**Genetics Review Questions**

List the advantages Mendel had by using pea plants for his experiment.

* Short generation time frame
* Could control reproduction
* Can self-pollinate

In Mendel’s F2 generation, one out of four plants had yellow peas because:

* Both parents were heterozygous
* The yellow allele was recessive

Compared to previous genetic tests, Mendel’s work was exceptional because

* Choosing a set of simple binary traits
* Starting with true-breeding plants
* Studying multiple generations
* Keeping records of numbers of different child plants

The genotypes of a man and woman are IAIB and IAi. How many different possible genotypes and phenotypes are possible among their children?

* 4 genotypes, 3 phenotypes

An allele is:

* One of the several possible forms of a gene

Two true breeding parents are crossed similar to Mendel's P generation. A tall plant (dominant) is crossed with a short plant (recessive). What is the expected outcome for the F1 generation?

* All tall

If the cross from #1 is continued, what would be the expected outcome in the F2 generation?

* 3:1 - tall:short

If a plant that has round seeds has a parent that has wrinkled seeds, what is its genotype? (Assume that round is dominant.)

* Rr

This principle states that alleles separate during gamete formation:

* Law of Segregation

If you crossed two heterozygous plants, how many of the offspring will also be heterozygous?

* Half

A plant that has purple flowers is crossed with one that has white flowers. The offspring were half white and half purple. What were the genotypes of the parents?

* Pp x pp

Phenotype refers to an organism's:

* Physical characteristics that result from its genetics

In each case where Mendel crossed true breeding plants as parents, the offspring displayed only one of the two traits seen in the parents. This observation supports which principle of genetics?

* Law of Dominance

Which of the following outcomes would you expect from the following cross: tall, round seed (TTRR) x short, wrinkled (ttrr)

* All tall and round

How does height of the plant affect the shape of the seed of the plant?

* It doesn’t. Law of Independent Assortment

Two pea plants heterozygous for plant height and seed shape (dihybrid) are crossed.  Draw a Punnett square to determine phenotypic ratio of offspring.  The ratio will be:

* (9:3:3:1) (Tall&Round:Tall&Wrinkled:Short&Round:Short&Wrinkled)

Carnations have red (R) and white (r) alleles for their colour. These alleles show incomplete dominance. What would be the colour of the offspring between a homozygous red and a homozygous white carnation?

* Pink

Two pink carnations are bred together. Give the phenotypic ratio for the offspring.

* 1:2:1 (Red:Pink:White)

A red carnation is bred with a pink carnation. Give the phenotypic ratio for the offspring carnations.

* 1:1 (Red:Pink)

A man has six fingers on each hand and six toes on each foot.  His wife and their daughter have the normal number of fingers and toes.  Extra digits is a dominant trait.  What fraction of the couple's children would be expected to show this condition?

* ½

The genetic make up for an organism is:

* Genotype

A man with A blood type has a child with a woman with B blood type. The child has type O blood. What are the genotypes of the parents and the child?

* Man IAi, Woman IBi, Child ii

Which antigens will a person with type A blood have on their blood? Which antibodies will they produce? What happens when they receive a transfusion from somebody with type AB blood?

* A antigens
* Produce antibodies that attack B antigens
* Agglutination (the blood with clump)

The gene that is responsible for colour vision is on the X chromosome. Who is more likely to be colour blind, males or females? Why

* Males
* They only need ones of the recessive colour blind alleles since the Y chromosome does not have the matching gene. Females would need two of the recessive alleles to be colour blind.

Hypertrichosis, hairiness of the pinna of the ear, is inherited as a Y-linked recessive in humans. If a man with hypertrichosis marries a normal woman, what types of children may they have?

* All sons have hypertrichosis, no daughters have it.