Honors Biology Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
NDHS Per: \_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_

**DNA Replication**

Cell Division occurs after  **.** - occurs in the

Occurs so that each daughter cell can have its own copy of the instruction book (DNA)

Occurs in the

Requires .

**Replication Enzymes**:

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
4. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
5. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
6. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Process of Replication:**

1. . DNA is  in the nucleus. Gyrase  **.**

2.  by breaking the adenine from the thymine and the guanine from the cytosine.

3.  attach to each side of the DNA to .

4. . This is called an  and acts as the  for DNA to start building.   
 This is like the foundation of a house. You don’t just build the house on the ground, you need something flat and solid to build on.

5.  building from in the 5’ to 3’ direction. **It can only add new nucleotides to the 3’ end of another nucleotide**. Builds unidirectionally. The nucleotides build on this side of the RNA primer and is called the .

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**. DNA polymerase the DNA nucleotides . A’s are matched with new T’s, G’s are matched with new C’s, etc.

Parent (original) Strand of DNA: AGTCGATAGC  
Complementary Daughter (new) Strand: \_\_\_\_\_\_\_\_\_\_\_\_

Because DNA can only be built unidirectionally (on the 3’ of the previous nucleotide),  to the other side of the 5’ end.

Therefore another . The DNA polymerase then .   
 As the helicase continues to unwind the DNA, . This side of the DNA, since it is built in short segments,  than the other side. Therefore it is called the .

6. Once the DNA has been built, another form of DNA polymerase removes the .

7.  **.**

**THE OTHER SIDE OF THE DNA**:

Both sides of the DNA strands are replicated . Since they are **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**Each . Since each of the copies of DNA contains one half parent (original) DNA and one half daughter (new) DNA, DNA replication is said to be .

**Problems with DNA Replication:**1. : sometimes the wrong nucleotide is put in place () . A third type of DNA polymerase scans the newly replicated DNA for errors and cuts them out and corrects them 🡪

2.  with each replication. Each lagging strand end . After the very last RNA primer has been removed, there is . So a short section of DNA is not replicated and some information is lost.   
 To compensate, each chromosome is capped with  **.** Once the telomeres have been worn down, . The shortening of telomeres is one of the .

**Differences Between Prokaryotes and Eukaryotes**

* Prokaryote chromosomes are .
  + Don’t need