

#### Key Questions:

- How can hair and fibre be examined?
- How can hair and fibre help solve a crime?

#### Desired Outcomes:

- Students can explain how hair and fibre is examined.
- Students can explain the significance of hair and fibre as evidence in a crime.

#### Activities and Timelines (30 minutes)

Introduction 10 minutes

How is Hair and Fibre Analyzed?

Main Activities 15 minutes

Hair and Fibre Game

Conclusion 5 minutes

Hair and Fibre Word Search

#### Resources

- Resource 8-1: Hair and Fibre Images
- Resource 8-1a: Hair and Fibre PowerPoint
- Resource 8-2: Three Parts of a Hair and Hair Growth
- Resource 8-3: Hair and Fibre Word Search
- Resource 8-4: Hair and Fibre Video

#### Extension Activity

- Looking at hair under a microscope activity

## Introduction

10 minutes

- Samples of hair or fibre are viewed as one of the most helpful sources of information that forensic investigators can find in a crime scene.
- **Show** students Resource 8-1 (images).
  - ▷ **Answers:**
    - Image 01: Silk under a microscope
    - Image 02: Cotton under a microscope
    - Image 03: Wool under a microscope



- **Say:** We were looking at hair and fibres under a microscope! They each look unique and have special characteristics that allow us to tell them apart.
- **Discuss:** How can hair and fibre help us solve a crime?
- **Say:** Hair is a valuable piece of evidence that can help investigators expand the profile of a suspect, helping to assist police in tracking down who is criminally responsible.
- **For Example:**
  - ▷ Hair varies from person to person. Some people have fine, blond hair while others may have coarse, dark hair. Examine your own head of hair for a moment! Do you have course or thick hair? Straight or curly? What colour is it? Can you be specific when describing the colour?
  - ▷ Police can tell the difference between human and animal hair, and what part of the body that the hair came from.
  - ▷ Using a comparison microscope, investigators examine two hairs side-by-side, looking at the colour, width, and the patterns of the medulla, cortex, and cuticle (the three parts of the hair). Show students Resource 8-2: Three Parts of a Hair and Hair Growth.
  - ▷ If the hair has a follicle, DNA can also be obtained for comparison. Only forcibly removed hair will have follicles. Broken or naturally shed hair does not.
- **Say** the following about examining fibres:
  - ▷ Fibre is also an important piece of evidence and can help investigators figure out what a criminal was wearing during the time of a crime.
  - ▷ Forensic scientists can even determine the specific make of a piece of clothing, which can tell the investigators who the manufacturer was. In some cases, when the clothing is a unique or rare piece, investigators can narrow down the suspect by finding out where the limited number of units were sold.

## Main Activity

15 minutes

- **Materials**
  - ▷ Resource 8-1a
- **Teacher Prep:**
  - ▷ Open Resource 8-1a



**Teacher's note:** Before starting the activity feel free to split the class into 2 teams to compete against each other to see which group can answer the most questions correctly. This activity can also be done as a whole class.

- Open Resource 8-1a: Hair and Fibre PowerPoint
- **Instruct the students:** We are going to play a fun guessing game to see if we can determine whether a sample is a hair or a fibre by looking at sample images under a microscope.
  - ▷ As you go through the PowerPoint the slide will first show the sample image. Pressing the “next slide” button will reveal the name of the sample.



**Teacher's note:** A scoring system could also be set up for each sample, if desired for this game. Perhaps give 1 point for guessing if it is hair or fibre, and 5 points for guessing exactly what the sample is. (le: Human hair, wool fibre, etc)

## Conclusion

5 minutes

- **Hand out** Resource 8-3: Word Search. Students can work in pairs or independently to complete the crossword.
- Once students have completed the puzzle, **review** the answers.
- Additionally, for an optional video see Resource 8-4: Hair and Fibre Video. This video will show how hair and fibre evidence is found, collected, and assessed from a crime scene.



**Materials:**

- ▷ Microscope (preferable if each student is able to have their own)
- ▷ Student's hair
- ▷ Paper, pencil, and scissors for each student
- ▷ Resource 8-2 (opened on a screen for students to see)

**Instructions:**

- Each student will remove one hair from their own head and examines it under a microscope. They are to look at:
  - The colour
  - The root (if visible)
  - The cut end of the hair and then again after they have made a fresh cut at the end of the hair
- Have each student draw a small diagram of the hair root and the shaft before and after the end is cut. Refer to Resource 8-2: Three Parts of a Hair and Hair Growth for the expected appearance of pulled versus shed hair under a microscope.
- Have the students record a summary of what they found in their observation.



**Teacher's note:** To add another element to this activity, ask students to bring a hair from their pets at home. These can then be compared to the student's own hair.

## Curriculum Links

**Science: Evidence and Investigation***General Learner Expectations:*

- 6-9: Apply knowledge of the properties and interactions of materials to the investigation and identification of a material sample.

*Specific Learner Expectations:*

- SLE 3: Recognize that evidence found at the scene of an activity may have unique characteristics that allow an investigator to make inferences about the participants and the nature of the activity and give examples of how specific evidence may be used.
- SLE 4: Investigate evidence and link it to a possible source: e.g. by: comparing samples of fabric.

