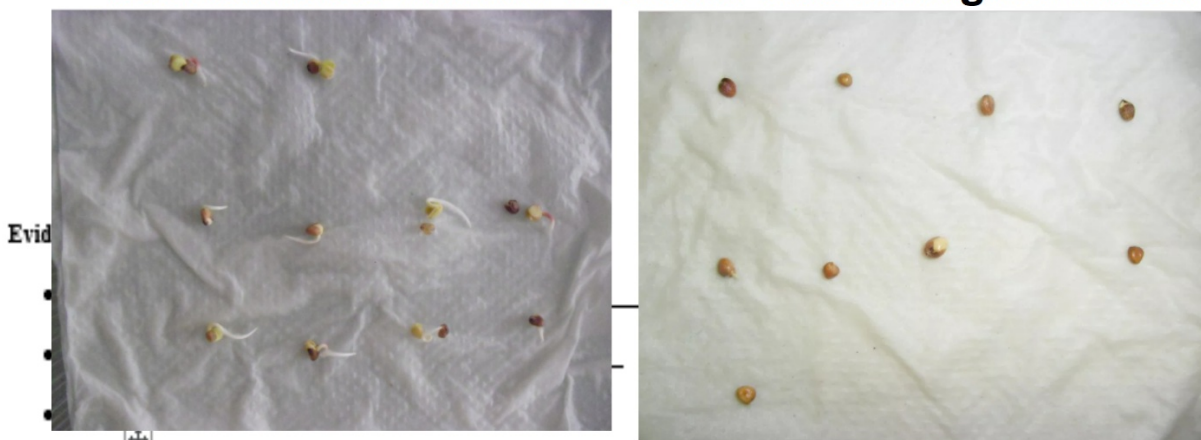
ii.

**Forest- delay seed germination**

iii.

**Swamp- salt can kill trees and cause it to turn into a marsh**

Get your bag with your seeds. Unwrap the paper towel and count the number of seeds that have germinated.



Time (Day)	Control Group 0 mg/L NaCl		Experimental Group __ mg/L NaCl	
	Number of seeds germinating	%	Number of seeds germinating	%
0	0	0	0	0
1	0	0	0	0
2	3	30	1	10
3	7	70	5	50
4				

Fill in the chart for day 1 control group and day 1 experimental group.

Ex: 5 seeds germinated = 50%

Calculating %: (# observed germinating / Total number of seeds) x 100 = %



Go to weebly: Sept 13th to record your data

Click on your class period

ONLY type in the cells that go with your rows

Fill in the control group and the Experimental Group (scroll down) data for your table.

Once everyone has typed in their data copy down the class averages

	Class Average Percent of Seeds Germinated				
Day	Conc: 0 mg/ L	100 mg/L	250 mg/L	1000 mg/L	3000 mg/L
0					
1					
2					
3					
4					

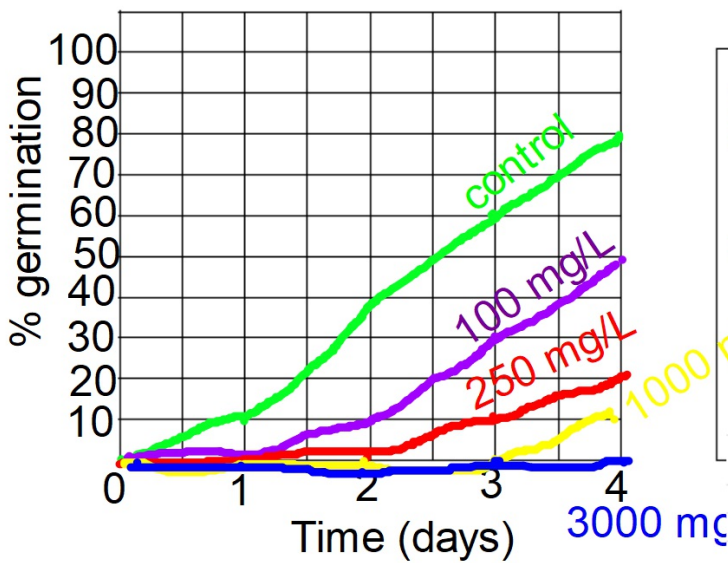
Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

### Effect of Saline Water on Seed Germination

Data Analysis- Graph the percent of seeds germinating each day at each concentration. This is a line graph with each concentration being a different colored line. You will be graphing 5 different colored lines. One line for each concentration.

X Axis= Time in days Y Axis= % Germination

Title: Effect of Salt water on Seed Germination



**Key: (identify the color of each line)**

- Control: 0 mg/L= ■
- Experimental: 100 mg/L= ■
- 250 mg/L= ■
- 1000 mg/L= ■
- 3000 mg/L= ■

Class Data Average	day 0	day 1	day 2	day 3	day 4
Control	0	10.83333	30	35.83333	48.33333
100 mg/L	0	5	10	20	30
250 mg/L	0	3.33333	23.33333	33.33333	36.66666
1000 mg/L	0	3.33333	6.66666	13.33333	26.66666
3000 mg/L	0		0	5	15

(you are graphing the class data!!!)

## Use your graph to answer the analysis questions

### Analysis:

- 1) Compare the slopes of the lines that you see on your graph. The steeper the slope the higher the rate of germination at that concentration. In which concentration of salt did the greatest percent of seeds germinate the fastest?
- 2) Which concentration of salt caused the lowest % of seeds to germinate?
- 3) Between which two concentrations of salt do you see the biggest impact on the germination rate of the seeds?
- 4) How does salt affect seed germination rates?
- 5) What happens in the cells of the seeds when they are exposed to high levels of salt?

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

Soil salinity causes severe problems in agriculture worldwide. Detrimental effects of high salinity on crops affect plants in a variety of ways and as a result, plant growth, development and survival are reduced. Additionally, natural vegetation of salt-affected areas is destroyed or damaged when salt concentration is too high resulting in major changes to landscape and biodiversity. Areas impacted by high salt concentrations include remaining natural habitat in many agricultural areas and developed areas such as parks in Montgomery County, and the fragmentation of many wildlife corridors.

Ecosystems around your home and school are impacted by salt runoff from winter-time road treatments every year. **Make a claim about how repeatedly using road salts to melt ice on the roads will affect these ecosystems over time.**

<b>Claim</b> A claim is a statement about what happened	
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Use evidence (from the lab you just completed, as well as online sources) and reasoning to support your claim.

<b>Evidence</b> Evidence uses <b>NUMBERS with UNITS</b> from your graph to support your claim	
<b>Reasoning</b> Reasoning uses science to explain <b>WHY</b> it happened.	

This is **IMPORTANT**

Read this

Make a claim about how repeatedly using road salt to melt ice on roads will affect these ecosystems over time

Use data (numbers) from your lab to support your claim.

Use science concepts and vocab to explain what is happening to plants at the cell level.

# **Review of Scientific Method and Vocab**

What are the characteristics of a well designed scientific investigation (experiment)?

A testable question.

Large sample size.

Repeatable; multiple trials.

Investigate one variable at a time.

Keep other variables from impacting the investigation.

Control Group for comparison

What is the importance of each?



Make flash cards of vocabulary:

Front of card

Independent  
Variable

Dependent  
Variable

Control Group

Back of card

What is changed  
by the experimenter  
in the experimental group

What is measured in the  
experimental and control  
group

A group that is tested  
as a comparison to the  
experimental group.

Make flash cards of vocabulary:

Front of card

Experimental  
Group

Constants/  
Controlled  
Variables

Solute

Back of card

Group that is tested to see  
the affect of the  
independent variable.

What you keep the same  
in all trials

What is being dissolved

Make flash cards of vocabulary:

Front of card

Solvent

Back of card

What is doing the  
the dissolving (ex: water)

Solution

Mixture made when  
a solute dissolves in a  
solvent

