OERB® Virtual CLASSROOM

Fingerprinting Lesson Guide

Lesson Guide | Description

Instructor: Tina Valentine
Grade Level: 1-5
Subject: General Science

Students will investigate and discover their own fingerprints and identify (classify) the patterns in the print.

Wonder Why:

Have you ever wondered why people have different patterns in their fingerprints?

Goal:

Students will be able to identify different patterns in their fingerprints including the loop, whorl, and arch. Students will create a piece of art with their very own fingerprints!

Lesson Guide Agenda:

Lesson Guide | Vocabulary

Fingerprint – An impression or mark made on a surface by a person's fingertip, used for identifying individuals from the unique pattern of whorls and lines.

Ridge – A curved line in a finger image.

Loop – A pattern in which one or more of the ridges enter on either side of the impressions, recurve, and exit the pattern on the same side as it entered.

Whorl – A pattern of spirals or circles.

Arch - A type of pattern in which ridges enter upon one side, make a rise or a wave in the center and flow or tend to flow out on the opposite side.

Watch the "Fingerprinting: An Investigator's Guide" video before continuing to the challenge!

This can be messy, so be sure to have something on-hand to clean up!

If you have any questions throughout this lesson, please email teachers@oerb.com.
We would love to hear from you!

Materials Needed:

Magnifying glass or hand lens (or Ziploc with water)
Inkpad
#2 Pencil (graphite)
Notecards or paper
Wide tape
Balloons
Playdough
Permanent Marker
Baby or Clorox Wipes
Patterns of the basic fingerprints sheet

NOTE: This activity should be done on a table or a surface that can be wiped down. The ink from the inkpad could stain surfaces.

Activity 1

Materials Needed:

Magnifying glass or hand lens (or Ziploc with water)
Inkpad
#2 Pencil (graphite)
Notecards or paper
Wide tape
Baby or Clorox wipes
Patterns of the basic fingerprints sheet

NOTE: This activity should be done on a table or a surface that can be wiped down. The ink from the inkpad could stain surfaces.

FINGERPRINT PATTERNS

loop whorl arch

Activity 1 Instructions:

1. Take a notecard and rub the pencil until there is a dark mark to create a graphite pad. If you have an ink pad, skip this step and go to Step 5.

2. Outline your hand on a blank sheet of paper.

3. Now, collect your fingerprints! Roll the surface of your finger on the graphite pad from Step 1. Graphite should completely cover the prints on your finger.

4. Press your graphite fingerprint onto the sticky side of a piece of tape.

Activity 1 Instructions:

5. Place the piece of tape with your fingerprint onto the matching finger of your hand outline. If you are using an inkpad, press your finger into the ink and transfer your fingerprint to the matching finger of your hand outline.

6. Complete this process for all fingers so that each finger on the outline of your hand has a fingerprint.

7. Investigate the pattern in your fingerprints! Use the magnifying glass or the Ziploc bag with water to further investigate these patterns.

Reminder: Don't forget to clean your hands!

Activity 2

Materials Needed:

Inkpad
Balloons
Permanent marker
Baby or Clorox wipes
Patterns of the basic fingerprints sheet

NOTE: This activity should be done on a table or a surface that can be wiped down. The ink from the inkpad could stain surfaces.

FINGERPRINT PATTERNS

loop whorl arch

Activity 2 Instructions:

1. Press your thumb into the inkpad so that ink has completely covered your thumbprint.

2. Lay the balloon on a flat surface and press your inked fingerprint onto the balloon. When you lift your thumb, you should see your fingerprint on the balloon.

3. Blow up the balloon. When the balloon expands, your thumbprint will be magnified. This allows you to see the different patterns in your thumbprint.

4. Using a permanent marker, trace the lines in your thumbprint for an even better visualization!

Reminder: Don't forget to clean your hands!

Activity 3

Materials Needed:

Magnifying glass or hand lens (or Ziploc with water)
Inkpad
Notecards or paper
Permanent marker
Baby or Clorox wipes
Patterns of the basic fingerprints sheet

NOTE: This activity should be done on a table or a surface that can be wiped down. The ink from the inkpad could stain surfaces.

FINGERPRINT PATTERNS

loop whorl arch

Activity 3 Instructions:

1. Give 2 notecards to everyone participating in this activity.

2. Using the inkpad (or graphite), each person will print their right thumbprint onto both cards.

3. On the first card, write your name somewhere near your thumbprint.

4. On the second card, write down a secret code! This code is top secret, do not show this card to anyone. Put it away in a secret location.

5. Look at everyone's card with their name and fingerprint. Study each person's fingerprint with the magnifying glass or Ziploc bag with water.

6. Create a fun mystery game. Use the secret code cards and match each thumbprint with the matching person!

Reminder: Don't forget to clean your hands!

Activity 4

Materials Needed:

Playdough
Baby or Clorox wipes
Patterns of the basic fingerprints sheet

FINGERPRINT PATTERNS

loop whorl arch

Activity 4 Instructions:

1. Begin with clean fingers.
2. Roll a piece of Playdough into a ball.
3. With a clean thumb, push your thumbprint into the Playdough and pull it straight up.
4. You should see your thumbprint in the Playdough!

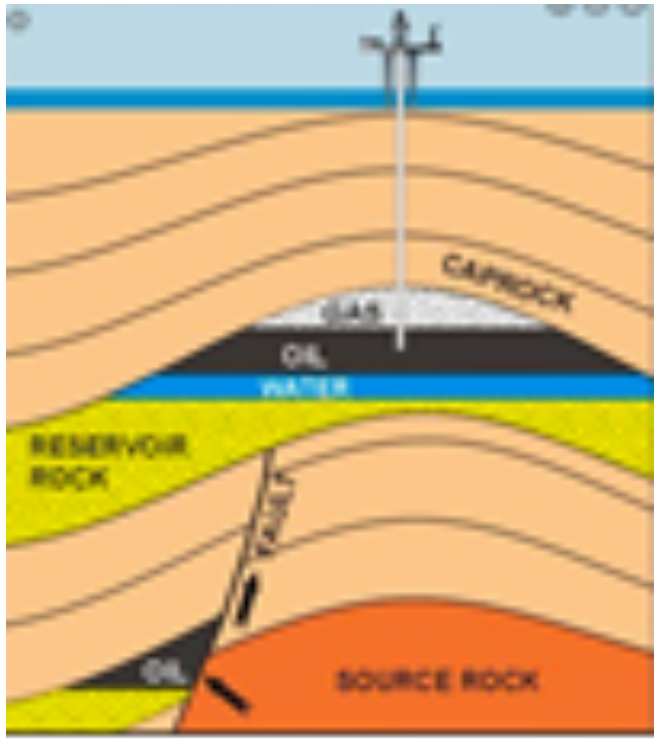
How it works!

There are little ridges on the ends of everyone's fingertips to help us grip things.

Everyone leaves fingerprints when we touch things because our bodies produce oils that get into the ridges.

Example:

Just like you looked at the patterns on your fingerprints, Petroleum Geologists can look at patterns in the rock layers underground to see where they want to drill!



Challenge:

Show your creative fingerprints in art, math, poetry, writing, or any other way you choose.

A creative worksheet for your artwork is provided on HomeRoom.

WANT TO WIN A PRIZE?

Submit your fingerprint art! Share a picture of your artwork with us by emailing teachers@oerb.com and on Facebook/Instagram by tagging us @oerbok.

Be sure to include your name, grade, school, and teacher!

The teacher with the most student submissions will win a $100 Amazon Gift Card!

Lesson Guide | Additional Resources

1. ***Fingerprints? Do Parents and Children Share Similar Components and Patterns?*** **| by Muriel Gerhard**
https://www.education.com/science-fair/article/fingerprints-parents-children-similar/

2. ***All About Fingerprints*** **| by Lela Davidson**
https://hubpages.com/education/All_About_Fingerprints

3: NSTA: Get Familiar with Fingerprints:
https://www.nsta.org/publications/news/story.aspx?id=47708

4. The Sprinkle Topped Teacher: fingerprint science project for kids
https://thesprinkletoppedteacher.com/?s=fingerprints

5. Careers Guide
https://oerbhomeroom.com/uploads/careersbrochure2017_DIGITAL.pdf

Lesson Guide | Oklahoma Academic Standards

1-LS 3-1 Students will make observations to construct an evidence-based account that young
plants and animals are alike, but not exactly like, their parents.

- Crosscutting Concepts: Patterns – Patterns in the natural world can be observed, used to describe phenomena and used as evidence.
- Science and Engineering - Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.

1.A.1 Identify patterns found in real-world and mathematical situations.
1.1.R.4 Students will restate and follow simple two-step directions.
2.1.R.4 Students will restate and follow multi-step directions.
2-ESS 2-2 Crosscutting Concepts: Patterns – Patterns in the natural world can be observed.
2-PS1-1 Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
2.A.1 Describe the relationship found in patterns to solve real-world and mathematical problems.
2.7.W.2 Students will create a simple presentation using audio, visual, and/or multimedia tools to support communication and clarify ideas, thoughts, and feelings.

Lesson Guide | Oklahoma Academic Standards

3-LS 3-1 Students will analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

- Crosscutting Concepts: Patterns – Similarities and differences in patterns can be used to sort and classify natural phenomena.
- Science and Engineering: Analyze and interpret data to make sense of phenomena using logical reasoning.

3.7.W.2 Students will create presentations using video photo, and other multimedia elements to support communication and clarify ideas, thoughts, and feelings.

4 ESS 1-1 Students will identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

- Crosscutting Concepts: Patterns – Patterns can be used as evidence to support an explanation.

4 ESS 2-2 Students will analyze and interpret data from maps to describe patterns of Earth's features.

- Crosscutting Concepts: Patterns – Patterns can be used as evidence to support an explanation.
- Science and Engineering: Analyze and interpret data to make sense of phenomena using logical reasoning.

Lesson Guide | Oklahoma Academic Standards

4 ESS 3-1 Students will obtain and combine information to describe that energy and fuels are derived from renewable and non-renewable resources and how their uses affect the environment.
5-PS1-3 Make observations and measurements to identify materials based on their properties.
5.7.W.1 Students will create multimodal content that affectively communicates an idea using appropriate technology and media.

If you would like to explore more Oklahoma Academic Standards for Science, click here.