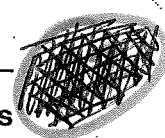


A

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Physical and Chemical Changes



Observing Changes in Matter

Materials

- 4 sugar cubes
- glass of water
- spoon
- mortar and pestle
- ~~Bunsen burner~~ *HOT PLATE*
- test tube
- tongs
- TEST TUBE HOLDER*

Procedure

Part A

1. Pick up one of the sugar cubes and observe it carefully. Describe the sugar cube in terms of the following properties:
 - a. Size _____
 - b. Shape _____
 - c. Color _____
 - ~~d. Taste~~ _____
 - e. Hardness _____
 - f. Texture _____
2. Take two sugar cubes and use the mortar and pestle to crush them into a powder.
3. Observe the powder. How have you changed the sugar?

In what ways has the sugar not been changed?

4. Take the crushed sugar and pour it into the glass of water. Stir with the spoon.
5. Look carefully at the mixture. Is the sugar still visible? How has the sugar changed?

6. Take a taste of the water. Is the sugar still present? How can you tell?

7. Suppose you could not taste the water. Can you think of any other way to prove that the sugar is still present?

Part B

1. Take two sugar cubes and place them in the test tube.
2. Light the Bunsen burner. **CAUTION:** *Be very careful when lighting and using a Bunsen burner.* Using the tongs to hold the test tube, heat the test tube until the sugar burns. Observe the contents of the test tube carefully as you heat it.
3. What do you see happening? Look closely at the sides and mouth of the tube as well as in the bottom. Do you see any substances forming in the tube that were not in the tube when you started?

4. Remove the test tube from the heat and let it cool. Turn off the Bunsen burner.

5. Observe the contents of the test tube. Describe the substance in the bottom of the tube in terms of the following properties:

a. Size _____

b. Shape _____

c. Color _____

~~d. Taste~~ (CAUTION: Do not swallow the substance.)

e. Hardness _____

f. Texture _____

6. Recall the two sugar cubes that you started with. How has the sugar changed?

7. Is the sugar still present in the test tube? How can you tell?

Critical Thinking and Application

8. Compare the changes in the sugar that took place in Part A with the changes that took place in Part B. How are these changes different?

9. The changes that took place in Part A are called physical changes, while the changes that took place in Part B are called chemical changes. Based on your observations, how would you define a physical change? How would you define a chemical change?
