

# Blood Type Lab

## What blood types can be mixed during transfusions?

People can have one of four types of blood: A, B, AB, or O. A blood type is based on the presence or absence of two proteins (A, B) on the surface of the red blood cells.

Because there are two proteins are involved, there are four possible combinations or blood types (ABO groups):

- Type A – Only the A protein is present.
- Type B – Only the B protein is present.
- Type AB – Both the A and B proteins are present.
- Type O – Neither protein is present.

In addition to the A and B proteins, there is another protein involved called the Rh factor. The Rh factor is either present (+) or absent (-). So, blood types are described as the type and Rh factor (such as O+, A+, AB-). When someone takes the blood of another person (during surgery, or after an accident) it is called a **transfusion**. If two different blood types are mixed together during a transfusion, the blood cells may begin to clump together in the blood vessels, possibly causing death. Therefore, it is important that blood types be matched before blood transfusions take place.

### Materials

- 5 clear cups
- Eye droppers
- Water
- Yellow food coloring
- Blue food coloring
- Post-its

### Form a hypothesis

(Change the question into a testable statement.) (Choose 2 types of blood that you predict can be mixed during transfusions.)

1. \_\_\_\_\_

### Procedure

- Label the beakers:
  - Beaker #1 - TYPE A
  - Beaker #2 - TYPE B
  - Beaker #3 - TYPE AB
  - Beaker #4 - TYPE O
  - Beaker #5 - PATIENT
- Fill beakers #1 – #4 three-quarters full of water.
- Add 2 drops of yellow food coloring to beaker #1.
- Add 2 drops of blue food coloring to beaker #2.
- Add 1 drop of yellow food coloring and 1 drop of blue food coloring to beaker #3 (this will make the water purple.)
- Leave beaker #4 alone.
- To determine which transfusions are safe and which are not, think of blood types as different colors.
  - If a color can receive another color without a color change, it is a safe transfusion.
  - If a color changes when you add the other color to it, it is an unsafe transfusion.
  - Make sure to look for a color change, not just the color getting lighter or darker.
- Pour a small amount of water from beaker #1 into the patient beaker. The "patient" now has "Type A blood".
- Add some more color from beaker #1. The "patient" is now "receiving a transfusion of blood Type A."
- Record your observations as "Safe" or "Unsafe" to mix the types of blood.
- Rinse out the patient beaker.
- Pour a small amount of beaker #1 into the patient cup. The "patient", once again, has Type A blood.
- Pour a small amount water from the "Type B" beaker.
- Record your observations.
- Rinse out the patient beaker.

p. Repeat the steps for all combinations: A:A, A:B, A:AB, A:O, B:B, B:AB, B:O, AB:AB, AB:O, O:O

**Results**

**Table 1** Safety of Blood Transfusions

Blood Type	Donor Type A	Donor Type B	Donor Type AB	Donor Type O
Patient Type A	2.	3.	4.	5.
Patient Type B	6.	7.	8.	9.
Patient Type AB	10.	11.	12.	13.
Patient Type O	14.	15.	16.	17.

**Analyzing Results**

18. What blood types can Type A blood:

- a. Receive? \_\_\_\_\_
- b. Donate to? \_\_\_\_\_

19. What blood types can Type B blood:

- a. Receive? \_\_\_\_\_
- b. Donate to? \_\_\_\_\_

20. What blood types can Type O blood:

- a. Receive? \_\_\_\_\_
- b. Donate to? \_\_\_\_\_

21. What blood types can Type AB blood:

- a. Receive? \_\_\_\_\_
- b. Donate to? \_\_\_\_\_

22. Which blood type can give to ALL other blood types and is known as the UNIVERSAL DONOR?

\_\_\_\_\_

23. Which blood type can receive blood from all other blood types and is known as the UNIVERSAL RECIPIENT?

\_\_\_\_\_

24. What are the 4 parts of blood? \_\_\_\_\_

\_\_\_\_\_

25. Which of these 4 parts determine a person's blood type?

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