Blood Test

**Background:**

Surface proteins on red blood cells determine an individual’s blood type. These surface proteins are called “antigens.”

The system used to classify human blood is called the “ABO system.” Dr. Karl Landsteiner, an Austrian physician, received the Nobel Prize in physiology for this discovery in 1930.

With the ABO system, the kinds of antigens present on red blood cells determine the blood type. An individual with A antigens has blood type A, one with B antigens has blood type B, one with A and B antigens has blood type AB, and one with no antigens on the surface of his/her red blood cells has type O.

Blood plasma has circulating proteins called “antibodies.” For example, individuals with A surface antigens have anti-B antibodies; those with B surface antigens have anti-A antibodies. Those with both A and B surface antigens have no antibodies. Individuals with no surface antigens have both anti-A and anti-B antibodies.

Blood typing is performed using “antiserum” – blood that contains specific antibodies. “Anti-A Serum,” which contains anti-A antibodies, and “Anti-B Serum,” which contains anti-B antibodies, are used in ABO blood typing.

These blood group substances can last for several years in the dried state. Forensic technicians can recover blood surface proteins by using a special solution.

To perform a blood typing test, anti-A and anti-B sera are each separately mixed with a drop of sample blood and observed for “agglutination” or a clumping reaction.
Procedure:

1. Place 5 drops of one of the Recovered Blood Samples in a watch glass (this is watch glass “A”) and then do the same thing in another watch glass (which is watch glass “B”).

2. Place 6 drops of Anti-A Simulated Serum in watch glass A.

3. Now place 6 drops of Anti-B Simulated Serum in watch glass B.

4. Use a separate toothpick to mix the simulated blood and serum in each watch glass for about 10 seconds.

5. Carefully examine each watch glass to determine if the recovered blood from the scene in each watch glass has clumped or agglutinated. Record your results and observations.

   *Note: Just because the solutions might not mix well DOES NOT mean there is clumping. You should see clear, visible signs of clumping.

6. Repeat for remaining blood samples.

Understanding Your Results:
Clumping indicates that the simulated blood sample contains antigens that reacted against the antibodies in the typing serum that you mixed it with.

Type A:
If the blood in watch glass A is the only blood that agglutinates or clumps, then the blood sample you tested is Type A blood.

Type B:
If the blood in watch glass B is the only blood that agglutinates or clumps, then the blood sample you tested is Type B blood.

Type AB:
If the blood in both watch glass A and watch glass B agglutinates or clumps, then the blood sample you tested is Type AB blood.

Type O:
If the blood in both watch glass A and watch glass B does not agglutinate or clump, then the blood sample you tested is Type O blood.

7. You may choose to look up the medical records of the victim and known acquaintances. Your instructor has this information.