

Key - Unit 2A Study Guide

1. direct evidence - establishes a fact
circumstantial evidence - requires making an inference about what happened
 2. Fingerprints form in the dermal papillae between the epidermis and the dermis
 3. Fingerprints form at 7 weeks gestation (in utero).
 4. No, there is never any known case of 2 individuals having the same fingerprints, even identical twins because the formation of fingerprints is dependent on both genetic and environmental factors in the womb. Those environmental factors are different for each individual.
 5. No, a person cannot permanently destroy their fingerprints. At most, they would create scars which leads to a more unique print. Plus, the ridges grow back.
 6. See below.
 7. A fingerprint is an individual characteristic & no two fingers have identical ridge characteristics, or minutiae
 8. A fingerprint will remain unchanged during a person's lifetime.
 9. Fingerprints have general ridge patterns, making it possible to classify them.
 10. loops - 65% of population
whorl - 30% of population
arch - 5% of population
6. Fingerprints are individual evidence because they are unique

11. loops



- enter from one side of finger, loop around, & leave from the same side.
- have 1 delta

whorls



- are circular
- have 2 deltas

arches

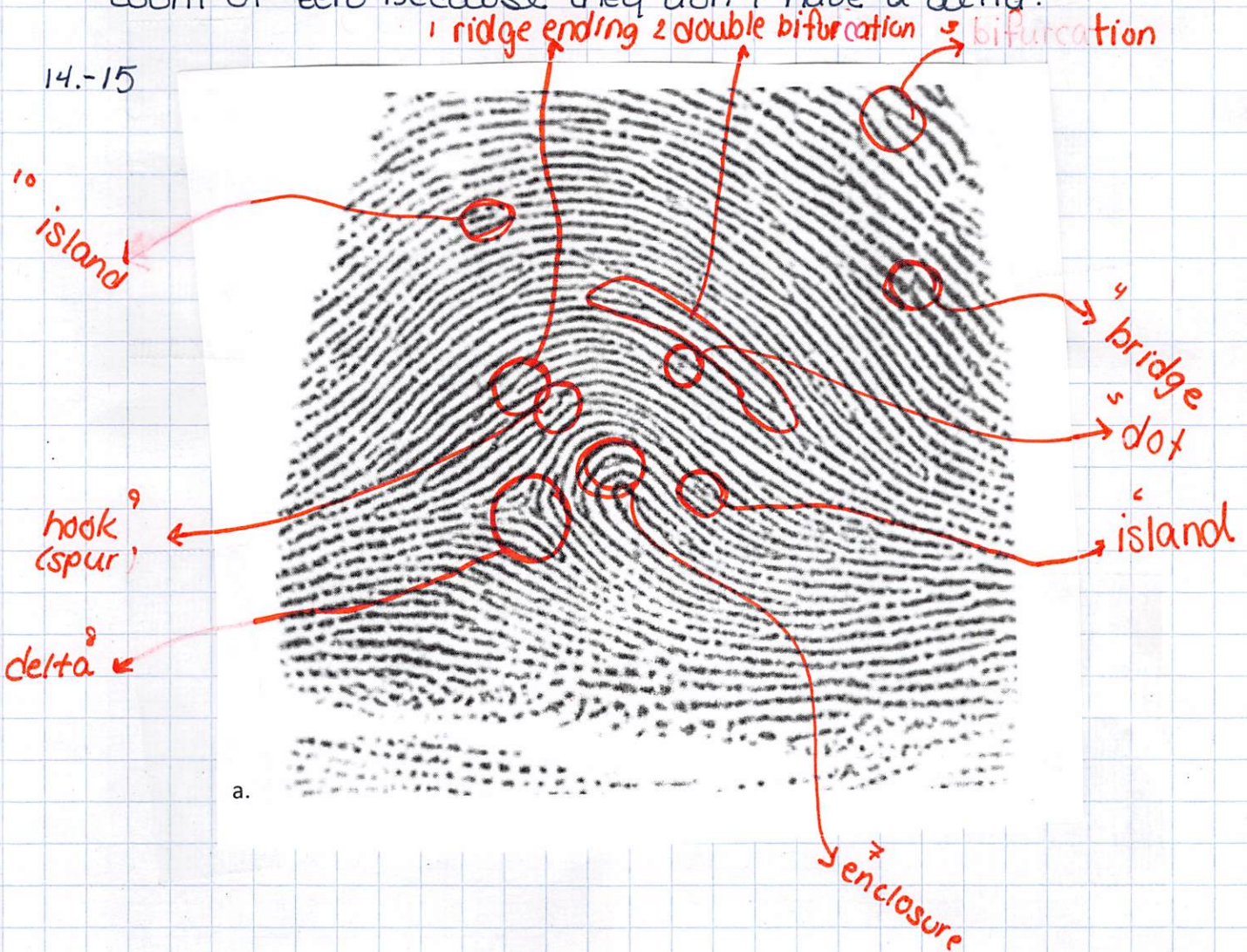


- enter from one side of finger & leave on the other side
- have no deltas

12. Minutiae are individual ridge characteristics that can be used to identify a fingerprint

13. Draw a straight line from the core to a delta & count the # ridges that line crosses. Arches have a ridge count of zero because they don't have a delta.

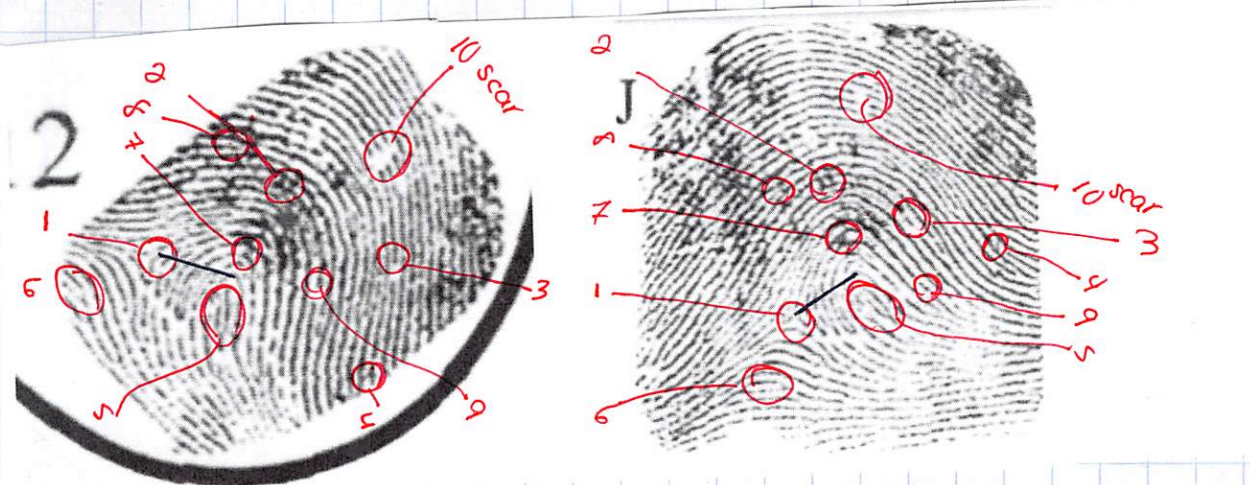
14.-15



a.



16.



ridge count = 7

ridge count = 7

17 AFIS - Automated Fingerprint Information System maintained by the FBI

18. patent prints - visible prints left in a liquid like blood, paint, or ink
plastic prints - impressions left in soft material, such as clay or mud
latent prints - invisible prints left by oils & sweat on your fingers

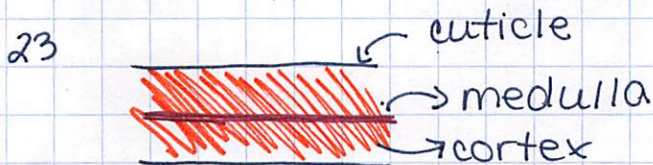
19. 1) physical developers - various powders: black powder, magnetic powder, fluorescent powder
2) cianoacrylate (superglue) fuming
3) iodine fuming
4) ninhydrin * preferred method by investigators

20. Fingerprint matching is not a perfect method, even if AFIS is used, because people are the final determiner of a match and people can make mistakes.

21. keratin

22. Hair grows in 3 stages from the follicle:

- 1) anagen - active growth stage, lasts 3-6 years
- 2) catagen - transition stage where hair rests, lasts 2-3 weeks
- 3) telogen - stage where the follicle recedes and the hair falls out => follicle begins to prepare to grow a new hair



24. medullary index = $\frac{\text{diameter of medulla}}{\text{diameter of hair shaft}}$

medullary index equal to or less than .33 => human
medullary index equal to or larger than .50 => animal

25. a follicular tag is a translucent piece of tissue surrounding a hair shaft near the root, that contains dna.

26. Hair is class evidence unless it has a follicular tag, then it's individual because follicular tags contain dna.

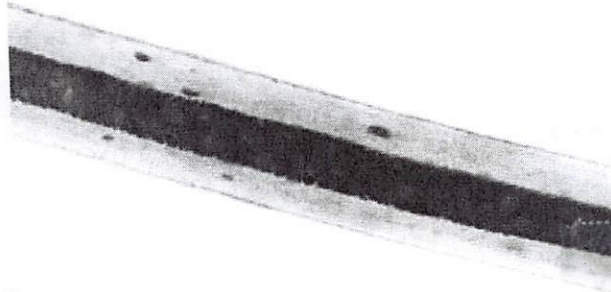
27. a)

Matching hair using a comparison microscope



These hairs are not from the same head. The hair on top has a fragmented medulla & the hair on the bottom has a continuous medulla.

b.



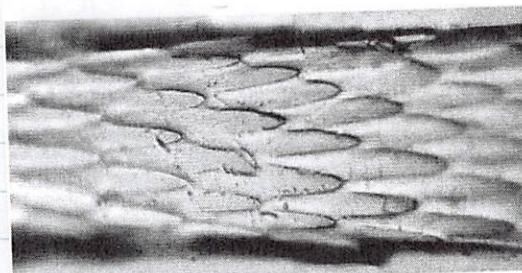
animal, the medulla makes up $\frac{1}{2}$ or more of the hair shaft.
medullary index $> .50$



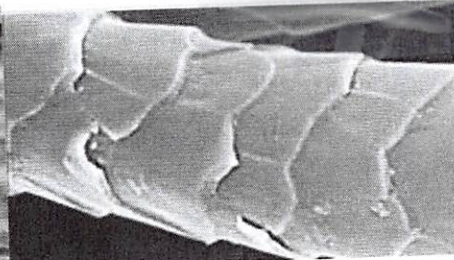
human, the medulla makes up less than $\frac{1}{3}$ of the hair shaft
medullary index $< .33$

c.

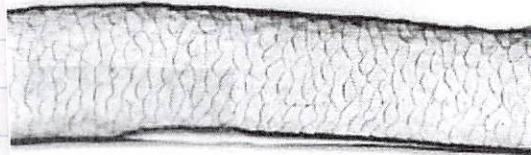
spinous



coronal



imbricate



28. Natural fibers are derived entirely from animal or plant sources.

- Ex) animal - wool, mohair, cashmere, fur, silk
- plant - cotton, coir, hemp, jute, sisal, flax
- mineral - asbestos, fiberglass

29. Synthetic fibers are partly or entirely derived from natural or synthetic (man-made) polymers
Ex. nylon, spandex, polyester, rayon, acetate

30. Investigators look mainly at color and diameter of fibers microscopically.

31. Different fibers burn differently and produce different odors when burned. See burn chart

32. a. weighted silk
b. acrylic
c. linen, jute, or hemp
d. cotton

