

Activity 4: Evaluating Experiment Designs

Name _____

Date _____

Class _____

Your friend is interested in finding out how the temperature of water affects the amount of sugar that will dissolve. Specifically, she wants to do an experiment to find an answer to the following:

Experiment: *If the temperature of the water increases, what will happen to the amount of sugar that will dissolve in it?*

To carry out the experiment, she puts 50 mL of water into each of four identical jars. Then she changes the temperatures of the jars of water until she had one at 5°C, one at 20°C, one at 60°C, and one at 95°C. She then dissolves as much sugar as she can in each jar by stirring. She records the number of teaspoons of sugar that dissolve.

Decide whether her experiment is a fair test. Use *How To Analyze an Experiment Design/Analyze and Determine if the Experiment is a Fair Test* as you answer the following questions.

1. What is the question the experiment is designed to answer?

2. The *manipulated variable* is _____

The *responding variable* is _____

3. What are the values (including units) of the *manipulated variable*?

4. What method is used to measure the *responding variable*?

5. What variables or conditions are kept the same (controlled) during the experiment?

6. Is the experiment a fair test? Yes No

Explain your answer.

(Questions 7 – 8) After your friend did the experiment with the four jars, she retrieved two more jars (labeled E and F). She filled the new jars with a different volume of two new liquids. The amount of sugar dissolved in each of the six jars (under different conditions) is shown in the table below. (In this case, she actually measured the mass of the sugar that would dissolve.)

Table: Amount of Sugar Dissolved (gm)				
Jar	Type of Liquid	Temperature (°C)	Volume (mL)	Amount of Sugar Dissolved (g)
A	Water	5	50	92
B	Water	20	50	102
C	Water	60	50	144
D	Water	95	50	224
E	Milk	20	100	173
F	Water	20	100	204

7. Which two jars would you select to make a fair test if you wanted to answer the following question:

If the volume of the liquid is changed, what happens to the amount of sugar dissolved?

Write your reasoning.

I would select jars _____ and _____ because _____

8. Which two jars would you select to make a fair test if you wanted to answer the following question?

If the volume of the liquid is changed, what happens to the amount of sugar dissolved?

Write your reasoning.

I would select jars _____ and _____ because _____
