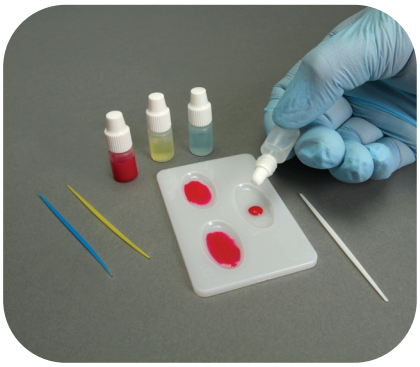
Blood Typing Activity



Investigation question

How can blood typing be used to identify and connect a suspect to a crime scene?

Investigation objective

Perform ABO-Rh blood typing to identify the blood type of an unknown sample.

Safety

Follow established laboratory safety practices and use appropriate personal protective equipment (PPE) such as gloves, chemical splash goggles, and lab coats or aprons.

Materials

Each student should have:

- Blood Typing Investigation Sheet (found below procedure)
- 2 Unknown Synthetic Blood Samples (label bottle with a number for students and your own record keeping)
- 1 Bottle of Each Antisera (anti-A serum, anti-B serum, and anti-Rh (anti-D) serum)
- 1 Blood Typing Slide
- 6 Mixing Sticks (2 blue, 2 white, and 2 yellow)

Procedure

1. Mix/shake all vials well before starting the activity.
2. Record in data table the number of each blood sample.
3. Using one of the blood samples, place a drop into each well of the blood-typing slide.
4. Add a drop of synthetic anti-A serum (blue) to the well labeled A. Replace the cap.
5. Add a drop of synthetic anti-B serum (yellow) to the well labeled B. Replace the cap.
6. Add a drop of synthetic anti-Rh serum (clear) to the well labeled Rh. Replace the cap.
7. Using a different color mixing stick for each well (blue for anti-A, yellow for anti-B, white for anti-Rh), gently stir the synthetic blood and antisera drops for 30 seconds. Discard each mixing stick after a single use to avoid contaminating your samples.
8. Examine the thin films of liquid mixture. If the film remains uniform, there is no agglutination. If the sample appears granular or clumpy, agglutination has occurred. Record in table positive agglutination or no reaction for each well.
9. Clean the blood typing slide and repeat the procedure for the remaining blood samples.

continued

Blood Typing Investigation Sheet

	Sample _____	Sample _____
Anti-A		
Anti-B		
Rh		
Blood Type		

Analysis

1. Identify the blood type of each sample you tested on the chart above.

2. Describe the cause of agglutination when performing a real blood typing test.

3. Explain how blood typing can be used to connect a suspect to a blood sample found at a crime scene.

Examine the global distribution of blood types below to answer questions 4 and 5.

Blood Type	**A+**	**A-**	**B+**	**B-**	**AB+**	**AB-**	**O+**	**O-**
Percent of Global Population	31%	2.5%	15%	1%	5%	0.5%	42%	3%

4. What influence does the blood type of a suspect have in a forensic investigator's ability to narrow between suspects in the population of a small town? City? State?

5. Considering that the global population is over 8 billion (and growing), what are some limitations of using blood typing for forensics identification?

6. List other types of biological tests that can be performed on biological evidence such as blood. When and why would the tests you listed be preferred by forensic scientists instead of using blood typing?