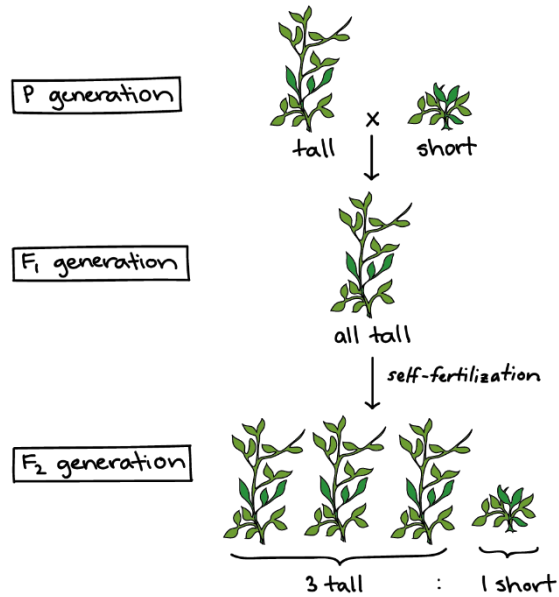
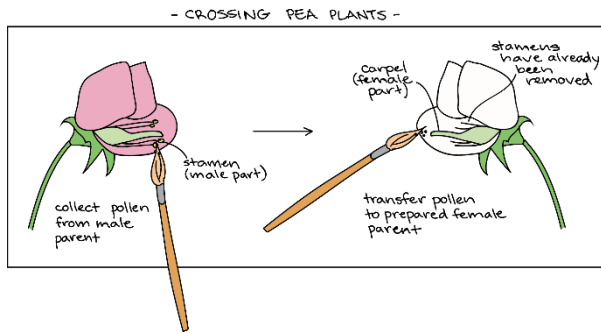


Biology 1
Classical Genetics Test Review
Practice

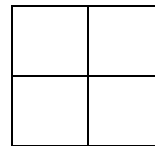
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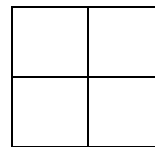


Monohybrid Crosses:

Yellow seeds are dominant to green seeds in peas. Show a cross between a homozygous yellow seed with a green seed. Identify the genotypic and phenotypic ratios.



As in the previous problem... The offspring have self-fertilized. Show this in a Punnett square. Identify the genotypic and phenotypic ratios.



Dihybrid Crosses:

Purebred wingless red-eyed fruit fly is crossed with a purebred winged white-eyed fruit fly. What is the genotype of the offspring? Red is dominant to white and wings is dominant over wingless. (Hint: They should all be the same so don't do an entire dihybrid cross to answer this)

Two of the F₁ flies (answer from above) are mated to produce an F₂ generation of flies. What is the *phenotypic* ratio of the F₂ flies? You can do the cross below. Be sure to list the phenotypes after you've completed the cross:

Phenotypes:

Exceptions:

The Set-up:



A snapdragon plant with red flowers is homozygous dominant (RR). A snapdragon plant with white flowers is homozygous recessive (rr). Heterozygous snapdragons (Rr) produce pink flowers.

A red plant is crossed with a white plant.

What color will the offspring be?

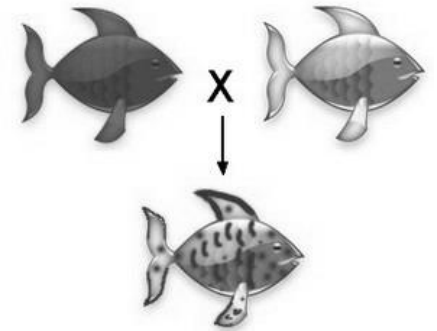
The Set-up:

In a certain fish, blue scales (B) and red (R) scales. Homozygous fish have either red or blue scales only. When a fish has a heterozygous genotype, it has a patchwork of blue and red scales.

B R = patchwork fish

B B = blue fish

R R = red fish



Cross a red fish with a blue fish.

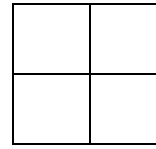
What is the likelihood of blue offspring?

The Set-up:

In humans, blood type A (I^A) and blood type B (I^B) are both dominant. This means that an individual that receives alleles for both type A and type B blood ($I^A I^B$) will have blood type AB. Individuals with type O blood are homozygous recessive (ii).

A heterozygous type AB male is crossed with a type O female.

What blood type will the offspring have?



A type O male is crossed with a heterozygous type A female.

What blood type will the offspring have?



The Set-up:

In humans, the trait for normal color vision is located on the X-chromosome (X^N). A mutated copy of this gene (X^n) leads to condition called color-blindness. This is characterized by an inability to perceive differences in colors. The Y-chromosome does not contain this gene. Therefore, females get two copies of the gene and can have normal vision, but carry the mutated gene ($X^N X^n$) have no copies of the mutated gene ($X^N X^N$) or be color blind ($X^n X^n$). Males are either normal ($X^N Y$) or colorblind ($X^n Y$).

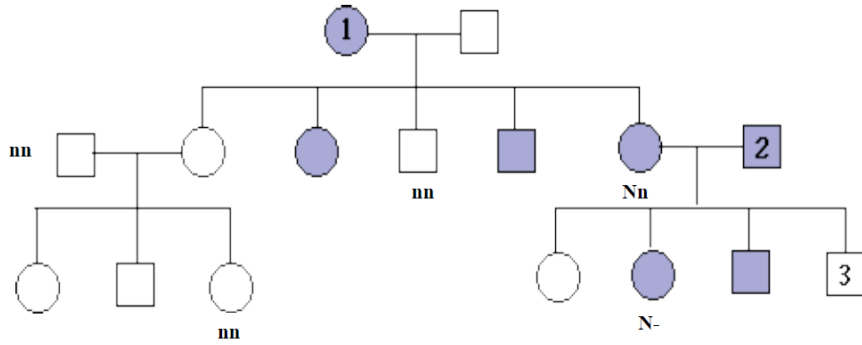
Cross a normal male with a female carrier.

What is the probability of a male offspring being colorblind?

What is the probability of a female offspring being is colorblind?



Pedigrees:

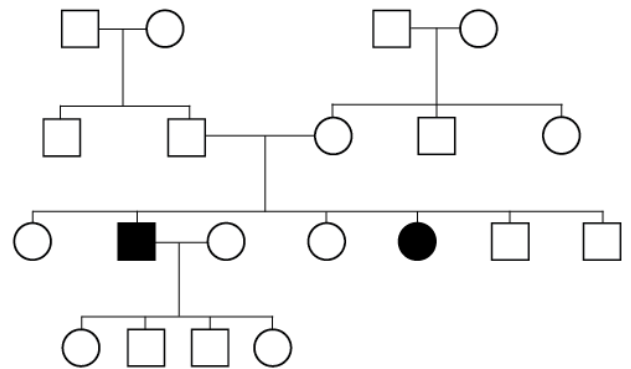
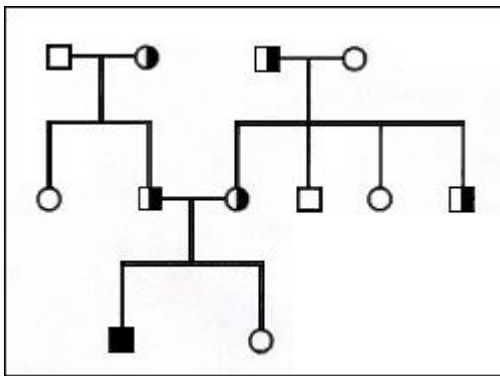
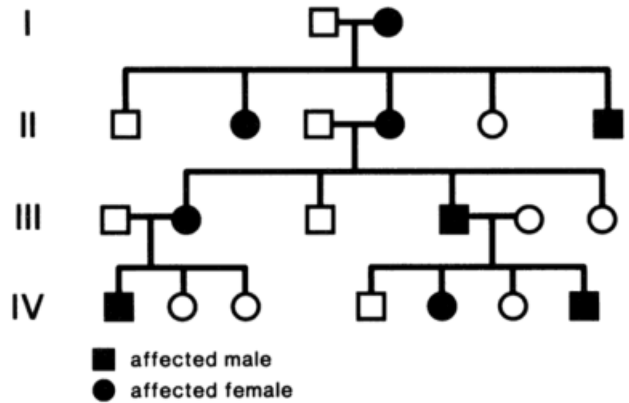
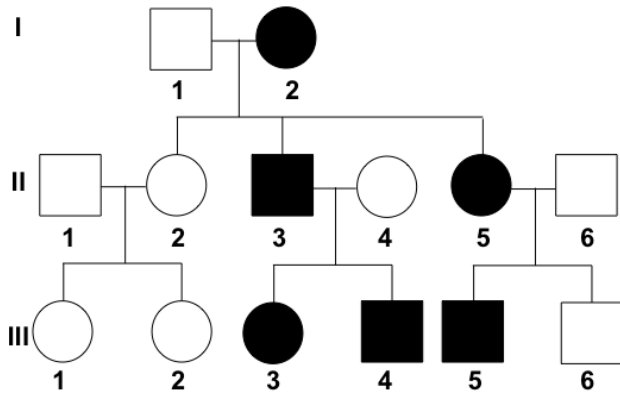


Analysis Questions:

1. Is individual #1 most likely homozygous dominant or heterozygous? Explain how you can tell. _____

2. What is the genotype of individual #3? _____

Is the trait most likely autosomal dominant or autosomal recessive? If recessive, shade carriers.



How are these sex-linked recessive (X-chromosome) pedigrees different than the pedigrees above?

