

1. In cats, black fur(t) is a recessive trait. You have two black cats whose parents had tabby-coats(dominant).

What is the probability that their mother will have more black kittens? Show a Punnett square.

2. In peas, seed_shape and seed color are Mendelian traits found on separate chromosomes.. **R is the allele for the dominant, spherical shape** characteristic; r is the allele for the recessive, dented shape characteristic. **L is the allele for the dominant, yellow color characteristic;** l is the allele for the recessive, green color characteristic. What will be the phenotypic ratio of the offspring, if a rrLl pea plant is crossed with RrLl? Show a Punnett square

3. When we write “Rr”, how many chromosomes are carrying the R and r genes?

4. a) If the messenger RNA code is AAAGUGUCA, what was the corresponding DNA code?

b) Give the three transfer RNA codes matching the messenger RNA code of AAAGUGUCA.

c) What amino acids will be picked up by the transfer RNA’s from question(b). See mRNA codes in table.

		Second letter				
		U	C	A	G	
First letter	U	UUU } Phe UUC } UUA } Leu UUG }	UCU } UCC } Ser UCA } UCG }	UAU } Tyr UAC } UAA Stop UAG Stop	UGU } Cys UGC } UGA Stop UGG Trp	U C A G
	C	CUU } CUC } Leu CUA } CUG }	CCU } CCC } Pro CCA } CCG }	CAU } His CAC } CAA } Gln CAG }	CGU } CGC } Arg CGA } CGG }	U C A G
	A	AUU } AUC } Ile AUA } AUG Met	ACU } ACC } Thr ACA } ACG }	AAU } Asn AAC } AAA } Lys AAG }	AGU } Ser AGC } AGA } Arg AGG }	U C A G
	G	GUU } GUC } Val GUA } GUG }	GCU } GCC } Ala GCA } GCG }	GAU } Asp GAC } GAA } Glu GAG }	GGU } GGC } Gly GGA } GGG }	U C A G

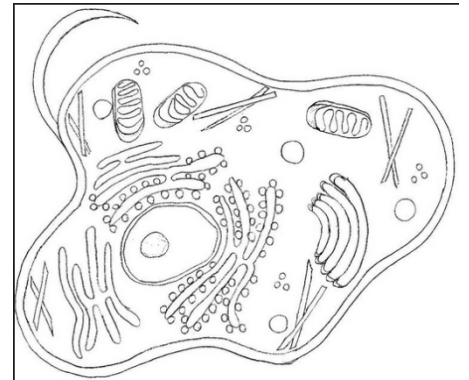
d) What is the advantage of having different codes for the same amino acid?

e) Which nitrogen base in the DNA probably changed if valine(val) was replaced by aspartic acid (asp) in the protein being made?

5. TRUE? Or FALSE?

- a) A gene is part of a chromosome that has the genetic code required to make 1 protein._____
- b) A gene is made up of DNA.
- c) Lipids and carbohydrates consist of amino acids :
- d) The order in which amino acids are combined influences the type of protein being made.
- e) Human sex cells have 23 unpaired chromosomes

6. Show the locations of transcription and translation in the cell.



7. Red hair is caused by two mutations in the genes necessary to bring about the conversion of the reddish pigment to brown or black eumelanin. What molecules can't be made by the mutated genes? Why not?

8. A hemophiliac man has a mother and sister who do not have the disease. Hemophilia is recessive and is carried only on the X chromosome.

Give his genotype, and also that of his mother, and the possibilities for his sister and father.
(If you're really good, also predict his shoe size.....bad joke!)



What will the concentration of Li^+ be in a total of 250 ml if 39.2 g of H_2SO_4 react? Respect your grandmother and sig figs.

10. Why would there be $3 \times 6.02 \times 10^{23}$ atoms of oxygen atoms in 1 mole of ozone molecules?