Name:

Date:

QA7 – Nucleic Acids

1. Give another name for a nucleic acid.
   Polynucleotide.

2. Nucleic acids can be divided into two groups, DNA and RNA. What do DNA and RNA each stand for?
   Deoxyribonucleic acid
   Ribonucleic acid

3. Describe the general function of DNA.
   DNA contains the **genetic information** which **codes for amino acids**. DNA can be read to indicate how to build amino acids, and this in turn affects the polypeptides and **proteins** which ultimately form. The genetic code which is found in DNA **ultimately dictates how cells, structures, and whole organisms form**.

4. Describe the general function of RNA.
   RNA **transfers the genetic code** which is in DNA, to **convert it into actual amino acids**. DNA is transcribed into RNA, which can then be read by ribosomes. These ribosomes are able to convert the RNA code into amino acids, with RNA acting as an intermediary.

5. What is a ribosome made from? And what is its role?
   Ribosomes are molecular machines, which are complexes of **RNA** and **proteins**. They convert the genetic code in RNA into amino acids, ultimately **synthesising proteins**.

6. What is the monomer unit which make up a nucleic acid called?
   Nucleotide.

7. What are the three components of this monomer?
   Phosphate group, **pentose sugar**, and **base**.

8. What type of bonds join the monomers together to form a nucleic acid?
   Covalent bonds, known as **phosphodiester** bonds.

Produced by Adam Stubbs at Newcastle University as part of a summer outreach project.

9. The individual monomers of DNA and RNA have similar, yet different structures. Describe the two key differences in the structures of DNA and RNA.
DNA uses a pentose sugar called **deoxyribose**, whereas RNA uses a pentose sugar called **ribose**.
DNA has four bases, adenine, cytosine, guanine, and thymine. In **RNA**, **thymine** is **replaced** with **uracil**.

10. The overall 3D shape of DNA is a double helix, where two strands of DNA combine through complementary base pairing. How does the overall shape of an RNA molecule differ?
RNA exists as **short, single strands**, which fold to **base pair with themselves**.