Answer on Question #51690 - Biology - Other

The allele V represents the color purple, the allele v represents the color white, the allele J is green peas and j allele is yellow peas.

1. For an individual, what are all the possible genotypes for these two characters?

Gametes	VV	Vv	vv
JJ	VVJJ (purple flowers, green peas)	VvJJ (purple flowers, green peas)	vvJJ (white flowers, green peas)
Jj	VVJj (purple flowers, green peas)	VvJj (purple flowers, green peas)	vvJj (white flowers, green peas)
jj	VVjj (purple flowers, yellow peas)	Vvjj (purple flowers, yellow peas)	vvjj (white flowers, yellow peas)

2. It is the intersection of a heterozygous for both traits with VVjj individual. Manufactures Punnett square for this cross.

Heterozygous individual VvJj produces VJ, Vj, vJ and vj gametes. VVjj individual produces only Vj gametes.

Gametes	VJ	Vj	vJ	vj
Vj	VVJj (purple flowers, green peas)	Vvjj (purple flowers, yellow peas)	VvJj (purple flowers, green peas)	Vvjj (purple flowers, yellow peas)

3. With the same crossing, what are the odds of getting:
a. heterozygous individual for the two characters?

The chance of getting an individual heterozygous by both characteristics is 25% as follows from the Punnett's square.

b. VVJJ an individual?
The chance of getting VVJJ individual is 0 as VVjj individual does not have J allele.

4. Describe in your own words both Mendel's laws.
There are three Mendel's laws:
The Law of Segregation states that gametes, produced by any individual, receive only one copy of gene (allele), one or another.
The Law of Independent Assortment states that separate genes that are responsible for given characteristics are distributed to gametes independently, so the characteristics are inherited independently.
The Law of Dominance states that in offspring's dominant characteristics suppress recessive ones. So individuals that are hybrid for this characteristic will have the dominant phenotype.