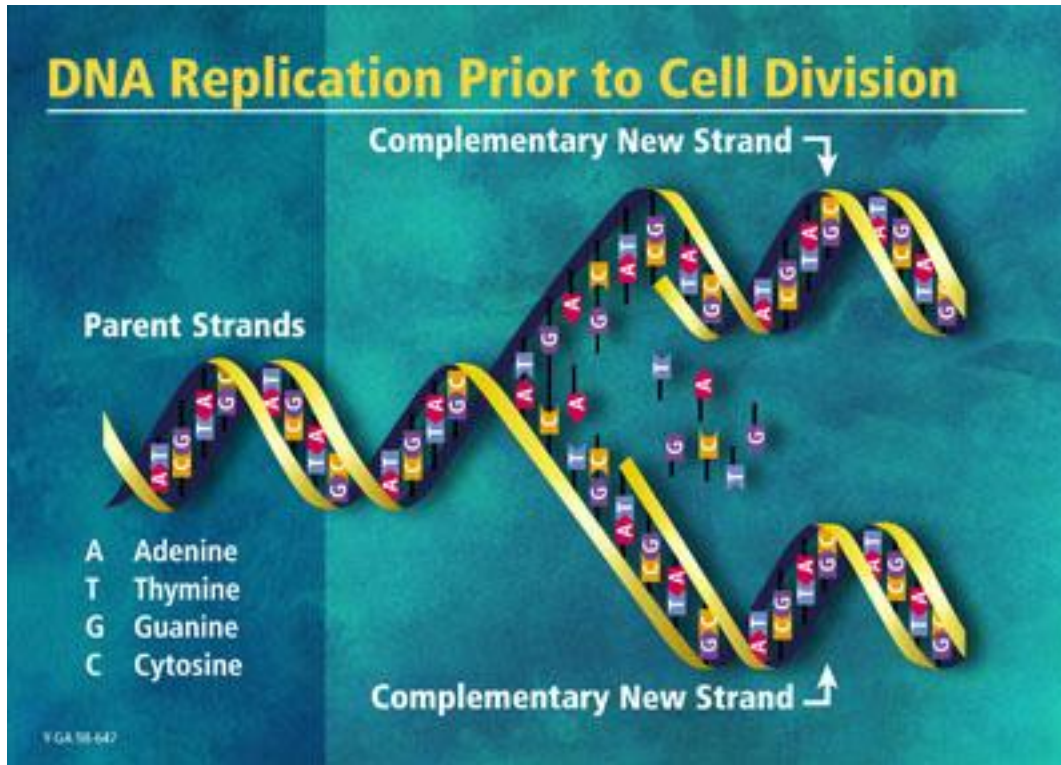


DNA Replication Practice Worksheet



The double helix of DNA unwinds and each side serves as a pattern to make a new molecule.

Image courtesy [U.S. Department of Energy Human Genome Program](#)

DNA Replication

DNA carries the information for making all of the cell's proteins. These proteins implement all of the functions of a living organism and determine the organism's characteristics. When the cell reproduces, it has to pass all of this information on to the daughter cells.

Before a cell can reproduce, it must first **replicate**, or make a copy of, its DNA. Where DNA replication occurs depends upon whether the cell is a prokaryote or a eukaryote (see the RNA sidebar on the previous page for more about the types of cells). DNA replication occurs in the cytoplasm of prokaryotes and in the nucleus of eukaryotes. Regardless of where DNA replication occurs, the basic process is the same.

DNA Replication is a process that must be done exactly. When it is not completed correctly, *mutations* (mistakes) then result. In order to make sure that everything is replicated correctly, you will want to make sure that you use the proper *base pairing rules*: **A** will bond with **T** only, and **G** will bond with **C** only.

Directions:

For each strand of DNA, show the three steps to demonstrate that you could “replicate” the DNA correctly. See the example for details if you don't recall how.

Example:

TCCTG ACCCC GCCGG GATAT CCTTC TACCT CCAAA TGTAT

Solution in two parts:

A. *Fill in the complementary strand.*

Original DNA: TCC TG ACCCC GCCGG GATAT CCTTC TACCT CCAAA TGTAT

Complementary: AGGAC TGGGG CGGCC CTATA GGAAG ATGGA GGTTT ACATA

B. *Split the DNA and fill in the complementary strands to create two complete double helix strands.*

T CCTG ACCCC GCCGG GATAT CCTTC TACCT CCAAA TGTAT (original)

AGGAC TGGGG CGGCC CTATA GGAAG ATGGA GGTTT ACATA (new)

TCCTG ACCCC GCCGG GATAT CCTTC TACCT CCAAA TGTAT (new)

AGGAC TGGGG CGGCC CTATA GGAAG ATGGA GGTTT ACATA (original) comp. from example A

1.

A. Original DNA: CCTAT ATCTC TCTAT ATCTC TCATA CTGTG TGTCT CTATA

Complementary DNA: _____

B. Make identical strands of DNA

CCTAT ATCTC TCTAT ATCTC TCATA CTGTG TGTCT CTATA (original)

_____ (new)

_____ (new)

_____ (compl. From 1A)

2. A. Original DNA: CCGGA TTTTA ATTAG CTA CTACT ATCGT ACTAC GTTGG TGCTA

Complementary DNA: _____

B. Make identical strands of DNA

CCGGA TTTTA ATTAG CTA CTACT ATCGT ACTAC GTTGG TGCTA (original)

_____ (new)

_____ (new)

_____ (compl. from 2A)

3. A. Original DNA: TGCTG ATCGA TCGAT CAGTC AAACG CTGTT TCGAT ACTCG

Complementary DNA: _____

B. Make identical strands of DNA

TGCTG ATCGA TCGAT CAGTC AAACG CTGTT TCGAT ACTCG (original)

_____ (new)

_____ (new)

_____ (compl. from 3A)