

ABO Blood Type Game

The following lesson is adapted from the Red Cross ABO Blood Type Game



American Red Cross

Together, we can save a life

Materials

8	3.5 oz cups labeled “ A”
8	3.5 oz cups labeled “ B”
8	3.5 oz cups labeled “ AB”
8	3.5 oz cups labeled “ O”
32	pipettes
1	250 ml bottle water plus 15 drops red food coloring, labeled “A”
1	250 ml bottle water plus 10 drops blue food coloring, labeled “B”
1	250 ml bottle water plus 7 drops red + 5 drops blue food coloring, labeled “AB”
1	250 ml bottle water, labeled “O”
15	12-well plates
30	worksheets

Color Concentration for food coloring:

I use the ratio of 5 drops of food coloring for every 100 mL water. So a 1,000ml beaker or flask would have 50 drops. Set these up ahead of time. For purple do half red and half blue drops, for green I would just use the green food coloring at 5/100mL.

Blood Type A is Red (*or Blue)

Blood Type B is Blue (*or Yellow)

Blood Type AB is Purple (*or Green)

Blood Type O is Clear

Background Information

The following information is from the Red Cross

- Almost 40% of the population has O+ blood
- Patients with Type O blood must receive Type O blood
- About half of all blood ordered by hospitals in our area is Type O
- Type O blood is the universal blood type and is the only blood type that can be transfused to patients with other blood types
- Only about 7% of all people have Type O negative blood
- Type O negative blood is the preferred type for accident victims and babies needing exchange transfusions
- There is always a need for Type O donors because their blood may be transfused to a person of any blood type in an emergency

If your blood type is:

Type	You Can Give Blood To	You Can Receive Blood From
A+	A+ AB+	A+ A- O+ O-
O+	O+ A+ B+ AB+	O+ O-
B+	B+ AB+	B+ B- O+ O-
AB+	AB+	Everyone
A-	A+ A- AB+ AB-	A- O-
O-	Everyone	O-
B-	B+ B- AB+ AB-	B- O-
AB-	AB+ AB-	AB- A- B- O-

Out of 100 donors

84 donors are RH+	16 donors are RH-
38 are O+	7 are O-
34 are A+	6 are A-
9 are B+	2 are B-
3 are AB+	1 is AB-

Experiment.

Tell students that:

- If the color of the “blood” changes, it is not compatible.
- If the “blood” color stays the same, then it is compatible.

A. Patient #1 is Type A.

Patient #1 needs a transfusion. Ask students what blood types can this patient receive?

For patient #1, tell students to:

- 1) Pipette 3 squirts of liquid from Type A into the 1st well .
- 2) Do a “transfusion” by adding 3 more squirts of Type A to the 1st well and note if there is any change in color. **(There is no change.)**
Explain that **No change = Safe, Change = unsafe.**
- 3) Now pipette another 3 squirts of type A from patient #1 into the second well on row 1
- 4) This time, add 3 squirts of Type B to the patient for the ”transfusion.”
 - a. Students will notice a color change and see the change means that this is **Unsafe**,
 - b.
- 5) Add 3 squirts of Type A to wells 3 and 4 on Row 1 and add Type AB and O to determine if these blood types are safe for patient 1.

B. Patient #2 is Type B.

C. Patient #3 is Type AB.

D. Patient #4 is Type O.

Tell students to make an hypothesis as to which blood types the patients #2, 3 and 4 could safely receive in a transfusions and then test it. Follow the same procedure as above.

Results and conclusions:

- Blood type A can only be given to type A and AB patients.
- Blood type B can only be given to type B and AB patients.
- Blood type AB individuals can receive blood from everyone, but they can only donate to other AB blood type patients.
- Blood type O individuals can only receive type O blood, but they can donate blood to every other type.

Adapted from the Red Cross Blood Typing game

Blood Type Chart:

	Color change (yes/no)? A added	Color change (yes/no)? B added	Color change (yes/no)? AB added	Color change (yes/no)? O added
Patient #1 Type A				
Patient #2 Type B				
Patient #3 Type AB				
Patient #4 Type O				

Conclusions

Blood type A can only be given to type _____ patients.
 Blood type A patients can only receive _____ type blood.

Blood type B can only be given to type _____ patients.
 Blood type B patients can only receive _____ type blood

Blood type AB can only be given to type _____ patients.
 Blood type AB patients can only receive _____ type blood

Blood type O can only be given to type _____ patients.
 Blood type O patients can only receive _____ type blood