

PREDICTING THE INHERITANCE OF TRAITS WHEN ALLELES DEMONSTRATE CODOMINANCE!!

1. For the blood phenotypes listed below, list all the possible genotypes which may produce that particular phenotype.

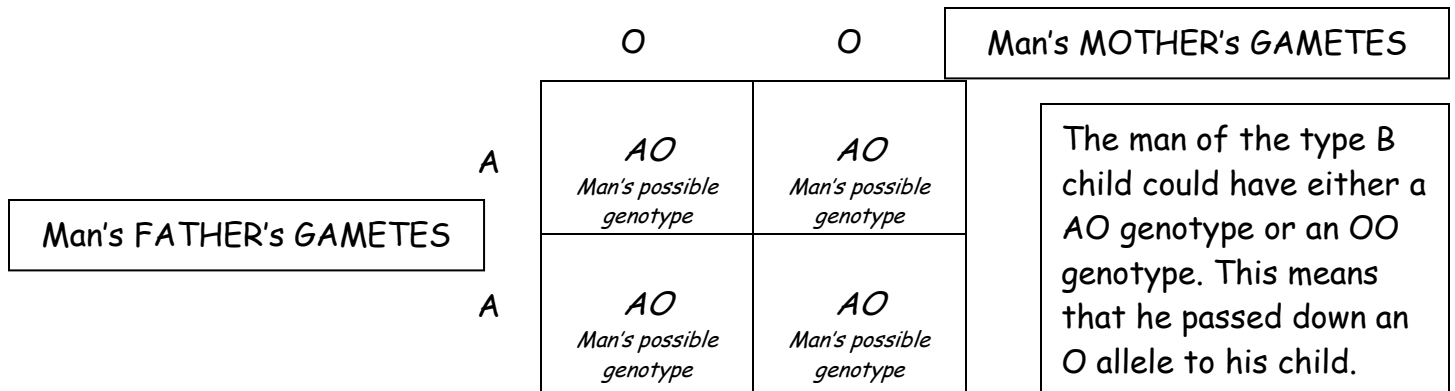
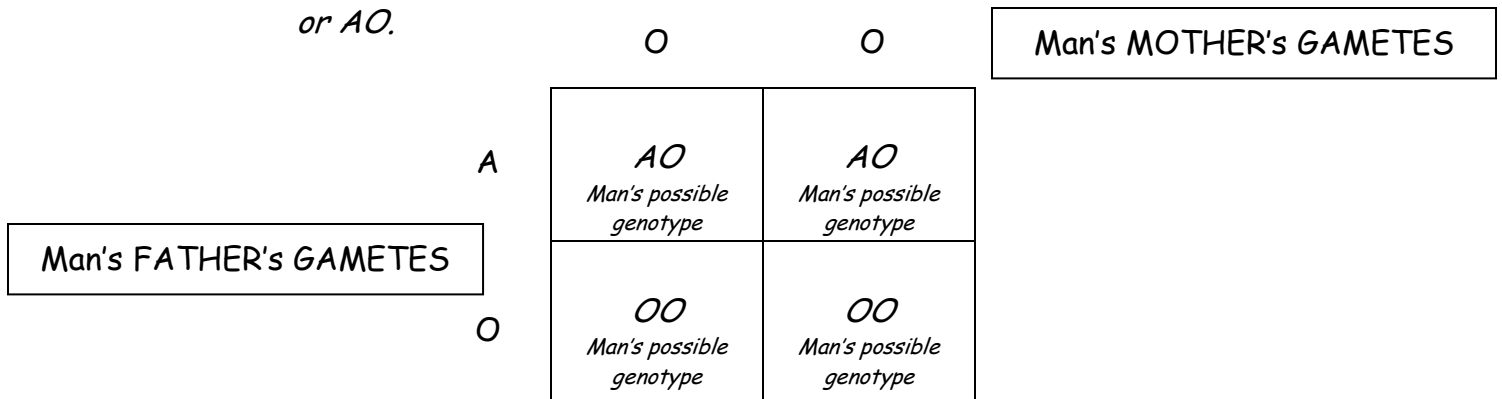
A+	B+	AB+
A-	B-	AB-
O+	O-	

Co-dominance Example Problem

Sometimes there is not one single allele which is dominant. For the case of antigen on the cells of red blood cells in humans, there is actually two alleles which are co-dominant over another recessive allele. The A and B cell surface antigen alleles are co-dominant to each other and both dominant over the O (no surface antigen) allele. See the example below:

A woman with type B blood marries a man whose mother was type O and whose father was type A. They have a son who is type B. What are the possible genotypes of the father?

- The man's mother was type O. The only genotype she could possibly be is OO.
- The man's father was type A. His father could have the genotype AA or AO.



2. For this question, consider only the ABO blood group alleles! What genotypes would you expect from the parents of the following 5 offspring? You must include a punnet square as evidence for your answer!!

- 1- Child with Type A blood
- 2- Children with Type AB blood
- 1- Child with Type B blood
- 1- Child with Type O blood

PARENTAL GENOTYPES

3. Blood typing may be used in some cases to solve paternity cases. A mother (Rene') with blood phenotype B+ has a son (William) with blood phenotype O-. The alleged father (John) has blood type B+ also. Provide evidence which either supports or refutes the allegation that John is the father of William. You must include a punnet square as evidence for your answer!! **(This is a two trait cross!!)**

Remember that ABO follows co-dominance and that + is dominant to -.

	—	—	—	—	—	—	—	—	—	John
—										
—										
—										
—										
—										
—										

RENE

Could John be the father of William??

If yes, what is John's genotype?

4. Consider the patients and their blood phenotypes below. What blood types would not be successfully received by each patient? You must provide a reason for why the transfusion would be unsuccessful in your answer!!

a) Patient A who has type O+ blood

b) Patient B who has type AB- blood

c) Patient C who has type A+ blood

5. Blood Type is determined by alleles which code for A, B, or no antigen on the surface of red blood cells. The A and B alleles are dominant over the O(no antigen) allele. Use this information in order to **complete the pedigree** below. Be sure to label each individual with the **correct Pedigree nomenclature**. Additionally, label each individual with their known **genotype** or **possible genotype with percentages**.

Shaded individuals have type O blood

The phenotype for some individuals is also given to you

