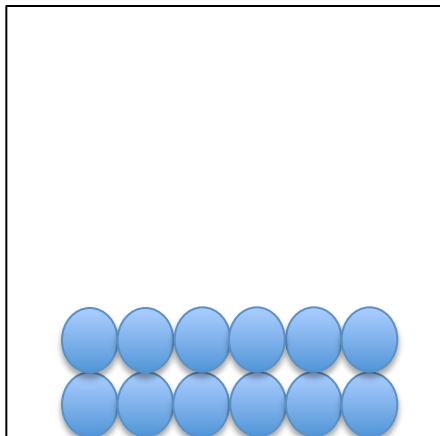


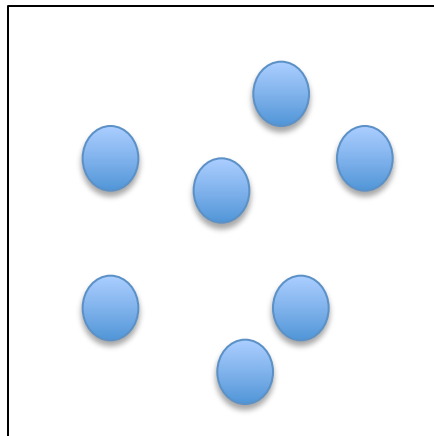
## 8.8 Colligative Properties

SPARK

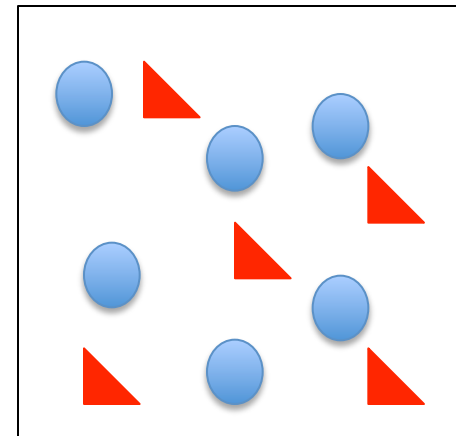
You want to freeze the water (represented by a circle) so that it becomes ice. Knowing that freezing is an exothermic process, which box (Box A or Box B) would release more energy in order for water to freeze? Why?



BOX A



BOX B



# Objective

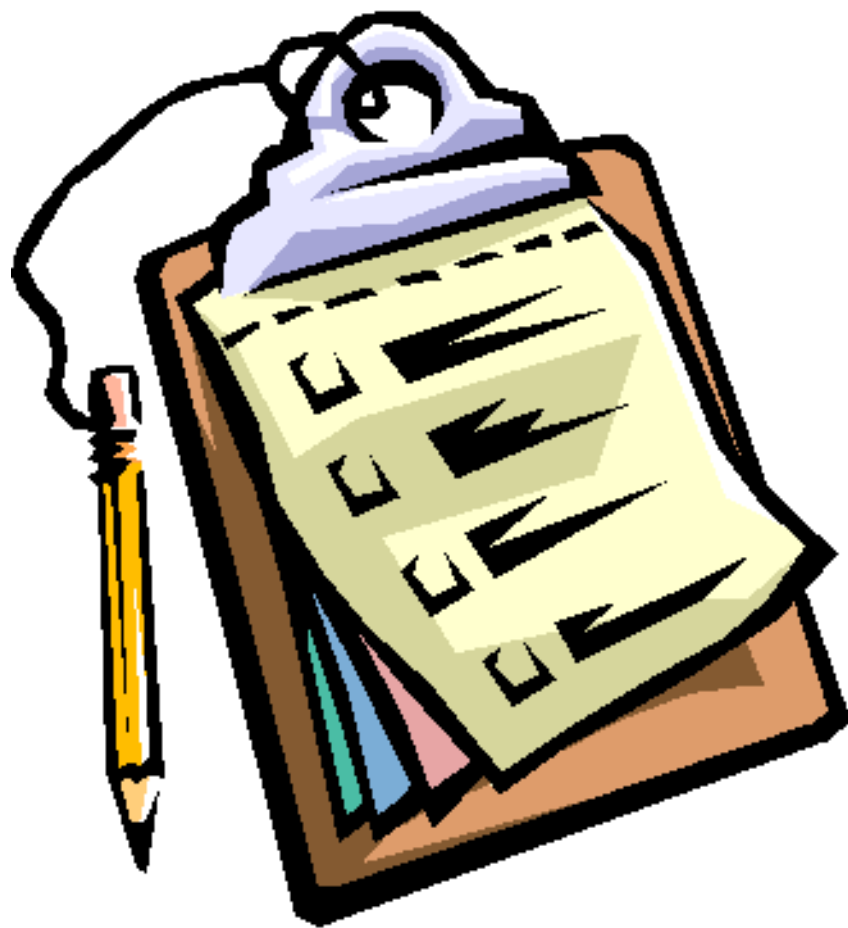
- SWBAT explain the presence of a solute on the boiling and freezing point of a solvent

# Where are we?

Lecture	Lesson
8.1	What is a solution and the parts of a solution? <i>KEY POINT: Solutions are homogenous mixtures that are made up of the solute and the solvent.</i>
8.2	What factors determine the solubility of a substance? <i>KEY POINT: Temperature, Pressure, and Polarity affect the solubility of a solute in solution.</i>
8.3	How do you determine if a ionic compound is soluble in water? <i>KEY POINT: A solubility table (Table F) can tell us whether ionic salts are soluble in water.</i>
8.5	How do you determine the saturation of a solution? <i>KEY POINT: A solubility curve (Table G) can help you determine whether a solution is unsaturated, supersaturated, or saturated.</i>
8.7	How do you determine the exact concentration of a solution? <i>KEY POINT: The concentration of a solution measures how much solute is present for a defined amount of solution. It is measured in molarity or ppm.</i>

# Agenda:

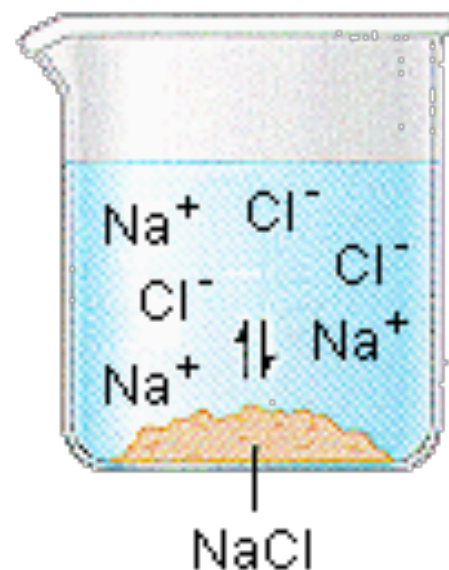
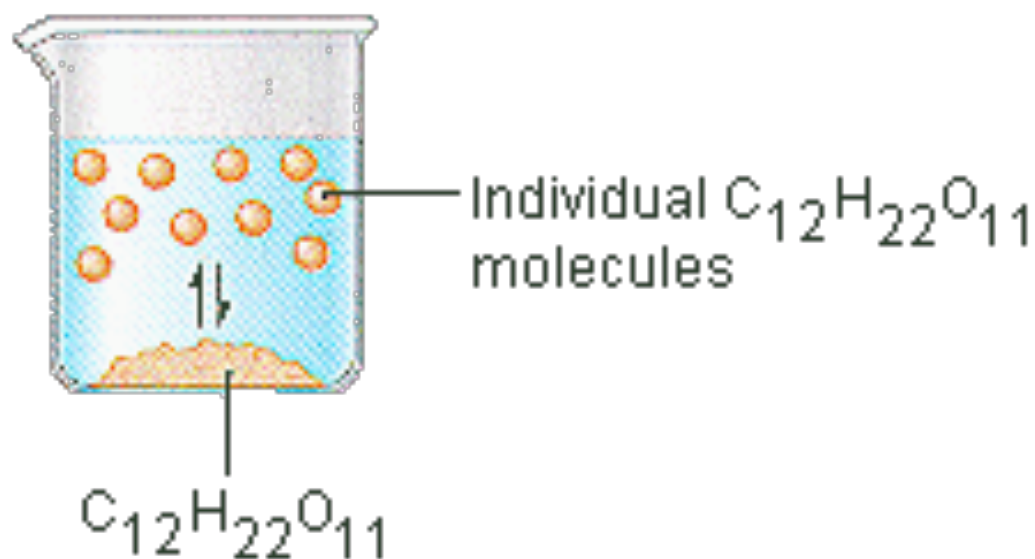
- SPARK/Objective
- Notes
- Practice
- Homework



Objective: SWBAT explain the presence of a solute on the boiling and freezing point of a solvent

# Review- Ionic versus Covalent in solution

- How are these two beakers different?
- **Ionic solids SEPARATE IN SOLUTION!**



Objective: SWBAT explain the presence of a solute on the boiling and freezing point of a solvent

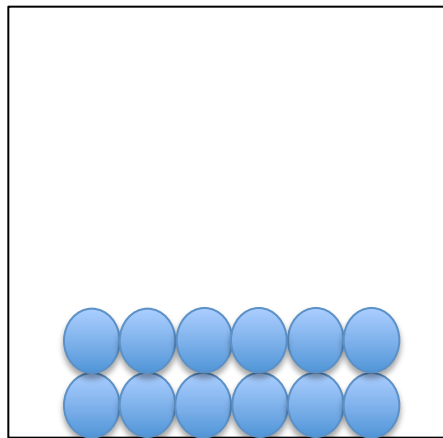
# Let's review quickly...

	Molecular Compounds	Ionic Compounds
What are they?	2 or more non-metals bonded together	1 NM and 1 metals/ polyatomic ions bonded together
How are they bonded?	Sharing of valence electrons	Transfer of valence electrons
What happens when they dissolve in water?	Intermolecular interactions with the solvent	Ions separate in solution
Example	$\text{C}_6\text{H}_{12}\text{O}_6 (\text{s}) \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 (\text{aq})$	$\text{NaCl} (\text{s}) \rightarrow \text{Na}^+(\text{aq}) + \text{Cl}^-(\text{aq})$

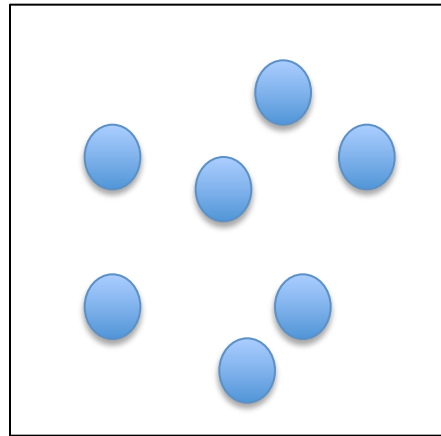
Objective: SWBAT explain the presence of a solute on the boiling and freezing point of a solvent

# Let's go back to the SPARK

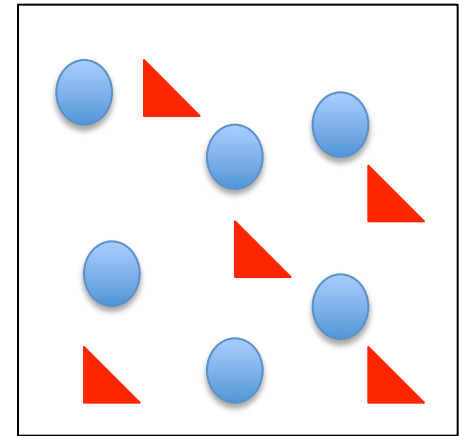
- You want to freeze the water (represented by a circle) so that it becomes ice. Knowing that freezing is an exothermic process, which box (Box A or Box B) would release more energy in order for water to freeze? Why?



BOX A



BOX B



Objective: SWBAT explain the presence of a solute on the boiling and freezing point of a solvent

# Colligative Properties

- A property that depends only on the **number of dissolved particles** of solute rather than the **IDENTITY** of the solvent

Objective: SWBAT explain the presence of a solute on the boiling and freezing point of a solvent



With your neighbors... explain what happens to freezing point and boiling point in the presence of a solute. DEFEND YOUR ANSWER!

	<b>FREEZING POINT</b>	<b>BOILING POINT</b>
<b>Definition</b>	Temperature at which a substance goes from liquid to solid	Temperature at which a substance goes from liquid to gas
<b>How does the presence of a solute affect it?</b>	LOWERS THE FREEZING POINT	RAISES THE BOILING POINT
<b>How does the number of particles affect it?</b>	More particles = LOWER FP	More particles = HIGHER BP

Objective: SWBAT explain the presence of a solute on the boiling and freezing point of a solvent

# KEY POINT

**FREEZING POINT DEPRESSION**  
**BOILING POINT ELEVATION**

Objective: SWBAT explain the presence of a solute on the boiling and freezing point of a solvent

# Number of particles in solution is important!

Compound	Ionic compound or Molecular compound?	Number of Particles in an aqueous solution
NaCl	ionic	2
CaCl <sub>2</sub>	ionic	2
CO <sub>2</sub>	Covalent/ molecular	1
Ca(NO <sub>3</sub> ) <sub>2</sub>	ionic	3
NH <sub>4</sub> Cl	ionic	2

Objective: SWBAT explain the presence of a solute on the boiling and freezing point of a solvent

# Classwork

- Complete your 8.8 classwork!

Objective: SWBAT explain the presence of a solute on the boiling and freezing point of a solvent

# HOMEWORK

Finish 8.8 Classwork/Homework

Objective: SWBAT explain the presence of a solute on the boiling and freezing point of a solvent