CONCEPT: DNA REPAIR

●DNA replication is _____ always a perfect process; base-pairing errors can occur (ex. A paired with a C instead of a T)

□ Errors occur 1 out of 100,000 base-pairs (a relatively high error rate).

□ Unrepaired errors result in permanent _____, which can lead to diseases like cancer.

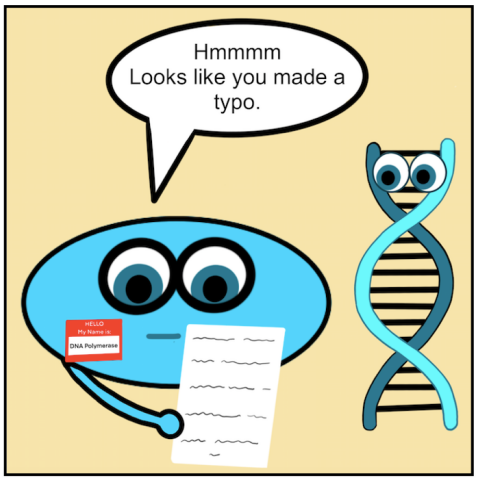
EXAMPLE: DNA Errors Resemble "Typos."

DNA Proofreading & Repair Enzymes

●DNA polymerases have a "_____" ability allowing them to fix *many* errors/mistakes.

□ Proofreading _____ the error rate to 1 in 10 billion base-pairs.

●Other DNA _____ Enzymes can help to correct errors that were not fixed by proofreading.



PRACTICE: Researchers found a strain of *E. coli* bacteria that had mutation rates one hundred times higher than normal. Which of the following statements correctly describes the most likely cause of these mutations?

a) The single-stranded binding proteins were malfunctioning during DNA replication.

b) There were one or more mutations in the RNA primer.

c) The proofreading mechanism of DNA polymerase was malfunctioning.

d) The DNA polymerase was unable to add bases to the 3' end of the growing DNA strand.