

## UNIT 3: Fingerprints

NAME \_\_\_\_\_

Period \_\_\_\_\_

### History and Anatomy

#### Historical Development

1. **3rd century B.C. in China**—oldest known documents
2. **Ancient Babylon** (1792-1750 B.C.)—fingerprints pressed into clay tablets marked contracts
3. **1684**—Dr. Nehemiah Grew's paper describes the patterns on human hands, including the presence of ridges
4. **1788**—Johann Mayer noted that the \_\_\_\_\_  
\_\_\_\_\_
5. **1823**—Jan Evangelist Purkinje describes nine fingerprint patterns;  
\_\_\_\_\_
6. **1856**—Sir William Herschel (right) began the collection of fingerprints and noted they were not altered by age
7. **1883**—Alphonse Bertillon used \_\_\_\_\_  
that were repeat offenders using 11 body measurements
8. **1888**—Sir Francis Galton (r) identified and \_\_\_\_\_  
and Sir Edmund Richard Henry developed the \_\_\_\_\_  
\_\_\_\_\_
9. **1891**—Iván (Juan) Vucetich collected all ten fingerprint impressions and noted measurements. He was the first to use fingerprints in a \_\_\_\_\_
10. **1896**—Sir Henry, with two colleagues, created a system that divided fingerprints into groups. All ten fingerprints are imprinted on a card (called a *tenprint card*) along with other notations

Example of a \_\_\_\_\_ Card

#### Levels of Organization in the Body

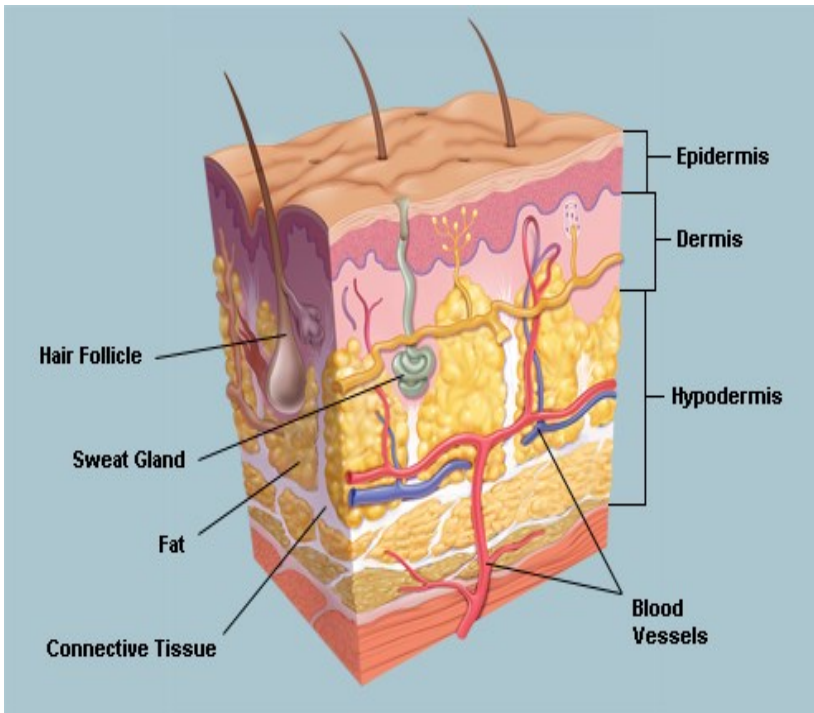
- o \_\_\_\_\_ makes possible a division of labor at the cellular level
- o Cells, tissues, organs, and organ systems maintain relatively \_\_\_\_\_

#### What Are Fingerprints?

- o All fingers, toes, feet, and palms are covered \_\_\_\_\_
- o Ridges help us grip objects
- o Ridges are arranged in connected units called \_\_\_\_\_

- o Fingers accumulate \_\_\_\_\_
- o \_\_\_\_\_ on objects we touch

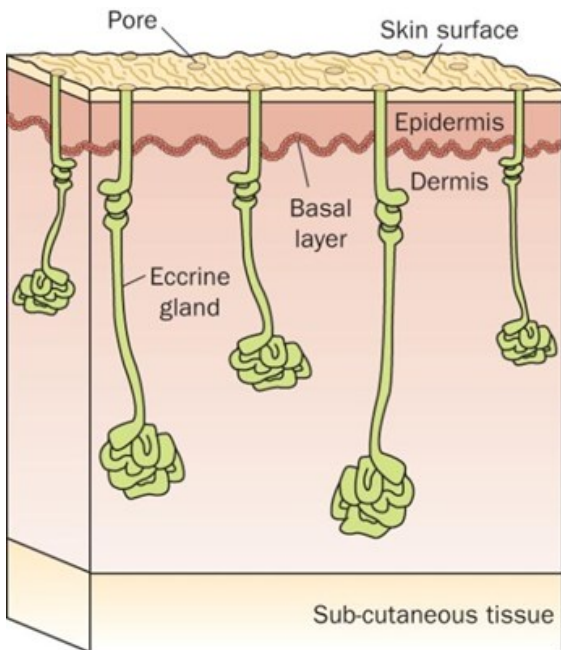
**Structure of Skin: Anatomy**



Glands:

- \_\_\_\_\_:  
secretes largely \_\_\_\_\_.
- Found on \_\_\_\_\_.
- Most important for fingerprints.
- \_\_\_\_\_:  
secretes \_\_\_\_\_.
- Found in axial and genital regions.
- \_\_\_\_\_:  
secretes \_\_\_\_\_.
- Sprouts a hair.

**Structure of Skin: Anatomy**



Layers of skin:

- o \_\_\_\_\_:  
outermost layer, provides a waterproof barrier
- o \_\_\_\_\_:  
beneath the epidermis, contains tough connective tissue, hair follicles, and sweat glands.
- o \_\_\_\_\_  
(hypodermis): is made of fat and connective tissue.

**Structure of Skin: Fingerprints**

- o **Location of Sweat Glands:** Most numerous in the \_\_\_\_\_, where they open on the summits of the papillary ridges.

- o **Stimulus Responses:** The chief stimuli to sweating are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ (eating spicy foods). Emotional perspiration occurs characteristically on the forehead, axillae, palms, and soles.

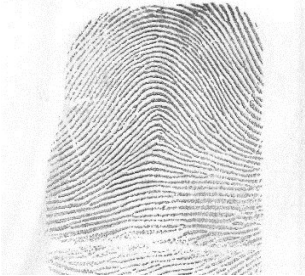
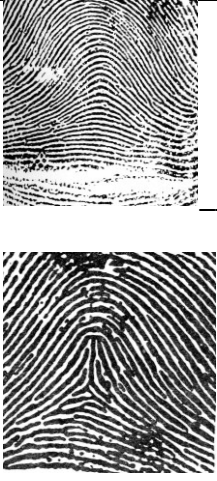


**Fingerprint Formation:**

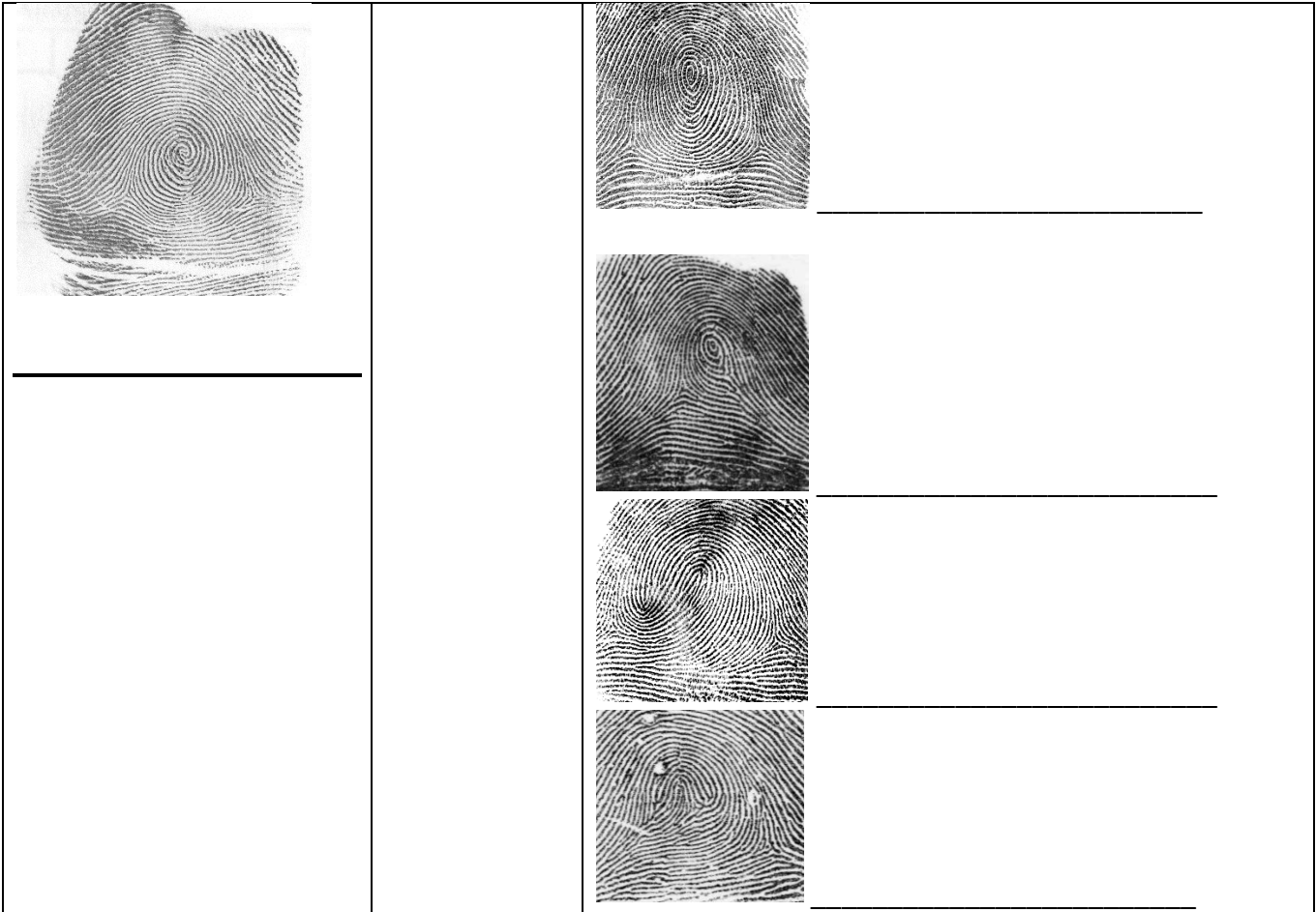
1. \_\_\_\_\_
  2. Basal layer
- 
- o Fingerprints are made of an arrangement of ridges, called \_\_\_\_\_.
  - Each ridge contains pores, which are \_\_\_\_\_ under the skin.
  - o You leave fingerprints on glasses, tables and just about anything else you touch because of this sweat.

**Inheritance of Fingerprints**

1. Read: **Succession Science: Are Fingerprint Patterns Inherited?**
2. Do activities described in article and answer questions.
3. Read Scientific American: **Are one's fingerprints similar to those of his or her parents in any discernable way?**
4. Complete reading questions from article.

**Fingerprint Classification, Processing, & Comparison**

Basic Patterns/Names	% of Population	Sub Categories/Names
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How are fingers numbered?



What is a:

Rolled impression

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Plain/Flat impression

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How to ink fingerprints (notes:

Principal of Permanence:

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Principal of Uniqueness:

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Do identical twins have identical fingerprints? \_\_\_\_\_

3 Major Points of Comparison:

- 1.
- 2.
- 3.

Also called: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

How many matching points does it take to make a positive identification? \_\_\_\_\_

What is AFIS?

Type of Print	Description	Types and Example
Patent		Contaminated (2-D)
		Plastic (3-D)
Latent		

How to dust for prints (take notes):

What are some other methods of identification?

Voiceprints:

Ear Prints:

Lip Prints:

Foot prints:

Retinal Prints:

### Chemical Developing of Latent Prints

Chemical development method	Describe how it reacts and what part of the fingerprint it reacts with	Color development	Use this method on....	Other notes/info
Iodine	How reacts: What part of fingerprint:	From: To:	Example:	
Ninhydrin	How reacts: What part of fingerprint:	From: To:	Example:	
Silver Nitrate	How reacts: What part of fingerprint:	From: To:	Example:	
Cyano-acrylate (super glue)	How reacts: What part of fingerprint:	From: To:	Example:	