



Blood Typing



This activity challenges students to determine human blood types using Anti-A serums, Anti-B serums, and Anti-RH serums.

Key Facts:

- Type A Blood has Type A antigens on the RBCs and Type B antibody in the blood.
- Type B Blood has Type B antigens on the RBCs and Type A antibody in the blood.
- Type AB Blood has Type A & B antigens on the RBCs and NO antibody in the blood.
- Type O Blood has NO antigens on the RBCs and BOTH A & B antibodies in the blood.



Purpose:

Upon the completion of this investigation, your team will:

- Use the materials provided to create a model for blood typing reactions
- Identify the 4 different blood types attributed to human blood



Materials:

You will need:

- Blood [actually a solution of milk and food coloring]
- Type A serum [Antibodies]
- Type B serum [Antibodies]

Engage:

A crime had been committed, Mr. Lamb's store was robbed. When the police arrived on the scene, the CSI team examined the area and found a large rock used to break the glass in the door. The criminal cut his hand when breaking into the store and left a pool of blood near the rock. Police notified the local emergency rooms to be watching for someone with a serious cut on the arm or hand. The Boone Hospital Emergency room contacted Detective Schwartz later that day to report a known criminal, Slippery Syl came into the Emergency room with a serious cut on his right hand.

Explore:

The CSI unit used the blood sample from the crime scene and compared it with the sample taken from Sam. The challenge is shown below:

Challenge:

- 1) Students will fill out the chart after testing the blood to determine the blood type.
- 2) Use the plastic Plates to complete the tests and determine if the blood was actually from Slippery Syl.
- 3) Remind students to follow the procedure carefully and to avoid cross contamination.
- 4) A positive test is indicated with clumps form in the blood.
- 5) Just so you know, this is not real blood but rather a mixture of food coloring and milk. The Anti-sera are actually made up of vinegar or water.

Conducting the tests with artificial blood samples:

⇒ Protocol:

- ⇒ Time considerations will require you to ask students to work together in teams of 4. Each student will test one suspect.
- ⇒ Instruct each student to place 20 drops of blood from one of the 4 suspects into a 3 separate cups labeled for a specific suspect:
 - Suspect 1 - A
 - Suspect 1 - B
 - Suspect 1 - Rh
- ⇒ You will provide test kits of anti-serum for each suspect. It is important to keep these test kits separate from one another.
 - The table for the test kits is shown below. Keep in mind that the reason this lab simulates an actual blood typing test is that the vinegar causes the proteins in the milk to coagulate or clump. This reaction actually mimics blood type testing. A positive reaction means that the antigen on the RBCs is attracted to a specific anti-serum causing the RBCs to clump together. A negative reaction occurs when there is no clumping, this indicates that the antigen in question is not on the outside of the RBCs.

| Kit Type | Anti-A | Anti-B | Anti-Rh | Blood Type |
|--------------------|---------|---------|---------|------------|
| Suspect 1 | Vinegar | Water | Vinegar | A+ |
| Suspect 2 | Water | Vinegar | Vinegar | B+ |
| Suspect 3 | Vinegar | Vinegar | Water | AB- |
| Suspect 4 | Vinegar | Vinegar | Vinegar | AB+ |
| Crime Scene | Water | Vinegar | Vinegar | B+ |



CSI - Test Results - Blood Typing: Student Page

This is the result from the blood test conducted on the blood from the crime scene. What do you think the blood type would be?

Is there a match between the crime scene blood and the blood from each of the 4 suspects?

| | |
|--|----------|
| Crime Scene Blood - Typing Data | |
| Type A Test: | |
| Positive | Negative |
| Type B Test: | |
| Positive | Negative |
| Rh Factor Test: | |
| Positive | Negative |
| Blood Type: _____ | |