OBJECTIVES

- Define agglutinogen and agglutinin
- Perform an actual blood typing procedure
- Observe the antigen/antibody reaction in blood
- Determine the ABO and Rh blood type of your own blood
- Analyze class data to determine if it is representative of the human population

MATERIALS

MATERIALS NEEDED PER GROUP

2	Sterile alcohol pads
1	Sterile lancet
1	Blood typing tray
3	Toothpicks
	Gloves
	Goggles
	Apron

DID YOU KNOW?
The average life span of a red blood cell is about 120 days.

SHARED MATERIALS

Anti-A typing serum
Anti-B typing serum
Anti-Rh typing serum
Biohazard bag

PROCEDURE

Protective gloves, goggles, and face shield should be worn when handling blood samples or when in contact with contaminated materials.

Dispose of all contaminated items in the included biohazard bag and placed in a properly labeled biomedical waste container.

ABO and Rh BLOOD TYPING

1. Thoroughly clean the tip of one finger on your non-writing hand with a sterile alcohol pad.
2. Carefully open a sterile lancet package from the end that is closest to the blunt end of the lancet and then remove it.
3. Prick the sterile area on your finger with the lancet.
4. Carefully place the lancet back in its package and dispose of it in the biohazard bag.

If you cannot perform this step, ask your teacher for assistance.

5. Add one drop of blood to each well of the blood typing tray.
6. Clean the tip of your finger with another sterile alcohol pad and dispose of in the biohazard bag.
7. Add one drop of anti-A serum to the A well of your blood typing tray, one drop of anti-B serum to the B well and one drop of anti-Rh serum to the Rh well.
8. Using a clean toothpick, stir the A well thoroughly. Dispose of the toothpick in the biohazard bag.
9. Repeat the above step for each of the B and Rh wells. Be sure to use a new toothpick for each well to avoid cross-contamination. Dispose of each toothpick in the biohazard bag when you are done stirring each well.
10. Examine each well for agglutination. Agglutination indicates a positive test result.

Phlebotomists collect blood samples and body fluids from patients for laboratory testing.

Agglutination **No Agglutination**

11. Record your results in Table 1 in the Analysis section and determine your blood type.
12. Pool the class data and calculate the percentage of students with each blood type using the following formula:

$$\frac{\text{Total number of students with type (x) blood}}{\text{Total number of students in class}} \times 100$$

13. Record your results in Table 2.

Name:_____
Group: _____
Date: _____

ANALYSIS

Table 1

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

Table 2

Blood Type	# of Students With Blood Type	Total # of Students in Class	% of Students With Blood Type

Name: _____
Group: _____
Date: _____

ASSESSMENT

1. Answer the following questions based on your ABO blood type. Ignore the Rh factor for this question.

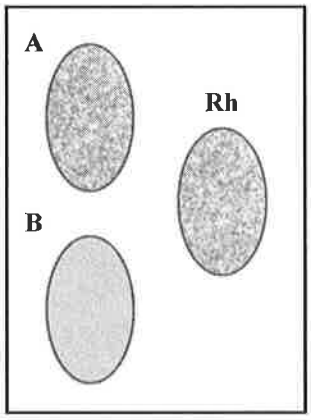
   a. What agglutinins are found in your plasma? _____

   b. What agglutinogens are present on your red blood cells? _____

   c. If you needed a blood transfusion, what blood type(s) could you safely receive? _____

   d. If you donated blood, what blood type(s) could safely be transfused with your blood? _____

2. Below is a diagram representing the blood type analysis of a new patient (patient X). From the information obtained from the slide, fill out the medical technologist's report.



Medical Technologist's Report

Patient Name: _____

ABO Type: _____

Rh Type: _____

Med Tech Name: _____

3. Using a Venn diagram, compare and contrast agglutinogens and agglutinins. In your diagram, show at least two similarities and two differences.

4. Pretend you went with your class on a medical career field trip to a local hospital. One of the stops on the visit was to the hospital's blood lab. The medical technologist at this stop gave a demonstration of how blood types are determined. Your job is to write a paragraph for the school newspaper on the visit to the blood lab, summarizing what you've learned about how ABO/Rh blood groups are determined. Write a paragraph and include the title.

5. List at least three situations where blood typing could be used.

6. a. Define erythroblastosis fetalis.

b. Describe the sequence of events that result in this condition.

c. What might be some benefits if the medical profession developed a shot or vaccination that could desensitize an Rh^+ situation?

7. You are a type A erythrocyte placing an ad in the personals and you are seeking a compatible mate for a long lasting transfusion. Create an ad to be submitted to the newspaper. The newspaper charges $0.25 per word and the ad can cost no more than $10.

8. You are a lawyer representing a man with blood type B. A woman of blood type O has a child with blood type A and is proposing that the man fathered the child. Using what you have learned about blood typing and genetics, briefly state your argument to the jury in defense of your client.

9. Each year thousands of people contract blood borne diseases. What could be done in a clinical blood lab to minimize the risk of obtaining or spreading a blood borne disease?

10. The flowchart below represents a short history of the study of blood and blood typing. The area marked "????" represents possibilities for the next important new discovery in blood and blood typing. In a short paragraph, identify what you think may be the next important breakthrough, milestone or discovery in the study of blood and blood diseases and explain why.

Landsteiner and Weiner
↓
Fisher and Race
↓
Clark
↓
Hunt
↓
????

11. Two parents, genotypes I^AI^B and I^Bi, produce a child. Determine what the probability is that the child may display each of the four ABO blood types. Use the Punnett square below.