

Sleuth Sciences

Mystery, illusion, science, and technology are our tools as you join this team of undercover agents traveling around the world to fulfill secret missions. Explore electronics, global tracking, fingerprinting, physics, chemical reactions, and sharpen your logic skills through analysis and problem solving. Students will explore a variety of science and engineering themes to unravel the mysteries of compression waves, the science of SCUBA, light-producing chemical luminescence, convection with model hot air balloons, and alarm systems with basic electrical circuits. Each class includes multiple hands on activities, labs, and interactive investigations to complete the week's challenge.

Week 1: Analysis - Mapping and Voice Modification

- Each student learns to use Google Earth to view mission locations and create markers to record information. Introduce geographic coordinates (latitude and longitude) and how to use them.
- Build a listening device to learn about speakers and microphones and how they convert sound waves into electrical signals.

Week 2: Data Analysis - Fingerprint Identification and Voice Analysis

- Students learn about and analyze voice prints (linear spectrographs)
- Students use digital microscopes to analyze fingerprint samples and compare against a partial print and learn to identify fingerprint characteristics

Week 3: Chemistry - Chemiluminescence

- In this mission agents will hone their chemistry skills by creating a glow stick using a chemical reaction to induce chemiluminescence.
- We'll learn about atoms, molecules, chemical reactions and how the light is produced by these chemicals.

Week 4: Chemistry - Laboratory Testing

- Agents learn laboratory testing techniques while trying to determine the identity of a terror suspect by performing chemical analysis on simulated substances.
- Students practice data analysis by reviewing intelligence reports.

Week 5: Physics - Compression Waves

- Students understand the need to complete a daring rescue of a fellow agent and explore how our lungs and SCUBA works by creating a model lung
- Students then transform their model lungs into air cannons and learn about compression waves to create a diversion and complete the rescue mission

Week 6: Physics - Convection

- Build and launch hot air balloons constructed using tissue paper and a heat engine
- We will learn about convection and the relationship between density, volume and temperature – then apply the concepts to fly our balloons

Week 7: Electronics - Alarm System

- Agents will test their skills in uncovering clues, collect evidence and escaping without detection by building and setting up an alarm system.
- Agents will learn about electronics and circuits. We will create a circuit and analyze how the components work together to create the alarm circuit.

