

2/27/2015

Fiber is important



Fiber Evidence

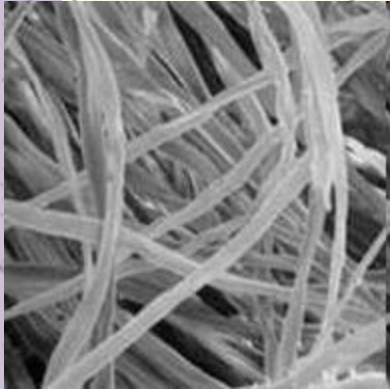
- A **fiber** is the smallest unit of a textile material that has a **length** many times greater than its **diameter**.
- A fiber can be spun with other fibers to form a **yarn** that can be woven or knitted to form a fabric.
- Transfer of fibers to/from victim/suspect is affected by:
 - Type and length of fiber used
 - Type of **spinning** method
 - **Fabric** construction

Fibers

- # Class characteristic because of mass use of fibers
- # Two types of fibers
 - Natural
 - Man-made

Natural Fibers

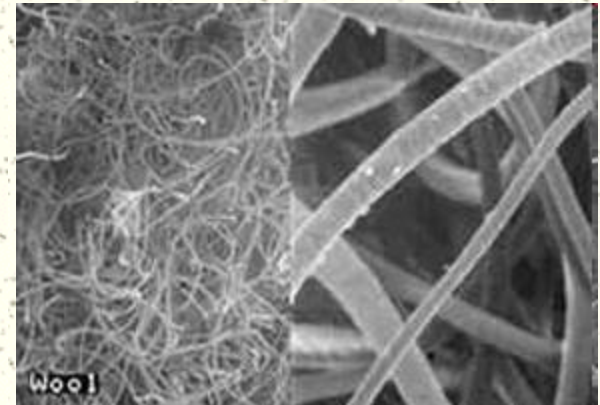
Many different **natural** fibers that come from plants and animals are used in the production of fabric.



← **Cotton** fibers are the plant fibers most commonly used in textile materials .

Notice the “twisting” along cotton fibers

→ The animal fiber most frequently used in the production of textile materials is **wool**, and the most common wool fibers originate from sheep.

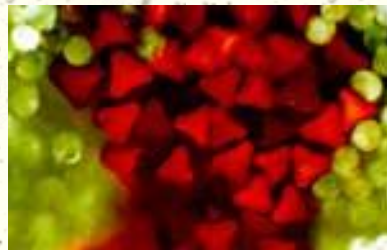


Silk is also considered to be a natural fiber.

Synthetic Fibers



- *More than half of all fibers used in the production of textile materials are synthetic or man-made.*
- *Created from chemical **polymers***
- *Nylon, rayon, and polyester are all examples of synthetic fibers.*



Cross-section of a man-made fiber



Fibers under a microscope

Matching Fibers

- *Matching **unique** fibers on the clothing of a victim to fibers on a suspect's clothing can be very helpful to an investigation*
- *Matching of **common** fibers such as white cotton or blue denim fibers would be less helpful.*
- *The discovery of **cross transfers** and multiple fiber transfers between the suspect's clothing and the victim's clothing dramatically **increases** the likelihood that these two individuals had physical contact.*

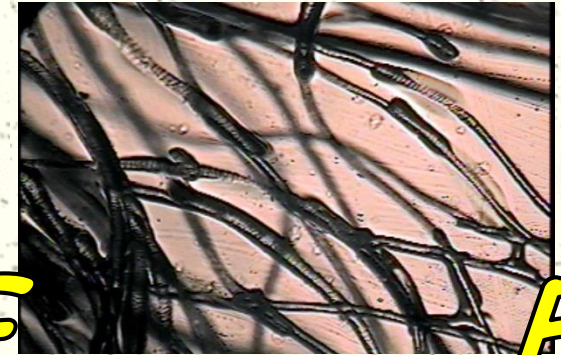
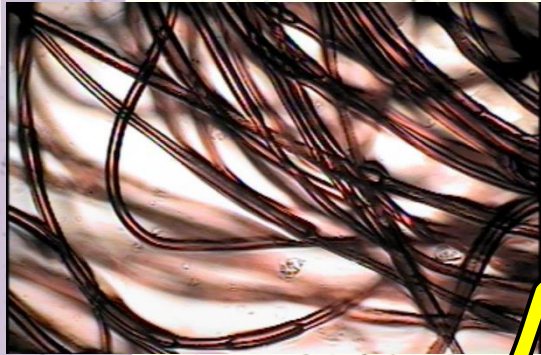
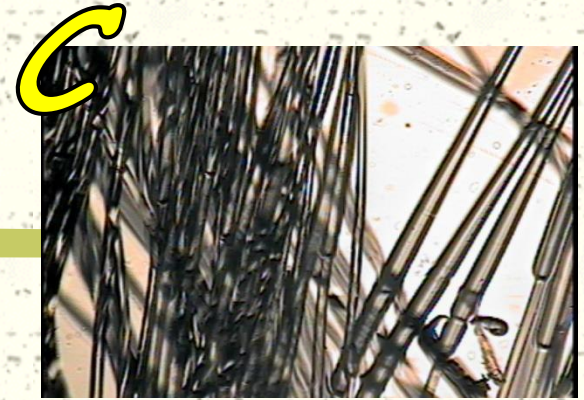
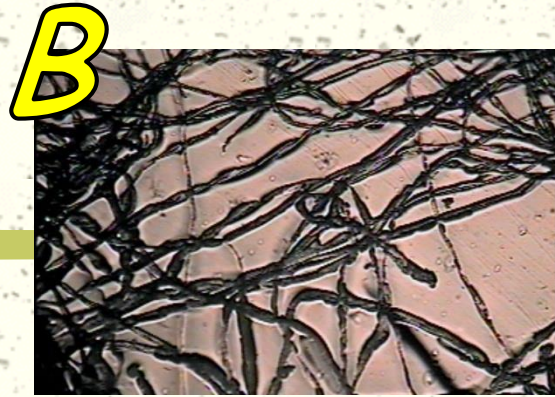
Identification and comparison of man made fibers

- # Compare color and diameter of control and crime scene specimens
- # Compare lengthwise striations on surface of some fibers
- # Fibers can be broken down into more than two dozen subclasses
- # Dyes in fibers allow for a good comparison of specimens
 - # Leads to a more individualistic identification
 - # Done by Microspectrophotometer
 - # Can use a chromatographic spectrum to separate dyes

Collection of fiber evidence

- # Difficult because usually not visible to naked eye
- # Necessary to identify potential carriers of fibers
- # Clothing should be wrapped in paper bags
- # Fold rugs and linen to ensure fibers will not fall off
- # Use tweezers if you find it necessary to pick up a fiber

Can you identify the types of fibers shown?



Think About It ...

- (1) Which samples are natural fibers?*
- (2) Which samples are synthetic fibers?*
- (3) What characteristics can be used to identify fiber samples?*

