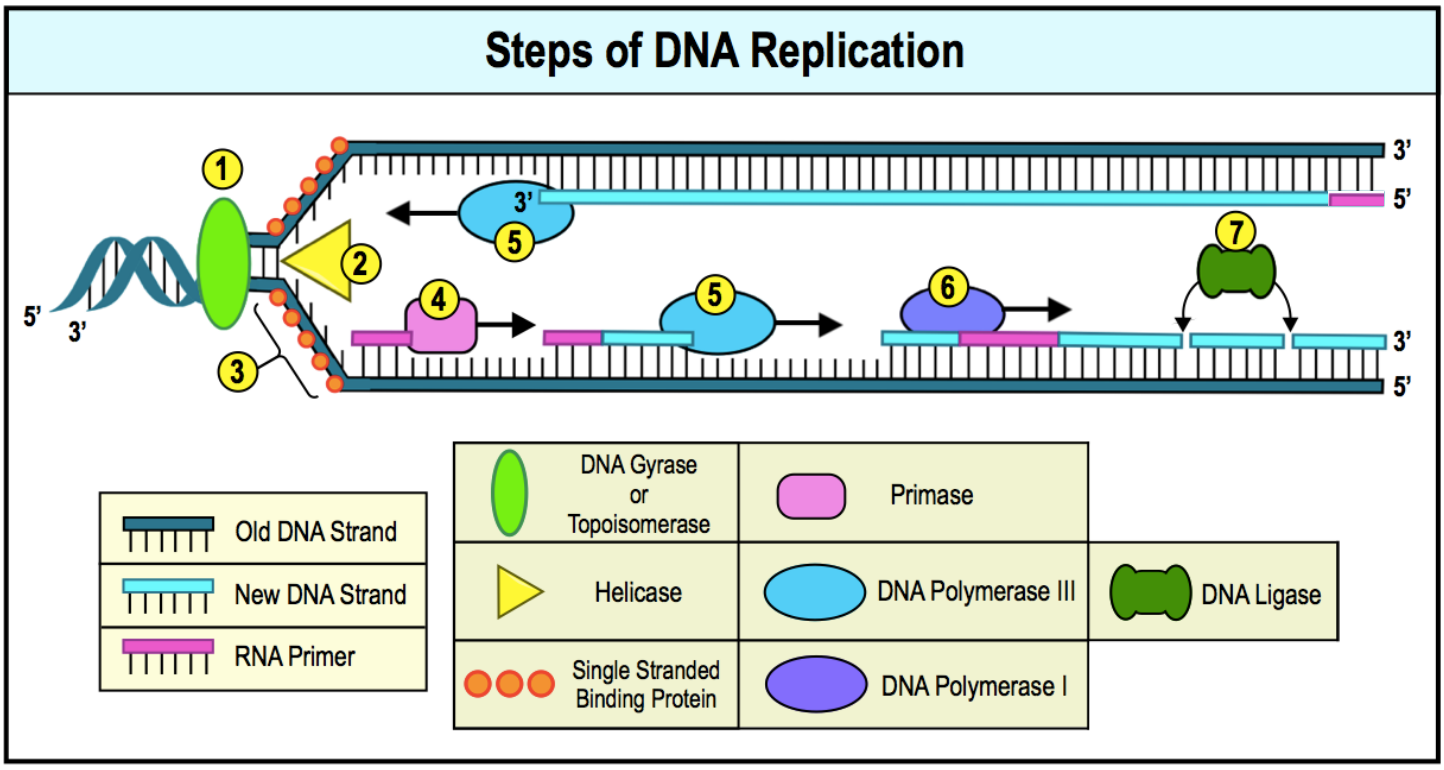
CONCEPT: STEPS OF DNA REPLICATION

●DNA Replication in prokaryotes can be simplified into _____ steps.

1. *Topoisomerase* binds to the *ORI* & _____ the strain due to DNA supercoiling.
2. *Helicase* binds & _____ the two strands of the template DNA by breaking hydrogen bonds.
3. ***S**ingle-**S**tranded-**B**inding proteins* (_____) bind to the single-stranded-DNA.
4. *Primase* adds the RNA primer to the template DNA so that polymerase can start replicating.
   - □ Continuously adds primers to the _____ *strand* to make several *Okazaki fragments*.
5. DNA Polymerase _____ adds nucleotides to ____' end of primers & continues elongation on both DNA strands.
6. DNA Polymerase _____ removes RNA primers & replaces them with DNA nucleotides.
7. *DNA Ligase* _____*Okazaki fragments* together on the *lagging strand* to create a single, new strand.



PRACTICE: During DNA replication, the enzyme _____, catalyzes the elongation of new DNA by adding, to the 3' end of the previous nucleotide, new nucleotides that are complementary to a DNA template.

a) Helicase.
b) DNA polymerase.
c) DNA ligase.
d) ATP synthase.

CONCEPT: STEPS OF DNA REPLICATION

PRACTICE: Which of the following enzymes breaks the hydrogen bonds between the DNA strands?

a) Primase.
b) Helicase.
c) Topoisomerase.
d) DNA ligase.
e) DNA polymerase.

PRACTICE: Which of the following enzyme-function matches is incorrect?

a) Helicase - relieves tension of supercoiling by breaking and rejoining ahead of fork
b) Primase - provides short stretch of RNA at initiation of strand synthesis
c) Polymerase – synthesizes new strand of DNA while using old strand of DNA as a template.
d) DNA ligase - joins 3'-OH to 5'-phosphate to seal adjacent DNA nucleotides.

PRACTICE: Which of the following enzymes is responsible for removing RNA primers and replacing them with DNA?

a) Primase.
b) DNA Helicase.
c) DNA Polymerase III.
d) DNA Polymerase I.