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| **Activity 1.1.4: The Evidence** |

Introduction

Evidence at a crime scene, such as blood, DNA, fingerprints, or shoeprints all help forensic investigators determine what might have occurred and help identify or exonerate potential suspects. We all have things in common biologically, but there are differences that make us all unique. Forensic scientists use these differences to help identify potential suspects. In the last activity, you were introduced to the crime. After you examined the scene at Anna’s house, a crime scene investigator walked through the scene and collected all of the evidence. Now that you are back at the lab, it is your job to process the evidence in order to try to determine what happened at Anna’s house and identify potential suspects. In this activity you will play the role of forensic scientists to analyze each piece of evidence collected from the crime scene.

Equipment

* Computer with Inspiration® Software
* Activity 1.1.4 Student Response Sheet
* Unit 1 - Investigative Notes Resource Sheet
* Laboratory journal
* PBS Course File
* Gloves
* Safety goggles
* Scale
* Disposable transfer pipets
* Magnifying glass
* Black construction paper
* Weighing dishes (18) or well plate
* Indicator 1
* Indicator 2
* Indicator 3
* Simulated powders:
  + Cocaine
  + Acetaminophen
  + Acetylsalicylic acid
  + Methamphetamine
  + Ecstasy
  + Unknown substance
* Stations 1 – 4

Procedure

Part II: Identifying an Unknown Substance

Four unmarked, white pills were found at the scene of the crime. It is your job to take on the role of a forensic chemist to identify the unknown substance. Forensic chemists use two categories of tests to analyze drugs and other unknown substances: presumptive tests and confirmatory tests. *Presumptive tests*, such as colorimetric tests, indicate which type of substance is present but cannot specifically identify the substance. *Confirmatory tests*, such as gas chromatography and mass spectrometry, are specific tests that can determine the exact identity of the substance. In this activity you will perform simple simulated tests to identify the unknown substance found near Anna’s body. Before you begin your chemical analysis, you grind the pills into powder in order to conduct your investigation. Follow the steps below to determine the identity of the unknown pills.

1. Obtain the materials listed in the Equipment list above from your teacher and a Student Response Sheet.
2. Put on gloves and safety glasses.
3. Label a spot for each of the five known substances on a sheet of black construction paper.
4. Measure 0.5 grams of the five known substances and place them on the corresponding sheet of black construction paper.
5. Study each substance using the magnifying glass. Examine what each substance looks like (i.e., What color and texture does it have? Does it have large or small grains?). Record your observations in the data table of your Student Response Sheet.
6. Examine the feel of each substance. Do this by rubbing each substance between your fingers. Record your observations on your Student Response Sheet.
7. Determine whether any of the substances have an odor. Note: Never smell any unknown substance directly. Use a cupped hand to waft a small sample toward your nose. Record your observations on your Student Response Sheet.
8. Measure a very small amount and place it into each of the three wells.. Make sure to label your paper like the example.
9. Repeat Step 10 for the Acetaminophen\*, Acetylsalicylic Acid\*, Methamphetamine\*, Ecstasy\*, and the unknown substance.
10. Using a clean transfer pipet, carefully place two drops of Indicator 1 on each individual powder. Observe what happens to each powder. Record your observations on your Student Response Sheet.
11. Using new transfer pipets, repeat Step 12 with Indicator 2 and Indicator 3. Record your observations on your Student Response Sheet.
12. Clean your lab bench.
13. Rinse your wells into the water and dry off with paper towels.
14. Carefully remove your gloves.
15. Record the conclusions of your experiment on your Student Response Sheet.

\*All substances are simulated

Part III: Stations

Your teacher has organized the evidence collected from the crime scene into different stations set up around the classroom. You will work with a partner to go through each station and analyze the evidence in order to piece together what happened to Anna Garcia.

1. Follow your teacher’s instructions for how to rotate through each station. You will notice that there are specific directions for how to perform the analysis at each station.
2. Fill out the Activity 1.1.4 Student Response Sheet as you work through each station.
3. Revise your theories of what happened to Anna. Consider all analyzed evidence and what the evidence suggests at this time. **Include any updated theories or information to your Unit 1- Investigative Notes sheet.**
4. File your Unit 1 - Investigative Notes sheet and your Activity 1.1.4 Student Response Sheet in the appropriate tab of your course file. Use the PBS Course File – Table of Contents as a guide.

Conclusion

1. Why is it so important to properly don and remove personal protective equipment?