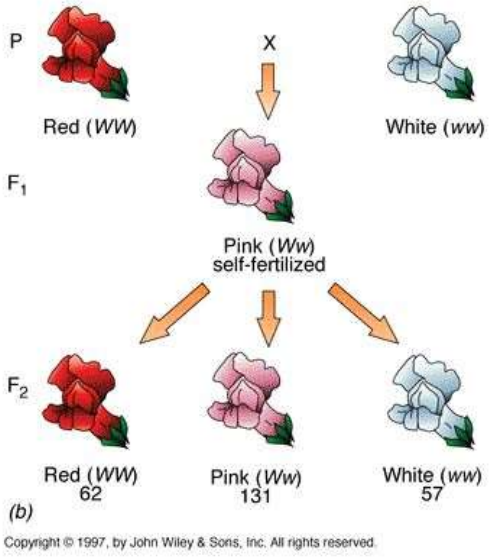
Genetics_Codominance, multiple alleles

Not all traits are controlled by single genes with simple dominant/recessive alleles.

Multiple alleles

Codominance

Incomplete dominance



Polygenic traits

Genetics_Codominance, multiple genes (bloodtype)

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

Blood Type (Phenotype)	**Genotype**	**Can donate blood to:**	**Can receive blood from:**
O	ii	A,B,AB and O (universal donor)	O
AB	I^AI^B	O, AB	A,B,AB and O (universal receiver)
A	I^AI^A or I^Ai	AB, A	O,A
B	I^BI^B or I^Ai	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?

3. Draw a Punnett square showing all the possible blood types for the offspring produced by a type "O" mother and an a Type "AB" father

4. Mrs. Clink is type “A” and Mr. Clink 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. Clink must have the genotype _____

    b. Mrs. Clink 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.”

    a. Mother’s genotype: _____

    b. Father’s genotype: _____

    c. Baby’s genotype: _____ or _____

    d. Punnett square showing all possible genotypes for children produced by this couple

    e. Was the baby switched?

6. Two other parents think their baby was switched at the hospital. The mother has blood type “A,” the father has blood type “B,” and the baby has blood type “AB.”

    a. Mother’s genotype: _____ or _____

    b. Father’s genotype: _____ or _____

    c. Baby’s genotype: _____

    d. Punnett square that shows the baby’s genotype as a possibility:

    e. Was the baby switched?

7. Based on the information in this table, which man could not be the father of the baby? Justify your answer with a Punnett square.

Name	Blood Type
Mother	Type A
Baby	Type B
Sammy the player	Type O
George the sleeze	Type AB
The waiter	Type A
The cable guy	Type B

8. Based on the information in this table, which man could not be the father of the baby? Justify your answer with a Punnett square.

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

9. Explain why blood type data cannot prove who the father of a baby <u>is</u>, and can only prove who the father <u>is not</u>.