Name:

The Blood Type Compatibility Pogil

Why?

Blood types have important medical applications. Knowing a person's blood type can prevent organ transplant failure and miscarriages.

Model 1 -

Blood Typing Compatibility

Recipient	Donor			
	O	A	B	AB
O	+	-	-	-
A	+	+	-	-
B	+	-	+	-
AB	+	+	+	+

1) What is a recipient? What does it mean in the context of model 1?

2) What is a donor? What does it mean in the context of model 1?

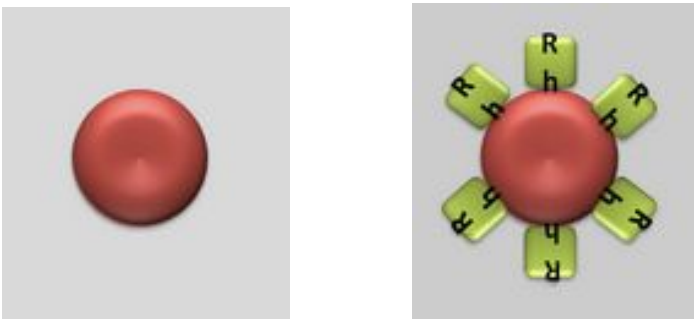
3) Which blood type(s) can a person with A blood receive? Explain how you know from model 1. Based on prior knowledge, why does this make sense to you?

4) Which blood type(s) can a person with A blood donate to? Explain how you know from model 1. Based on prior knowledge, why does this make sense to you?

5) Which blood type can receive all of the other blood types? How do you know? Why does this make sense?

6) Which blood type can donate to all of the other blood types? How do you know? Why does this make sense?

Model 2 -



http://lyceum.algonquincollege.com/lts/AandPResources/Images/11-8_bloodtypes.png

7) What is the blood type of the red blood cell on the left in model 2? How do you know?

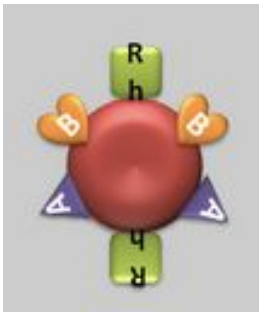
8) Does the red blood cell on the right have either an A or B antigen on it's surface?

9) What is the name of the new antigen on the red blood cell on the right in model 2?

10) There are two systems of blood types: ABO and RH +/-. If the complete blood type of the red blood cell on the right is O+, then what is the complete blood type of the red blood cell on the left?

11) Which cell would most likely come from an individual that made RH antibodies? How do you know?

Model 3 -

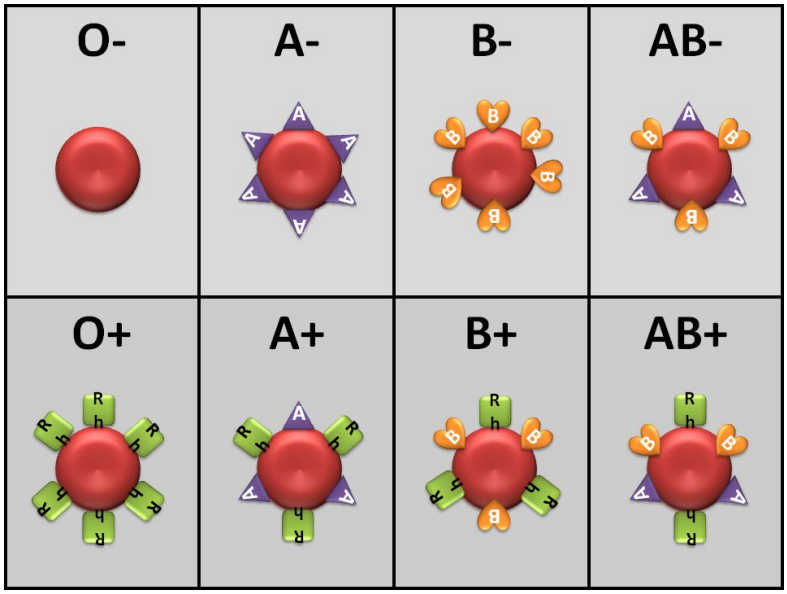


http://lyceum.algonquincollege.com/lts/AandPResources/Images/11-8_bloodtypes.png

12) What is the blood type shown above?

13) What kind, if any, of antibodies are created by the individual with this blood type?

Model 4 -



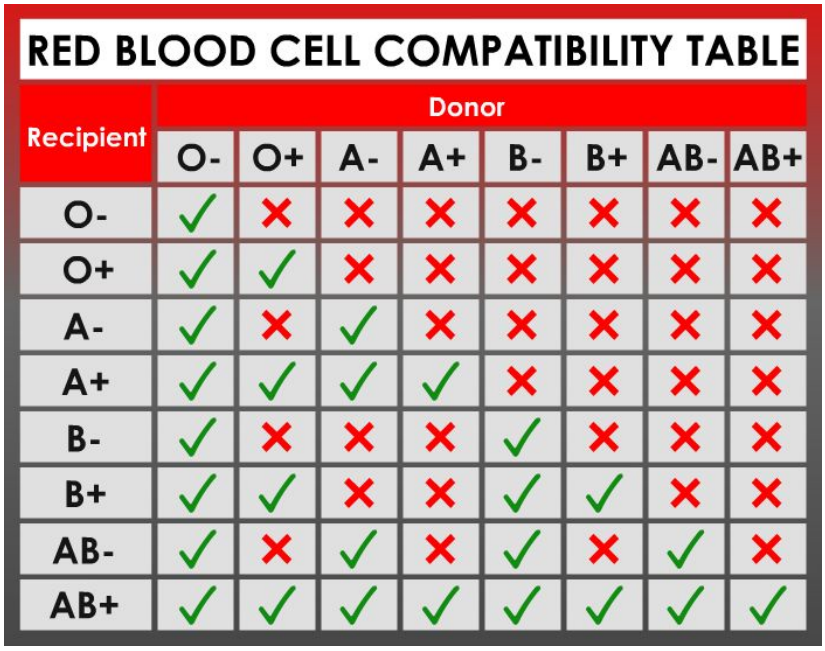
http://lyceum.algonquincollege.com/lts/AandPResources/Images/11-8_bloodtypes.png

14) List all of the possible blood types?

15) Use model 4 and your knowledge of biology to fill in the chart below.

Blood type	Antigens on red blood cells	Antibodies made in blood

Model 5 -



http://bloodbanker.com/plasma/wp-content/uploads/2012/07/Red-Blood-Cell-Compatibility-Table-1.png

16) In question 5 you identified a blood type that can receive blood from all of the other blood types. Which blood type did you identify? According to model 5, is that accurate?

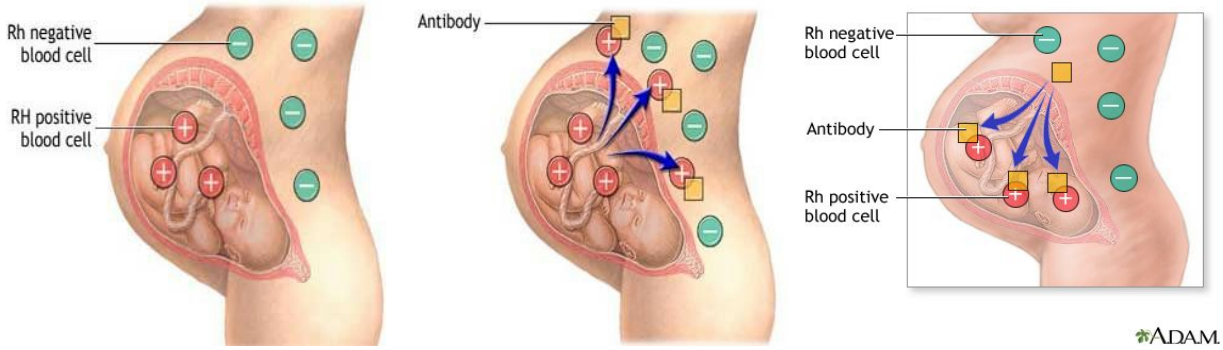
 17) The “universal recipient” is the blood type that can receive blood from anyone. Which blood type is the universal recipient? Why does this make sense?

18) In question 6 you identified a blood type that can donate blood to all of the other blood types. Which blood type did you identify? According to model 5, is that accurate?

 19) The “universal donor” is the blood type that can donate blood to anyone. Which blood type is the universal donor? Why does this make sense?

Model 6 -
RH+ = dominant, RH- = recessive
20) A dad homozygous for RH+ blood mates with a mom with RH- blood. What percent of their offspring will have RH+ blood? (Show your work below.)

Model 7 -



http://www.upmc.com/health-library/pages/adam.aspx?gencontentid=000203&projectid=14&productid=14

21) Looking at the left image, what is the phenotype of mom? What are her possible genotypes?

22) What is the phenotype the baby? What are the baby's possible genotypes?

23) Looking at the center image, what would happen if some of the baby's cells entered the mother?

24) The right image shows a second pregnancy. What is the 2nd baby's phenotype?

25) How will the mother's body respond to this 2nd baby?

26) Putting the pieces together, what does RH have to do with miscarriages?

Extension -

27) When there is an accident in the hospital, why do doctors ask for O- blood?

28) Which body system is responsible for killing germs? What does this system have to do with organ transplants and organ rejection?

29) What are immunosuppressant drugs? When someone gets an organ transplant, why are

they medicated with immunosuppressant drugs?

30) A married couple expects their third child. A test shows that the mother has developed antibodies against the blood type of the fetus. The mother has blood type B Rh negative. *Which of the following men can be the father: Number 1 - blood type B - , Number 2 - blood type O - or Number 3 - blood type A+? Why?*

31) An elderly couple died in a traffic accident. The man had blood type AB+ and his wife had O+. Shortly after, a young man showed up and claimed to be the sole heir to the dead couple. His blood type is AB+. *Can the young man be the couple's biological child? Why or why not?*

32) A group of six people (three men and three women) go climbing in the Andes. While passing a ledge, one of the men loses his foothold and falls down some 15 feet. The others manage to bring him to the nearest hospital where it is established that an immediate surgical operation is needed in order to save the use of his damaged legs. It may be necessary to carry out a blood transfusion during the operation. Unfortunately, the injured person does not know his own blood type, however, he does remember that both his father and mother have blood type A Rhesus negative. The other five participants immediately offer to donate blood, if necessary. However, even before knowing the blood type of the patient three potential donors can be ruled out. *Which three out of the five are not suitable donors for this recipient: male 1 (AB-), male 2 (A-), female 1 (O+), female 2 (B-) and female 3 (O-)?*