

DNA Cut-and-Paste Activity

DNA is built from building blocks called _____. Each of these building blocks has 3 parts:

- (1) _____
- (2) _____
- (3) _____ (there are 4 kinds of these each symbolized by a letter: _____, _____, _____, _____)

A. Make The Chain

1. Use the accompanying paper DNA pieces to make a strand (chain) of 9 nucleotides in this order:
adenine, adenine, guanine, cytosine, cytosine, adenine, thymine, thymine, guanine
2. Cut and paste the nucleotides in the middle of a piece of blank paper in a line so that the phosphate on one is bonded to the deoxyribose sugar of the next one.

B. Make the Complementary Strand

1. DNA is composed of not 1 but 2 strands side-by-side. Each nitrogen base on one strand bonds to a nitrogen base on the other strand. Thus, it is the _____ that hold the 2 strands together.
2. Construct the complementary strand by correctly pairing up nitrogen bases to your original 9-nucleotide strand. (Note: to correctly join the 2 strands, the second strand is upside down)

C. DNA Replication

1. Before a cell divides, the DNA must be replicated (copied). This happens during _____ of the Cell Cycle.
2. DNA is able to unzip into it's 2 complementary strands by separating down the middle, breaking the bonds between A and _____ and between C and _____. Now there are 2 separate strands.
3. New nucleotides (with bases) enter between the 2 strands and bind to the separated original strands using "complementary base pairing" (ie. A-T, C-G).
4. Complete the following diagram by writing in the letters (A, T, C, G) for each nucleotide in the original and replicated strands:

1st original strand	A	A	G	C	C	A	T	T	G
complementary strand									

complementary strand									
2nd original strand									

5. How similar are the 2 DNA molecules? _____

D. The Genetic Code

1. The genetic code is like words 3-letters long (ie. CAT, DOG, BOX). In DNA, the letters are nucleotides. So a code in DNA might read: ACC, TCG, CGA. Each 3-nucleotide code word is called a "codon".
2. How many codons does the 1st original strand of your DNA molecule have? _____
3. List the codons of your 1st original strand: _____, _____, _____.
4. Use your text to answer these:
 - (pg. 117) a) A codon actually codes for one particular _____.
 - (pg. 117) b) Many _____ join together to produce a _____ (which make up most of the structure of cells and tissues and act as enzymes and hormones).
 - (pg. 117) c) A gene is _____

 - (pg. 118) d) A genetic mutation may occur if a mistake occurs in: _____
