### DNA and Genes QUESTION

**Question:** Use the diagram below to help you explain the relationship between chromosomes, genes, alleles, phenotype, genotype, and the molecule DNA.

![Diagram](image)

**ANSWER**

1. explain link between chromosomes and DNA
   - Chromosomes are made up of DNA.

2. describe the physical structure of DNA
   - DNA is a large molecule that is coiled into a double helix (twisted ladder structure). It is responsible for determining the phenotype of an organism. Along this molecule are bases.

3. Explain the pairing rule of DNA
   - These bases pair up; A always pairs with T, and G with C.

4. link the base sequence to trait and gene (use example)
   - A sequence of bases which codes for a particular trait (eg, eye colour) is called a gene.

5. Give the definition for an allele (use example)
   - The different versions of each gene are called alleles, and these show the different variations of each characteristic, eg brown / blue eyes.

6. link pair of chromosomes to pair of alleles
   - Because chromosomes come in pairs for each trait, there will be two possible alleles

7. link alleles to base sequence
   - These different versions of genes (alleles) occur as the DNA base sequence is different.

8. give the definition of a genotype
   - This combination of alleles for each trait is called the genotype; this can be any combination of two of the available alleles.

9. link genotype to phenotype
   - The genotype determines the phenotype (the physical appearance) of the organism.

10. give definition of dominant alleles
    - Whichever alleles are present may be expressed. Dominant alleles (B) will be expressed over recessive alleles (b).

11. give definition of recessive alleles
    - Two recessive alleles are required for the recessive phenotype to be expressed

**NOTE:** The white column is how your answer would appear on your test paper so make sure you write out complete sentences. The grey area is just to help you structure your answer and would not appear in the question.