

Locard's Lab

By Nancy Kochis

This is my 7th year teaching forensic science to seniors at my high school. I received my master's degree in forensic science in 2010, and I currently have 3 sections of forensic science. I love this lab exercise because it shows my students that wherever they go and whatever they touch there is always going to be some kind of transfer. It is always exciting to see my students question themselves about their contacts. I've heard them say they enjoy this lab exercise and that they will never forget Locard's exchange principle because of it.

I do this lab in the first chapter after talking about the history of forensic science and its major contributors. I have modified the activity a little from my first year by adding some analysis questions at the end and by having the students attach any tape/lint rolled papers to their lab sheet. I take off points for any students who have not brought or worn their assigned evidence clothes and tell them for that day to look at another person's slides. They are still responsible for the rest of the lab and will make up the activity on their own. More on this later.

I made a pre-lab video using volunteer students to demonstrate the procedures the students will follow during the lab, and all of my students must watch this before coming to class with their evidence clothes. The video is on my website



in Google classroom. I attach questions the students answer there too.

I buy white socks and T-shirts at the beginning of school in various sizes when all of the sales are going on. I tell the store, usually WalMart, what I am using the clothing for and they will sometimes give me a price break. A letter from your principal might help a lot here with a store manager. If you do not have the funds to purchase the items yourself, then ask your students at the beginning of school to buy a pair of new white socks and a new white T-shirt when they are cheaper and not to wear them until told to do so. Tell them it is important to leave the new clothing inside the sealed plastic bag it came in until it is time to perform the exercise. Tell them they will be using the new clothes for this lab. Once a class set has been purchased the cost is much lower the following year, because I can wash the shirts and socks that were purchased (and any the students donated after the exercise is over) and store them in a sealed plastic garment bag until they're needed again.



I buy small and large brown paper lunch bags at the grocery store and evidence labels from different suppliers of forensic science supplies. You can buy the paper bags in bunches of 50 or 100 depending on the size. Here too you can have your students bring in a new brown paper bag and have them write the information on the front of the bag after collecting their evidence. I purchase boxed, powder-free disposable vinyl gloves for my students at WalMart. However, you can ask your students to buy a box of the gloves at the beginning of school to be used by them throughout the year. I purchase packaging tape in rolls and tape lifters at the dollar stores. The rolls that I have now are the ones that I originally purchased in 2009. They will last for years. I have magnifying glasses that came with other science kits that I use for everything. Microscope slides and cover slips can be re-used because the students are only using water. They can clean the slides after use. I have so many students this year that I modified the activity to use a Petri dish per student for the evidence they find. The problem is that they cannot label specific evidence to distinguish if it was identified using the naked eye, hand lens, or stereoscopic microscope. I think I will have them use a marking pencil next year to label the evidence in the dish. Petri dishes can be cleaned and used again. Someone in your department likely has an extra sleeve

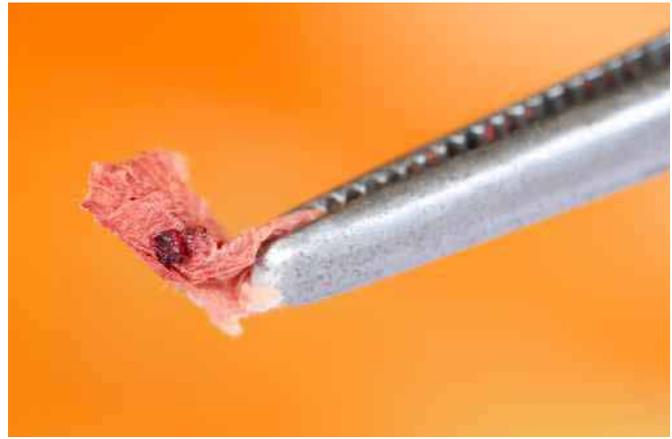
or two of these beauties lying around.

At the beginning of the lab I tell the students they are to don their gloves and aprons away from the lab tables. This is to ensure they don't add evidence to the table. Make sure students are emptying their bags over the tables. I cover the tables with white paper purchased in rolls from my favorite butcher. He also gives me a break on the price. HyVee (our local supermarket) may donate butcher paper in rolls. However, it is brown and has a plastic film on one side, so I use it for other experiments. The brown plastic film is easy to wipe off between classes, especially after the drug labs. The rolls should last at least 2 years. The aprons that my students wear are purchased from the school cafeteria supervisor. I buy a whole box and it should last a few years because not every lab calls for wearing an apron. If money is an issue, there is a website called donorschoose.org where teachers can write a grant proposal for school supplies.

The students will search for and collect evidence as per the procedure on the student worksheet which you should go over with them before anyone starts anything. Encourage them to work slowly to avoid missing evidence. You might want to hint to them they'll find more if they scan the fabric in a grid-like pattern than if they search here and there according to whim.

During the lab I rotate around the room to make sure all the students have a properly marked evidence bag and are working in a logical manner. I take notes of the ones that do not have an evidence bag because those students will have to make up the lab. Also, in the past I have found the occasional student who will try to pass off their item as having been worn when it clearly wasn't. I use the stereoscopic scope to quickly scan the item to be sure. If I'm correct, I tell the student if they want credit, they have to take the item home, wear it and bring it back the next day for processing. For students that are absent when you hand out the socks/T-shirts, I usually give them a day to wear the item and bring it back to school. I have them do the lab before school, during study hall (if this is possible), or after school. Students that want the points will be cooperative. Please make sure students understand they are not to wear their evidence clothes to school on lab day!

My students love this lab because it applies not only to the Locard principle, but to them as well. This is something they can relate to because they have to connect their contacts to their evidence. They will undoubtedly never forget, "Every contact leaves a trace". Isn't that what forensic science is all about - finding that trace evidence that can link a suspect to the crime scene? I'm always telling my students, "It's all about the evidence".



Locard's evidence



Locard's T-shirt



Locard

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Name _____

Locard's Exchange Principle

Introduction:

Edmund Locard believed that, "when two people/objects come into contact with each other, a cross transfer of materials occurs." In this lab you will utilize the scientific method to explain this concept.

Pre-Lab Procedure:

1. Obtain a pair of socks/T-shirt and a paper evidence bag from your teacher.
2. Choose one day this weekend. You are to wear the item throughout the day.
3. Record your movements paying special attention to your locations and any animals/humans you may come into contact with. Be specific.
4. At the end of the day, place your item in your paper evidence bag and seal it with tape. Write your name and the date on the front of the bag.
5. Record your visited locations on the evidence label on your evidence bag.
6. Record your interacted contacts in the table below.
7. Bring your evidence bag and this worksheet to school on Monday.

Contacts – Locations and Animals/Humans	

Materials:

- ✓ **Gloves and aprons**
- ✓ **Forceps**
- ✓ **Clear Tape**
- ✓ **Lint Roller**
- ✓ **Hand lens**
- ✓ **Stereoscopic Microscope**
- ✓ **Compound Light Microscope**
- ✓ **Comparison Microscope**
- ✓ **Microscope slides and coverslips**

Lab Day Procedure:

1. Put on gloves and aprons before going to the lab table.
2. Carefully remove your item from the bag and onto the clean, white-paper covered table. Make sure to empty the contents over the paper and not the floor.
3. Using your naked eye, scan your item. If you can visually see any evidence use the forceps to lift the evidence and place it on a microscope slide. Label the slide with **NE** for naked eye. Be careful not to blow the evidence away.
4. Then use the hand lens (magnifying glass) to scan your item. Use the forceps to lift any evidence you missed with the naked eye. Place new evidence on microscope slide(s). Label the slide(s) **HL** for hand lens.

Name _____

10. Describe three possible pieces of evidence found at a crime scene that can be transferred between a suspect and victim during the crime. Briefly explain how they can be used to link a suspect to a victim and/or crime scene. Record your answers in the table below.

Material	How can this evidence be used in court?

Questions:

1. What is Locard's Exchange Principle?
2. Why was it necessary to use gloves and aprons during the lab?
3. What is the importance of emptying your evidence over the paper covered table?