AACHOO! Dusting for Fingerprints

Contributors

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Intended Audience

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<td>K-4</td>
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<td>5-8</td>
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<td>9-12</td>
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Activity Characteristics

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<tbody>
<tr>
<td>Classroom Setting</td>
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<tr>
<td>Requires special equipment</td>
<td>X</td>
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<tr>
<td>Uses hands-on manipulatives</td>
<td>X</td>
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<tr>
<td>Requires mathematical skills</td>
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<tr>
<td>Can be performed individually</td>
<td>X</td>
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<tr>
<td>Requires group work</td>
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<tr>
<td>Requires more than one (45 min class) period</td>
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<tr>
<td>Appropriate for special needs student</td>
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Introduction

Description

In this lab activity, students will demonstrate the proper procedure for dusting and lifting fingerprints off a variety of materials. Students will be provided an introduction to techniques and fingerprint patterns.

Abstract

Latent fingerprints are often left at the scene of a crime and are highly individualized. In this activity, students will demonstrate proper techniques for dusting and lifting fingerprints off of different materials. Students will also classify their fingerprint patterns as loops, whorls, or arches.

Core Themes Addressed

<table>
<thead>
<tr>
<th>Microbial Cell Biology</th>
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<tr>
<td>Microbial Genetics</td>
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<td>Microorganisms and Humans</td>
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<td>Microorganisms and the Environment</td>
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<td>Microbial Evolution and Diversity</td>
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<td>Other</td>
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Keywords
Fingerprint patterns, lifting prints

Learning Objectives

At completion of this activity, learner will

1. Demonstrate the proper procedure for dusting and lifting fingerprints off a variety of materials.

National Science Education Standards Addressed

Standard A: Science as Inquiry

- Abilities necessary to do scientific inquiry
Student Prior Knowledge

Students should have the following knowledge prior to completing this activity:

1. Be able to recognize the importance of fingerprints as evidence.
2. Be able to recognize different fingerprint patterns.

Teacher Background Information

A fingerprint is an impression of the patterns of ridges on the last joint of a person’s finger. Properties that make a fingerprint useful for identification are: (1) its unique, characteristic ridges; (2) its consistency over a person’s lifetime; and (3) the systematic classification used for fingerprints.

There are three types of prints found at crime scenes: plastic prints (indented or molded print), visible prints (left by a finger that has touched colored material such as blood), and latent prints (essentially an invisible print that must be developed by chemical or physical means). In today’s lab students will be developing latent prints that are the result of deposits of perspiration and body oils. One of the most common methods of visualizing a latent print is by carefully dusting it with a fine powder. This method is most effective on hard, nonabsorbent surfaces. The color of the powder is chosen to stand out against the surface being examined. The developed print can then be “lifted” by means of clear sticky tape and collected for analysis.

All fingerprints can be classified into three basic patterns: loops, whorls, and arches. You should become familiar with the different fingerprint patterns so you can help the students identify their prints if they have questions.

Class Time

This activity will require a minimum of one 50 minute class period.

1. Introduction PowerPoint – 10 minutes
2. Lab Activity – 35 minutes
3. Wrap up questions/Review – 5 minutes
Teacher Preparation Time

This lesson will require approximately 10 minutes of preparation to set everything on the students’ lab bench. Enough soda cans should be collected so every student in a class period can have his or her own. Before each class period the soda cans should be wiped down with a baby wipe to remove previous fingerprints.

Materials and Equipment (2 per group)

1. Fingerprint dust
2. Fingerprint brush
3. Clear packing tape
4. White computer paper
5. Soda can
6. Microscope slide
7. Baby wipes

Methods

1. Provide an overview to dusting and lifting fingerprints (PowerPoint).
2. Generate groups with two students per group.
3. Give each group one set of activity materials: fingerprint dust, fingerprint brush, clear packing tape, white computer paper, soda can, microscope slide.
4. In this activity, students will:
   a. Practice dusting fingerprints on white computer paper.
   b. Practice dusting and lifting fingerprints on a microscope slide and a soda can.
   c. Identify their fingerprint patterns.
5. As a wrap up, facilitate student discussion on which surfaces are hardest to dust and lift prints from and why.

Tips/Suggestions

1. Students can become discouraged if they cannot successfully lift a print. Encourage them to keep trying.
Answers to Student Handouts

A. Accept any answer as long as the student can explain how they qualify a successful print and with which objects they were successful.

B. The most common answer was the soda can because of its curved surface; but accept any answer as long as the student can explain logically why it was difficult.

C. The answers can vary from student to student. As long as the student explains logically why it would be hard for forensic scientists to lift the print from the object accept the answer.
   a. Examples include: steering wheel, wooden surfaces, any commonly handled surface with many prints, etc.
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Introduction

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Student will be developing latent prints that are the result of deposits of perspiration and body oils. One of the most common methods of visualizing a latent print is by carefully dusting it with a fine powder. This method is most effective on hard, nonabsorbent surfaces. The color of the powder is chosen to stand out against the surface being examined. The developed print can then be “lifted” by means of clear sticky tape and collected for analysis.

Student Background Knowledge

Students should have the following knowledge prior to completing this activity:

1. Be able to recognize the importance of fingerprints as evidence.
2. Be able to recognize different fingerprint patterns.

Vocabulary

Fingerprints: an imprint made by ridge patterns on the tip of a finger.

Plastic print: three-dimensional print made as indentations in soft material such as fresh paint.

Visible print: fingerprint left by a finger that has touched blood, paint, ink, or the like.

Latent print: fingerprint made by the deposit of perspiration or body oils; invisible to the naked eye until developed.

Materials Checklist

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<th>Item</th>
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<tbody>
<tr>
<td>Fingerprint dust</td>
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<tr>
<td>Clear packing tape</td>
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<tr>
<td>White computer paper</td>
</tr>
<tr>
<td>Soda can</td>
</tr>
<tr>
<td>Microscope slide</td>
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Procedure

1. Practice dusting fingerprints on white computer paper.
2. Practice dusting and lifting fingerprints on a microscope slide and a soda can.
3. Identify their fingerprint patterns.

An example of a student fingerprints that were dusted from computer paper.
Introduction: You have been hired as a new crime scene investigator with the Effingham County Police Department. As part of your training you will be learning how to dust for fingerprints on different objects that could be found at the scene of a crime.

Instructions:

Object 1: Computer paper

1. Retrieve one piece of white computer paper found on your lab bench.
2. Rub one finger over an oily area of your skin or scalp (ex. crease of nose).
3. Press the tip of your finger down on to the computer paper, taking care not to move front to back, side to side or press too hard because you will smudge the print.
4. Lightly touch the tips of the fingerprint dusting brush to the fingerprint dust. Avoid applying too much powder - only a small amount is needed to develop the print.
5. Swirl the fingerprint dusting brush over the container of the fingerprint dust to release the extra dust from the brush.
6. Hold the powdered brush over the area that contains your fingerprints. With the bristles barely touching the paper begin to twirl the brush over the print you just made.
7. Repeat this entire procedure one more time before you move to the next object. Try to put this print close to the original one so that both can be covered with one piece of tape.
8. Label the print with your name, date, and print type (ex: double loop whorl).
9. Ms. Reid or Mrs. Dean will bring you tape to cover your fingerprint.
10. Cover the print by rolling the piece of tape onto the fingerprint working from left to right. Using your index finger, smooth out the tape to insure that you do not have any bubbles. DO NOT REMOVE THE TAPE.

Object 2: Microscope slide

1. Obtain a microscope slide from your lab bench. Clean the slide if needed.
2. Place a print on the slide using the same procedure from Object 1.
3. Begin to dust the print without adding any additional dust to your brush. You can add more dust if needed.
4. Cover the print by rolling the piece of tape onto the fingerprint working from left to right. Using your index finger, smooth out the tape to insure that you do not have any bubbles. Slowly peel the tape away from the slide to lift the print.
5. Adhere the tape to the non-lined side of an index card using the same technique described in #4 above.
6. Make sure to label the print with your name, date, object print was lifted from, and print type.
Object 3: Soda can

1. Repeat steps 1-6 from the microscope slide to lift prints from the soda can.

Questions:

A. Were you successful at lifting prints from all three objects? Why or why not?

B. What object was the hardest to dust and lift prints from? Why do you think it was hard?

C. What other objects do you think are hard for forensic scientists to lift prints from? Explain why.