

Name:	Monica Cooper
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Guiding Questions

- Compare this STEM Gem to a typical student in your class. What set the STEM Gem on a path towards a science career – i.e., what was different about this STEM Gem’s experiences?
- Which of the experiences and/or attributes listed in the eight “Crystals” chapters at the end of the book are demonstrated by this STEM Gem’s story?
- What takeaways do you hope your students would get from this STEM Gem’s story?
- How can we support all of our students to have similar experiences or develop similar attributes? In your classroom, how can you:
 - Be an exceptional teacher? Promote exceptional teaching in your school? (chapter 1)
 - Foster/support summer activities for students? (chapter 2)
 - Promote students’ curiosity and passion? (chapter 3)
 - Help students recognize their talents and interests? Recognize and avoid stereotypes? Be assertive? (chapter 4)
 - Develop students’ work ethic? Support students’ hobbies? (chapter 5)
 - Support students’ risk-taking? Help students learn from failure? (chapter 6)
 - Develop students’ vision? Provide role models and mentors for students? (chapter 7)
 - Highlight, critique, and resist gender (and other) bias in school, science, and society? (chapter 8)

STEM Gem Overview

Directions: Complete the following section using information about a “STEM Gem” from the *STEM Gems Book*

Career:
Forensic Scientist (latent fingerprints and trace evidence; DNA isolation and analysis; drug chemistry; ballistics and tool marks; digital evidence/document recovery)
Schooling/Certification Requirement(s):
B.S. in Forensic Technology; M.S. & Ph.D. in Chemistry
Name:
Karen Olson
Key experiences:

<p>Dr. Olson credits two female grade school science teachers with getting her interested in forensics. She also had one freshman lab professor and one organic chemistry professor encourage her to expand her studies beyond forensics into chemistry.</p>
Challenges faced:
<p>She had to work on overcoming a fear of public speaking, which she did through experience and practice. Her advisor helped her make the slides for her presentation, and made her practice over and over again while telling her different tips and tricks so she would give a smooth talk.</p>
Accomplishments:
<p>Earned “best talk” award the first time she had to give a presentation about her research in front of her peers. Works as a forensic research science for Defense Forensic Science Center and other Department of Defense organizations.</p>

STEM Gems Activity for Students Planning Guide

Directions: Find a simple activity for students to engage in to introduce them to this STEM Gem’s career and/or foster the types of learning experiences that were important for this STEM Gem. Describe the activity below.

Name of activity:
Mystery Activities for the Classroom: Fingerprinting
Adapted from:
http://classroom.synonym.com/mystery-activities-classroom-8460924.html
Rationale for this activity: <i>Why did you chose this activity? Will it help students learn about the career of the STEM Gem? Will it address any of the actionable steps from the “Crystals” chapters? What do you hope students will get out of this activity?</i>
Fingerprint analysis has been used to identify suspects and solve crimes for more than a hundred years. It continues to be a cornerstone of forensic science, and a very important tool for law enforcement today. This activity gives students experience gathering evidence and making inferences about that evidence, which is a quintessential aspect of science in general.

Time needed:
30 minutes
Materials:
Pencils, red sharpies, white paper, and clear tape. "FBI Fingerprint Guide" which shows students the seven fingerprint patterns, which include the loop, the double loop, central pocket loop, tented arch, plain arch, plain whorl, and accidental.
Directions for teachers:
Have one student remove and hide an object, such as a stapler or paperweight, from the classroom. Make copies of the fingerprints of the "thief" to distribute later. Instruct students to search the room and identify what's been taken. Query them as to how they would investigate the crime. Discuss the use of fingerprints in solving crimes. Rub the tip of your pencil over a piece of paper and touch the paper with your finger. Press your fingertip on a piece of tape and stick the tape on the paper, showing the fingerprint. Have students use this technique to make two sets of their own fingerprints. Return the "stolen" item to the class and tell the students you have lifted the thief's fingerprints from the object. Divide the students into two groups. Have each group use the guide to match the prints you lifted to the fingerprints of the student who took the paperweight. (Each student gets to keep one copy of their fingerprints, while the other is given to the opposing group for the analysis part.)
Directions for students:
One student removes and hide an object, such as a stapler or paperweight, from the classroom. Students provide examples of how police officers / detectives solve a crime. Students watch the teacher demonstrate a technique to "lift" fingerprints and make two sets of their own fingerprints. Students keep one copy of their fingerprints, and give the second copy to the teacher. Students are broken up into two groups and given copies of the other students' fingerprints by the teacher. Have each group use the guide to match the prints you lifted to the fingerprints of the student who took the paperweight.
Post activity discussion points:
<ul style="list-style-type: none">- <i>How can a person avoid leaving fingerprints at a crime scene?</i> Wear gloves or wipe down objects that they touched.- <i>How are fingerprints formed?</i> Fingerprints are formed when a person is developing inside the womb: pressure on the fingers from the baby touching their surroundings create the ridges that make the patterns of a fingerprint.