Physics of Blood Spatter Analysis - How Height Impacts Spatter Size

Sections

Joey Scouts | Cub Scouts | **Scouts** | **Venturer Scouts** | **Rover Scouts**

Scouts VICTORIA

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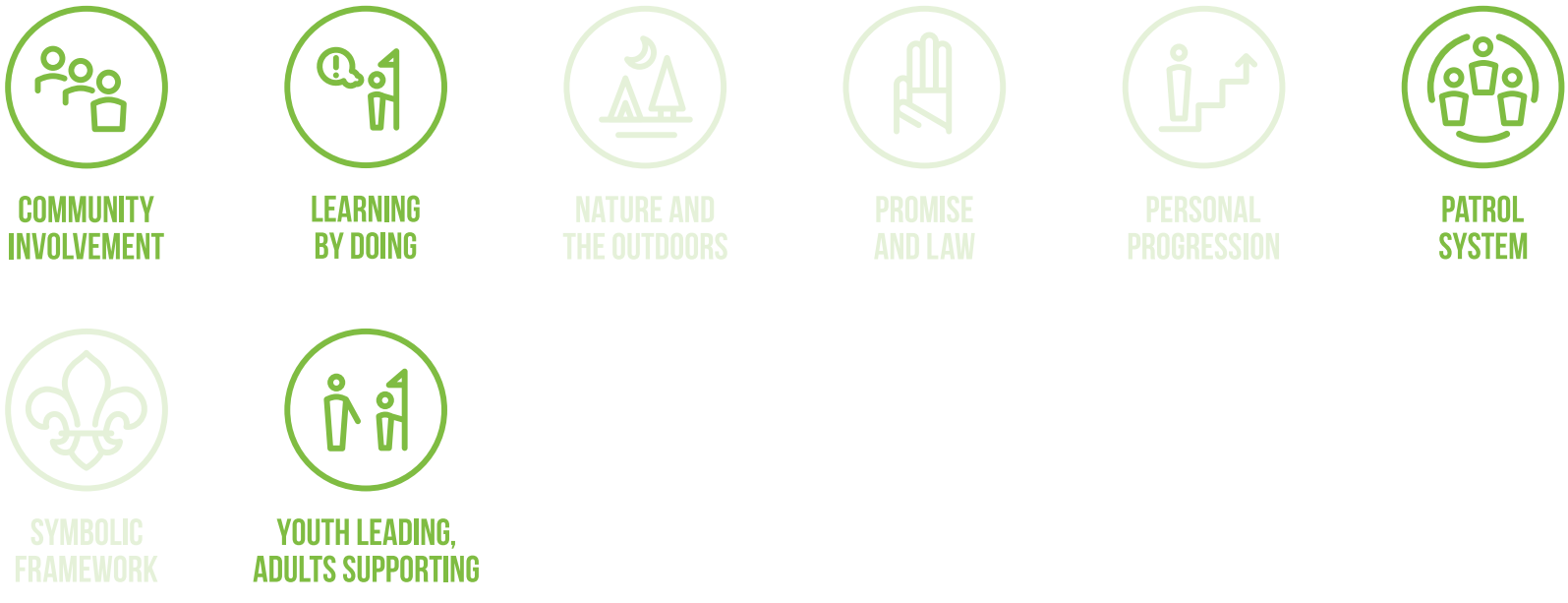
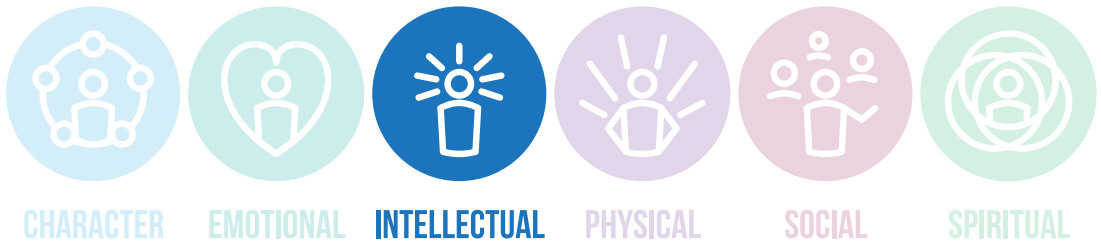
Challenge Areas

Scout Method Elements



SPICES Growth Areas



The Adventure

Delve into the physics that dictates how blood patterns form on surfaces when impacted by only gravity.

Plan

1. Investigate how gravity affects fluids and fluid dynamics.
2. Investigate blood spatter pattern analysis (BSA) and how it is used in criminal investigations.
3. Read the safety information and discuss with your leaders or another appropriate adult what safety equipment, precautions, and supervision may be required. Ensure that you have these safety measures in place before starting the 'Do' section.
4. Gather all the equipment that you need to investigate the effects of angle and drop distance on the pattern made from dropping blood. You will need the following equipment: water, glucose syrup, cornflour, red food colouring, blue food colouring, a small bowl, a spoon, a tablespoon, a ruler, a measuring tape to measure up to 1.5 metres, a protractor, some white paper, a clipboard or other sturdy board, a pen, a pipette, and a drop sheet to protect the surrounding area.

Do

1. Make up your blood replicate by mixing the following together in a small bowl. *These quantities can be amended during production as needed to make the fake blood as realistic looking as desired.*
   a. One and a tablespoon of cornflour
   b. One tablespoon of water
   c. Two tablespoons of glucose syrup
   d. Two drops of red food colouring and one drop of blue food colour.
2. Set up your experiment area ensuring by placing a blank piece of white paper on the ground on top of the necessary protective equipment to protect against damage to the ground.
3. Draw some of your blood replicate up into the pipette.
4. Hold the pipette 15 cm above the paper and allow one drop to fall from the pipette onto the paper.
5. Label the drop with "15 cm".
6. Repeat Steps 3 and 4 with the pipette at heights of 30 cm, 45 cm, 60 cm, 75 cm, 100 cm, and 150 cm, making sure to note the height of each drop next to the drop.
7. Allow the drops to dry.
8. Compare the size and shapes of the drops by measuring the diameter of the circular part of the drop (ignoring the spines) in mm and drawing around the drops.

Review

1. How did the drop patterns change depending on the height? What do you think this could tell us in a forensics sense?
2. What effect do you think altering the blood replicate recipe might have on the drop patterns?
3. What did you enjoy most about your blood spatter pattern investigations? What did you learn?
4. What other factors do you think may impact blood pattern?
5. Do you think that patterns will vary depending on the surface that the blood is being dropped onto? Why or why not?

Safety

- This activity uses replica blood which some youth members may find disturbing.

Variations

- This challenge card can pair well with other forensic science-based challenge cards such as other challenge cards in the 'Figuring Out Fingerprints' series, Who Wrote It? Paper Chromatography, and Soil pH Testing, to create a forensics program or a 'Whodunit' night.
- Investigate other heights and factors and how they interplay with each other.
- Investigate other surfaces for blood drops. Do blood drops look the same on paper as they do tiles or glass?
- Depending on the section and challenge area used, this challenge card can also be paired with a police station visit or some other law enforcement related community involvement.