

# FORENSIC FUN (CSI CHALLENGE)

AN INSTANT MEETING FOR PATHFINDERS  
FROM THE BC PROGRAM COMMITTEE

The CSI Challenge is designed to introduce forensic science to girls and Guiders. There are a wide variety of activities available in the CSI Challenge booklet, so if you want to change up an activity, please check it out for ideas. We have only selected a few for this meeting plan. If you think your girls would be interested in doing more forensic science, there are several activities in the booklet, including the plan for an entire mystery to be solved (great for a sleepover or camp). Doing all the activities in this Instant Meeting will earn Pathfinders the CSI Challenge crest.



*\*originally published in the June 2013 FunFinder.*

## Meeting Plan

- 5-10 min: Gathering: Super Sleuth Maze
- 5 min: Opening Discussion
- 5-10 min: Evidence in a Bag
- 20-30 min: What's That? Round Robin Activities
  - 5-10 min: What's That Noise?
  - 5-10 min: What's That Smell?
  - 5-10 min: What's That Texture?
- 20 min: Fingerprints
- 20 min: Unknown Powders
- 20 min: Guest Speaker
- 5-10 min: Forensic Science in Real Life
- 5 min: Closing

*120 minute meeting. Approximate activity times shown.*

### Program Connections

**Exploring a Theme: Secret Agent 007** 1. Collect Fingerprints; 2. Tour a police station (if doing a field trip in addition to this meeting); 3. Investigate a career in forensics; 7. Design your own maze

**Creating Your Future: Your Dream Career** 3. Invite women to talk about career options when they were your age.

**Exploring a Theme: Everything Comes from STEM** 4. Invite someone in scientific research to talk about their work.

**CSI Challenge**

## Meeting Supplies

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> white paper   | <input type="checkbox"/> a variety of common items with a strong - but not harmful or potent - scent | <input type="checkbox"/> cornstarch               |
| <input type="checkbox"/> printed mazes   | <input type="checkbox"/> opaque cups   | <input type="checkbox"/> salt                     |
| <input type="checkbox"/> pencils, crayons, markers   | <input type="checkbox"/> cotton balls  | <input type="checkbox"/> sugar                    |
| <input type="checkbox"/> wig or doll hair  | <input type="checkbox"/> a variety of common items with distinct textures and/or shapes              | <input type="checkbox"/> measuring spoons         |
| <input type="checkbox"/> scissors  | <input type="checkbox"/> tea towels  | <input type="checkbox"/> black construction paper |
| <input type="checkbox"/> transparent tape  | <input type="checkbox"/> clean drinking glasses  | <input type="checkbox"/> white crayon or chalk    |
| <input type="checkbox"/> non-toxic ink pads  | <input type="checkbox"/> sifted cocoa  | <input type="checkbox"/> eyedroppers              |
| <input type="checkbox"/> red acrylic paint   | <input type="checkbox"/> small spoon   | <input type="checkbox"/> water                    |
| <input type="checkbox"/> mini resealable bags  | <input type="checkbox"/> magnifying glass  | <input type="checkbox"/> small jars               |
| <input type="checkbox"/> safety pins   | <input type="checkbox"/> baking soda   | <input type="checkbox"/> iodine solution          |
| <input type="checkbox"/> a variety of common items that make noise or a recording of common sounds |  | <input type="checkbox"/> dish towel               |
|  |  | <input type="checkbox"/> vinegar                  |
|  |  | <input type="checkbox"/> powder analysis charts   |

## Gathering: Super Sleuth Maze

### Directions

Have the girls design their own maze, then switch with a partner.

Alternately, download a variety of mazes from the internet: <https://www.google.ca/search?q=printable+mazes> or use the maze included in the CSI challenge booklet.

### Supplies

- white paper
- printed mazes
- pencils, crayons, markers

## Opening Discussion

Explain to the girls that you'll be working on the CSI Challenge. Ask them for ideas about what they think forensic science is and how it might be used in a broad context. Television shows often depict forensic science as a way to investigate violent crimes, but use this opening discussion to help the girls understand that forensic science is used to investigate other crimes, as well - from theft and art forgery to accounting fraud and cyber-crime.

## Evidence in a Bag

These make great traders!

### Directions

1. Cut a lock of hair from the wig and tape the cut ends together.
2. Roll your finger on the ink pad then onto paper. Cut out the fingerprint.
3. Put a small drop of red paint onto a piece of paper to represent a drop of blood. Let the paint dry.
4. Put everything in the bag, seal it and add the safety pin to the top.

### Supplies

- wig or doll hair
- scissors
- tape
- non-toxic ink pad  
(washable ink makes for the easiest clean up)
- paper
- red acrylic paint
- mini resealable bag
- safety pin

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## What's That Noise?

### Directions

1. With the girls' backs turned so they can't see what is making the noise, start up each of the noise-makers in turn and ask them to identify what is making the sound.
2. To increase the difficulty, look for items that sound similar but not identical (jingling keys vs. a chain).

### Supplies

- a variety (10-15) of common items that make noise or a recording of common sounds  
(examples: telephone, mixer, bell, computer keyboard, stapler, party noise maker, crinkling plastic, keys)

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## What's That Smell?

### Directions

1. Place one item in each cup and cover with cotton balls so you can't see the item.
2. Then, ask girls to try and identify the item in each cup using only their sense of smell.

### Supplies

- a variety of common items with a strong - but not harmful or potent - scent  
(examples: vanilla, chocolate, black and red licorice, lemon, coffee)
- opaque cups
- cotton balls

## What's That Texture?

### Directions

1. Place one item under each tea towel, so that it is hidden from view, and ask the girls to try and identify what is under the tea towel.
2. Again, using similar but not identical items might make it more difficult for older girls.

### Supplies

- a variety of common items with distinct textures and/or shapes (examples: sandpaper, small distinctively shaped toys, baking supplies, fabrics, tinfoil)
- tea towels

## Fingerprints

Ahead of time, have one of your suspects (a Guider) press her fingers onto a glass, being careful not to smudge the fingerprints that are left. For better fingerprints, have the suspect touch her forehead before touching the glass.

### Directions

1. Have everyone press their own fingers onto the ink pad and then onto a sheet of white paper, being careful not to smudge. Use the magnifying glasses to examine your fingerprints and identify which features you can see (arches, loops, whirls). Make sure all your suspects get their fingerprints taken as well.



Arch



Loop



Whirl

### Supplies

- ink pads
- clean drinking glasses
- sifted cocoa
- small spoon
- transparent tape—not the “magic” invisible kind
- white paper

2. After everyone has taken their fingerprints, gather everyone around and demonstrate how to take fingerprints from a glass.
3. Carefully handle the glass by the rim, the base or the stem so that you do not smudge the fingerprints left by the suspect. Hold the glass up to the light to find where the fingerprints are.
4. Using the small spoon, sprinkle a small amount of cocoa over the fingerprints, making sure they are completely covered. Gently blow off the excess cocoa.
5. Press one end of the tape to the glass on one side of the fingerprint, then stretch the tape across the fingerprint and down onto it. Be careful not to drag the tape across the fingerprint or to press it down onto the fingerprint with your fingers.
6. Lift the tape off the glass and stick it to a sheet of white paper.
7. Ask each girl to compare the fingerprints from the glass to the sample prints provided by the suspects and see if they can guess who dirtied the glass.

## Unknown Powders

Sometimes investigators discover powders or liquids at a crime scene and need to find out what they are. Powders may be illegal drugs; liquids might be fuels or accelerants used in arson. Forensic investigators use chemistry to test unknown powders or liquids and compare the results to known powders and liquids to figure out what the unknown substance is. In this experiment, you test several known white powders, then challenge your partner to identify an unknown one using the test results.

A note on scientific methods: In this experiment, you touch and smell the white powders. It's okay to do that in this case, because all the powders are everyday things that are completely harmless. However, in a real forensic investigation (or any real chemistry experiment) you would never touch or smell an unknown substance - if you don't know what it is, you don't know if it is toxic or corrosive!

### Directions

Complete the appearance, texture and smell activities before opening the vinegar and iodine bottles.

1. Place one-quarter teaspoon (1 ml) of the four white powders on a sheet of black construction paper. Label the powders with the white chalk or crayon.
2. Study the powders with the magnifying glass. Examine what each powder looks like. How would you describe the powder's shape? Does it have large or small grains? Write your observations in the "Appearance" column of the powder analysis chart.
3. Rub a pinch of each powder between your fingers. Describe how each powder feels in the "Texture" column of the chart.
4. Determine if there is a smell to any of the powders. Write your observations in the "Smell" column of the chart.
5. Using the eyedropper, place a drop of water on each powder. Examine what happens. Do the powders dissolve? Is there a reaction? Write your observations in the "Reaction to Water" column.
6. Place one-half teaspoon (2 ml) of each powder in a separate jar. Add 2 drops of iodine to each jar using the eyedropper. Record what happens in the "Reaction to Iodine" column. Iodine should be handled with care.
7. Rinse the jars and dry them thoroughly, then repeat Step 6 using vinegar instead of iodine. Record what happens in the "Reaction to Vinegar" column.
8. Once you have analyzed and recorded the results for each known powder, ask your partner to leave the area. Place one of the four powders onto a new sheet of black construction paper, but don't label it. Call your partner back and see if she can identify the unknown powder using the results in your chart. Then switch jobs and see if you can identify a powder selected by your partner.

### Supplies

- baking soda
- cornstarch
- salt
- sugar
- measuring spoons
- four sheets of black construction paper
- magnifying glass
- white crayon or chalk
- sheet of white paper
- eyedropper
- water
- four small jars
- iodine solution
- dish towel
- vinegar
- pencil or pen
- powder analysis chart (an example follows the instructions)

## Powder Analysis Chart

Powder	Appearance	Texture	Smell	Reaction to Water	Reaction to Iodine	Reaction to Vinegar
Baking Powder						
Cornstarch						
Salt						
Sugar						

## Guest Speaker

Having a guest speaker or field trip is a requirement Pathfinders to complete the CSI Challenge. If you are unable to schedule someone to come speak at your CSI Challenge meeting then make sure and do this part of the challenge on at a later date.

### Ideas for a Speaker

- Invite a local police officer to come in and talk to your group about local laws, law enforcement, street safety or cyber bullying.
- Ask your fire department to do a presentation on arson investigation.
- If your RCMP detachment has a forensics department; they may be able to speak about crime scene investigation and the tools they use.
- Have a lawyer or judge teach your group about the BC legal system and court procedures.

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## Forensic Science in Real Life: The Cold Case of the Iceman

Ötzi the Iceman was found in September of 1991 by a couple hiking in the Alps. They called the authorities thinking they had found a hiker or skier buried in an accident but forensics revealed that he was over 5000 years old! Initially, scientists thought he had perished from exposure to the elements but in June of 2001, forensic investigators found evidence that pointed to another cause of death – Murder!

Ask the Pathfinders to research the story of Ötzi the Iceman and ask some of the following questions. Results can be discussed at the opening of your next meeting.

What role did forensic evidence play in the investigations?

What forensic science techniques did the investigators use?

Was there any controversy about any of the evidence?

Were there any questions about the case that couldn't be answered by forensic evidence?

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## Closing

To wrap up your meeting and the challenge, discuss what you've learned about forensics from the activities. How do you think forensics in real life compare to what we see on television? We only tried one forensic activity at this meeting – how else do forensic scientists discover the answers to their questions?

Do your usual closing.