




FORENSICS



RATIONALE FOR ADVENTURE

This activity will help the Bear Scout learn about being observant, looking for clues, and solving situations with those clues.

TAKEAWAYS FOR CUB SCOUTS

- Learning observation and listening skills
- Following instructions
- Working with a team
- Helping others
- Problem solving
- A Scout is loyal. 

Bear Handbook, page 194

ADVENTURE REQUIREMENTS

1. Talk with your family and den about forensics and how it is used to help solve crimes.
2. Analyze your fingerprints.
3. Learn about chromatography and how it is used in solving crimes. Do an investigation using different types of black, felt-tip markers. Share your results with your den.
4. Do an analysis of four different substances: salt, sugar, baking soda, and cornstarch.
5. Make a shoe imprint.
6. Visit the sheriff's office or police station in your town. Find out how officers collect evidence.
7. Learn about the different jobs available in forensic science. Choose two, and find out what is required to work those jobs. Share what you learned with your den.
8. Learn how animals are used to gather important evidence. Talk about your findings with your den.

NOTES TO DEN LEADER

Meeting 3 will be an outing to a sheriff's office or police station. In advance of the outing, the leader will need to make arrangements with the outing location and confirm the outing plan with families, including transportation and any additional items they need to bring. Make sure a tour and activity plan has been submitted, if required, and activity consent forms are distributed, signed, and collected.

See the Appendix for optional den meeting activities, including openings, gatherings, and closings.

MEETING 1 PLAN

PREPARATION AND MATERIALS NEEDED

- U.S. and den flags
- "Tree cookie" illustrations or examples, if available, for Talk Time (A tree cookie is a sliced portion of a tree stump that indicates the tree's history and how the environment affected its growth. Some educational websites offer a variety of tree cookies, or you might look into available resources through your local council.)
- Fingerprint analysis supplies: balloons, index cards, and washable ink

- Shoe impression: chalk, dark-colored paper
- Chromatography: paper towels or coffee filters, different black pens/markers, scissors, bowl or glass, small amount of water, pencil, and tape

GATHERING

The Detective Game: Two boys are detectives and are sent out of the room. The others choose an object that the detectives will try to discover, such as a piece of furniture, a book, or a button on someone's clothing. The detectives are called back, and they try to solve the mystery by asking each of the other players only three questions. Suggest that they first narrow their search to a specific area of the room and then identify the object.

OPENING

- Conduct a flag ceremony of your choosing that includes the Pledge of Allegiance and, as appropriate, the Scout Oath and Scout Law.
- Bears can sing "The Bear Went Over the Mountain" to fit the theme of being searching detectives.

The Bear Went Over the Mountain

The bear went over the mountain,
 The bear went over the mountain,
 The bear went over the mountain,
 To see what he could see.
 And all that he could see,
 And all that he could see,
 Was the other side of the mountain,
 The other side of the mountain,
 The other side of the mountain,
 Was all that he could see.

TALK TIME (REQUIREMENT 1)

- Carry out business items for the den.
- Allow time for sharing among Cub Scouts.
- Introduce the Forensics elective adventure. Explain what forensics is, how it is helpful to us, and how it is used in the solving of crimes. Let the Bears talk about the shows they watch on TV that deal with forensics and how they feel about what they see. Talk about the different things at a crime scene that can be used as evidence.
- Ask questions about the Detective Game they played such as:
 - Did certain questions make solving the case harder or easier?
 - Could they have solved the case by asking only one question?
 - Would solving the case have been easier if they could have asked more than three questions?
- Discuss fingerprints and how each person's fingerprints are unique. Then compare the use of fingerprints in solving crimes to the use of tree cookies in finding out what happened with a tree. Have the boys look at some illustrations of tree cookies and talk about what tree cookies tell us. Then talk about what fingerprints tell us. Show illustrations of the three basic fingerprint patterns.

ACTIVITIES

◆ Activity 1: Fingerprint Analysis (Requirement 2)

Let each Bear use a balloon or a plain index card to make a fingerprint. (Note: If you plan to use balloons, be sure there are no latex allergies in the group.) Boys can also refer to the *Bear Handbook* for instructions.

Materials:

- Balloons (at least one per boy)
 - Index cards
 - Washable ink
1. Have each boy take a balloon. Before he blows it up, press one of his fingers in the washable ink and then have him carefully press that finger on the surface of the balloon. If Bears would like, they can put more than one fingerprint on their deflated balloons.
 2. Allow the fingerprints to dry for a couple of minutes.
 3. Scouts blow up their balloons, blowing only a small amount of air at a time. Each boy should stop periodically to take a look at the print as it gets larger. Have him tie the balloon before the print is too large and becomes blurry.
 4. Have the boys describe what they see looking at their prints.

◆ Activity 2: Shoe Impression (Requirement 5)**Materials:**

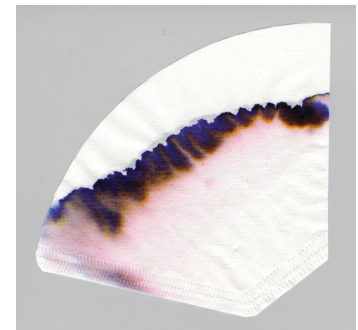
- Chalk
 - Sheets of dark-colored paper (one per Scout)
1. Have each boy color the sole of his shoe with chalk.
 2. Then have him press his shoe on the dark-colored paper.
 3. After Bears are done with their imprints, mix up the papers and see if they can identify which print goes with which shoe.

◆ Activity 3: Chromatography (Requirement 3)

Chromatography is a method to separate the components of a substance so it can be analyzed. The steps for chromatography can be found in the *Bear Handbook*. It may be helpful to review the steps and test the process before the den meeting.

Materials:

- Black, nonpermanent felt-tip pens (have several options as only some will work)
- Coffee filter
- Scissors
- Small glass with water
- Newspaper



You can see through this process that black ink is actually a mixture of colored inks. The different colors have different weights, and they can be separated using this form of chromatography.

CLOSING

- **Akela's Minute:** Seat the den members in a circle on the floor. Spend a few moments reflecting on the activities and the game that they played. Have each boy share one new thing that he learned during the meeting.
- Confirm the location of the upcoming outing. Tell each Scout to think of two questions he can ask at the law enforcement office.

AFTER THE MEETING

- Serve refreshments, if desired.
- Record completion of requirements 1, 2, 3, and 5.
- Work together to clean up the meeting place.
- Prepare thank-you notes for the Scouts to sign at the next meeting.

MEETING 2 PLAN

PREPARATION AND MATERIALS NEEDED

- U.S. and den flags
- Checker puzzle supplies for Gathering: a copy of the instructions for each boy; a bucket of checkers, discs, bottle caps, or similar items
- Materials for Missing Pieces Opening (See Meeting 2 Resources.)
- Powder Analysis Activity supplies: magnifying glass, chalk, salt, sugar, baking soda, cornstarch, black paper, and the chart in the *Bear Handbook* for recording the analysis
- If you choose to do Activity 2, set up a “crime scene” in an appropriate space indoors or outdoors that will allow the boys to look, discover, and analyze what is in the area and solve the “crime.”
- The den leader or a designated adult should go ahead of time to prepare the scene. Depending on the area available, try to mark off a space of 3 or 4 square feet and leave things there that may be considered evidence.
- You can make shoe prints or—with permission from the property owner—drop small items like a gum or candy wrapper, an apple core, or piece of paper with part of a phone number on it. The items could be any kind of small “clues” that might be used to determine who was there.
- You may also invite a professional—a police officer or other individual who has knowledge of working with detection and/or forensics. This person will be able to help with the questions and clues.

GATHERING

Have Bears try the Checker puzzles. (See Meeting 2 Resources.)

OPENING

- Conduct a flag ceremony of your choosing that includes the Pledge of Allegiance and, as appropriate, the Scout Oath and Scout Law.
- Have Bears participate in the Missing Pieces Opening. (See Meeting 2 Resources.)

TALK TIME

- Carry out business items for the den.
- Allow time for sharing among the Scouts.
- Discuss with Bears the need for observation skills when faced with a mysterious situation. Emphasize that each and every piece of a puzzle usually means something.
- Tell boys that they will be visiting a local law enforcement agency during their upcoming outing. Ask them to consider questions they might ask the people who work there. Consider recording the questions to help Bears remember them during the visit.

ACTIVITIES

◆ Activity 1: Powder Analysis (Requirement 4)

Forensics chemists help analyze evidence that is found at a crime scene. Explain to the boys how powder analysis is done. (See the instructions in the *Bear Handbook*.)

Materials:

- Sheets of black paper (two per boy)
- White chalk

1. Have each boy use the chalk to list the following items on his paper: sugar, baking soda, salt, and cornstarch.
2. Put a small amount of each item on the paper next to its name.
3. Using the chart in the *Bear Handbook* or on a separate sheet of paper, have each boy analyze the substances and fill out the chart.
4. When this is done, bring Bears together and discuss their findings.
5. Now give each boy a new piece of black paper and put each of the substances on the paper without labeling them. Have Bears try to identify each substance. Discuss how they were able to determine what each substance was.

◆ Activity 2: Crime Scene Detection (Optional)

The idea of this activity is to have the boys go to an area that has been marked off and look for clues that could be used as evidence. This gives boys the opportunity to use the knowledge they gained about collecting evidence and the importance it plays in solving questions.

1. Have Bears gather around the area that you have marked off. Explain that they will be collecting clues to try determining who was in the area.
2. Ask the boys to consider the following:
 - a. Has someone or something recently passed through this area?
 - b. Was it a human or an animal?
 - c. Male or female?
 - d. Adult or child?
 - e. Can we figure out what they were doing there?
 - f. If they find an apple core (or other item), was it dropped by the same person or someone else?

As the boys discover the clues, help them analyze each one to solve the mystery. For instance, if they see a shoe print, ask them to look at it. Is it a small shoe, a larger shoe, a sneaker, etc.? They might find a gum wrapper; is it a kind of gum that an adult might chew, or is it bubble gum (which would suggest they're looking for someone younger)?

If you have a visitor (forensics professional, detective, or police officer), have him or her talk with the Bear Scouts about what they found and point out what they might have missed. Discuss how what they missed could be important information used in solving crimes.

CLOSING

- Do the Case Solved Cheer. Split the boys into two groups. When the leader points a finger at the first group, they will say, "Case." When the leader points a finger at the second group, they will say, "Solved." Do this three times, getting louder each time until all the Scouts say in unison, "Case solved!"
- Review details for the upcoming outing in Meeting 3. Make sure all Scouts and their families know the plans.

AFTER THE MEETING

- Serve refreshments, if desired.
- Record completion of requirement 4.
- Work together to clean up the meeting place.
- Prepare thank-you notes for the Scouts to present at the den outing.

MEETING 2 RESOURCES

CHECKER PUZZLES

Think of the puzzles below as crime scenes. The Scouts must collect the “evidence” and then analyze it to solve the “crime.” Note that a row does not always need to be horizontal and checkers may be stacked.

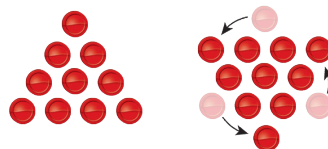
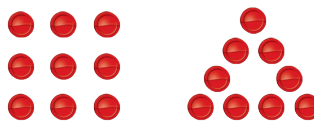
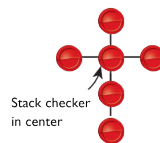
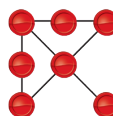
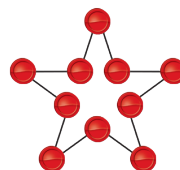
Materials:

- Copy of instructions for each boy
- Bucket of checkers, discs, bottle caps, or similar items

Puzzle Setups

1. Place 10 checkers in five rows with four checkers in each row.
2. Put seven checkers in four rows with three checkers in each row.
3. With six checkers arrange two rows, having four in each row.
4. Put nine checkers in three rows with three checkers each. Now, rearrange the nine checkers to form rows of four checkers per row.
5. Upside-down pyramid: First, arrange 10 checkers to form a triangle with four in the bottom row, three in the second row, two in the third row, and one on top. Now, moving only three checkers, turn the triangle so that it points down instead of up.

Solutions



MISSING PIECES OPENING

You will need a puzzle with just a handful of pieces, but enough to give one to each person at the meeting (Scouts, den chief, leaders, etc.). This can be a simple child’s puzzle or one you make from cardboard with a picture glued on and cut out into puzzle pieces.

Some of the puzzle pieces should be put together on a table before the meeting with the missing sections spread out so it is very obvious where the others go. Then the den chief or denner hands each person a piece. Ask Bears to look at the puzzle and see if they can tell what the picture is. Then have them go forward, either one by one or as a group, and insert their pieces into the puzzle. After the boys are finished, the leaders should do the same.

Now that the puzzle is complete, remind the boys that until all the pieces were in the right place, they could not see the entire picture.

MEETING 3 PLAN (Den Outing)

PREPARATION AND MATERIALS NEEDED

- Plan well in advance for your visit to a local sheriff station, police station, or forensics lab. When you contact the location, explain the reason for the visit and ask about the possibility of having hands-on activities.
- As an alternative, a professional from the location could visit the den meeting as a guest. However, the excitement of an on-site tour will reinforce the learning experience for the boys.
- Review any questions the Scouts want to ask to make certain they are appropriate.
- Confirm that a tour and activity plan has been submitted, if required, and that transportation to and from the event is in place. Secure signed activity consent forms.
- Unit den leader should have in possession (if required by local council practices) the tour and activity plan and a copy of the *Guide to Safe Scouting*.

GATHERING

- Remind the boys of the importance of staying together and being on their best behavior.
- Use the buddy system.
- Once you arrive, identify where restrooms are located.

OPENING

- Most government facilities will have a flagpole available. Your den may wish to hold a simple flag ceremony. You may also want to invite members of the group you are visiting to take part in this ceremony.
- Ask Scouts to name points of the Scout Law they will demonstrate during the outing.

TALK TIME

- Carry out business items for the den.

ACTIVITIES

◆ Activity 1 (Requirements 6, 7, and 8)

- Visit a local sheriff or police station or a forensics lab.
- Have the Scouts ask the questions they prepared.
- Ask the professional you are visiting to share about the different jobs available in the forensics field.
- Discuss the role animals can play in forensics.

CLOSING

- Plan a cheer in advance to give to helpers at the tour site.
- Have Scouts give the thank-you notes prepared in advance.

AFTER THE MEETING

- Serve refreshments, if desired.
- Record completion of requirements 6, 7, and 8.

Upon completion of the Forensics adventure, your Bears will have earned the adventure loop shown here. Make sure they are recognized for their completion by presenting the adventure loops, to be worn on their belts, as soon as possible according to your pack's tradition.



NOTES