**DNA Replication Notes: Honors**

* *DNA Replication is the process where DNA is copied producing two identical daughters from one parent. Each of the two original parental strands serve as templates for 2 new or daughter strands.*

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* *DNA replication is necessary for growth and repair of an organism’s cells.*
* *Steps in DNA Replication:*
1. DNA breaks apart with the help of the enzyme helicase which breaks the hydrogen bonds between the strands of DNA causing it to unwind.
2. Free floating DNA nucleotides form complimentary base pairs to each of the original strands of DNA with the help of the enzyme DNA Polymerase III
	1. DNA can only be copied in one direction 3’🡪 5’, so the two strands must be copied differently.
		1. The Leading strand (3’🡪5’) is copied in one continuous strand.
			1. DNA Polymerase III moves down the strand (toward helicase) and forms complementary base pairs to the original strand.
		2. The Lagging strand (5’🡪3’) is copied discontinuously in segments called Okazaki Fragments.
			1. RNA primase adds a RNA primer (on the end of the strand closest to helicase and the replication fork) and then DNA polymerase III works in the correct direction (3’🡪5’).
			2. DNA polymerase I then replaces the RNA primer.
			3. DNA Ligase joins each of the segments to form one strand of DNA that is complementary to the original strand.

