

Directions: Use the DNA tutorials from my wiki to answer the following questions. You are not expected to already know the answers. Use the buttons in the DNA tutorials to investigate. Play around with the DNA models to try and figure out the answers. The questions are not necessarily in the order of the tutorials. You may also need to use your book.

### Question Set A (basic)

- What is a "strand" of DNA made of? What is a nucleotide?
- How many strands make up a DNA double helix?
- Each strand is made up of two zones or regions. One zone of each strand is made up of identical repeating units, while another zone is made up of differing units. What are these zones of each strand called?
- What holds one strand against the other in the double helix?
- How do cells make accurate copies of DNA?
- When do cells duplicate their DNA?
- What information is coded into DNA? What do we call the regions of DNA that code for this information? What do we call the regions that control the previous answer?
- What is a "codon"?
- What is "transcription" of DNA?
- What is "translation" of DNA?
  
- What is the difference between ribose and deoxyribose?

### Question Set B (intermediate)

- What are the four pairs of DNA bases that form in the double helix?
- Which carbon in the sugar attaches to one of the four bases?
- How can A distinguish T from C?
- Which DNA double helix do you think would be harder to separate into two strands: DNA composed predominantly of AT base pairs, or of GC base pairs? Why?
- What is a mutation?
- The DNA double helix looks like a twisted ladder. What makes up each rung of the ladder? What holds the rungs together at the sides?
- How can you differentiate the 3' end from the 5' end?
- Is there mostly empty space between the atoms in a DNA double helix?

### Question Set C (advanced)

- How does DNA get packaged so it is small enough to fit inside a cell nucleus?
- Which bases are purines? Pyrimidines?
- If a purine were substituted for a pyrimidine at a single position in one strand of a DNA double helix, what would happen?
- In a DNA double helix, why doesn't an A or T form two hydrogen bonds (out of the three possible) with G or C?
- How many different kinds of 5-membered rings are in DNA?
- How many different kinds of 6-membered rings are in DNA?
- Does the "free arm" of deoxyribose (the carbon that is not a member of the pentose ring) point in the direction in which the coding strand is read, or against it?
- Based on the codons shown (in the Codons movie in section **B. The Code**), is the DNA strand shown the template strand or the coding strand?