

Biology behind the Crime Scene Lab #8 Simulated Blood Exercises

Adapted from BIO187, BIO188, and CPSC450 Labs;
Also includes Ward's Natural Science Instructions

Today you will be performing a variety of serology work, including a class-wide demonstration of blood detection using Blue Star and blood typing with simulated blood.

Simulated Blood: Using Blue Star to Detect Blood Spatter

Simulated blood has been used to create bloodstains to be detected by Blue Star during a demonstration by your instructor.

From your textbook:

“Another important presumptive identification test for blood is the Blue Star test. Unlike the benzidine and Kastle-Meyer test, the reaction of Blue Star with blood produces light rather than color. By spraying Blue Star reagent onto a suspect item, investigators can quickly screen large areas for bloodstains. The sprayed objects must be located in a darkened area while being viewed for the emission of light (luminescence).

The Blue Star test is extremely sensitive – it is capable of detecting bloodstains diluted up to 300,000 times. For this reason, spraying large areas such as carpets, walls, flooring, or the interior of a vehicle may reveal blood traces or patterns that would have gone unnoticed under normal lighting conditions. It is important to note that Blue Star does not interfere with subsequent DNA testing.” [There seems to be some disagreement over this last statement.]

Simulated Blood Typing:

Be sure to read the background on Pages 1-5 of your Simulated Blood Typing Whodunit Lab Activity Instructions for some history and information on blood types and blood typing.

There may be quiz questions on this background material.

Purpose/Objectives for Simulated Blood Exercises Lab:

- To observe how Blue Star is used to detect leftover blood stains
- To analyze blood spatter patterns

From Ward's Simulated Blood Typing Whodunit Lab Activity Instructions:

- “Assume the role of a forensics lab technician
- Examine suspected blood evidence found at a crime scene
- Confirm that the evidence is real blood
- Perform the ABO/Rh procedure to determine the blood type
- Relate the evidence to four possible suspects”

Materials:

Student stations: Per group of 4

Toothpicks
Blood typing trays
Various simulated bloods
Various anti-sera
“stained cloth squares”
Carpet square with 4 blood spatters
Cloth with ‘blood-looking’ substances
Dissecting microscope

Teacher’s station:

Blue Star tablets and spray bottle

Procedure

Wear gloves during today’s exercises.

Be careful - the simulated blood may stain clothing.

Part 1. Blue Star Detection of Bloodstains:

1. Your carpet square has been divided into 4 sections. Look at your carpet square and draw a picture in your notebook as well as recording any additional observations. Do you see any blood stains?
2. An instructor will turn off the lights in the laboratory, let everyone’s eyes adjust to the dark, and then demonstrate the use of Blue Star detection to locate and identify the blood stain patterns by coming over to each group’s carpet square and spraying it with Blue Star. This may take some time to demonstrate to all 6 groups.
3. You must **write and draw** your observations of the detected blood spatters in your notebook **for all four sections of the carpet**. You may need to do this in the dark or from memory. If you need your instructor to spray a second time, let him/her know.

Possible blood spatter patterns:

- High Impact Spatter
- Low Impact Spatter
- Drip Trail
- Wipe/Swipe
- Pattern Transfer
- Cast Off

4. Once you have made your observations in your notebook, your group may move on to Part 2.

Part 2. Simulated Blood Typing Whodunit Lab Activity

1. Working **in pairs** for this activity, follow the instructions from the Ward's Simulated Blood Typing Whodunit Lab Activity
[and make sure to include these detailed Ward's instructions in your flowchart.]

Note: For Part A. Microscopic Investigation, you will be using the green cloths that have been stained with various substances that may look like stained blood instead to determine the characteristics that blood possesses as opposed to other substances when it comes in contact with cloth that indicates it is blood. Record your observations in Table 1.

2. Complete Part B. as a group and then by yourself, answer in your notebook questions 1-11 from the Ward's Assessment section.

Part 3. Clean-up and Notebook Signing

Clean up your group's area so it is in the original condition it was when you arrived. Make sure you have answered all questions, made necessary observations, and drawn your overall conclusions in your laboratory notebook before you have your instructor sign your notebook.

Have you answered all of the questions for this week in your notebook? Have you had the instructor sign your notebook before you leave?