PARENTS WARNING

*Students who are not allowed to use the stove, should have an adult supervising them during this investigation.

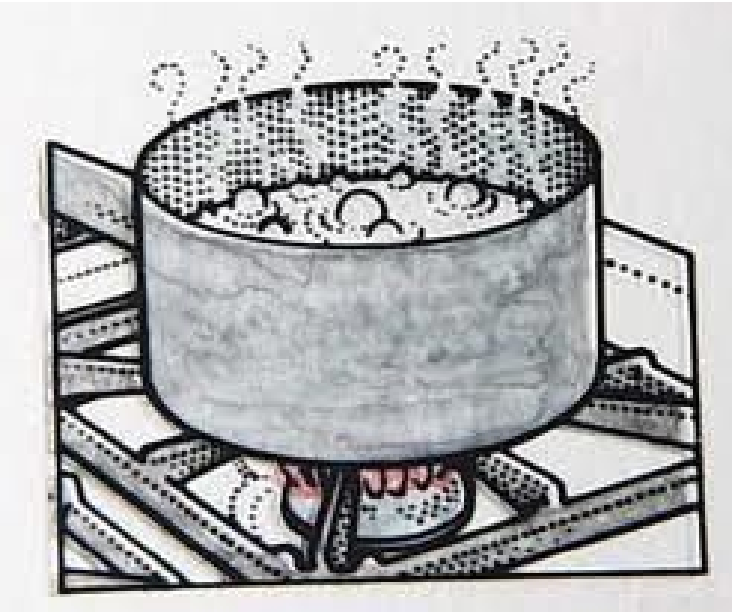
SUMMER SCIENTIFIC METHOD PROJECT:
8th Grade Science Investigation

Main Question: Which **Solute** will make water boil the fastest:

Salt or Sugar?

Purpose of the lab is to find out:

Will water boil faster if you add sugar or salt to it?



Parent/ Guardian Signature Required:

X_____

Due Back:

The first day of school

10 Points will be taken off your project grade for every day it is late.

SUMMER 8th Grade Science Investigation

In preparation for your 8th Grade Exit/ Science Fair Project and the Scientific Method Unit, you will have the opportunity to practice your investigative skills, and improve your understanding of the scientific method.

(Follow this format for doing your lab report)

Copy the questions and answer in complete sentences On Loose Leaf Paper

Student Name CAMS

CLASS Do Not Put the Date

Learning Objective: I can determine which substance will have the greatest effect on the boiling point of water, by conducting an investigation and analyzing the data to draw conclusions.

TITLE: **SCIENCE LAB REPORT**

(You don't need to answer step#1, it is the title of the lab)

Step#1) Main Question: Which solute will make water boil the fastest: Salt or Sugar?

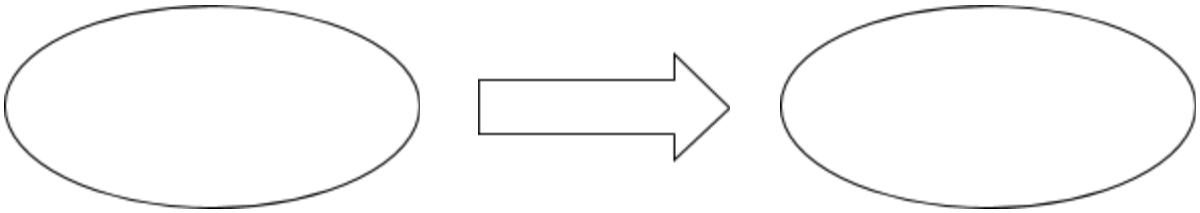
Will water boil faster if you add sugar or salt to it?

Step#2) Background (Research): Use the internet, library, or encyclopedia to answer the background questions (30% of your grade)

1) Define "Solution", "Solute", "Solvent"?

2) Using the circles below, show what happens to the particles of a liquid as it boils?

The Particles Of A Liquid Boiling



3) How does salt affect the boiling point of a liquid?

4) How does sugar affect the boiling point of a liquid?

5) At what temperature does water boil? In Celsius? In Fahrenheit?

6) What effect does adding a "solute" to water have on the boiling point of water?'

7) Looking at salt and sugar, identify any similarities. Identify any differences.

Step#3) (Educated Guess/ Prediction)

Q#3- What substance do you think will make water boil the fastest?

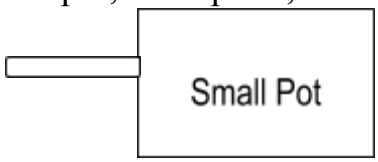
USE THE IF....., THEN..... FORMAT FOR WRITING YOUR PREDICTION.

If I test 2 different solutes to see which has the greatest effect on the boiling point of water, then I think that _____ (sugar/ salt) will make water boil the fastest because _____. (Use your research to help you answer the because).

Step#4) Experiment (Test Your Prediction)

4A) Materials needed to complete the experiment

1) A small pot, a teaspoon, a clock/timer, salt, sugar, the stove.



* Place the same amount of water in the pot each time.

Small Pot Just Cold Water	Small Pot Cold Water with 10 spoons of Salt	Small Pot Cold Water with 10 spoons of Sugar

4B) Procedure

1) You will put the same amount of very cold water in the small pot every time. (Fill the pot ¾ of the way)
2) When you heat up the pot turn the heat on half way (Have your parents assist/ help you.)
3) Heat up the pot with just water until it boils. Record how long it took to boil.
4) Heat up the pot with water with 10 spoons of salt until it boils. Record how long it took to boil.
5) Heat up the pot with water with 10 spoons of sugar until it boils. Record how long it took to boil.

Step#5) Data Table: Record Observations

Complete the chart

Different Setups	Trial #1 (First Try) Time it took to boil in minutes and seconds	Trial #2 Time it took to boil in minutes and seconds	AVERAGE TIME (1 + 2) ÷ 2
Water Only			
Water with 10 spoons of Salt			
Water with 10 spoons of Sugar			

Step#6) Analyze the results

Question#1- Looking at the data table, how did the boiling point of plain water compare to that of water with salt? Compared to water with sugar? Support your answer with your data as evidence (include the numbers).

Question#2- Based on the data from the table, what would happen to the boiling point of water, if you added 20 spoons of salt to water. Explain why

2B- Based on the data from the table, what would happen to the boiling point of water, if you added 20 spoons of sugar to water. Explain why

Question#3- What do you think the dependent variable in this experiment is?

Question#4- What do you think the independent variable in this experiment is?

Question#5- Which factor (Constant Variable) did you think was the most important to keep the same throughout the whole experiment? What is your reason?

CONCLUSION:

Using evidence from your experiment, explain whether your hypothesis was **valid (right)** or **invalid (wrong)?** Explain why.

Science Lab Report Rubric

Student Self Assessment Checklist

TASK CHECKLIST	PLACE A CHECKMARK	TASK CHECKLIST	PLACE A CHECKMARK
#1- I have stated my hypothesis		#5- Student has answered **all** the questions on the lab report outline.	
#2- I completed data table correctly with units (0.0 inches or 0.0 cm)		#6- Responses are written in complete sentences with questions restated. Used data in your responses.	
#3- I have completed the analyze the data questions completed			

Score	Description of The Work	Student Score
4 (95)	**EXCELLENT: Student shows a high level of attention to detail.** Student completes **all** the required parts of the assignment in an exemplary way (**plus additional effort is clearly visible)**. Is neatly written (Or typed). Student answers all questions in complete sentences, **always** using the appropriate data and content to support their answer. Student responds in a way that shows a high level of understanding of the information presented. Professional looking and accurate representation of the data in tables and/or graphs. Graphs and tables are labeled and titled. Student shows all necessary and correct calculations. Graphing is excellent.	
3 (85)	**GOOD: Student shows attention to details and the effort is visible for the lab report.** Student completes **most** of the required parts of the assignment. Is neatly written (Or typed). Student answers most questions in complete sentences, using the data and content to support their answer. Student responds in a way that shows good understanding of the information presented. Good representation of the data in tables and/or graphs. Tables are labeled and titled. Student shows most of the necessary and correct calculations.	
2 (75)	**Average/FAIR: Student followed the instructions.** Student completes **some** of the required parts of the lab report. Teacher can read the work. Student answers some questions in complete sentences, using important information and data. Student responds in a way that shows some confusion on the information presented. Some information in tables and/or graphs are missing. . Student shows some of the necessary calculations and data. Data and observations is understandable.	
1 (65)	**STRUGGLING/ INCOMPLETE**: Student did not complete the lab report. Lab report is missing many of the required parts/ components. Student's work looks like they rushed. Student answers questions in incomplete sentences. Calculations and graph not done correctly.	
0 (55)	**NO PROGRESS SHOWN:** Student did not complete the lab report. Lab report is missing many of the required parts/ components. Student's work looks like they rushed. Student answers questions in incomplete sentences. Calculations and graph not done correctly.	

Part#2- After you complete your lab report, grade your work by writing down what you feel that you did well, what you feel you can work on, & what score you feel you deserve.

Look at rubric and identify your strengths and weaknesses.

GLOWS	GROWS
I think I deserve a score of:	What are some things I still need to work on? :
List things you did well in your lab report:	

Name _____ Class _____

Part#1- Define independent variable, dependent variable, constant variable, control group, and experimental group.

Part#2- Independent and dependent variables: Practice worksheet

Please identify the independent and dependent variables in the following descriptions of experiments:

1) Students watched a cartoon either alone or with others and then rated how funny they found the cartoon to be.

Independent Variable:

Dependent Variable:

2) A comprehension test was given to students after they had studied textbook material either in silence or with the television turned on.

Independent Variable:

Dependent Variable:

3) Some elementary school teachers were told that a child's parents were college graduates, and other teachers were told that the child's parents had not finished high school; they then rated the child's academic potential.

Independent Variable:

Dependent Variable:

4) Workers at a company were assigned to one of two conditions: One group completed a stress management training program; another group of workers did not participate in the training. The number of sick days taken by these workers was examined for the two subsequent months.

Independent Variable:

Dependent Variable:

5) Students at a University were split into two groups and each received a different text for a philosophy course. Once group received a traditional text book, while the other received an interactive textbook on a tablet computer. After the course, the final exam marks between the two groups of students was compared.

Independent Variable:

Dependent Variable:

Part#3- Try and design an experiment from the following hypotheses.

1. The more time people spend using social media, the less able they are to express themselves in conversation.
Experiment:

_____
_____
_____

Independent Variable:
Dependent Variable:

1. Drinking energy drinks makes people more aggressive.

Experiment:

_____
_____
_____

Independent Variable:
Dependent Variable:

2. Taking a nap in the afternoon makes people more relaxed and less irritable for the rest of the day.

Experiment:

_____
_____
_____

Independent Variable:
Dependent Variable:

3. Spending time with a cat or dog decreases the amount of stress someone is feeling and allows them to perform better on tests.
Experiment:

_____
_____
_____

Independent Variable:
Dependent Variable:

4. Eating breakfast in the morning increases the ability to learn in school.
Experiment:

_____
_____
_____

Independent Variable:
Dependent Variable: