Year 10 Science: DNA, genes, chromosomes and proteins

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. One DNA strand reads G G A T C T. Write the partner strand.

2. Put these in order from largest to smallest: gene, nucleus, base, chromosome.

3. Name the protein type for each: antibody, amylase, keratin.

4. Is the number of petals on a flower discrete or continuous? What about the mass of a lamb at birth?

5. Give one strength and one limitation of a flat paper diagram of DNA.

Fix the mistake

6. Correct this statement: "The partner of A T G is A T G, or A pairs with G."

7. Correct this statement: "A chromosome is the same thing as a gene."

8. Correct this statement: "My height is 162 cm, a whole number, so height is discrete data."

9. Correct this statement: "Your phenotype is decided by your genes alone."

Answer key (for parents and tutors)

1. One DNA strand reads G G A T C T. Write the partner strand.
   C C T A G A, because G pairs with C and A pairs with T.
2. Put these in order from largest to smallest: gene, nucleus, base, chromosome.
   Nucleus, chromosome, gene, base: a nucleus holds chromosomes, a chromosome carries many genes, and a gene is a sequence of bases.
3. Name the protein type for each: antibody, amylase, keratin.
   An antibody defends against disease, amylase is an enzyme that speeds up digestion of starch, keratin is a structural protein.
4. Is the number of petals on a flower discrete or continuous? What about the mass of a lamb at birth?
   Petal number is discrete, since you cannot have 5.3 petals. Birth mass is continuous, since it can be any value such as 4.27 kg.
5. Give one strength and one limitation of a flat paper diagram of DNA.
   Strength: base pairs and their order are easy to read. Limitation: it is flat, so it hides the double helix twist.
6. Correct this statement: "The partner of A T G is A T G, or A pairs with G."
   A always pairs with T and C with G, so the partner of A T G is T A C.
7. Correct this statement: "A chromosome is the same thing as a gene."
   A chromosome is one long DNA molecule carrying hundreds to thousands of genes, and each gene is just one section of it.
8. Correct this statement: "My height is 162 cm, a whole number, so height is discrete data."
   Height is continuous because any value in between is possible; rounding a measurement does not make it discrete.
9. Correct this statement: "Your phenotype is decided by your genes alone."
   Phenotype comes from genes and environment together, which is why identical twins can differ in weight.