FORENSICS

See General Rules, Eye Protection & other Policies on www.soinc.org as they apply to every event.

1. **DESCRIPTION**: Given a scenario and some possible suspects, students will perform a series of tests. These tests, along with other evidence or test results will be used to solve a crime.

A TEAM OF UP TO: 2 **EYE PROTECTION**: C **APPROXIMATE TIME**: 50 minutes

2. **EVENT PARAMETERS:**

a. **Students** may bring only these items:
   i. test tubes (brushes & racks), or any devices in which they can perform the tests
   ii. droppers
   iii. funnel(s) and filter paper
   iv. pH or litmus paper
   v. spatulas, plastic spoons, and/or stirring rods
   vi. 9-volt or less conductivity tester (no testers will be allowed that run on AC current)
   vii. thermometer
   viii. flame test equipment (nichrome wire, cobalt blue glass, etc.)
   ix. slides & cover slips
   x. hand lens
   xi. writing instruments
   xii. a pencil and ruler (for chromatograms)
   xiii. paper towels
   xiv. metal tongs
   xv. Each team may bring 5 pages (both sides) containing information in any form from any source (sheet protectors are permitted).
   xvi. Two non-camera calculators
   Note: Students not bringing these items will be at a disadvantage. The Supervisor will not provide them.

b. **Supervisor will provide**:
   i. iodine reagent (I_2 dissolved in KI solution)
   ii. 2M HCl
   iii. 2M NaOH
   iv. Benedict's solution
   v. a hot water bath
   vi. a Bunsen burner or equivalent BTU heat source to perform flame tests
   vii. a waste container
   viii. chromatography materials (e.g., beakers, Petri dishes, etc.)
   ix. a wash bottle with distilled water

c. **The supervisor may provide**:
   i. other equipment (e.g., a microscope, probes, etc.)
   ii. candle & matches if fibers given
   iii. differential density solutions or other method of determining density of polymers if plastics given
   iv. reagents to perform other tests

d. **Safety Requirements:** Students must wear goggles, an apron or a lab coat and have skin covered from the neck down to the wrist and toes (gloves are optional, but if a host requires a specific type they must notify teams). Long hair, shoulder length or longer, must be tied back. Students who unsafely remove their safety clothing/goggles or are observed handling any of the material or equipment in an unsafe manner will be penalized or disqualified from the event.

3. **THE COMPETITION:**

Level	# Part a samples	# Part b samples	Part c chromatograms	Part d	Part e
Regional	3-8	5-9	1 type + Mass Spectra	1-2 topics	Required
State	6-10	6-12	1-2 types + Mass Spectra	1-3 topics	Required
National	10-14	10-18	1-3 types + Mass Spectra	3-5 topics	Required

a. **Qualitative Analysis**: Substances to identify: sodium acetate, sodium chloride, sodium hydrogen carbonate, sodium carbonate, lithium chloride, potassium chloride, calcium nitrate, calcium sulfate, calcium carbonate, cornstarch, glucose, sucrose, magnesium sulfate, boric acid, and ammonium chloride (there will be no mixtures). All teams will have the same set of solids to identify.

b. **Polymers**: Students may be asked to identify:
   i. **Plastics**: PETE, HDPE, non-expanded PS, LDPE, PP, PVC, PMMA, PC - students may not perform any burn tests on these polymers, but the supervisor may provide burn test results on these plastics.
   ii. **Fibers**: cotton, wool, silk, linen, nylon, spandex, polyester - burn tests will be permitted on the fibers.
   iii. **Hair**: human, bat, **cow, squirrel,** and horse hair - students will need to know hair structure including medulla, cortex, cuticle, and root.

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