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Blood Patterns

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Starting the Day**

***In your science journal, write down your observations of the sample blood spatter using the terminology you reviewed for today. It may help to draw and make labels to identify different features of the blood stain.***

**SINGLE DROPS**

1. Use the dropper to drop blood by gently squeezing the dropper and gently depressing the plunger from a height of 15cm above the newspaper.
2. Allow the blood drops to dry.
3. Label this drop “15cm” on the newsprint.
4. Record the diameter of the **parent** droplets (ignoring spines and protrusions) with each height in a table in your *Scientific Journal*.
5. Draw a picture of the droplet in your *Scientific Journal.*
6. Repeat steps 1-5 from 30cm, 45cm, 60cm, 90cm, and 150cm, placing your information in a table.
7. Answer the following questions in your *Scientific Journal*:
	1. What did you notice about the diameter of the **parent droplets** as you *increased* the height of the drop?
	2. ****How do the **spines** compare from different heights?

**MULTIPLE DROPS**

1. Create a drop from 30cm. Without moving from this height, make a second drop on top of the first.
2. What happened when one drop landed on top of another one? Record your answer in your *Scientific Journal.*
3. Add another drop onto the first two from 30cm (the same height). Record your observations.
4. Add a fourth drop from the same height and record your observations.
5. When the blood is dried, label it “multiple single vertical blood drops.”
6. Perform the same test, but increase the height with each added drop (30cm, 45cm, 60cm, and 90cm). What did you notice about the diameter of the parent droplets as you increased the height of the drop? What did you notice about the diameter of satellite spatter as the height increased? Record your answers in your *Scientific Journal*.
7. Measure 2-3mL of simulated blood in a 10mL graduated cylinder. Position the cylinder 30cm from a NEW sample of newsprint and poor out the entire container.

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 **COMMON PATTERNS**

**Walking Drip Pattern**

1. Fill your dropper with simulated blood and press it slowly enough that drops begin to fall. As drops fall at a normal rate, walk at a slow speed, allowing them to fall on newsprint.
2. Label the newsprint “Slow Walking Drip.” Record your observations and draw pictures in your *Scientific Field Journal* showing size, shape, and/or distance between the drips.
3. On a new piece of newsprint, repeat the following steps at average and fast pace.
4. Answer the following questions:
	1. What did you notice about the shape of the droplets as you increased your walking speed?
	2. What did you notice about the spines as you increased your walking speed?
	3. What did you notice about the distance between droplets as you increased your walking speed?

**Wipes**

Make a small puddle of simulated blood on a large piece of newsprint. Use a paper towel to wipe the blood around (wipe it as if you were cleaning it). Use a gloved hand to push the stain around while trying to wipe up the blood with the paper towel. In your *Scientific Journal,* note how the appearance of the stain relates to your motions or the direction that your hand/the towel travels. Label this stain “Wipe Pattern”

**Swipes**

Lay out a piece of newsprint. Place a small amount of Simulated Blood on a towel, cloth, rag, wig, etc. Use the “bloodied” object to swipe across the newsprint and, in your journal, note the appearance of the stain pattern. In particular note the appearance of the stain relative to the direction that your object travels.

**Arterial Spurts – Vertical**

Lay out a longer piece of newsprint (3-5ft). Fill a syringe with simulated blood. Walk the length of the paper, squeezing short spurts of Simulated Blood to simulate the beating of a heart. Record the shape and pattern of the stain along with your other observation in your journal.

**Arterial Spurts – Horizontal**

Lay out a longer piece of newsprint (about 10ft). Fill a syringe with Simulated Blood. Stand at the far end of the paper, looking down the 10ft toward the other end. Holding your syringe parallel to the ground, squeeze several short spurts to simulate the beating heart. Try to keep the drops on the paper, so don’t push too hard on the plunger and aim carefully. In your journal, note the way the drops traveled and how they were deposited on the surface.

**Cast-off Spatter**

Lay out two sheets of 5ft long newsprint next to each other. Place about 1mL of Simulated Blood on a tongue depressor. Being careful to only deposit blood on the target surface, use a horizontal slashing motion in the direction of the surface. Go back and forth several times. Each time, record the pattern that the stain makes, noting how it changes with each slash.

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The Case:

Now that you have developed your skills as a blood pattern analyst you can apply them to the murder case. Evaluate your evidence and prepare for a presentation to your research team by following these steps:

1. Using what you now know about blood patterns, try to evaluate what type of pattern(s) can be found at the scene of the crime. You may use pictures posted online ([www.ubstem.weebly.com](http://www.ubstem.weebly.com)) or pictures that you/your group captured on the first day. Be sure to fully utilize proper terminology to identify patterns, as you will present this analysis in court.
2. To confirm your hypotheses about these patterns, try to reproduce the pattern using newsprint and Simulated Blood. Create as many simulations as necessary until you can come somewhat close to the patterns found at the crime scene. It’s okay if your hypotheses change – science often involves exploration. **Just be sure to record the procedure for each trial, down to the last detail. Not doing this could identify you as incompetent in a court case.**
3. You will need to present your findings both to your research team (on Friday 4) and in court during the mock trial (on Friday 5). Using the presentation rubric put together a visual presentation displaying your findings (a printable poster measuring 3ft x 2ft). You can make this sized poster in PowerPoint (remember our posters from last year). Be sure to include a picture from the crime scene and from your simulation for comparison and label the various features of the patterns (spike, parent drop, etc.). Remember that the people you will present this to won’t know anything about Blood Pattern Analysis.