Introduction to Genetics

1. What is inheritance? (1)

All of the genes passed down from generation to generation.

2. What is genetics? (1)

The scientific study of heredity

3. Who was Gregor Mendel? (1)

An Austrian monk who did experiments with pea plants to study inheritance.

4. Name two things that Mendel knew about the pea plants. (2)

a) He knew that flowers had male and female parts, with the male part containing pollen or sperm and the female parts containing the egg.

b) He knew that pea plants were true breeding- that left to self-pollinate, they would produce offspring identical to themselves

5. What did Mendel want to do with the plants? What did he do to accomplish this? (2)

He wanted to produce seeds by cross pollinating two different pea plants. He cut away the pollen-bearing male parts then dusted pollen from other plants on the flower.

6. How many traits did Mendel study? (1)

Seven- seed shape, seed colour, seed coat colour, pod shape, pod colour, flower position, plant height

7. What is a trait? (1)

A specific characteristic that varies from one individual to another.

8. What is each original pair of plants referred to as? (1)

P generation or Parental Generation

9. What are the offspring of the parents called? (1)

F_1 generation

10. What are hybrids? (1)

The offspring resulting from the crosses between parents with different traits

11. What is the differences between genes and alleles? (1)

Genes are chemical factors that determine traits, Alleles are the different forms of a gene.

12. The does the principle of dominance state? (1)

It states that some alleles are dominant and some alleles are recessive

13. What is true about dominant and recessive genes? (2)

An organism with the dominant allele will always exhibit that form of the trait. An organism with a recessive allele will only exhibit that trait when the dominant allele is not present.

14. What did Mendel discover about segregation? (1)

When the F_1 plant flowers and produces gametes, the two alleles segregate from each other so that each gamete carries only a single copy of each gene.

15. What can the principles of probability be used to predict? (1)

The outcome of genetic crosses

16. What is a Punnet Square? (1)

A diagram that can be used to show the gene combinations that may result from a genetic cross

17. What is the difference between homozygous dominant, heterozygous and homozygous recessive? (3)

Homozygous Dominant refers to having both dominant alleles (TT), heterozygous refers to having a dominant allele and a recessive allele (Tt), homozygous recessive refers to having recessive alleles (tt)

18. What is the difference between phenotype and genotype? (2)

Phenotype- physical characteristics   Genotype-the genetic makeup

19. What is the difference between a one factor cross (monohybrid cross) and a two factor cross (dihybrid cross)? (2)

In a one factor cross you are just looking at one trait (colour) while in two factor cross you are looking at two traits (colour and shape)

20. What does the principle of independent assortment state? (1)

That genes for different traits can segregate independently during formation of gametes.

21. What is incomplete dominance; codominance; multiple alleles; polygenic traits? Given an example of each one. (4)

Incomplete Dominance-situation in which one allele is not completely dominant over another- red, white and pink flowers

Codominance-Situation in which both alleles of a gen contribute to the phenotype of the organism. Speckled chickens

Multiple alleles- situation in which there is more than one allele for a trait. Coat color in rabbits

Polygenic trait- trait controlled by two or more genes-skin colour in humans