

LESSON 4:

FINGERPRINTING 101

Students will learn about unique Fingerprints, and discover how to analyze them

SUPPLIES

TEACHER BRINGS

- Hand wipes (optional)
- Poster board (optional)

PENCIL BOX

- Markers
- Pencils

MAIN BIN

- Tin foil (for paint)
- Paper towels
- Clorox Wipes (For messes)
- Plates (optional)

FOLDER

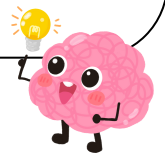
- Fingerprint Patterns Print Outs (15)
- Printer Paper (15-30)
- Construction Paper

GADGET BOX

- 4-5 bottles of washable temp paint

REMEMBER

Some supplies (like tape) may need to be replenished if it's late in the semester or you share your bin with another teacher!



MEET SPECIAL AGENT

NIGHTSHADE




Specialty: Biometrics Expert

Agent Nightshade is a master of disguise, blending seamlessly into any environment. With her extraordinary ability to change appearances and adopt different personas, Nightshade can infiltrate secret meetings, gather critical intelligence. In all the years, no counter-intelligence agency was able to obtain her fingerprints and as a result reveal her identity. How does she manage it? Why are fingerprints so important? Let's learn it together

OBJECTIVES

- To use Morse Code to break the code
- To create my own code

HOOK

 3-5 min

- Ask students to look closely at their own fingertips, what do they notice?
- Discuss how there are small lines or ridges, our fingerprints.
- Do you think people in the same family have the same fingerprints?
- What about twins?
- Explain that everyone has their own distinct fingerprint.

DISCUSSION

🕒 3-5 min

Humans and primates (like apes) have their own unique fingerprints. Fingerprints have three distinctive patterns: loops, whorls and arches. Arches are only found on 5% of people's hands, while loops are the most common pattern. Many people have a combination of patterns in their fingerprints.

Because of oils, grease, sweat or dirt, we can leave our fingerprints on things we touch. What surfaces do you think would be touched the most and would have fingerprints on them? Let students suggest ideas. Review that door handles, light switches, cups and silverware would be touched often in a house.

Because everyone has their own fingerprint, spies and detectives can tell exactly who touched a surface, based on their fingerprint.



HYPOTHESIS

🕒 3-5 min

- Do we have a different fingerprint on each finger?
- What kind of use do fingerprints have in the real world?
 - What are some other ways to find fingerprints and collect them?

EXPERIMENTATION

🕒 15-20 min

1. Give each student a sheet of the Fingerprint Pattern Worksheets.
2. Then, have students share work areas in groups of 3-4.
3. Pass out a small plate with some Washable paints on it
4. Have students take turns dipping each finger tip lightly into the paint, and pressing it on the paper
 - NOTE: Remind students not to get too much paint on their fingers for this. Too much paint on their finger results in the fingerprint being unreadable!
5. Then, have each student identify their fingerprint type, and compare to their group members.
6. Ask if they can describe the differences, and if they can tell that everyone's print is unique!

OBSERVATION & EXPLANATION

Ask students to observe the fingerprints:

- What do they notice?
- How many lines do they have in their fingerprint?
- Are they close together or far away?


Even though every single human has unique fingerprints, the prints follow three basic patterns. They are called whorls, loops, and arches. Let's look at how each of these patterns are different. Arches begin on one side of the finger and arch, then continue to the other side. Loops begin on one side of the finger then make a loop and back to the same side. Whorls are sets of circles inside each other.

After looking at the 3 fingerprint patterns, do I guess that I have more than one pattern out of the 5 fingers on my left hand?

Percents of people with each print type:

- 5% of prints are arches
- 30% of prints are whorls
- 65% of prints are loops

WORKSHEET

 5-7 min

Fill out Hypothesis/Observation/Conclusion charts on the white board together as a group. Ask students to explain, based on the experiment, why spies and detectives dust for prints.



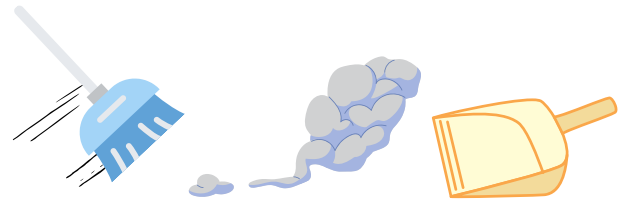
	Index Print	Middle Print	Ring Print	Pinke Print	Thumb Print
My Prints					
Name of Pattern: Loop, Arch, or Whorl?					

FINGERPRINT PATTERNS



loop whorl arch

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ASSESSMENT

 3 min

Ask students one of the following questions:

- Why are fingerprints used to identify suspects?
 - Everyone in the world has their own unique fingerprint
- What are some other ways to find fingerprints?
 - I bet all of you have seen a detective show or movie of some kind. Most of the time you will see them "dust for prints" by powdering different things in a room that a suspect could have touched.
 - They then "Lift" those fingerprints in order to find the person responsible

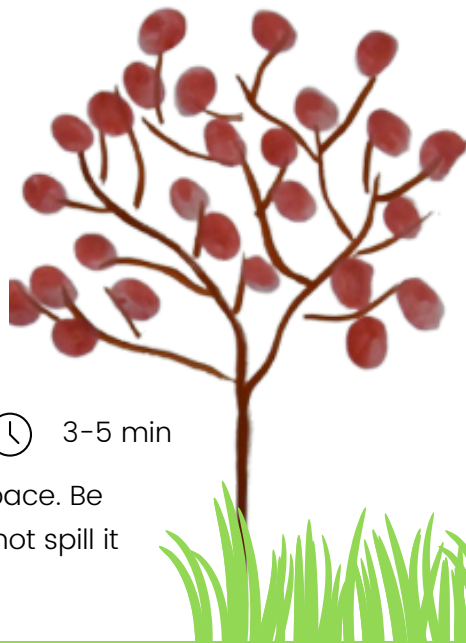
EXPERIMENT PART 2

 5-10 min


1. Pass out new white or colored pieces of paper.
2. Have students come up and retrieve a piece of tin foil
 - squeeze a small amount of the colors they want to take back to their seats.
3. Invite them to use their fingers to create art
4. They are only allowed to add minimal marker lines to add to their art,
5. it will mostly be how creative they can be with their prints.

TIP

Tell students not to dip their fingertip into the paint glob too much. Too much paint will be a glob on their paper and the finger prints will not be visible. Only a little is needed. The point is to create art in which their print patterns are noticeable.



CLEAN UP & DISMISSAL

 3-5 min

Students must then clean their workspace. Be careful with the paint, and be sure to not spill it anywhere!

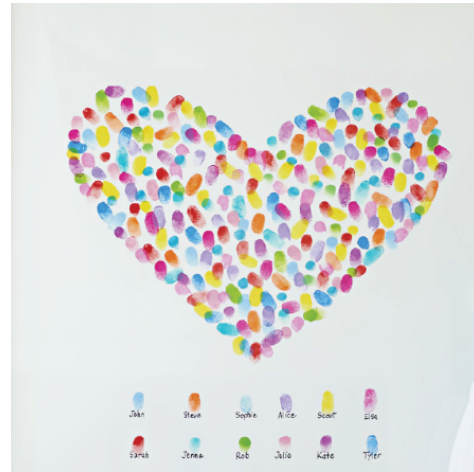
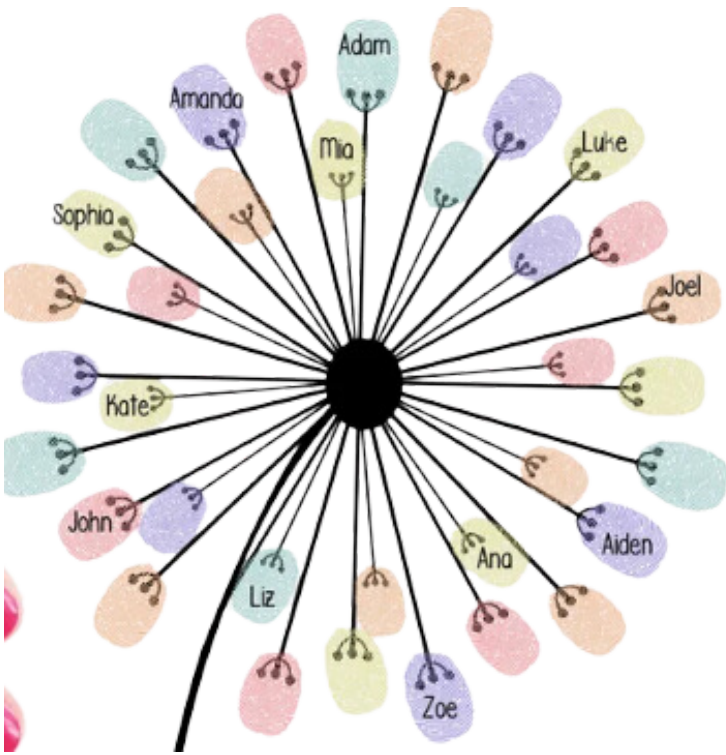
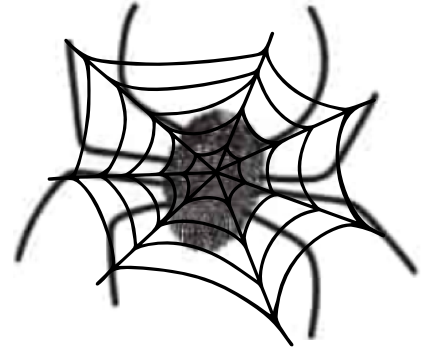
EXTENSION

Have the students look at the examples of Finger painting we provide and come up with their own creative ideas that they can create using their fingers!

Bonus Supply you can purchase:

- If you would like to bring in a large poster board or big sheet of paper, you can have your class create a group painting that each of them can sign
 - This allows for some fun cooperation, and you can have something special from the classes you taught!
 - One that works really well is the large tree with branches, and every student creates their own leaf and signs it. [Class Tree]

EXAMPLES OF FINGERPRINT ART FOR INSPIRATION



PINEAPPLE
fingerprint art



	Index Print	Middle Print	Ring Print	Pinkie Print	Thumb Print
My Prints					
Name of Pattern: Loop, Arch, or Whorl?					

FINGERPRINT PATTERNS



loop



whorl



arch