**DNA Replication Activity**

When DNA is taken out of the cell and stretched out, it looks like a twisted ladder. This shape is called a **Double Helix**. The sides of the DNA ladder are made from alternating units of deoxyribose sugar and phosphate. The steps of the ladder are pairs of small chemicals called nitrogenous bases.

There are four types of nitrogenous bases in DNA: **Adenine (A) Cytosine (C) Guanine (G) and Thymine (T)**

DNA bases form pairs in specific ways: Adenine (A) pairs with Thymine (T), and Guanine (G) pairs with Cytosine (C).

**Purpose:** Use pipe cleaners and pegs to construct a DNA Double Helix. The pipe cleaner will be the sides of the DNA strand and pegs will be the nitrogenous bases*.*

**Materials Required:**

• 4 pipe cleaners

• 24 coloured pegs (Choose four different colours, one colour for each base)

**Write your DNA sequence of 6 bases here: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Method:**

|  |  |
| --- | --- |
| Draw the diagram for each step | *Construct your DNA* |
|  | *Step 1:*  Put together one side of your DNA Double Helix (ladder) using the sequence above. Thread the pipe cleaner through the spring in the pegs. Attach six of the pegs according to the sequence written above. |
|  | *Step 2:*  Match the nitrogenous base pairs. Attach the coloured peg for the matching nitrogenous base to each peg. |
|  | *Step 3:*  Complete your DNA double helix. Attach the other backbone by threading the pipe cleaner through the newly attached pegs. Carefully twist your DNA so that it looks like a double helix (twisted ladder). |
|  | *Step 4:*  Unzip the DNA from the bottom of the strand by detaching the pegs- exposing the bases. |
|  | *Step 5:*  Attach coloured pegs for the complimentary chemical base to the exposed pegs. |
|  | *Step 6:*  Complete the two new strands by threading the pipe cleaners through the newly attached pegs |

**DNA Replication Practice**

1. What is DNA replication?

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2. What happens to the DNA molecule during the first step of DNA replication?

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3. What happens to the DNA molecule during the second step of DNA replication?

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4. What happens to the DNA molecule during the third step of DNA replication?

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5. (True or False) The process of DNA replication results in a copy of the original DNA molecule.

6. (True or False) DNA does not have to break apart to be copied.

7. (True or False) After DNA replication is complete, there are two new DNA molecules; one molecule has both of the original strands and one molecule has two new strands of DNA.

8. Where does DNA replication happen?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. When does DNA replication happen?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Below are DNA strands. Make the complementary DNA strand:

Original Strand: A T G C A A A T T G C T C A C C G G G G A T C A G C A C C

Complementary Strand: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Original Strand: A G G G G A T C A G C A C C G G A T T T C A T G A G C C C

Complementary Strand: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Show the complimentary base pairing that would occur in the replication of the short DNA molecule below. Use two different coloured pencils (or different pens, markers, etc.) to show which strands are the original and which are newly synthesized.

