

## Discover your fingerprint type

General information			
Respective blueprint	Discover your fingerprint type		
Description	Introduce Ivan Vučetić and his work to students. Talk with students about what a fingerprint is and where a fingerprint is used.		
Learning objectives	<ul style="list-style-type: none"> <li>• students will get to know who Ivan Vučetić is</li> <li>• learn the types of fingerprints</li> <li>• learn to make a fingerprint</li> <li>• learn to calculate percentages</li> <li>• calculate percentages</li> </ul>		
Related curricular subjects	art, mathematics		
Duration	40 min		
Level of difficulty	Basic	Medium	Advanced
	○	✓	○
Inclusivity guidelines			
How to integrate students with SLD	<p>work in pairs with another student, the help of the teacher or other students</p> <p>Use colours to separate information and be consistent in your colour codes.</p> <p>Use clear visual elements without overloading them to illustrate concepts and support the text.</p> <p>Ensure that the images used match the text.</p> <p>Use descriptions to explain diagrams and other illustrations.</p>		
How to integrate students who work faster	<ul style="list-style-type: none"> <li>• help students who are slower in their work</li> <li>• create a table in which the number of times a certain type of fingerprint is repeated in the class will be entered</li> <li>• calculate the percentage of a certain type of fingerprint in the class</li> <li>• conclude whether that percentage of a certain type of fingerprint in the class matches the percentage in the entire population</li> </ul>		

## Step-by-step description of the lesson

### Step 1: Introduction

Estimated time: 10 min

- Talk with students about what a fingerprint is. Each student studies on one finger of his hand. Two students try to compare their two fingers. The teacher asks - can you see the difference?
- Conversation with students where a fingerprint is used.
- **Ivan Vučetić** was a Croatian-Argentinian inventor of dactyloscopy.
- **Dactyloscopy** relies on the analysis and classification of patterns observed in individual prints. Fingerprints are made of a series of ridges and furrows on the surface of a finger; the loops, whorls, and arches formed by those ridges and furrows generally follow a number of distinct patterns.

Fingerprint analysis has been used to identify and prove the identity of living and dead persons, as well as perpetrators of criminal acts based on the traces of papillary lines.

- After studying several existing methods for the classification of fingerprints and noticing numerous shortcomings, Vučetić established his own system for the classification of fingerprints, which he called **iconophalangometry**.
- Applying his method of identification in practice, he solved his first major murder case. Vučetić fingerprinted the suspects, compared their fingerprints with the bloody fingerprints of papillary lines found on the wooden door frame, and confirmed that they were identical.

### Step 2: Make fingerprints

Estimated time: 20 min

- Each student takes a sheet of white paper and draws their hand
- The student dips their index finger into the paint (ink)
- Explore the three basic types of fingerprints: whorl, loop, arch
- Examine each fingerprint (with a magnifying glass or a mobile phone)

- Determine which type each fingerprint belongs to
- Students who finish the first part of the task faster, create a table on the board according to the template
- Each student ticks the column of the table that represents their type of fingerprint
- Count how many fingerprints there are of each type
- The teacher will explain how percentages are calculated
- Calculate the percentage of each type of fingerprint in the class

### Step 3: Finishing activity

Estimated time: 10 min

Students conclude which types of fingerprints are the most common and which are the least common in the class. They independently search for information on which type of fingerprint is the most common in the population and whether the result obtained in the class matches the result of the entire population.

The teacher asks the students about the difficulty of the task, and if they had any difficulties in creating a fingerprint.

### Assessment activities

#### Activity 1: Evaluation sheet

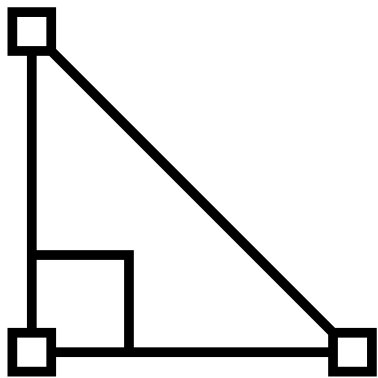
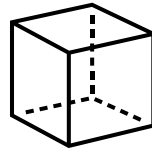
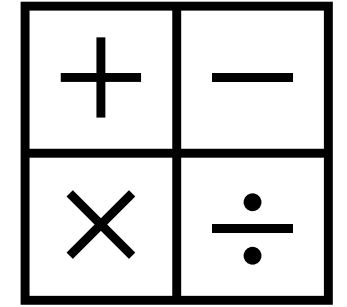
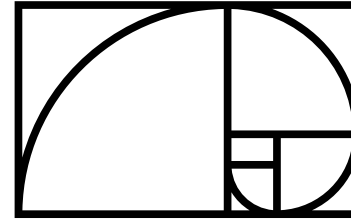
Students fill out the evaluation sheet

### Attachments

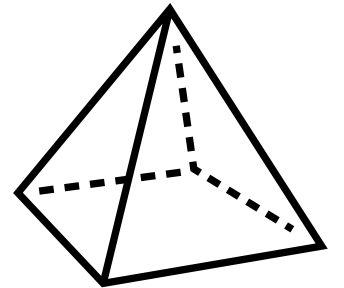
- Evaluation sheet
- Presentation
- Fingerprint template

### References

- [https://en.wikipedia.org/wiki/Juan\\_Vucetich](https://en.wikipedia.org/wiki/Juan_Vucetich)
- <https://en.wikipedia.org/wiki/Fingerprint>
- <https://hr.wikipedia.org/wiki/Daktiloskopija>
- <https://www.britannica.com/topic/dactyloscopy>



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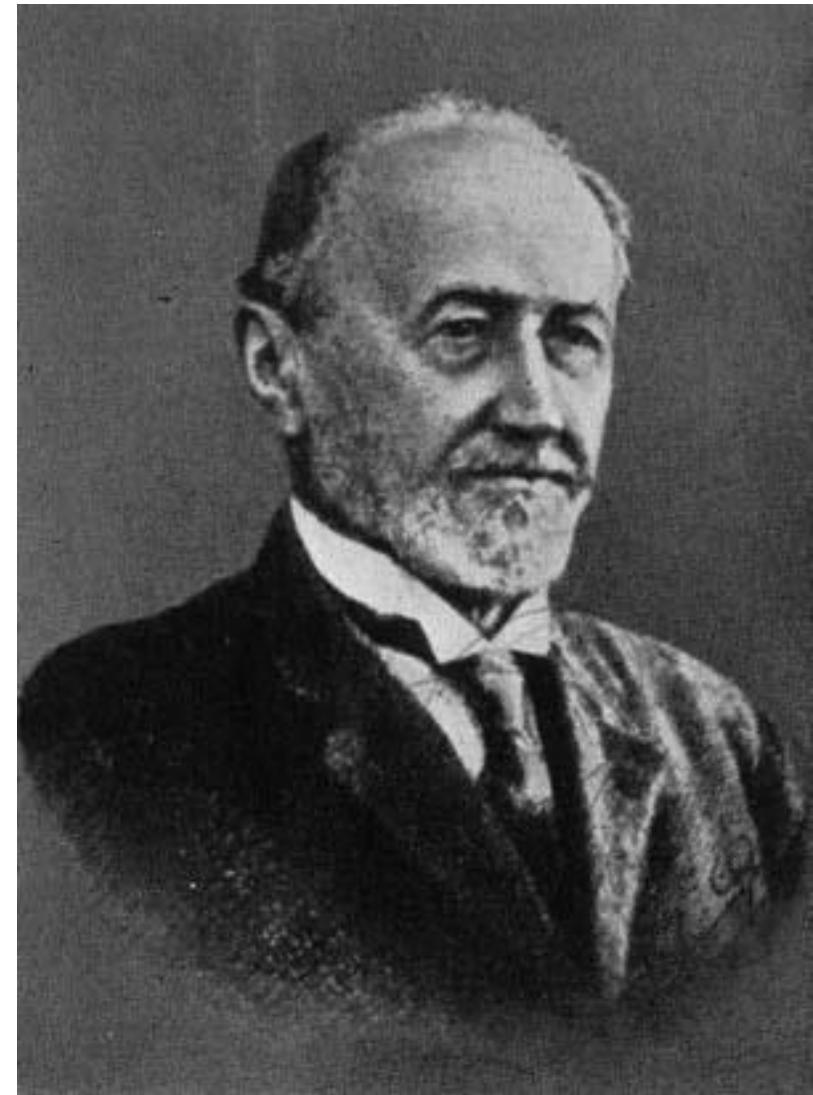
**Ivan Vučetić** (*Juan Vucetich Kovacevich*) was born in Hvar, Dalmatia on 20th July, 1858 - died in Dolores, Argentina on 25th January, 1925.



He was a Croatian-Argentine anthropologist and police official who pioneered the use of dactyloscopy (fingerprint identification).



Forensic Science Centre Ivan Vučetić in Zagreb bears his name.



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A **fingerprint** is an impression left by the friction ridges of a human finger.

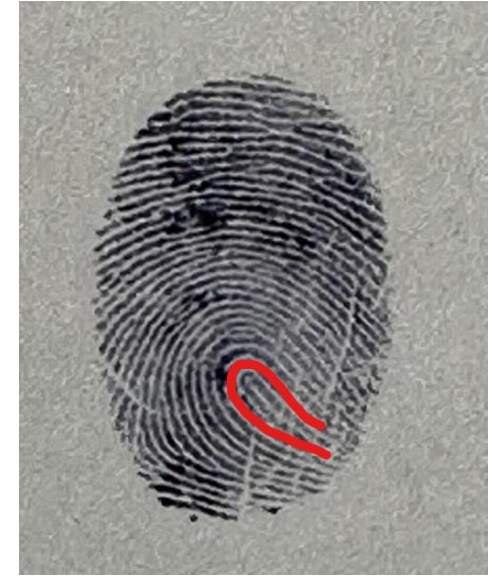
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There are three basic fingerprint patterns: the arch, the loop, and the whorl.

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Scientists have found that family members often share the same general fingerprint patterns, leading to the belief that these patterns are inherited.

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## Materials needed:

- white paper
- magnifying glass or a mobile phone
- an ink pad (stamp ink)
- a ruler
- a pencil



# STEP 1:

Each student takes a sheet of white paper and draws his/her hand





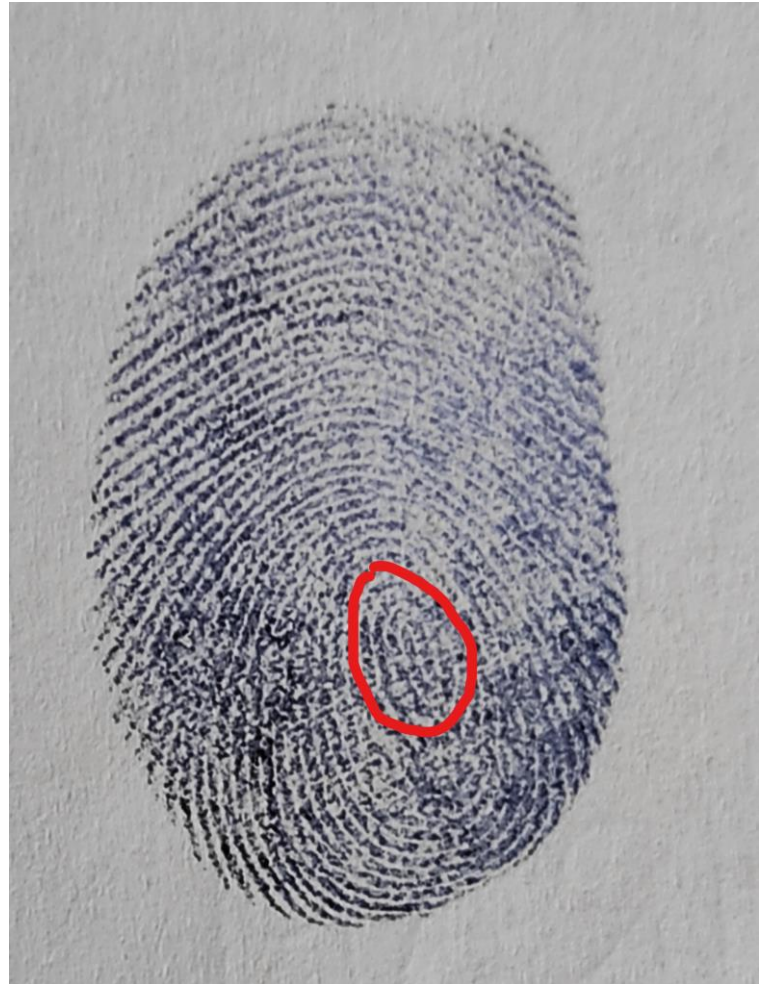
## STEP 2:

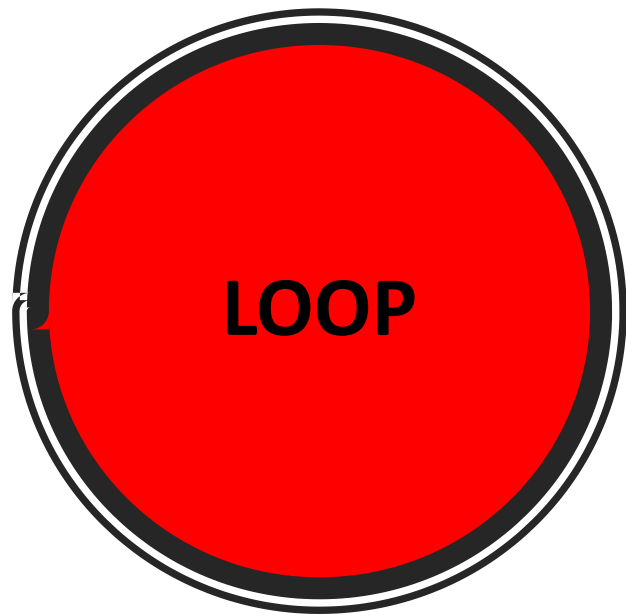
The student dips his/her index finger into the paint (ink)



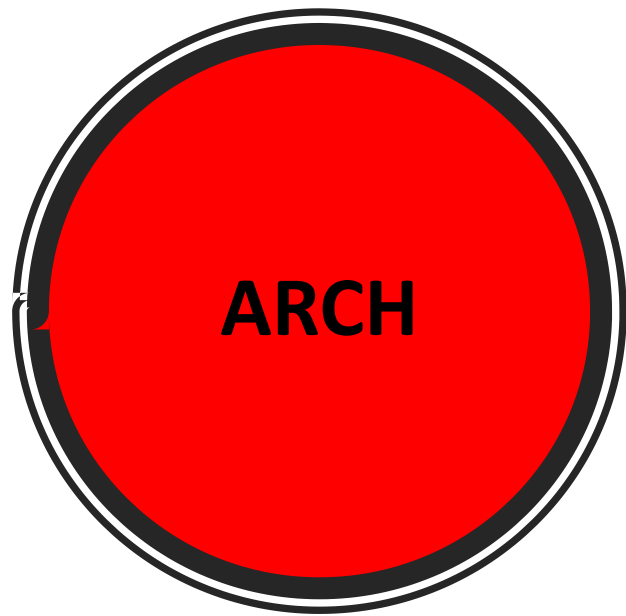
## STEP 3:

- Explore the three basic types of fingerprints: WHORL, LOOP, ARCH
- Examine each fingerprint (with a magnifying glass or a mobile phone)
- Determine which type each fingerprint belongs to












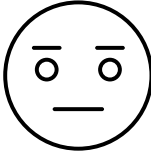
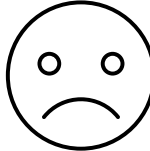

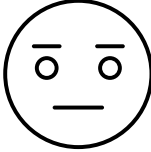


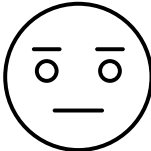


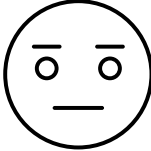

## Literature:

- [https://en.wikipedia.org/wiki/Juan\\_Vucetich](https://en.wikipedia.org/wiki/Juan_Vucetich)
- <https://en.wikipedia.org/wiki/Fingerprint>

## SELF – ASSESSMENT

NAME:

DATE:

I followed directions			
I did my best and had a positive attitude			
I completed my work			
I liked the activities			

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