Name _____ Block _____ Date _____

DNA Discovery, Structure, and Replication – BIO.5e, g

Match each scientist with his/her contribution to the development of the double helix model.

— American biologist credited with developing the double helix model of DNA

— British physicist credited with developing the double helix model of DNA

— Determined that in any sample of DNA, regardless of species, the amount of adenine (A) present always equaled the amount of thymine (T); and the amount of guanine (G) always equaled the amount of cytosine (C).

— Performed X-ray crystallography on DNA, producing images that would reveal the helical shape of the molecule.

A. Erwin Chargaff

B. Francis Crick

C. James Watson

D. Rosalind Franklin

Complete each of the following sentences by choosing the correct term in each parentheses.

1. The DNA molecule is a (double, single) stranded sequence of nucleotides that are highly (repetitive, variable) in their order. Across the strands, nitrogen-bases follow a (complimentary, identical) base-pairing pattern.
2. The DNA molecule stores (energy, information) in its nucleotide sequence. It is capable of (transmitting, hiding) the genetic code from parents to offspring through self-replication. This is important because DNA controls (metabolism, protein synthesis) in cells, which determines genetic traits. DNA is also capable of (change, self-destruction) through mutations, which can lead to evolutionary change.
3. DNA is a (nucleic acid, fatty acid) made of two strands of (amino acids, nucleotides). It is located in the (cytoplasm, nucleus) of prokaryotes and the (cytoplasm, nucleus) of eukaryotes. DNA molecules contain (genes, traits), which hold the instructions for making (carbohydrates, proteins). DNA is the main component of (cell membranes, chromosomes), which are distributed to daughter cells during cell division. DNA is the only molecule capable of (metabolism, self-replication).

Provide the complimentary nitrogen base sequence to the strand provided below.

A T T G C G C G A T A A T A A

_____

Calculate the percentage of each nitrogen base in the sample at left (including the complimentary strand, there are 30 bases).

A _____ T _____

G _____ C _____

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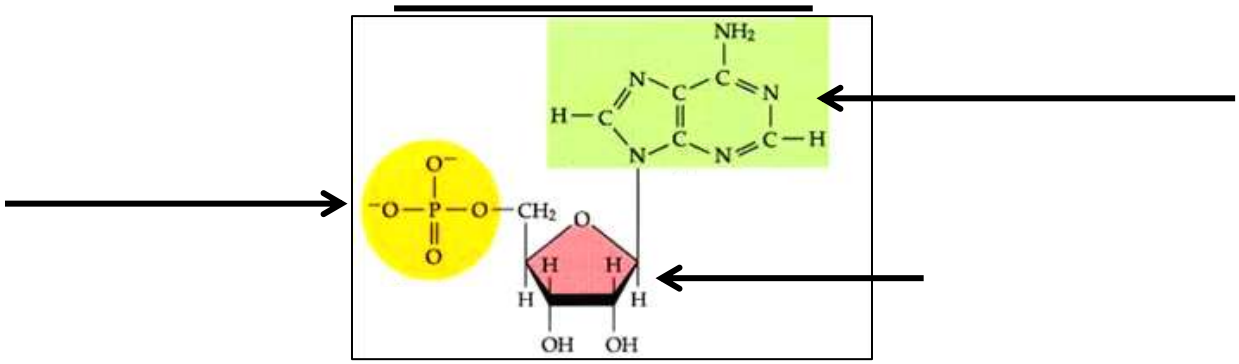
If a certain DNA sample contains 32% adenine, calculate the percentages of the other three bases in this sample.

A 32% T _____ G _____ C _____

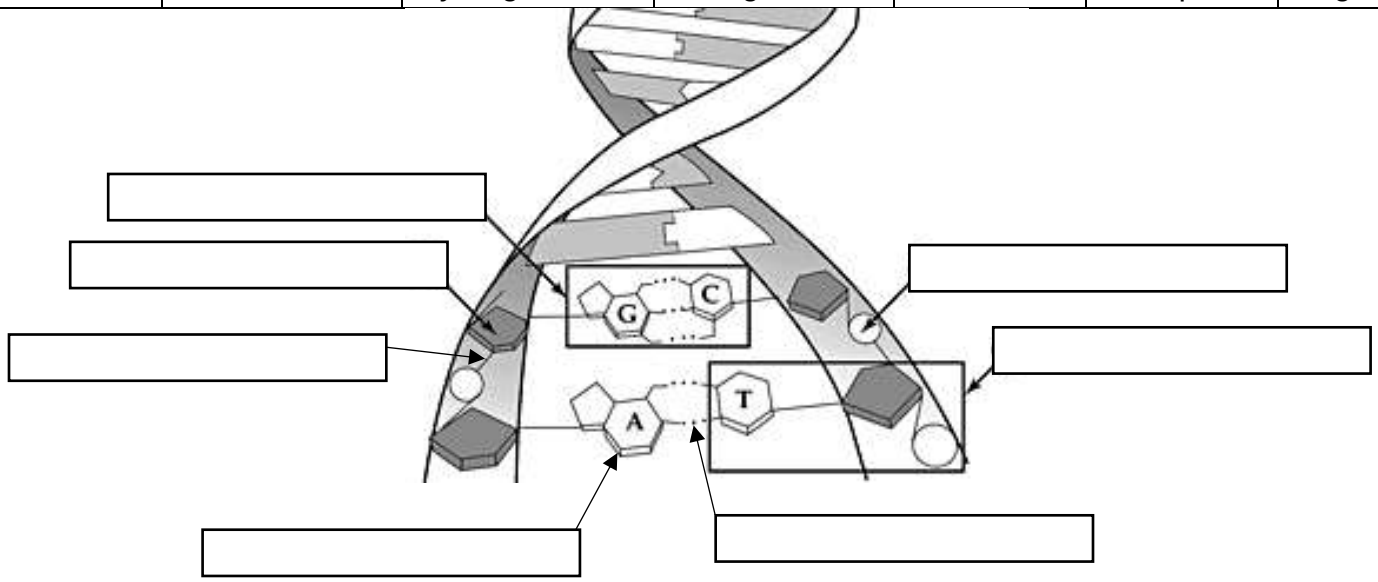
Fill in the blanks in the image below in order to correctly identify the molecule and label its parts using the following terms.

Nitrogen base	Nucleotide	Phosphate group	Sugar



Fill in the blanks in the image below in order to correctly label the DNA molecule using the following terms.

Base Pair	Covalent Bond	Hydrogen Bond	Nitrogen base	Nucleotide	Phosphate	Sugar



Place the following events in chronological order (1, 2, 3, 4) for the process of DNA replication.

— DNA polymerase (an enzyme) adds complimentary nucleotides to each conserved strand of template DNA.

— The DNA is condensed and the cell undergoes cell division.

— The double helix is separated by the enzyme helicase.

— Two identical DNA molecules, each made of one original strand and one newly synthesized strand, are completed.