Name _____ Date _____ Class _____

Inquiry Skill Practice | *Identify Variables and Controls* | **LESSON 3: 30 minutes**

How can known substances help you identify unknown substances?

While investigating a crime scene, you find several packets of white powder. Are they illegal drugs or just harmless packets of candy? Here's one way to find out.

Materials

test tubes

plastic spoons

Also needed: watch glasses; stirring rods; magnifying lens; plastic bags containing samples of ascorbic acid, cornstarch, baking soda, and sugar; dropping bottles of water, vinegar, and iodine solution; red cabbage indicator

Learn It

A **control** is something that stays the same. If you determine how a known substance reacts with other substances, you can use it as a control. Unknown substances are **variables.** They might or might not react in the same way.

Try It

1. Read and complete a lab safety form.
2. Use the data table below to record your data.

Phenol Phthalein

Substance	Appearance	Texture	Reaction to Water	Reaction to Iodine	Reaction to Vinegar	~~Red Cabbage Indicator~~
Baking soda						
Sugar						
Ascorbic acid						
Cornstarch						
Mystery powder						

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Skill Practice continued

3. Use a magnifying lens to observe the appearance of each known substance.
4. Test small samples of each known substance for their reactions with a drop or two of water, vinegar, and iodine solution.
5. Feel the texture of each substance.
6. Mix each substance with water, and add the red cabbage indicator.
7. After you complete your observations, ask your teacher for a mystery powder. Repeat steps 3–6 using the mystery powder. Use the data you collect to identify the powder.

Apply It

8. What test suggests that a substance might be cornstarch?

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9. Why should you test the reactions of the substances with many different things?

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10. **Key Concept** How did you use the properties of the controls to identify your variable?

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