Standard 3

~~Advanced~~ Genetics Study Guide **Name:** KEY **Block:** _____

Identify and **explain** complex patterns of inheritance including **interpreting** pedigrees.

Make the following vocabulary terms with the correct letter:

- Law of Independent Assortment: K.
- Incomplete Dominance : A.
- Co-Dominance: I.
- Homozygous: J.
- Heterozygous: D.
- Sex Linked: F.
- Polygenic: H.
- Multiple Alleles: C.
- Pedigree: B.
- Dihybrid Cross: _____
- Karyotype: G.
- Complete Dominance: L.

A. Heterozygous form is a blend of alleles
B. Tool used to show a family's history for a specific trait
C. Trait has three or more phenotypes
D. Two different alleles
E. Cross between two individuals for two traits
F. A trait that is only found on the X or Y chromosome
G. Tool used to view chromosomes of organism
H. Trait that is controlled by two or more genes; has a range of phenotypes
I. Heterozygous form shows both alleles
J. Two of the same alleles
K. Alleles of different genes are distributed independently of each other during meiosis
L. Dominant allele masks or hides the recessive allele

Complex forms of inheritance Punnett Squares:

If Cindy has blood type A(AA) and Max has blood type AB. What will be the genotype and phenotype ratios for their offspring blood type? (Show all possibilities).

Genotype: ½ AA : ½ AB

Phenotype: ½ A : ½ AB

Type of Inheritance: Multiple Alleles

	A	B
A	AA	AB
A	AA	AB

Frogs have alleles for green and brown skin color and skin color is co-dominant. If a green frog and frog with brown and green spots are crossed, what will be the genotype and phenotype ratios for the offspring?

G = green
B = brown
GB = brown & green

Genotype: ½ GG : ½ GB

Phenotype: ½ green : ½ green & brown

	G	G
G	GG	GG
B	GB	GB

If snap dragon flowers, red and white are common colors which follow incomplete dominance. If two pink flowers are crossed, what will be the genotype and phenotype ratios for the offspring?

W = White Pink = WR

R = Red

Genotype: ¼ WW : ½ WR : ¼ RR

Phenotype: ¼ white : ½ pink : ¼ red

WR x WR

	W	R
W	WW	WR
R	WR	RR

Pedigrees:

Pedigree Analys Rules:

Autosomal Dominant:

- Trait doesn't skip generations
- Affected married to non affected should have 50% affected offspring
- Equal in both sexes

Autosomal Recessive:

- Trait often skips generations
- Equal in both sexes
- Most affected individuals have non affected parents

Sex-Linked Dominant:

- Trait doesn't skip generations
- Affected males must come from affected mothers
- All daughters of affected father are affected

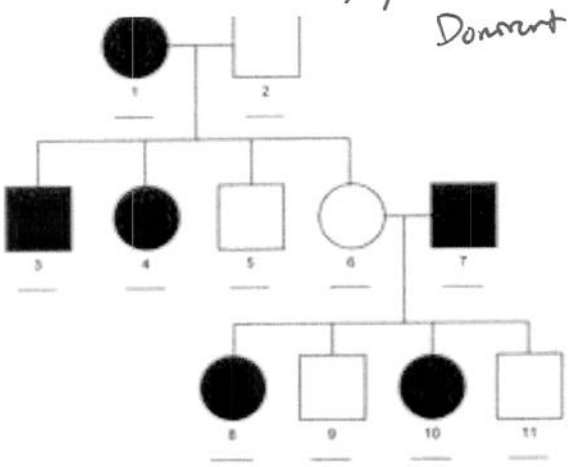
Sex-Linked Recessive:

- Most of affected individuals are males
- All sons of affected mother are affected
- For female to be affected, father must be affected and mother must be carrier

Identify the genotypes for each person and determine the type of inheritance for the following pedigrees:

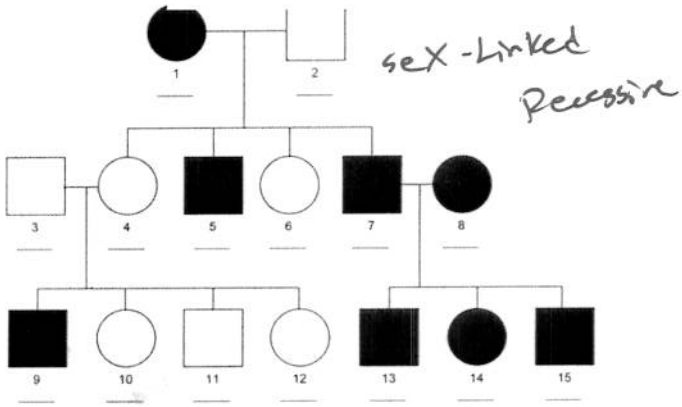
Pedigree 1:

sex-linked Dominant

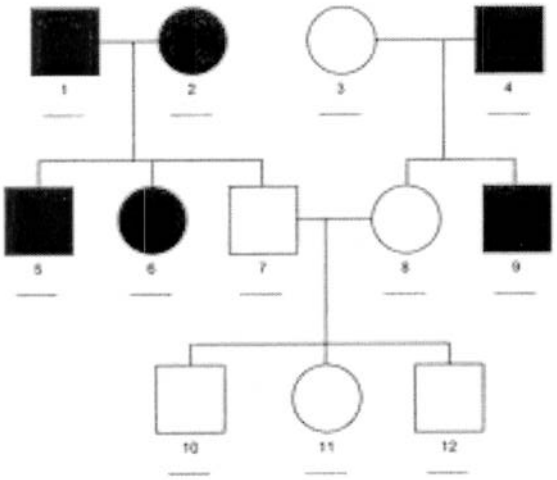


Pedigree 2:

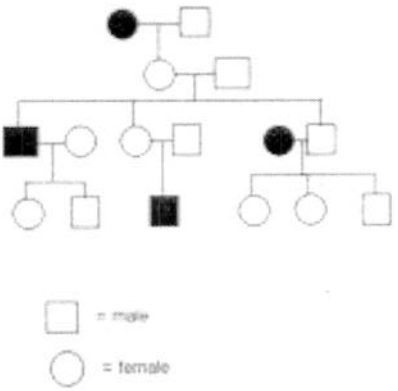
sex-linked Recessive



Pedigree 4 Autosomal Dominant



Pedigree 3 Autosomal Recessive



Create a pedigree for the following scenario:

- A man and woman marry.
- They have five children, 2 girls and 3 boys.
- The mother is a carrier of hemophilia, an X-linked disorder.
- The mother passes the gene on to two of the boys who died in childhood and one of the daughters is also a carrier.
- Both daughters marry men without hemophilia and have 3 children (2 boys and a girl).
- The carrier daughter has one son with hemophilia who dies.
- One of the non-carrier daughter's sons marries a woman who is a carrier and they have twin daughters.
- What is the percent chance that each daughter will also be a carrier? 0% Chance