



Science in Motion - Ursinus College

<https://www.ursinus.edu/offices/science-in-motion/>

Forensics Activities – High School

Ballistics lab

Students study bullets & casings, as well as identify shooting trajectory of a bullet hole/wound

Chem/Phys Mobile Educator

DNA Fingerprinting

Students use provided images of DNA fingerprinting gels to determine paternity and to match a crime scene sample to a suspect. Can be used as a stand-alone lab, or a follow-up after the Gel Electrophoresis lab.

Biology Mobile Educator

Faces / Forensic art

Students act as “eyewitnesses” and use a forensic art program to draw faces of suspects

Biology Mobile Educator

FTIR (Fourier-transform infrared spectroscopy)

Fibers: identification of fibers and fabrics in a forensic analysis

Liquid: students obtain spectra of several pure liquids and identify an unknown

Adhesives: compare and identify adhesive tape and labels

Plastics: analyze and identify plastics

Chem/Phys Mobile Educator

Gel electrophoresis: An introduction using food coloring

Students pour their own gels, load the gels with food coloring solutions, run the gels, and analyze the results

Biology Mobile Educator

The Heist:

This activity sets up a school crime scene where a mascot has been stolen with a note, fibers, a liquid, and a white powder are left behind. There are analyses of each of these pieces of evidence that may be done all together or separate:

The Note: students identify the ink on the note with TLC (see description of TLC below)

The Fibers: students identify the fibers with dyes and/or FTIR (see description of FTIR above)

The Liquid: students identify the liquid using our mini-GC (gas chromatography)

The White Powder: students identify the white powder by melting point

Chem/Phys Mobile Educator

Protein Identification through immunoassay

Students use an immunoassay to show how forensic scientists can determine if blood on a bumper is from a human or another animal.

Biology Mobile Educator

Review / Test prep activities

We can design fun, unique review sessions for nearly any topic using our programmable Spheros. (No prior programming experience needed.) Ask us for suggestions for your next review session!

Biology Mobile Educator OR Chem/Phys Mobile Educator

Sherlock Bones

Students study properties of bones to determine sex, height, race, and age.

Biology Mobile Educator

Spheros

Spheros are paired with a Kindle Fire (provided) through the SpheroEdu app. Beginners can draw a path for the Sphero robot to follow, intermediate users can drag and drop blocks of code, and advanced users can write text programs using JavaScript. Provide your own activities, or use one of the SpheroEdu prepared modules aligned to NGSS, CCSS, and various state standards.

Biology Mobile Educator OR Chem/Phys Mobile Educator

Thin Layer & Paper Chromatography

Analgesics: Students run TLC on acetaminophen, aspirin, and caffeine. They then identify 3 unknown analgesics made from a mixture of the above.

Ink: Students run TLC on various inks to determine an unknown ink sample

Lipstick: Students run TLC on lipstick samples, then match an unknown sample to one of the knowns

Marker: Students use paper chromatography to separate the inks in markers, then identify an unknown marker

Chem/Phys Mobile Educator

Trace Evidence Lab

Students use microscopes to examine a variety of animal hairs and fibers. This kit also includes materials to make your own wet mount slides of trace evidence such as pollen or human hair. A vial of diatoms and a diatom identification book are also provided.

Biology Mobile Educator

Whale Lab / Mislabeling Food

Students are given DNA sequences of common seafood, then use BLAST to identify which fish it is and whether or not it has been mislabeled.

Biology Mobile Educator

Other equipment:

Fingerprinting kit

Hair and fiber materials

Blood typing kit

Blood spatter kit

We are always working on new activities to bring to your classroom. If you have any curriculum for which you do not see an activity, please let us know! We may be able to design one for you.