# Engage: DNA Modeling

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**Objective:** To create a physical model of DNA to understand its structure and how it encodes genetic information.

### Materials Needed:

- Colored paper or cardstock (for nucleotides and backbone)
- Scissors
- Glue or tape
- Pencils

### Instructions:

#### 1. Prepare Materials:

Cut out paper shapes to represent nucleotides and the sugar-phosphate backbone. Use different colors for each nucleotide (Adenine, Thymine, Cytosine, Guanine).

### 2.Build the Backbone:

• Take a long strip of paper to represent the sugar-phosphate backbone of DNA. Label one end as the 5' end (attach a phosphate group) and the other end as the 3' end (attach a hydroxyl group).

### 3. Create Nucleotides:

• Cut out smaller shapes to represent each nucleotide (A, T, C, G). These should include the nitrogenous base (Adenine, Thymine, Cytosine, Guanine), sugar (deoxyribose), and phosphate group.

### 4. Build the DNA Strands:

- Start with one end of the backbone (either 5' or 3') and attach the nucleotides in the correct order according to base-pairing rules:
  - Adenine (A) pairs with Thymine (T)
  - Cytosine (C) pairs with Guanine (G)
- Continue adding nucle otides until you have completed one strand of DNA.

### 5.Create the Complementary Strand:

• Use the remaining nucleotides to build the complementary strand. Remember to follow base-pairing rules (A with T, C with G).

### 6.Secure Your Model:

Use glue or tape to secure the nucleotides to the backbone and ensure your DNA model is stable and accurate.

### 7.Label and Reflect:

- Label each part of your model (nucleotides, backbone, 5' end, 3' end).
- Answer the reflection questions below:

### **Reflection Questions:**

- A. How does your model demonstrate the double-helix structure of DNA?
  - My model demonstrates the double-helix structure of DNA by \_\_\_\_\_
- B. Why is it important for DNA to have a complementary strand?
  - DNA needs a complementary strand because \_\_\_\_\_
- C. How does the order of nucleotides in DNA relate to genetic information?
  - The order of nucleotides in DNA relates to genetic information because \_\_\_\_\_





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