Locard’s Exchange Principle
Transfer of Evidence

Instructor’s Notes

Purpose: Locard’s Exchange Principle is one of the foundations for evidence collection in forensic science. It is important for students to realize that transfer of personal items occurs easily and follows a chain that can be traced from person to person. This exercise addresses the movement of fibers, hairs or other trace evidence from object to object.

Learning Objectives
• Apply Locard’s Principle to an interaction between two objects
• Locate evidence and lift it from objects
• Trace the path of evidence as it is transferred
• Apply techniques to crime scene investigation

Preparation
1. If a fire blanket is not available any fabric that sheds will work or alternately use a fabric that has cat hair or other animal hair on it. The idea is to transfer evidence from the original fabric to 1-2-3-4 individuals by contact.

2. If students do not have the background to identify hairs/fibers, for this exercise they should minimally classify the lifted evidence as alike or different from each other.

Wherever he steps, whatever he touches, whatever he leaves, even unconsciously, will serve as a silent witness against him. Not only his fingerprints or his footprints, but his hair, the fibers from his clothes, the glass he breaks, the tool mark he leaves, the paint he scratches, the blood or semen he deposits or collects. All of these and more bear mute witness against him. This is evidence that does not forget. It is not confused by the excitement of the moment. It is not absent because human witnesses are. It is factual evidence. Physical evidence cannot be wrong, it cannot perjure itself, it cannot be wholly absent. Only human failure to find it, study and understand it can diminish its value.

Professor Edmond Locard

Paul L. Kirk

Crime Investigation: Physical Evidence and the Police Laboratory, 1953
2.1 Introduction

Edmond Locard, the famous French criminalist, once posited that every contact between person(s) and object(s) results in an exchange of evidence between those in contact. This became known as Locard’s exchange principle, which is still a central principle of the analysis of scientific evidence that arises from civil and criminal activity. Although some of the exchanged evidence is overlooked because of its small size, much of it is recovered and falls into the category of scientific evidence known as trace evidence. Trace evidence can be classified in a number of ways and there is general agreement that it includes such items as hair, fibers, wood, glass, paint, soil, and explosive and fire residues.

Probably the most common type of trace evidence encountered in criminal activity today is textile fibers. Fibers occur in a huge variety of products, so it is not surprising that they occur in many types and instances of crime. Some estimates put fiber evidence in one-quarter of all crimes. At the same time, it must be noted that mass production of garments and other fiber-containing products means that it is ordinarily not possible to individualize a loose fiber to a particular source. Therefore, fibers, in most cases, are considered class and not individual evidence.

2.2 Pre-Laboratory Questions

1. How does Locard’s exchange principle impact crime scene investigation?

2. What types of materials are easily transferred from one object to another?

3. Why are textile fibers common at a crime scene?

4. Can most fibers be classified as individual or class evidence? Why?

2.3 Scenario

Four individuals claim they were not in contact with each other. In fact, they have not seen each other for a week. It is your job to decide if their statement is factual or not, based on evidence.

2.4 Materials

- Woolen blanket (fire blanket works well)
- Translucent tape or fingerprint lifting tape
- Hand lens or microscope
2.5 Procedure

1. Within your group, take a tape lift from the back of each member’s shirt between the shoulder blades. A tape lift involves placing a length of tape (~5 cm) on the back of the shirt and lifting the tape to remove any trace evidence.
2. Enter the value of the initial tape lift in the table for each group member.
3. One group member should take the woolen blanket and vigorously rub it on his or her back between the shoulder blades. After contacting the blanket, the same person should rub backs with another student. This second student then rubs backs with a third student, and so forth, until all members have rubbed backs.
4. Take another tape lift on each member’s shirt as was done in step 1. Enter the value of this tape lift in the After Contact column in the table.
5. Compare the types of trace evidence found in the initial and after columns of the table.
6. Use a hand lens or microscope to compare and/or identify the evidence acquired.

2.6 Follow-Up Questions

1. What kinds of evidence were found in the initial tape lifts for each group member?
   Human hair, animal hair, fibers, plant residue (seeds, pollen, leaf parts)
2. What kinds of evidence were found in the after contact tape lifts for each group member?
   Wool fibers from the blanket, possible hairs/fibers found in question 1.
3. List any evidence that was not present in the initial lift and trace its path. How far did the evidence transfer?
   Wool fibers from blanket…trace from student to student. Last student should have less and may not have any in the final transfer.
4. List any evidence that was present in the initial lift that was transferred to other members. Show the path of transfer.
   Possible transfer of human or animal hairs if present initially.
5. How does this activity illustrate Locard’s exchange principle?
   “Every contact leaves a trace” should be illustrated at least once, twice or with each contact. Because the entire piece of clothing is not being searched, some transferred evidence may not be seen in the tape lift.
6. Tracy, a student in the classroom, has cat hair on her shirt. She states that she does not own a cat and neither do any of her friends. List the different ways that she could have gotten this hair on her shirt.
   Contact in the hallway on the way to class; student occupying the seat in a class prior to hers; she could have picked it up in another classroom desk; on the bus or car ride; etc.
2.7 Locard’s Exchange Principle Worksheet

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<tr>
<th>Group Member</th>
<th>Initial Lift</th>
<th>After Contact</th>
<th>Items Identified</th>
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<td>Initial lift:</td>
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Figure 9.1
Class characteristics of fingerprints.
Figure 9.2
Individual characteristics of fingerprints.