

Integrating Science and Mathematics Using the Hook of “CSI”

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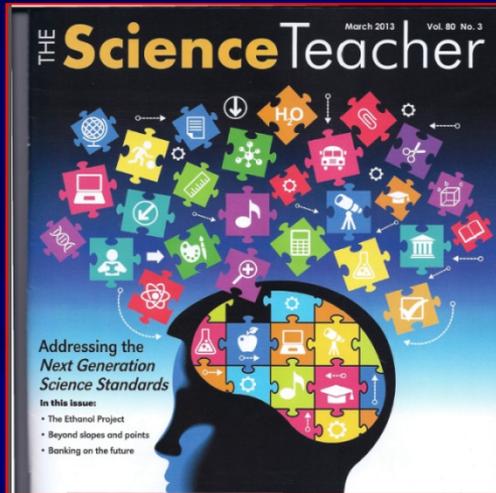
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www.forensicscience-ed.com

Why
Teach Forensic
Science In
School?



How does FS address NGSS?



Crosscutting Concepts

- Patterns
- Cause and Effect
- Scale, Proportion and Quantity
- Systems and System Models
- Energy and Matter: Flows, Cycles, and Conservation
- Structure and Function
- Stability and Change

Science and Engineering Practices

- Ask Questions and/or Define Problems
- Develop and Use Models
- Plan and Carry Out Investigations
- Analyze and Interpret Data
- Use Mathematics and Computational Thinking
- Construct Explanations and/or Design Solutions
- Engage in Argument From Evidence
- Obtain, Evaluate, and Communicate Information

The Capstone Science Class

- Models the Process of Problem Solving
- Integrates all Science Areas
- Connects to Real World Science
- Practices Critical Thinking Skills
- Increases Enrollment in Science
- Connects to Community



Integration Into Subject Areas

Chemistry

Fibers
White Powders
Explosives
Gunshot Residue
Chromatography

Biology

Genetics
Anthropology
Serology
Fingerprinting
Hairs
Autopsy
Entomology

Mathematics

Earth Science

Soil
Weather

Physics

Ballistics
Blood Spatter
Accident Investigation
Analysis of Glass

Integration: Physics & Biology & Chemistry



Mathematics in Forensic Science

■ Chromatography

- Retention Factor
- Ink and Watercolor

■ Blood Alcohol Content

- Calculate BAC using Widmark Formula

■ Bloodstain Patterns

- Vertical Drops Graph
- Impact Angles
- Stringing a bloodstain

■ Glass Analysis

- Density of glass
- Refractive Index (using Snell's Law)

Mathematics in Forensic Science

- DNA Analysis
 - Calculate probabilities
- Crime Scene Sketch
 - Drawing to scale
- Accident Investigation
 - Skidmark analysis
 - Yaw analysis

Sample Content: Semester Class

- History & Matters of Law
- Processing a Crime Scene—Techniques
- Forensic Anthropology
- Chromatography—Inks & Lipstick
- Fingerprinting—Dusting & Chemical
- Forensic Entomology
- Serology: Blood & Blood Detection
- DNA Fingerprinting
- Hairs & Fibers
- Forensic Analysis of Glass
- 2 Crime Scene “Tests” and 1 Crime Scene Final Exam



Sample Content: Additional Semester

- Forensic Odontology
- Advanced Entomology
- Advanced Blood Spatter
- Handwriting Analysis
- Toolmarks & Impressions
- Autopsy
- Soil Analysis
- Toxicology-Drugs/Alcohol
- Accident Investigation
- Forensic Archaeology
- Ballistics & Firearms ID



Resources

Websites—there are many—here are a few.....

www.fbi.gov

www.sciencespot.net

www.aafs.org

www.nlm.nih.gov

www.nobelprize.org

www.forensicscience-ed.com

Written & Lab Supply Material Sources

WARD'S Natural Science

Fisher Science Education

The Forensic Source (formerly Lightning Powder Company) www.forensicssource.com

Sirchie (supplier for law enforcement) www.sirchie.com

Taylor & Francis Publishers-CRC Press (textbooks/reference) www.crcpress.com

Forensic Science Workshops-Training

My Summer Forensic Science Workshops

Go to website: www.forensicscience-ed.com or email me.

Forensic Science Educational Conferences

Sponsored by the American Academy of Forensic Science

www.aafs.org