SECTION 3 WORKSHEET: DESIGNING YOUR SOLUTION

Name: _____ Period: _____

Date: _____

1. The objective of your custom solution is to have a boiling point of 224°F **and** to be the least expensive possible. Which solution (SALT or SUGAR) can meet both these objectives?

2. Now test the solution of your choice from 1 (remember to use 200 ml water) & record data in **TABLE 1**

Creating a Solution:

Step 1. Weigh solute and Record in **Table 1**= **Mass Solute**

Step 2: Weight Empty beaker and Record in **Table 1**

Step 3: Add 200ml water to empty beaker , Weigh and Record in **Table 1**

Step 4: Calculate… Step 3 - Step 2 = **Mass Solvent** Record in **Table 1**

Step 5: Calculate… Step 1 + Step 4 = **Mass Solute** + **Mass Solvent** = **Mass Solution** Record in **Table 1**

Step 6: Calculate… $\frac{\text{Mass Solute}}{\text{Mass Solution}} \times 100 =$ **Concentration** Record in **Table 1**

Boiling Point Testing:

Step 7: Make a foil lid for beaker (use a rubber band to secure over beaker)

Step 8: Make a small hole in lid for the thermometer to be inserted.

Step 9: Place beaker solution on burner and wait for it to boil. Boiling is described by a rapid and continuous boiling.

Step 10: Record the boiling temperature in **TABLE 1**; make sure thermometer is not touching sides of beaker.

Step 11: Drain, rinse, and dry beaker.

Step 12: 10. Calculate your error in the boiling point and Record in **TABLE 1**

$$\% \text{ Error} = \frac{\text{Actual Boiling Temperature} - 224^{o}F}{224^{o}F} \times 100\%$$

TABLE 1:

	Mass Solute (gram)	**Mass Empty Beaker (gram)**	**Mass Beaker + H_20 (gram)**	**Mass Solvent (gram)**	**Mass Solution (gram)**	**Concentration (%)**	**Boiling Point (°F)**	**Cost ($)**	**Error (%)**
	STEP 1	*STEP 2*	*STEP 3*	*STEP 4*	*STEP 5*	*STEP 6*	*STEP 10*		*STEP 12*
Test 1									
Test 2									
Test									

3									

3. Record your **Names**, if you used a **SALT** or **SUGAR** solution, **% Error**, and **Cost** on the board.

4. Optional if there is still time... Try again to create a solution with a boiling point of 224°F

5. Optional if there is still time... Try again to create a solution with a boiling point of 224°F and uses **both** SALT and SUGAR

a. How could you determine how much of each solute you would need?

b. Mass Salt = _____ g Mass Sugar = _____ g

Concentration = _____ % Total Cost = $ _____