# Whose Clothes Did This Come From?

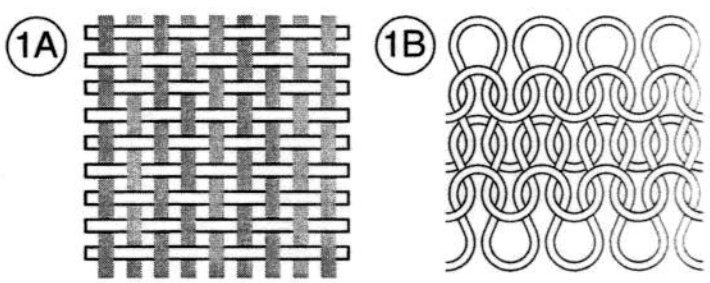
## Topic

Analysis of fiber samples

## Introduction

A scrap of fabric – or even some threads of fiber – found at a crime scene can yield many clues. Perhaps it tore away from a garment belonging to the perpetrator of a crime, an innocent passerby, or the victim? The most obvious visible attribute of the fabric is its color, but there are many other potential distinguishing factors. Is the fabric woven or knitted? (Diagram 1 below shows the difference between woven and knitted fabric.) Are the fibers matted together into felt? Is the fabric patterned or plain? Does it have a plain weave or a fancy weave?

The threads making up the fabric can also be distinctive. Natural fibers can be of either animal (e.g., wool from sheep, cashmere from goats, silk from the silkworm's cocoon) or vegetable (e.g., cotton made from fibers surrounding cotton seeds, linen made from flax fibers) origin. Such fibers tend to be irregular in construction compared with man-made fibers (e.g., Lycra®, polyester), which are made by extruding a synthetic substance through a nozzle, making a smooth fiber of uniform thickness. If a scrap of fabric can yield clues such as these, it may be possible to discover the source of the fabric. In significant cases, investigators have contacted manufacturers with fabric and fiber details, and have been successful in tracking down the source of the fabric. In this experiment, you will look at a variety of fabric samples through a magnifying glass to observe their features. You will then look through a microscope at a selection of fibers taken from the fabrics and observe the characteristics of natural and man-made fibers.




*Woven fabric (A) and knitted fabric (B).*

## Time required

Part A: 20 minutes
Part B: 15 minutes

## Materials

selection of six fabric samples labeled A to F (e.g., woven, knitted, felt, patterned, and plain)
magnifying glass
six samples of thread pulled from the different fabrics labeled A – F
fine-pointed tweezers

## Safety note

**Please read the general safety precautions at the beginning of the book.**

## Procedure

*Part A: Investigation of fabric*

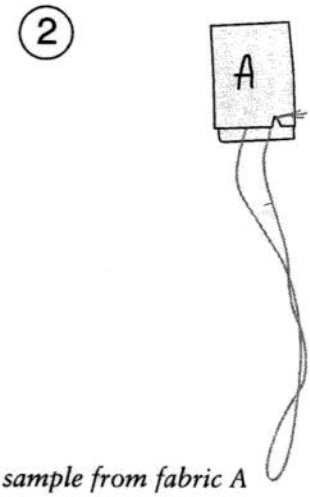
1. Feel fabric sample A with your fingers and try to stretch it.
2. Look at fabric sample A with the magnifying glass. Make sure you look at both sides of the sample.
3. Decide if the sample is woven, knitted, or felt. Check the appropriate box in data table A below.
4. Repeat steps 1 to 3 for the remaining fabric samples.

**DATA TABLE A**

| | Knitted | Woven | Felt |
|---|---|---|---|
| A | | | |
| B | | | |
| C | | | |
| D | | | |
| E | | | |
| F | | | |

*Part B: Investigation of threads*

1. Place the first thread sample (see diagram 2 below) under the magnifying glass.
2. Look at the thread and describe it in data table B on the next page. Does it seem to be made from a collection of fibers? If you think it is, use the tweezers to remove one of the fibers and look at it with the magnifying glass.
3. Do you think the thread is natural or man-made? Record your decision in data table B.
4. Repeat steps 1 to 3 for each sample in turn.




*Thread sample from fabric A*

| DATA TABLE B | | |
|---|---|---|
| | Description of thread | Natural/man-made/don't know |
| A | | |
| B | | |
| C | | |
| D | | |
| E | | |
| F | | |

## Analysis

*Part A: Investigation of fabric*

1. Did you find it easy to sort the scraps of fabric into the three categories in data table A?
2. Do all the woven fabrics have the same construction?
3. Did some of the knitted fabrics look the same on both sides?
4. Did any of the samples look like felt on one side but not the other?

*Part B: Investigation of threads*

1. Did the threads appear to consist of a number of fibers?
2. Can you distinguish between natural and man-made fibers?

## Want to know more?

See Section 10: Our Findings