



TeachEngineering

Mines to Mobiles: Aqueous Solutions and Environmental Chemistry

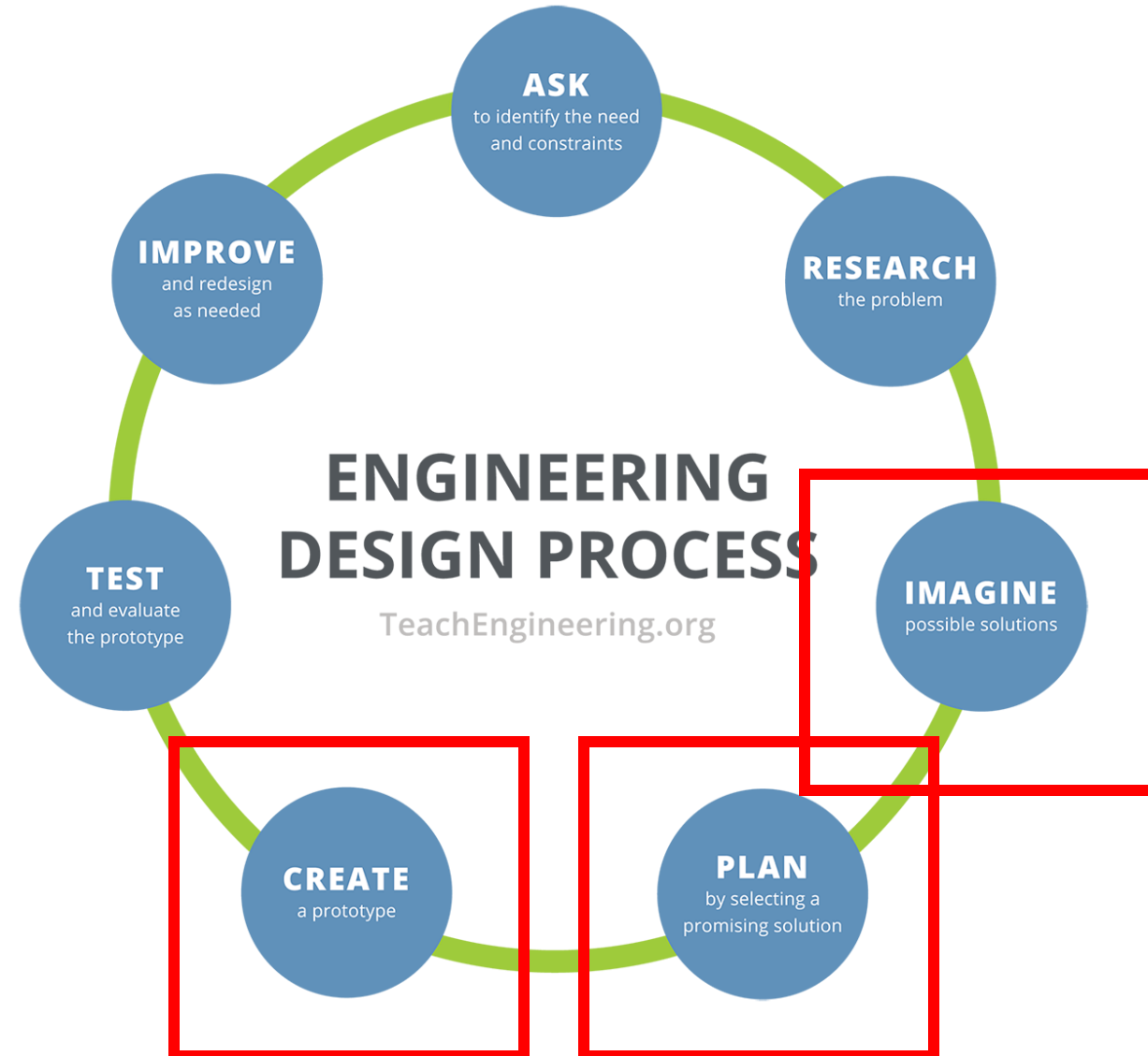
Day 3



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DAY 3 (45 MINS)

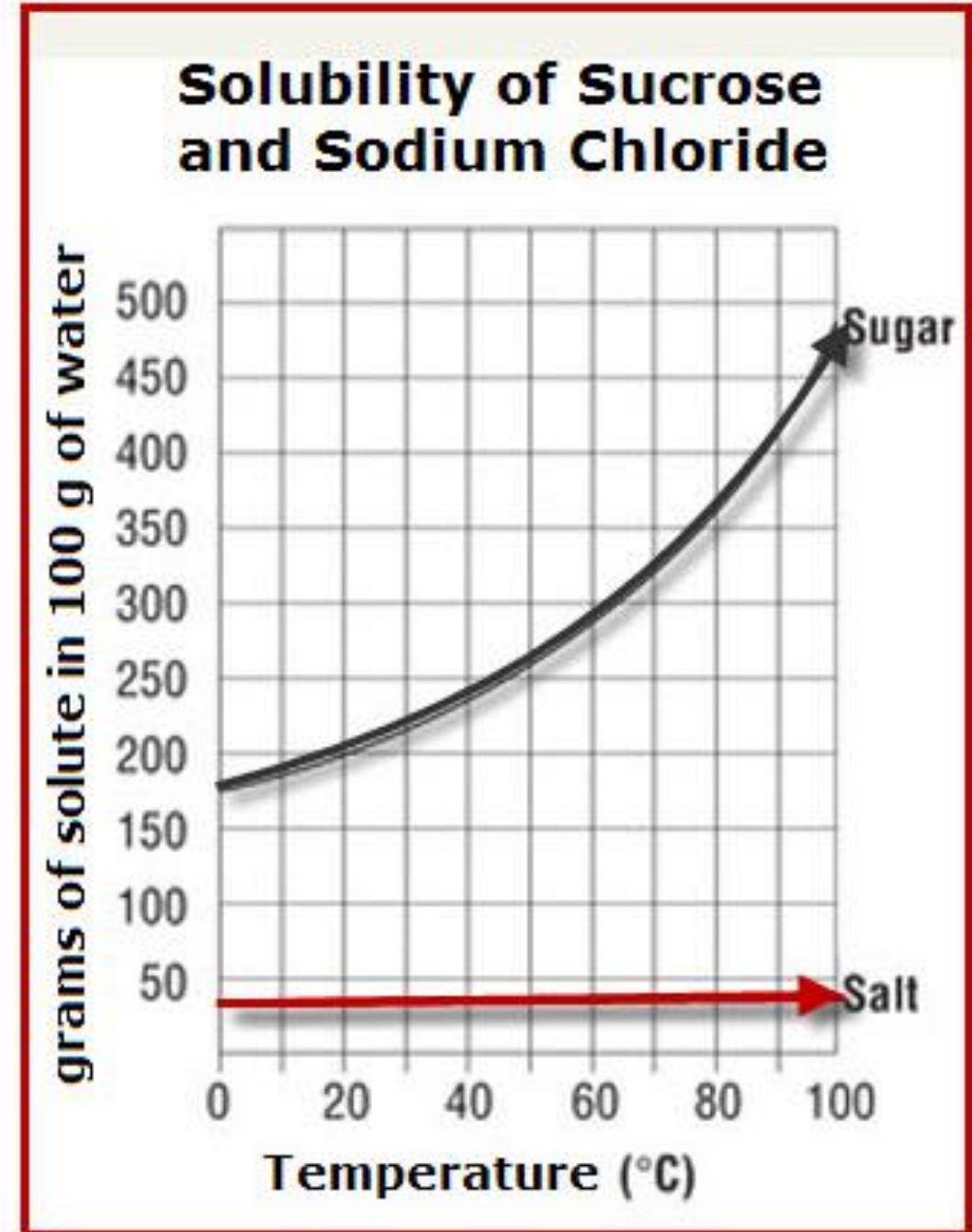


LET'S RECAP

DO NOW: Talk with your neighbors about the research we did last class.

What are some key trends we saw yesterday in lab?

What was the biggest difference between sugar and salt when dissolving?

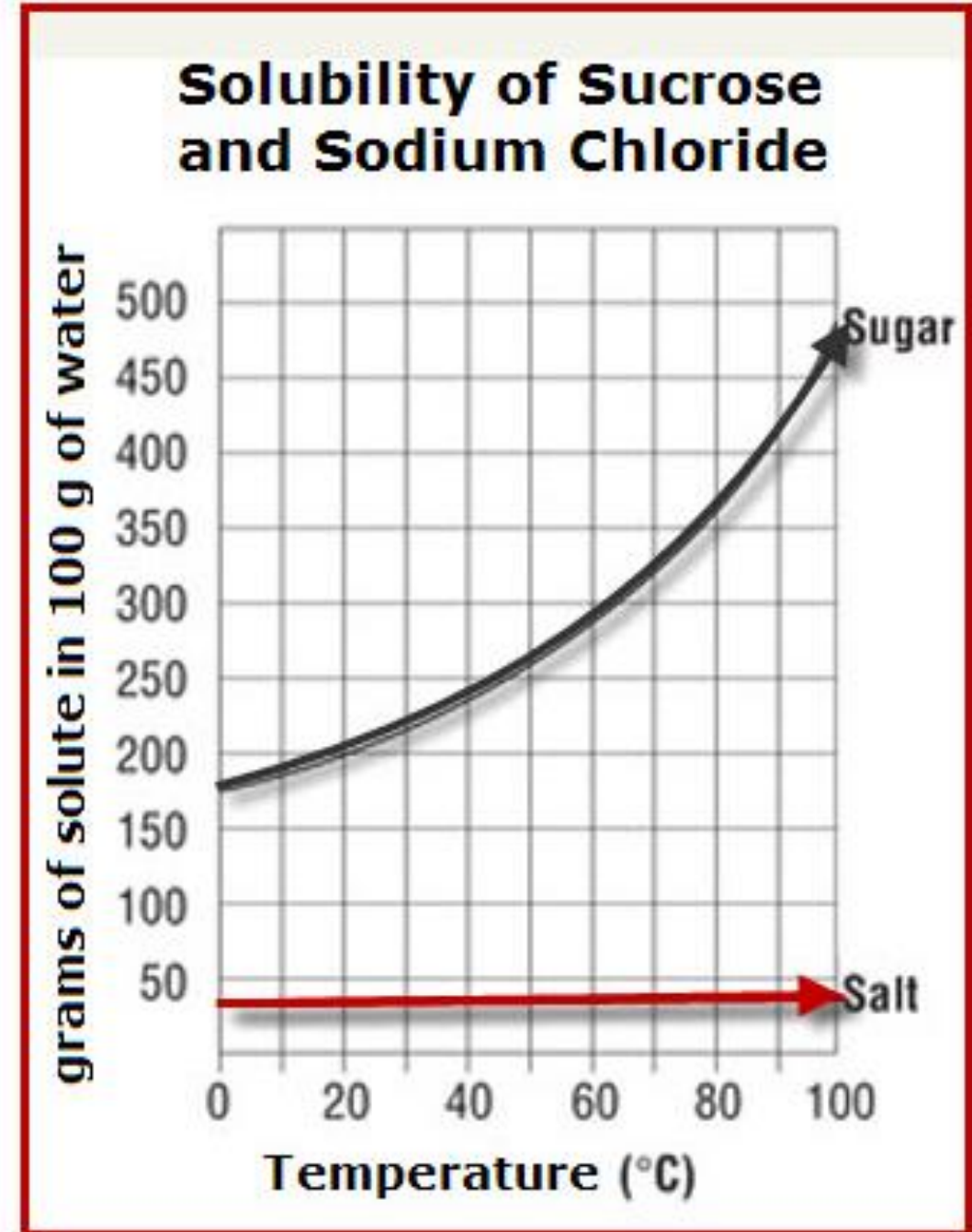


IMAGINE IDEAL SCENARIOS

Scenario 1: You receive a shipment of 20 grams of salt and 30 grams of pepper in 100 mL of water. What is the simplest way to extract the pepper?

You must use the coffee filter to separate the pepper from the water.

You must write the method like a recipe (ex: Step 1: _____, Step 2: _____, etc.).

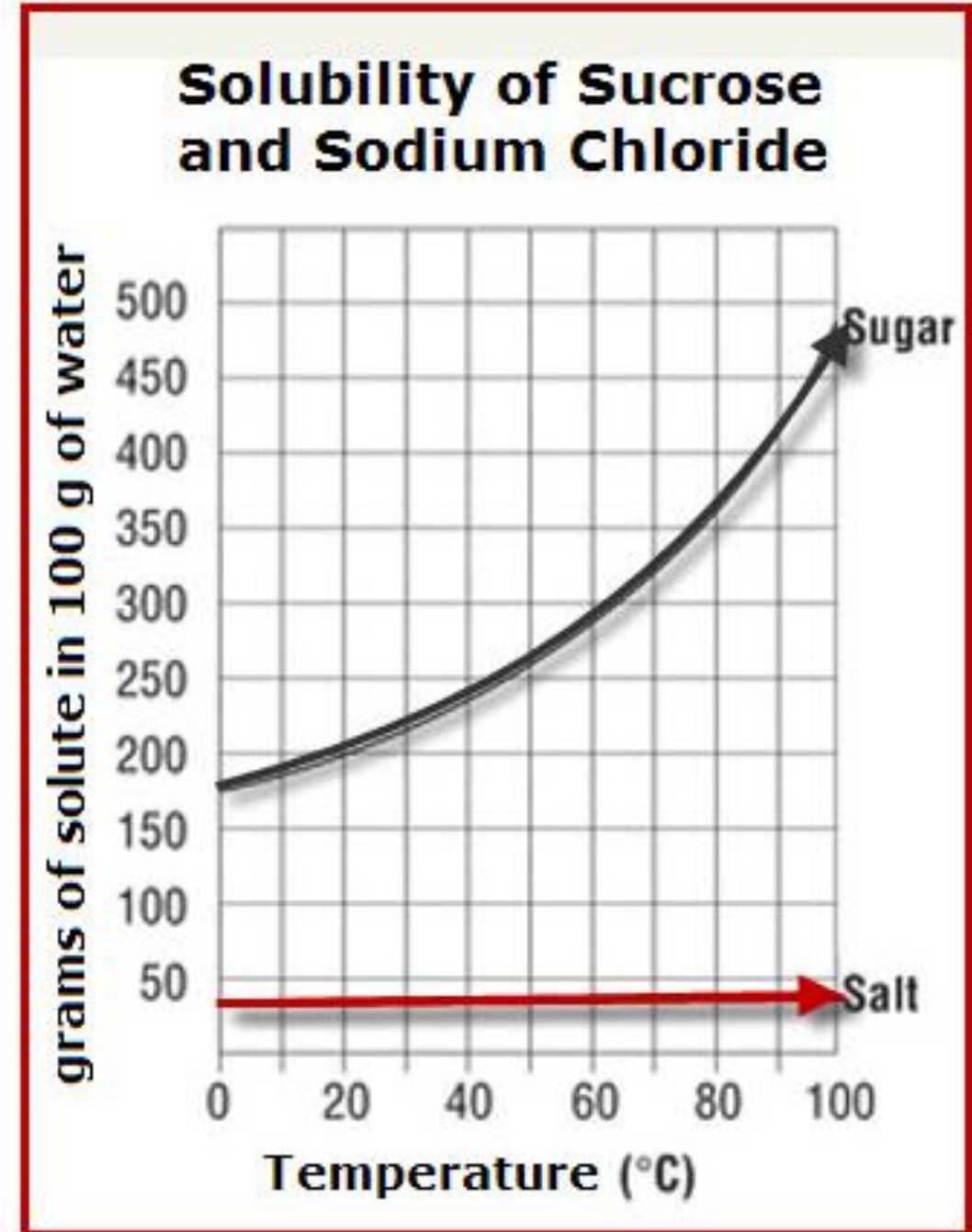


IMAGINE IDEAL SCENARIOS

Scenario 2: You receive a shipment of 300 grams of sugar and 30 grams of pepper in 100 mL of water. What is the simplest way to extract the pepper?

You must use the coffee filter to separate the pepper from the water.

You must write the method like a recipe (ex: Step 1: _____, Step 2: _____, etc.).

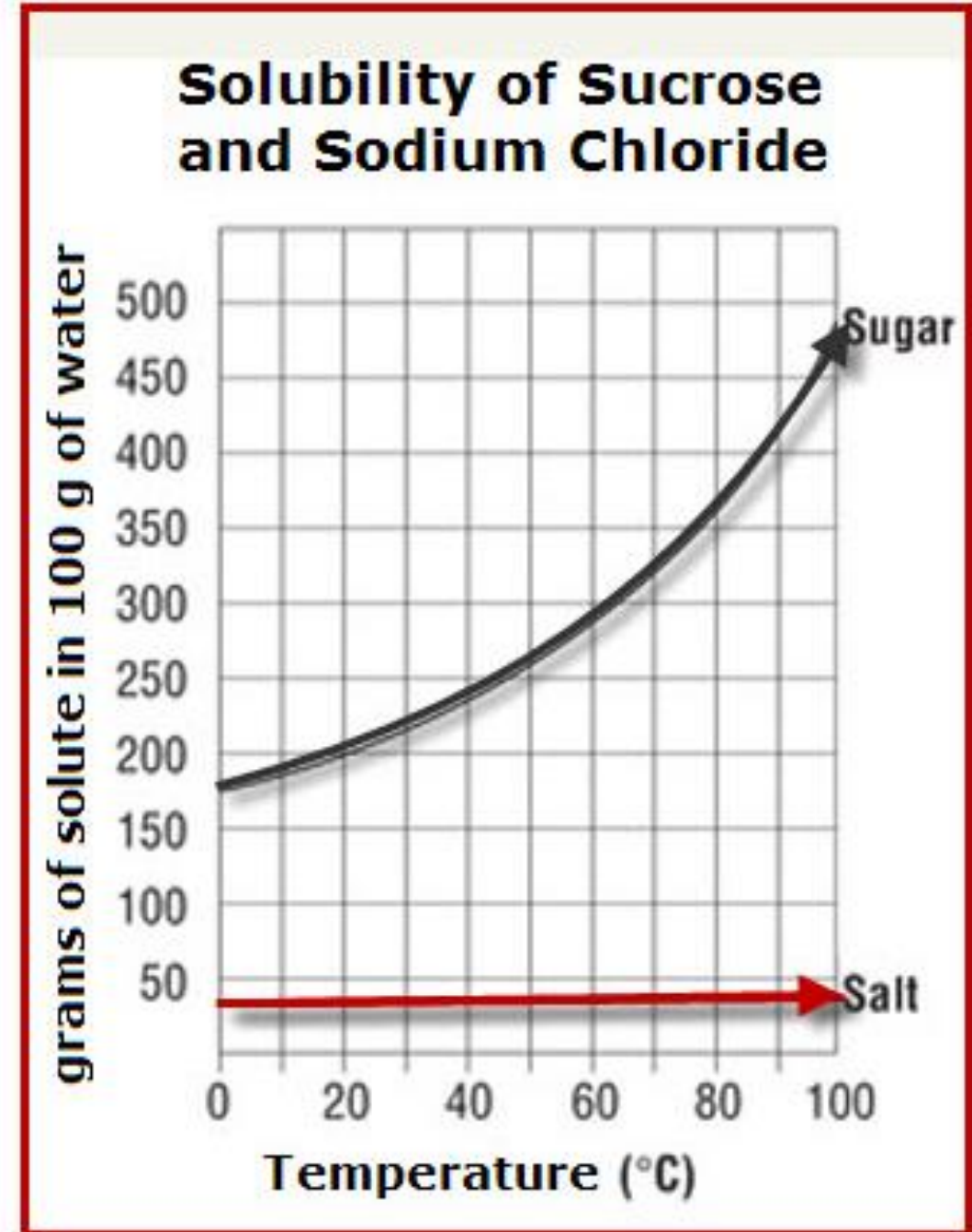


IMAGINE IDEAL SCENARIOS

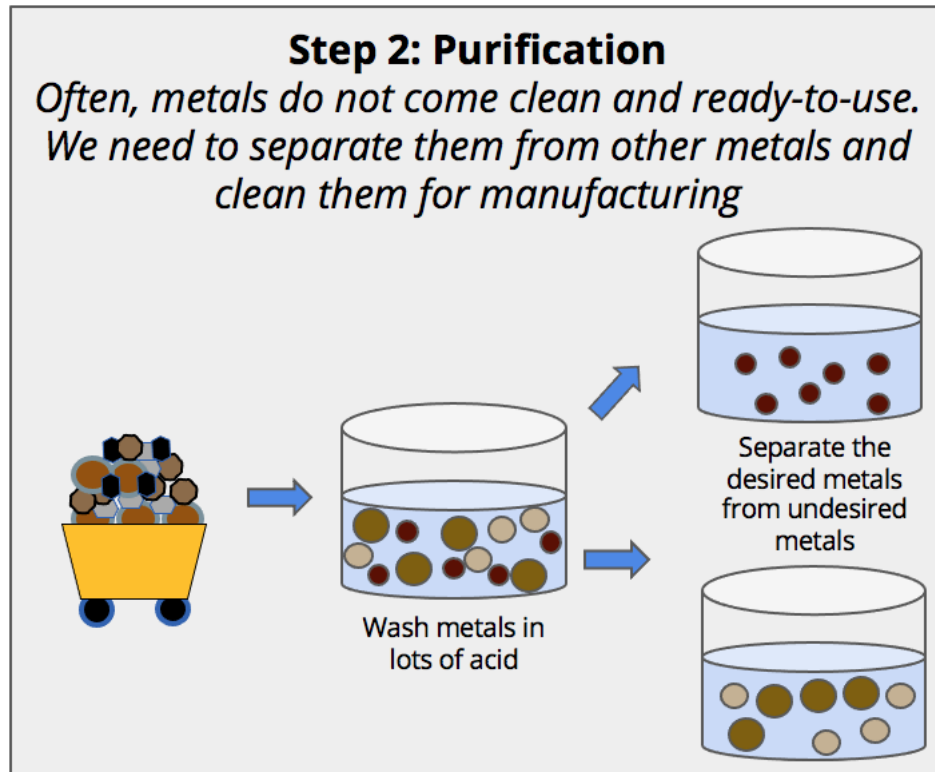
Scenario 3: You receive a shipment of 50 grams of salt and 30 grams of pepper in 100 mL water. What is the simplest way to extract the pepper?

You must use the coffee filter to separate the pepper from the water.

You must write the method like a recipe (ex: Step 1: _____, Step 2: _____, etc.).



WHICH SHIPMENT WILL YOU GET?



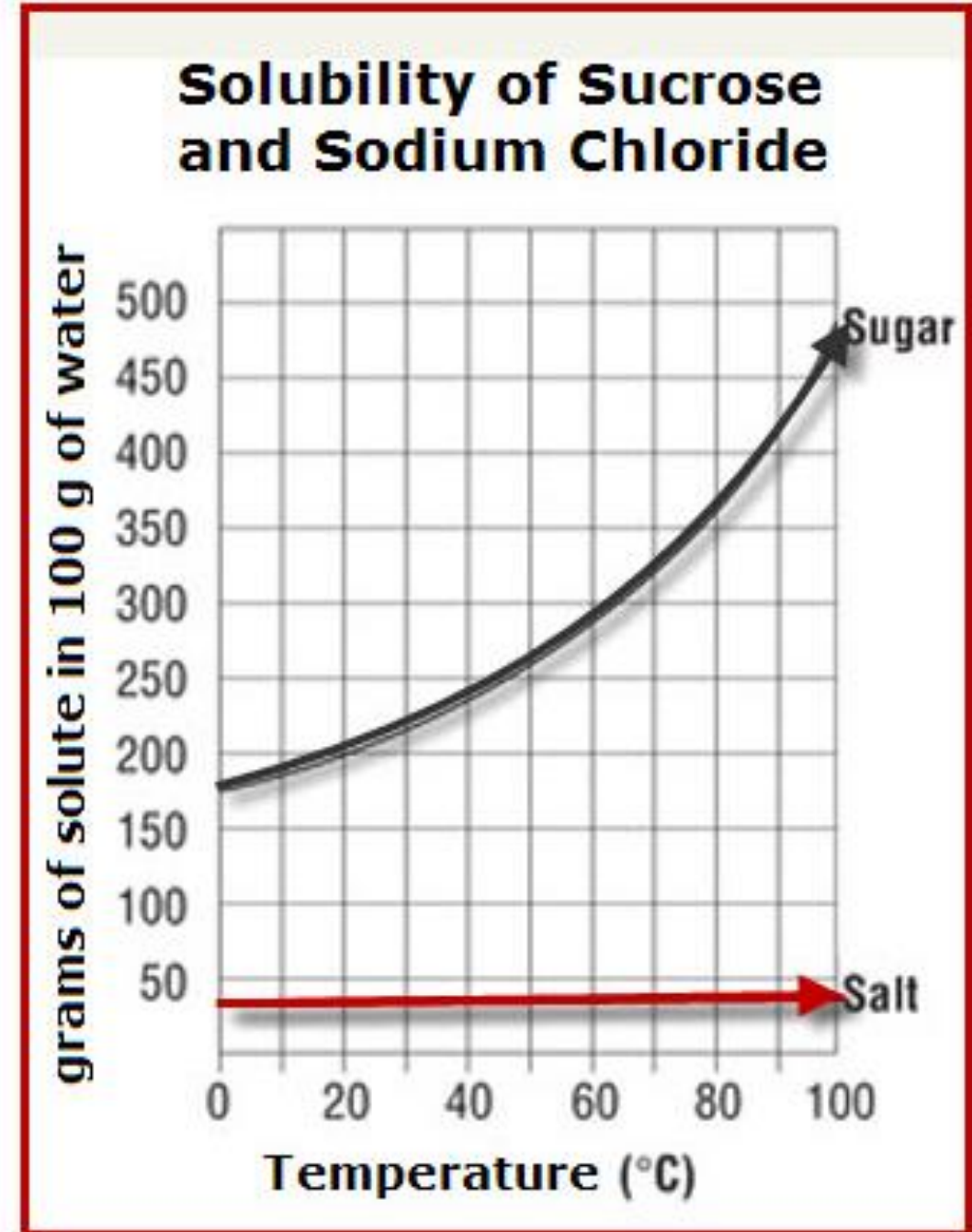
Mining Purification Process

Shipment A	Shipment B
10 Grams Total Solutes	10 Grams Total Solutes
All metals mixed evenly	All metals mixed evenly
60% Sugar	60% Salt
10% Salt	10% Sugar
30% Pepper	30% Pepper

PLANNING YOUR WASH

Your Scenario: You receive a shipment of 10 grams of total metals. Think about the following questions as you and your group fill out the Pepper Extraction Plan.

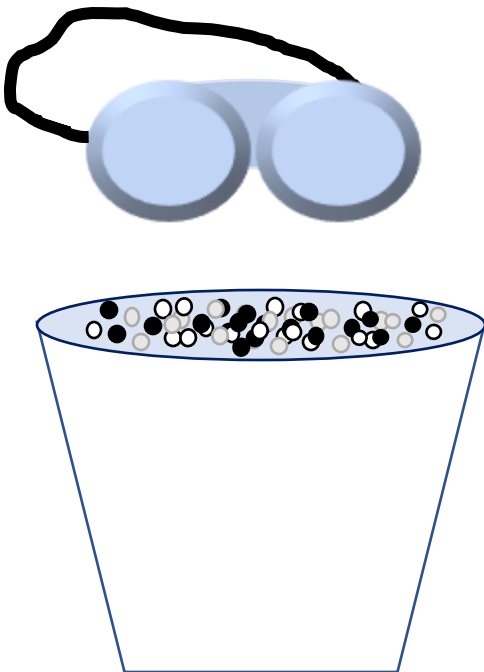
1. Do we have more sugar or more salt?
2. Which method will help that dissolve the fastest:
 1. Agitation
 2. Changing the surface area
 3. Heat
 4. Changing the concentration of the solution
3. How much water will we need to add to our cup of metals to help it dissolve?
4. Will we need any tools to help our metals dissolve?
 1. Spoons
 2. Straws
 3. Remember, you cannot touch it with your hands!



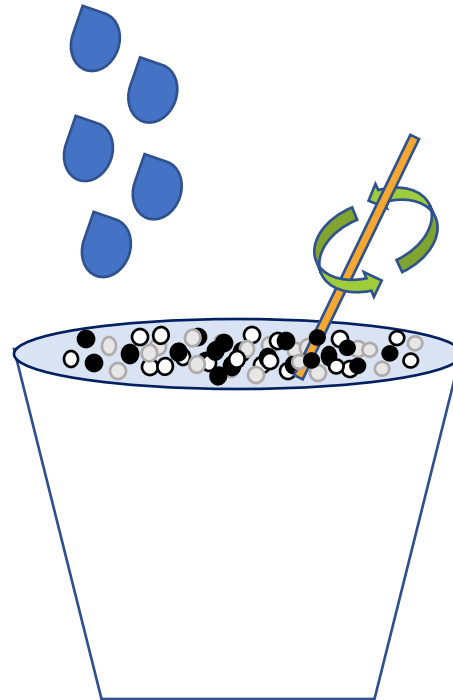
American Chemical Society. (2023, August 25)

TEST YOUR PLAN

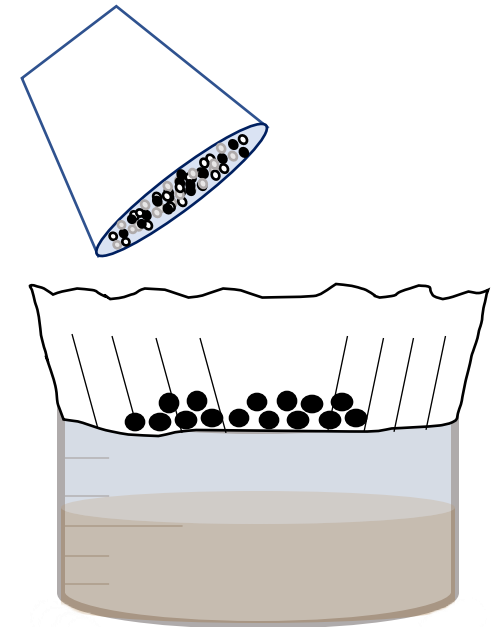
Put on proper safety equipment, and get your shipment from your teacher.



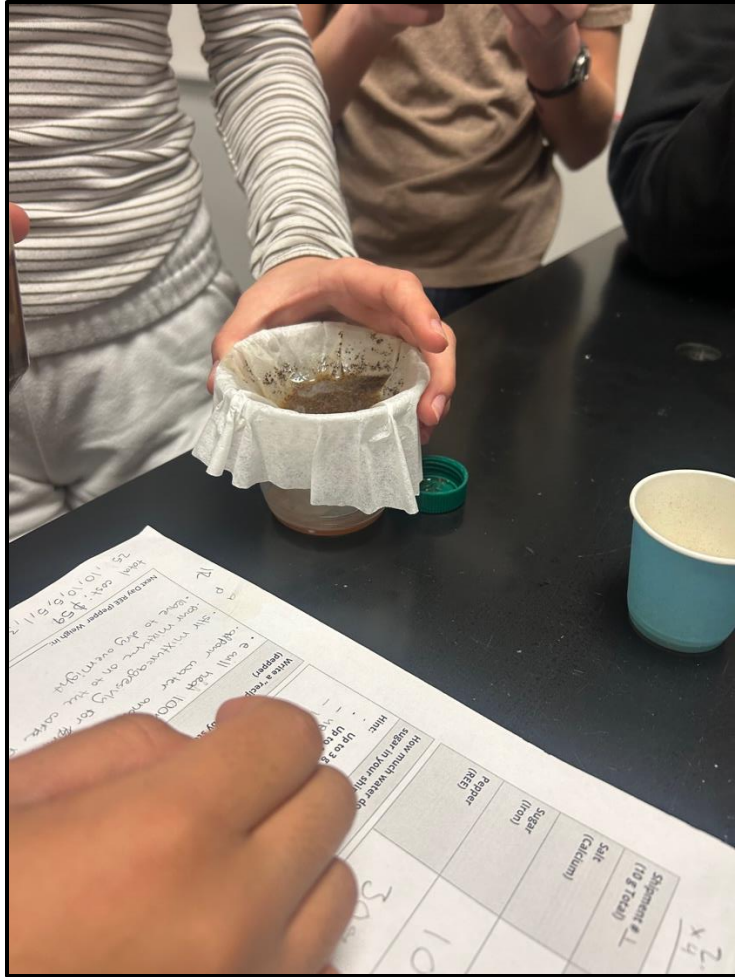
Add your water and dissolve your salt and sugar so only pepper remains.



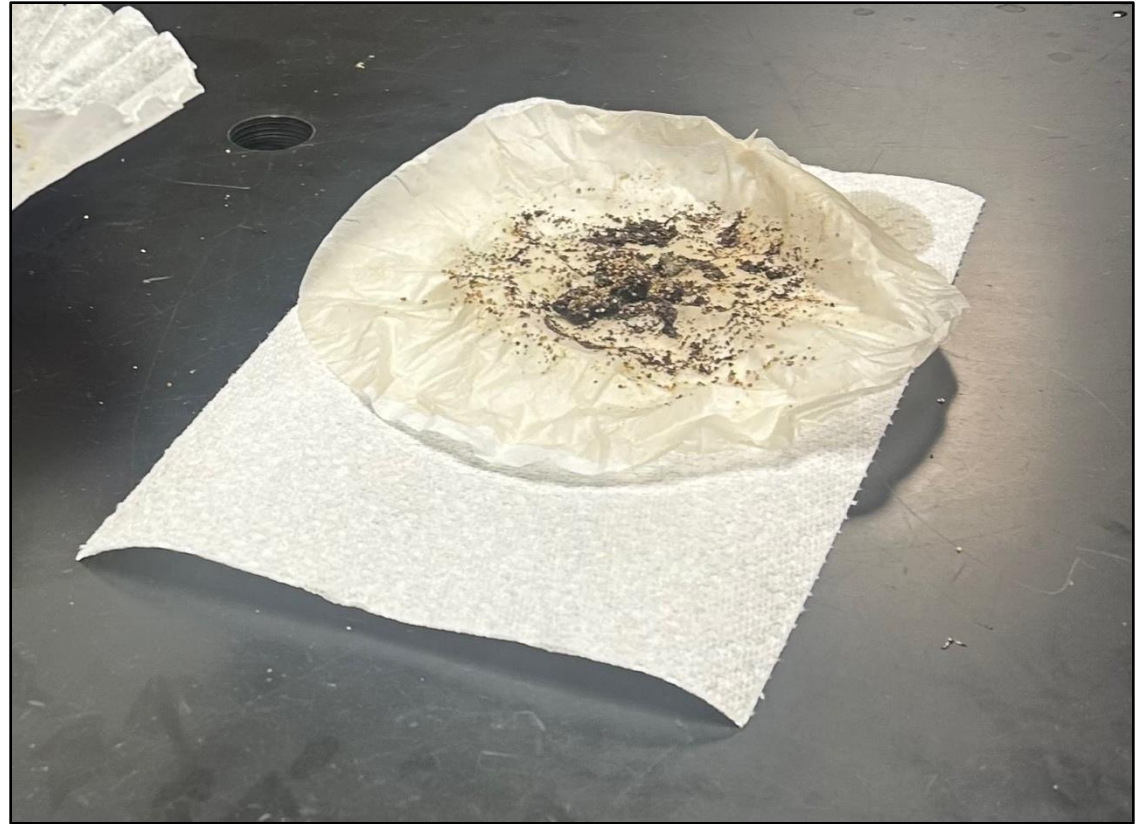
Rest the coffee filter on top of another beaker/cup and pour your solution through it to filter out the pepper.



TEST YOUR PLAN



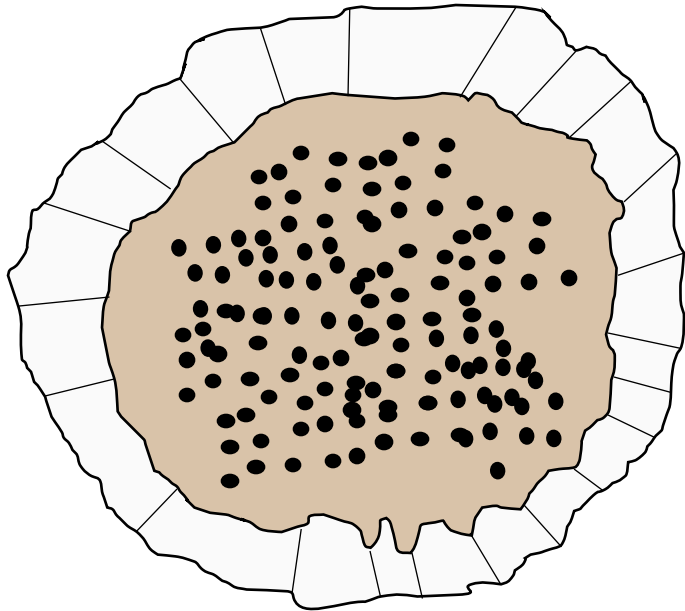
Filtration in Action



Drying The Pepper

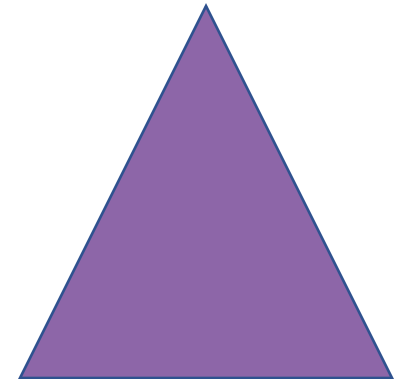
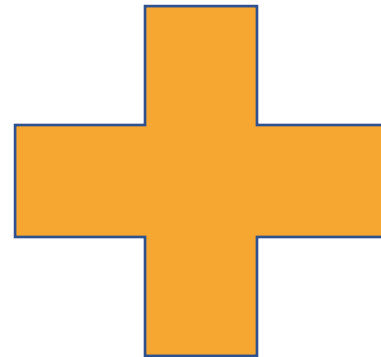
DRY THE PEPPER OVERNIGHT

Make sure the pepper is spread out as much as possible to allow all the water to evaporate.



Dried Pepper in Coffee Filter

On your “**Pepper Extraction Plan**” page, answer **Question 7** with your group. Be sure to clean your lab station.



END OF DAY 3

Citations

- American Chemical Society. (2023, August 25). *Lesson 5.6: Does Temperature Affect Dissolving?* American Chemical Society; American Chemical Society.
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<https://www.teachengineering.org/populartopics/designprocess>. Accessed 24 June 2025.