



# Marvelous Mystery Badge

## Marvelous Mystery Badge Requirements

Girls will learn about deduction, problem solving, and detective skills through chemistry magic, a trail mystery, decoding secret messages, or mystery prints, pictures and games. Girls will have fun with brain teasers, science experiments, mystery games, crafts and more.

**To earn the Marvelous Mystery Award, Junior Girl Scouts must complete 6 activities .**

1. Solve the following five number mysteries: **Attention all detectives:** We have a missing number. He is even. He has an older sister who is 4. Can you identify him. **Attention all detectives:** A number is missing. It was last seen around the middle of the number line. It has five tens, is odd, and is smaller than fifty-three. Who is it? **All cars be on the lookout for a missing number:** His hundred's place is even and between six and ten. His ten's place is seven. His one's place is an odd number less than three. Who is it. **Attention officers:** Pick up a blue car doing twenty miles over the speed limit in front of the school. How fast is he going? **There has been a robber at the bank!:** Attention all squads. The robber got two hundred dollar bills, one twenty, two tens, and one five. How much is missing?
2. Solve a science mystery. Here are some suspects: **Soda Fountain:** Baking soda is an important ingredient in the preparation of cookies, biscuits, and cakes. It is also important in making a "soda fountain." Pour two cups of water into a tall bottle. Dissolve one tablespoon of baking soda and a few drops of liquid detergent in water. Pour in a few tablespoons of vinegar. What happens? The chemical reaction produces tiny soap bubbles. In cooling, the gas bubbles in the dough make the final baked goods lighter in texture. **Paper Plate Puzzle:** Cut a one-quarter slice out of a paper plate, set the plate on a table and role a marble around the plate's rim. Which direction will the marble go when it gets to the cut edge? Can you explain why? **Coffee Filter Chemistry:** What color is black ink? You might change your answer after this science mystery. Cut a strip of coffee filter paper. Put a drop of ink near one end and allow it to dry. Staple or tape a pencil to the opposite end of the strip from the dot. The water is absorbed by the paper and climbs upward. When the water reaches the spot, it dissolves the ink and carries it up the paper. As the water continues to rise, some of the components in the ink are deposited at various distances from the original spot in effect taking the ink apart.
3. Learn how a detective interviews people by asking who, what, where, when, and how. Find out why a journal or diary is valuable to a detective's work.
4. Learn how to fingerprint. Fingerprint yourself and others. Do you notice any similarities or differences? Do a fingerprint craft.
5. Play three cooperative games. Learn why cooperation is so important to the games and solving mysteries.
6. Asking questions and finding answers is also the job of scientists. Practice these skills playing this game: One person thinks up an action or an event and the resulting evidence. She describes only the evidence to the other players. The players try to discover the action or event by asking questions that can only be answered "yes" or "no." Example: Evidence there is a small pile of dried twigs next to a tree. Action: A bird building a nest.
7. Invite someone who is a police detective or a private investigator to talk to your group. Find out what education/training is necessary. What is the average salary? What is an average work day like? Any other questions you would like to ask?

8. With the help of the police detective or private investigator, dust for and lift a fingerprint. Find out how to measure a footprint and tire track. Find out how this type of evidence is used in solving crimes.
9. Make four rubbings of something raised or engraved. Some ideas for rubbings are carved wood, a coin, an iron gate design, a leaf, a brick, or bark.
10. Play this "Murder Mystery" game: Use as many playing cards as there are players including the ace of hearts and the two of clubs. (Must have at least four players.) Shuffle the cards and pass one out to each player. Do not tell anyone what card you have. The person holding the ace of hearts is the "murderer," the detective is holding the two of clubs. The detective turns off the lights and leaves the room. Everyone moves around the darkened room. The "murderer" gently taps a victim on the head. The victim screams and falls to the floor. The detective enters the room and turns on the lights, everyone freezes. The detective questions the players who must tell the truth, except for the "murderer" who must make up an answer to every question. The game ends when the detective correctly identifies the "murderer." OR host a Murder Mystery Party. OR follow a mystery trail.