Notes:
- Competitors get 1 hour to complete as many stations as possible
- All stations are worth the same amount of points
- The stations are designed to go from 1-easy to 5-hard
- Sig figs should be enforced +- 1
- The test is not terribly difficult, but I tried to match the difficulty of the States test I took a while ago
- I tried to make most of the questions match the crime scene theme for 2015
- I did not provide exact answers since organizers will need to provide a lot of the materials; since this test is intended for use as a tryouts test, the logical process followed by test takers is much more important than actually arriving at the correct answer

Station Specific:

Station 1: Water Displacement
Please use the strangest solid object you can find

Possible Solution: Density = Mass / Volume; Mass the object using the balance and find the volume using the beaker of water (if the object floats, even better – the volume of whatever object is used to keep the measured object underwater should be taken into consideration)

Station 2: Geometry / Trigonometry
This problem is a classic

Possible Solution: Use the 5 m line as one of the legs of the triangle and aim the meter stick at the top of the door. Find the angle between the meter stick and the floor. $Height_{Door} = 5$ m x cos(theta)

Station 3: Grid Geometry
A competitor would actually be DQed, but since this is a practice either a verbal warning or a score of 0 at this station should be given

Possible Solution: Outline the shoes on the tracing paper and then draw a grid with the ruler and protractor; find the area by estimating the percentage of shoe in each grid box

Station 4: Physics
Conservation of momentum
Ideally the ramp should be ~1.0 m in length
Possible Solution: Find the speed at the bottom of the ramp (V_1) and the mass of the rolling object M_1. $V_1 M_1 = V_x(M_1 + M_2)$ where V_x is the final velocity and M_2 is the mass of Howie's vehicle. Astute students will note that taking the mass of the vehicles is ultimately unnecessary since the variables will cancel out. $V_x = V_1 / 1.5$

Station 5: Chemistry
Specific heat lab
Any metal can be used for Metal X, but a metal that either is aluminum or looks like aluminum is ideal
Possible Solution: Mass the aluminum sample($Mass_{Aluminum}$). Heat the aluminum sample in a beaker of water on the hot plate and record the temperature ($Temp_{AluminumInitial}$). Record the temperature of another beaker of water ($Temp_{WaterInitial}$) and the mass of the water ($Mass_{water}$) before placing the metal in the beaker. When the temperature stops changing, record the temperature ($Temp_{AluminumFinal}$ and $Temp_{WaterFinal}$).

Energy Change$_{Water}$ = - Energy Change$_{Aluminum}$ = ($Temp_{WaterInitial}$ - $Temp_{WaterFinal}$) x $Mass_{water}$
Temperature Change$_{Aluminum}$ = $Temp_{AluminumFinal}$ - $Temp_{AluminumInitial}$
Specific Heat = Energy Change$_{Aluminum}$ / ($Mass_{Aluminum}$ x Energy Change$_{Aluminum}$)

Repeat this for metal X and compare the values.