Assembled Den Meeting Plan – BEAR (3rd Grade)

This ***Assembled* Den Meeting Plan** combines ideas from Bear Den Meeting Resources found at Scouting.Org or from the requirements themselves, into the parts of a quality Den Meeting, which are **Preparation** (plan + collect materials needed), **Gathering** (something for early arrivals to do), **Opening** (a ceremony to start), then **Activities** (an Activities Intro chat, followed by a series of activities, ideally alternating quiet and energetic fun), **Closing + Recognition** (ceremony), and **After the Meeting** (follow up) …

Bear – 3rd Grade

Forensics



A "Science" Adventure

ELECTIVE (2 "electives" are needed to earn the Rank of Bear)

Snapshot of Adventure. Everywhere you go, you leave behind clues: fingerprints on your juice glass, DNA on your toothbrush, bits of fabric on your favorite chair, and footprints in your yard. Criminals leave behind clues, too. Forensic scientists study those clues to help law enforcement officers solve crimes. Forensics is all about using science to answer questions about crimes (and other things that have happened). In this Adventure, you will practice some skills of a forensic scientist: analyze a fingerprint, a footprint, the contents of ink, and some mysterious white powder. Grab your magnifying glass and start detecting!

The QR Code above takes you to scouting.org/cub-scout-adventures/forensics/

This Den Meeting Plan adapts Activity ideas from that Scouting link with other fun, simple, easy ideas. For more, see the Adventure Resources at the end of this Plan for a list of the suggested Activities at that link.

Requirements from the Bear Handbook

1. **Explore the term "forensics" and how it is used to help solve crimes.**
2. **Analyze your fingerprints.**
3. **Make a shoe imprint.**
4. **Do an analysis of four different substances: salt, sugar, baking soda and cornstarch.**
5. **Learn about chromatography and how it is used in solving crimes.**
6. **Find out how officers collect evidence.**

Meeting Plan

Does this take one Meeting to complete – or more? It's up to the Parents / Leaders! As written, you can do this in a single session, but if you do a visit to (or visit from) a law enforcement agency, you might do some parts on the visit and some in a den meeting. Add games for fun!

PREPARATION (and materials needed): Read the Forensics adventure in the Bear Handbook.

- As always, decide whether you like any of the "Activity Card" options for the Requirements or the suggested activities below or some other way to deliver this Adventure.
  - When you decide, check the materials and supplies you need.
- If you arrange a visit to a police station or sheriff's office or other law enforcement agency, share where and when you're meeting with all families.
  - Many law enforcement agencies have community officers who do group programs on topics like this.
  - Also consider contacting a school security guard – they have some law enforcement experience.

GATHERING: A "gathering" activity is to keep Scouts occupied as the rest of the den arrives. *What you do will depend on your location and leadership resources*.

- Use gathering time to connect with adults and "share the leader load": everyone can help with something! A good approach is for different parents (or teams) to share the "lead" of parts of the Adventure below.

OPENING: (Parent leader: _____) An Opening ceremony says, "we've begun" and helps set the tone.

- Maybe: a simple ceremony you like that includes the Pledge of Allegiance and the Scout Oath and/or Law.

ACTIVITIES (See also other Activities linked at Adventure Resources – use those if you like them):

◆Activity Intro: (Parent leader: _____) As you move into Activities, have some "talk time" where you (1) discuss today's Adventure activities (what you'll do, how you'll do it – share in a way to get the Scouts excited) and (2) let each of the Scouts share "what's new" with them and get to know each other better.

◆Activity 1: What Is Forensics? (Requirement 1: "*Explore the term "forensics" and how it is used to help solve crimes.***")** (Parent leader: _____)

- Everywhere you go, you leave behind clues: fingerprints on your juice glass, DNA on your toothbrush, bits of fabric on your favorite chair, and footprints in your yard.
  - Criminals leave behind clues, too.
  - Forensic scientists study those clues to help law enforcement officers solve crimes.
- Forensics is all about using science to answer questions about crimes (and other things that have happened).



- The word "forensics" comes from a Latin word that means to make public.
  - Forensic scientists make information public that was hidden in plain sight.

◆Activity 2: Fingerprints (Requirement 2: "*Analyze your fingerprints.***")** (Parent leader: _____)

The plan below adapts the substance of Fingerprint Fun. See https://cubscoutideas.com/8152/kids-fingerprint-activity/ for a way to do this with pencil graphite and clear tape instead of ink (which is messier).

- Supplies needed:
  - Fingerprint Card found in Fingerprint Fun or the simpler one in the Bear Handbook
  - Fingerprint Patterns found in Fingerprint Fun or the Bear Handbook
  - White cardstock or paper
  - 2 pads of dark ink, black, blue or red work best
  - Baby wipes
  - Magnifying glasses
- Let Scouts know that fingerprints are skin patterns on the ends of your fingers and thumbs.
  - Their fingerprints are different from those of everyone else on earth.
  - Even identical twins have different fingerprints!
  - When we touch things, we always leave fingerprints even if we cannot see them!
  - That's because our skin produces sweat and oil.
- Explain that because everyone has unique fingerprints, law enforcement officers can use them to figure out who was at a crime scene.
  - Using the Fingerprint Pattern worksheet or the Bear Handbook, show Scouts the fingerprint patterns and point out differences.

- Tell Scouts that now they will get to investigate their own fingerprints.
  - Make sure Scouts' hands are clean and dry so ink can stick to fingers.
- Demonstrate how to take a fingerprint.
  - Extend one finger at a time while tucking under the other four fingers.
  - Roll the finger on the ink pad so the entire fingerprint pattern area is evenly covered with ink.
  - The ink should cover from one edge of the nail to the other and from the crease of the first joint to the tip of the finger.
  - Try not to push too firmly on the pad, you don't want the finger to have too much ink.
  - Roll each finger from nail to nail in the appropriate space on fingerprint card.
  - Make sure to lift each finger up straight up after rolling to avoid smearing and smudging.
- Have each Scout practice fingerprinting a finger or two on a piece of scratch paper until they feel they have the technique down.
  - Give each Scout a fingerprint card to take their "real" fingerprints.
- Once each finger is printed give Scout a baby wipe to clean the ink off.



- Give each Scout a magnifying glass and a fingerprints patterns sample.
- Have each Scout share with a buddy what patterns they see in their fingerprints.
  - Do the ridges form an arch, a whorl, or a loop? Is the pattern short or tall? Does it lean one way?
  - How does it compare with the prints of others today?
- You can also use balloons, since when you blow up the balloon it magnifies the prints:
  - Give each Scout a balloon.
  - ***Before*** they blow it up, they should place a finger in the washable ink and then carefully press that finger on the surface of the balloon.
  - If your Scouts would like, they can put more than one fingerprint on their deflated balloon.
  - Allow the fingerprints to dry for a couple of minutes.
  - Have your Scout blow up their balloon, blowing only a small amount of air at a time.
  - Have your Scout should stop periodically to take a look at the print as it gets larger.
  - Tie the balloons before the print is too large and becomes blurry.
  - Let your Scout describe what they see looking at their prints.

◆Activity 3: Tracking Footprints (Requirement 3: *"Make a shoe imprint."*) (Parent leader: _____)

The plan below adapts the substance of Muddy Shoe from the Adventure Resources.

- Determine the best place near your meeting location to make a shoe impression in the dirt.
  - Avoid rocky or hard surfaces.
- Ask Scouts if they have ever walked outside in the snow or mud or sand and looked behind them?
  - What did they see?
- Explain to Scouts that just like our fingers have prints our shoes have prints.
  - Law enforcement officers will look for shoe prints and will then make an impression.
  - They can tell how much a person weighs by how deep the impression is in the mud or soft ground.
  - They can find the brand and size of the shoe.
  - They can tell how tall the person is by measuring the length of the shoe.

- Today they will be looking more closely at their shoe impression.



- Bring Scouts to the pre-determined spot and demonstrate how to make a shoe impression by firmly pressing your foot into the ground and the lifting straight up to avoid distorting your impression.
  - Have Scouts make their shoe impressions.
- Have Scouts observe their impression.
  - Ask what they notice about this impression?
  - Is there a difference in how deep their impression is versus yours?
  - Do they notice patterns or cracks?
- Have the Scouts measure their shoe.
  - Compare the size of their shoe to the impression.
  - Is the size the same?

🔶Activity 4: What Is It? Scientific Analysis! (Requirement 4: *"Do an analysis of four different substances: salt, sugar, baking soda and cornstarch."*) (Parent leader: _____)

The plan below adapts the substance of In the Kitchen from the Adventure Resources.

- Supply List
  - Substance Observations worksheet found in In the Kitchen or the Bear Handbook.
  - Pen or pencil, one for each Scout
  - ½ sheet black laminated paper split into 4 quadrants for each Scout. Lamination keeps the paper from soaking through and enables easier clean-up. If you can't laminate, use a sheet protector folded in half. Or use dark paper muffin cups or trays that have separate containers for each powder.
  - Magnifying glass, one for each Scout
  - Eye dropper/pipettes, one for each Scout (straws would work too to put a few drops in each powder)
  - Toothpicks, one for each Scout
  - 1/4 teaspoon of four powders (salt, sugar, baking soda, cornstarch) for each Scout (you could use others, like baking powder, flour, sugar, powdered sugar))
  - Cup of water and cup of vinegar, enough to share
- Explain to Scouts that forensic chemists do tests to identify unknown substances.
  - For example, they might add a chemical to the substance to see how it changes.
  - They will now get to analyze some white substances that look a lot alike to see how we can tell them apart like a forensic chemist.
- Give each Scout a black quadrant paper or other container(s) for powers, a Substance Observations worksheet (or their Bear Handbook), and a pencil.
- Tell Scouts that you will be putting a little bit of white powder on their black paper or in their containers. You'll repeat this for each powder. Have them begin looking at the substances with their naked eye.
  - Ask what difference do you see? What similarities do you see?
  - Have them share observations.
- Give each Scout a magnifying glass. Have them look at the substances again.

- Ask what difference do you see? What similarities do you see?
- Have them share observations.

- Have each Scout feel each substance between their fingers.
- Ask what it feels like. What differences do you feel?
- Have each Scout smell each substance.
- Not too close. Ask what does it smell like?
- Give each Scout a toothpick.
- Tell them to split each substance in half using the toothpick.
- Give each Scout an eyedropper/pipette or straw.
- Let each Scout put a drop or two of water on each of their substances.
- Ask what happened? Did the appearance change? Was there a chemical reaction?
- Let each Scout put a drop or two of vinegar on each of their substances.
- Ask what happened? Did the appearance change? Was there a chemical reaction?



◆Activity 5: What Is Chromatography? (Requirement 5: *"Learn about chromatography and how it is used in solving crimes."*) (Parent leader: _____)

The Adventure Resources offers an Activity Card of What Color Is It? – adapted below:

- Supply List and Preparation:
  - Coffee filters, cut into 1" strips.
  - Ruler and Scissors for cutting.
  - Assortment of nonpermanent felt-tip markers of different brands such as Flair, Sharpie, and Color Scents. Test out each of the markers to ensure that they will work for the experiment. Not all markers will separate.
  - Pencils
  - Glass of water for each Scout
  - Paper plates, one for each Scout
- Explain that chromatography is the process forensics scientists use to separate different parts of a mixture.
  - By separating the parts, they can identify drugs, DNA, and poisons.
  - Most chromatography is done in laboratories with expensive equipment, but today we will get to do a simple chromatography investigation using felt tips marker, coffee filters, and water.
- Give each Scout a strip of pre-cut coffee filter and have each Scout choose a marker.
  - Ask Scouts to label one end of the coffee filter with the color and brand of marker.
  - Fold the labeled end so that it fits over the glass.
  - Have each Scout draw a horizontal line across the middle of their coffee filter strip.
- Put the strip in the glass of water, making sure the line the Scout drew is above the water.
- Now watch what happens.
  - The coffee filter will slowly absorb water, which will rise toward the top of the strip.

- As the water rises, it will carry along components of the ink.
- Lighter components will travel the longest distance; heavier components will not travel very far.

- When the water nearly reaches the top of the strip (or when you don't see any more changes happening), take the strip out of the water and set it on a paper plate to dry.
  - Repeat with several pens. Compare the results to see how similar or different the inks you used are.



Activity 6: Collecting Evidence (Requirement 6: "*Find out how officers collect evidence.*") (Parent leader: _____) The Adventure Resources offers an Activity Card of Collect the Evidence, which assumes you'll get a local law enforcement agency to explain how they use forensics to solve a crime. That would be great!

But if you don't line up a visit, maybe do the following:

- Discuss that a person leaves evidence of their presence everywhere they go.
  - Forensic science is based on the principle that a person always brings something to a crime scene and also always leaves something behind – fingerprints, footprints, hair, blood, DNA, fibers, and more.
- Forensic science uses science to solve legal issues within the civic and criminal justice systems.
  - Forensic scientists collect physical and chemical evidence from crime scenes and then analyze the evidence in a laboratory.
  - Some laboratory tests can be done quickly, but others can take months.
  - They use principles and techniques from biology, chemistry, physics, and other scientific areas to provide evidence and sometimes even testify in court.



  - Forensics can involve all kinds of scientists (e.g., forensic anthropologists, forensic pathologists, forensic toxicologists, forensic entomologists) and can even be used by archaeologists to learn more about ancient peoples!
- In collecting evidence, there are some critical rules to follow:
  - Take pictures and video of everything.
  - Don't move anything unless it is absolutely necessary (like to administer first aid).
  - Don't contaminate the scene with your hair or blood or DNA or fibers!
  - Document everything relevant – investigators keep notes, then put them together into reports with photos and more. Measure everything relevant.
  - Safeguard items for further inspection, in marked clean plastic bags.
  - Keep a clean "chain of custody" of items.

◆Activity 7: [*OPTION*: Fun Game We Like (Parent leader: _____):



If this meeting is too dry or the games in the Activity Cards in Adventure Resources don't resonate with you as something your Scouts will like, you can turn up the "Fun Meter" and play a game or some other Fun Activity you like. Some ideas here. NOTE: the fun game doesn't' need to be connected to today's Adventure topic – it can just be FUN!

CLOSING: A Closing ceremony ends the meeting and highlights the achievements. A Den leader can reflect on the meeting + praise Scouts for specific good actions today. Thank every Parent who helped.

- If you have them, award Loops to all who completed the requirements. Maybe end with a "Living Circle".

AFTER THE MEETING: Clean up as needed. Share refreshments if that's what you like.

Upon completion of this Adventure, your Bears will have earned the Adventure Loop for it. 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. Text or email all Den parents to share these resources for future reference and so parents of Scouts who could not attend may complete this Adventure from home.

ADVENTURE RESOURCES: Den Meeting Resources and "Activity Card" options for this Adventure are found at https://www.scouting.org/cub-scout-adventures/forensics/. Those resources include the Snapshot of Adventure (included above), a "Safety Moment" of tips and links about doing this safely, and, for each Requirement, one or more "Activity Cards" you can click on for an activity to complete the Requirement.

Those "Activity Card" pages are linked below – along with the "Key" scoring of (a) whether the Activity must be done Outdoors, may be done Indoors, or involves Travel; (b) how much Energy Scouts will generate; (c) How "Supply Intensive"; and (d) Prep Time – those last 3 categories are scored on a 1 to 5 scale, with 5 being "most". Note that while that website page says "Choose one of the following" before the "Activity Cards", what that means is "Choose one of the following – *or do some other activity that will meet the Requirement*", because the Requirements are required, not the Activity Cards. In the Assembled Den Meeting Plan above we have adapted some of what's below or other ways to complete the requirement in easier ways.

1. **Explore the term "forensics" and how it is used to help solve crimes.**
   - Solve the Mystery (Indoor; **3** of 5 Energy; **3** of 5 Supplies; **3** of 5 Prep Time)
   - Visit an Expert (Travel; **2** of 5 Energy; **1** of 5 Supplies; **5** of 5 Prep Time)
2. **Analyze your fingerprints.**
   - Are You There? (Indoor; **2** of 5 Energy; **5** of 5 Supplies; **5** of 5 Prep Time)
   - Fingerprint Fun (Indoor; **2** of 5 Energy; **3** of 5 Supplies; **2** of 5 Prep Time)
3. **Make a shoe imprint.**
   - Gumshoe (Indoor; **2** of 5 Energy; **3** of 5 Supplies; **2** of 5 Prep Time)
   - Heavy Shoes (Indoor; **2** of 5 Energy; **5** of 5 Supplies; **5** of 5 Prep Time)
   - Muddy Shoe (Outdoor; **3** of 5 Energy; **1** of 5 Supplies; **2** of 5 Prep Time)
4. **Do an analysis of four different substances: salt, sugar, baking soda and cornstarch.**
   - In the Kitchen (Indoor; **2** of 5 Energy; **4** of 5 Supplies; **3** of 5 Prep Time)
5. **Learn about chromatography and how it is used in solving crimes.**
   - What Color Is It? (Indoor; **2** of 5 Energy; **4** of 5 Supplies; **3** of 5 Prep Time)
6. **Find out how officers collect evidence.**
   - Collect the Evidence (Travel; **2** of 5 Energy; **1** of 5 Supplies; **5** of 5 Prep Time)