RESULTS

Table

Fill out the table for each of your trials. For the variables that remain constant, write the value in *Trial A*. Then, draw an arrow through each box indicating the variable is a control. Remember to record measurements to the nearest tenth (Ex. 2.1 g).

Underline controls, circle changing variables and box information about data collection.

Variables	Trial A	Trial B	Trial C
Container Type:	*Beaker* →		
Water Volume:	50 mL →		
$CaCl_2$ Mass:	9.0 g	3.0 g	6.0 g
$NaHCO_3$ Mass:	2.4 g →		
NaCl Mass:	4.0 g →		
Stir Speed:	Level 3	level 0	level 1
Stir Bar Length:	25 mm →		
Beaker Size (Other Variable)	250 ml →		
Cap Placement (Other Variable)	on →		
Data and Calculations	**Trial A**	**Trial B**	**Trial C**
Measurements: Initial Temperature (°C):	19.6°C	20.0°C	19.8°C
Measurements: Maximum Temperature (°C):	34.6°C	27.7°C	28.6°C
Observations: Other:	Least bubbles	Most bubbles	
Calculations: Temperature Change (°C): $\Delta T = T_{max} - T_{min}$	~~34~~ 34.6°C -19.6°C 15.0°C	27.7°C -20.0°C 7.7 °C	~~28~~ 28.6°C -19.8°C 8.8°C

The independent variable(s) is(are) the changing variable(s) and the dependent variables are the maximum temperature and other.

RESULTS

Table

Fil lout the table for each of your trials. For the variables that remain constant, write the value in *Trial D*. Then, draw an arrow through each box indicating the variable is a control. Remember to record measurements to the nearest tenth (Ex. 2.1 g).

Underline controls, circle changing variables, and box information about data collection.

Variables	Trial D	Trial E	Trial F	Trial G
Beaker Size:	100 mL	150 mL	250 mL	300 mL
Water Volume:	50 mL →	→	→	→
$CaCl_2$ Mass:	6.0 g →	→	→	→
$NaHCO_3$ Mass:	2.4 g →	→	→	→
NaCl Mass:	3.9 g →	→	→	→
Stir Speed:	Level 2 →	→	→	→
Stir Bar Length:	25 mm →	→	→	→
_____ Other Variable				
Predictions	**Trial D**	**Trial E**	**Trial F**	**Trial G**
Put an "S" in the trial that will give the smallest temperature change and an "L" in the trial that will give the largest temperature change.	L	S		
Data and Calculations	**Trial D**	**Trial E**	**Trial F**	**Trial G**
Measurements: Initial Temperature (°C):	20.3°C	20.1°C	20.2°C	19.9°C
Measurements: Maximum Temperature (°C):	30.5°C	29.9°C	30.4°C	29.6°C
Observations: Other:	Felt warm; lots of bubbles	Felt warm; lots of bubbles	Felt warm; lots of bubbles	Felt warm, lots of bubbles
Calculations: Temperature Change (°C): $\Delta T = T_{max} - T_{min}$	30.5°C -20.3°C 10.2°C	29.9°C -20.1°C 9.8 °C	30.4°C -20.2°C 10.2°C	29.6°C -19.9°C 9.7°C

The independent variable is the changing variable and the dependent variables are the maximum temperature and other.

NOTES ON PRESENTATIONS

What variables affect the temperature change of the chemical reaction?

Changing Variable:				
Temperature Change (°C):				

Summary: _____

_____

Changing Variable:				
Temperature Change (°C):				

Summary: _____

_____

Changing Variable:				
Temperature Change (°C):				

Summary: _____

_____

Changing Variable:				
Temperature Change (°C):				

Summary: _____

_____

Changing Variable:				
Temperature Change (°C):				

Summary: ____

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Changing Variable:				
Temperature Change (°C):				

Summary: ____

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Changing Variable:				
Temperature Change (°C):				

Summary: ____

____

Changing Variable:				
Temperature Change (°C):				

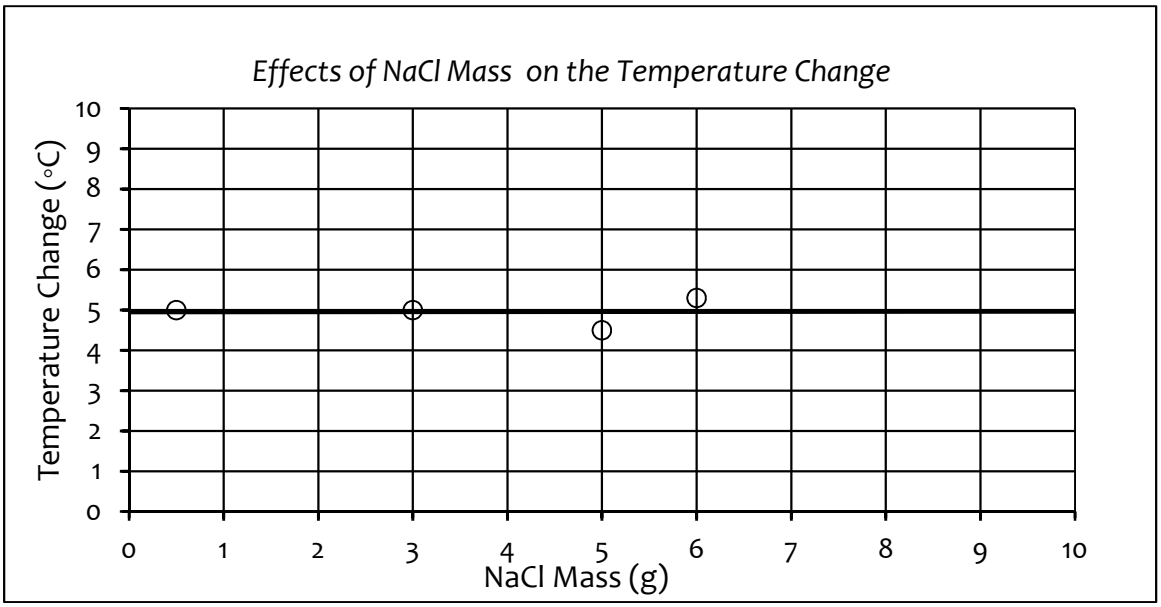
Summary: ____

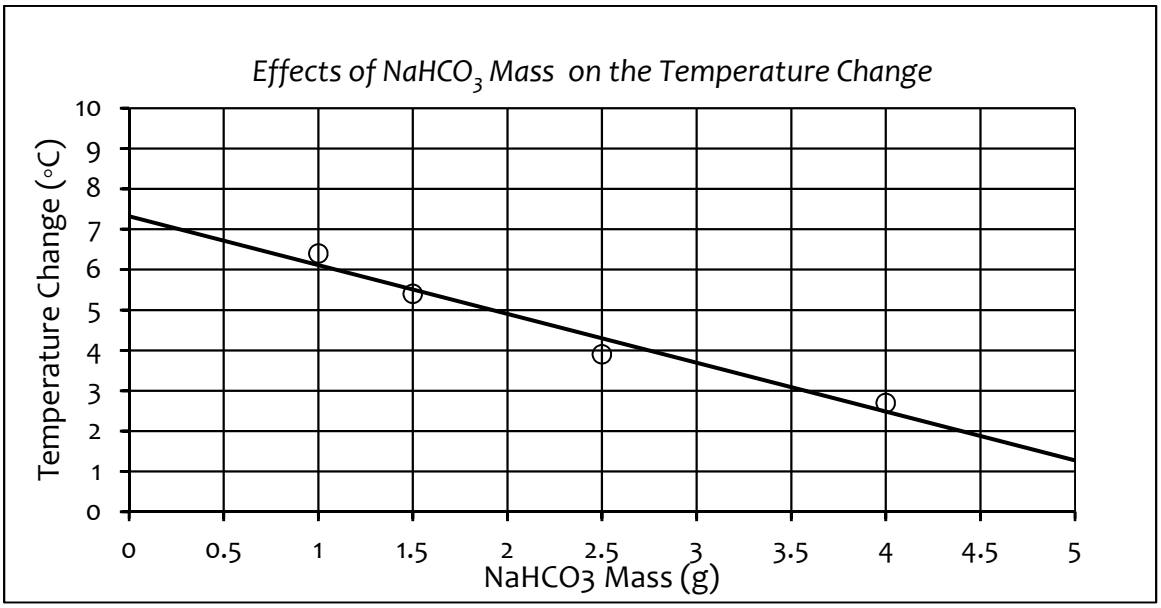
____

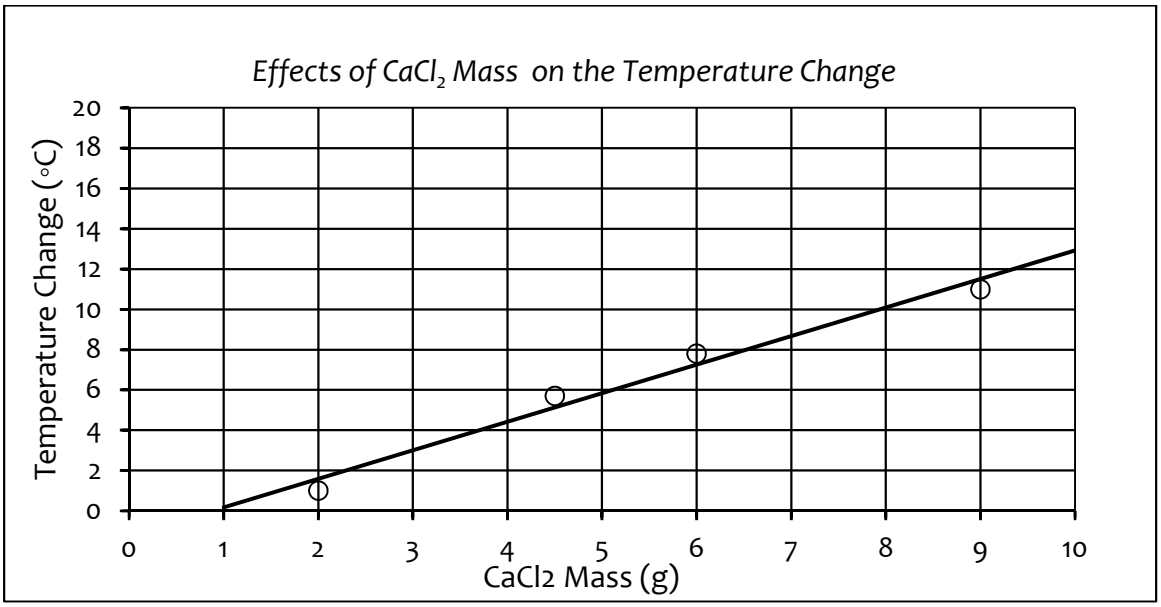
Changing Variable:				
Temperature Change (°C):				

Summary: ____

____


Effects of NaCl Mass on the Temperature Change
Temperature Change (◦C)
0 1 2 3 4 5 6 7 8 9 10
0 1 2 3 4 5 6 7 8 9 10
NaCl Mass (g)


Effects of NaHCO3 Mass on the Temperature Change
Temperature Change (◦C)
0 1 2 3 4 5 6 7 8 9 10
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5
NaHCO3 Mass (g)


Effects of CaCl2 Mass on the Temperature Change
Temperature Change (◦C)
0 2 4 6 8 10 12 14 16 18 20
0 1 2 3 4 5 6 7 8 9 10
CaCl2 Mass (g)

Sodium Chloride, NaCl

Calcium Chloride, $CaCl_2$

Sodium Hydrogen Carbonate, $NaHCO_3$