

Multiple Alleles Worksheet (Blood types)



Human blood types are determined by genes that follow the **CODOMINANCE** pattern of inheritance. There are two dominant alleles (A & B) and one recessive allele (O).

Blood Type (Phenotype)	Genotype	Can donate blood to:	Can receive blood from:
O	ii (OO)	A,B,AB and O (universal donor)	O
AB	I ^A I ^B	AB	A,B,AB and O (universal receiver)
A	I ^A I ^A or I ^A i (I ^A O)	AB, A	O,A
B	I ^B I ^B or I ^B i (I ^B O)	AB,B	O,B

1. Write the genotype for each person based on the description:

- a. Homozygous for the "B" allele _____
- b. Heterozygous for the "A" allele _____
- c. Type O _____
- d. Type "A" and had a type "O" parent _____
- e. Type "AB" _____
- f. Blood can be donated to anybody _____
- g. Can only get blood from a type "O" donor _____

2. Pretend that Brad Pitt is homozygous for the type B allele, and Angelina Jolie is type "O."
What are all the possible blood types of their baby?(Do the punnett square)

3. Complete the punnett square showing all the possible blood types for the offspring produced by a type "O" mother and an a Type "AB" father. **What are percentages of each offspring?**

4. Mrs. Brown is type "A" and Mr. Brown is type "O." They have three children named Matthew, Mark, and Luke. Mark is type "O," Matthew is type "A," and Luke is type "AB."
Based on this information:

- a. Mr. Brown must have the genotype _____
- b. Mrs. Brown must have the genotype _____ because _____ has blood type _____
- c. Luke cannot be the child of these parents because neither parent has the allele _____.

5. Two parents think their baby was switched at the hospital. Its 1968, so DNA fingerprinting technology does not exist yet. The mother has blood type "O," the father has blood type "AB," and the baby has blood type "B."
- Mother's genotype: _____
 - Father's genotype: _____
 - Baby's genotype: _____ or _____
 - Punnett square showing all possible genotypes for children produced by this couple.
 - Was the baby switched? _____

6. Two other parents think their baby was switched at the hospital. Amy the mother has blood type "A," Steven the father has blood type "B," and Priscilla the baby has blood type "AB."
- Mother's genotype: _____ or _____
 - Father's genotype: _____ or _____
 - Baby's genotype: _____
 - Punnett square that shows the baby's genotype as a possibility
 - Could the baby actually be theirs? _____

7. Based on the information in this table, which men **could not** be the father of the baby?

You can use the Punnett square if you need help figuring it out.

Name	Blood Type
Mother	Type A
Baby	Type B
The mailman	Type O
The butcher	Type AB
The waiter	Type A
The cable guy	Type B

8. The sister of the mom above also had issues with finding out who the father of her baby was. She had the state take a blood test of potential fathers. Based on the information in this table, why was the baby taken away by the state after the test?

Name	Blood Type
Mother	Type O
Baby	Type AB
Bartender	Type O
Guy at the club	Type AB
Cabdriver	Type A
Flight attendant	Type B