**Short DNA Replication Video: https://www.youtube.com/watch?v=dKubyIRiN84**

**DNA wrapping**

1. About how long is a DNA strand?

6 feet

1. DNA strands are wrapped around proteins called histones.
2. The combined loop of DNA and protein are known as nucleosomes.
3. The nucleosomes are packaged into a thread known as chromatin.
4. When the chromatin is looped and coiled yet again these structures are called chromosomes.
5. Chromosomes are visible when a cell is dividing.
6. Chromatin and chromosomes are both coiled DNA and proteins. Which is more tightly wound—chromatin or chromosomes?

chromosomes

**DNA Replication**

1. The DNA must be copied before every cell division.
2. The DNA strands are separated by the enzyme helicase.
3. SSB proteins keeps the strands apart.
4. Strands are built from the 5’ to 3’ end.
5. The enzyme DNA polymerase helps to build the new strands.
6. The lagging strand is built in pieces called Okazaki fragments.

**DNA Replication: https://www.youtube.com/watch?v=5qSrmeiWsuc**

1. DNA is the director for the cell and codes for traits.
2. DNA replication means:

Making a copy (replica) of the DNA strand

1. Where does DNA replication occur in eukaryotic cells?

nucleus

1. Does DNA Replication take place in prokaryotic cells?

Yes

1. When in the cell cycle does DNA Replication take place?

Interphase

1. Do DNA Replication and Cell Division take place at the same time in the cell cycle?

No

1. Molecules that end in –ase are generally **enzymes** which can: Speed-up reactions
2. Helicase Unzipping enzyme (helical staircase, unzipping the helix)
3. DNA polymerase The builder—builds new strands of DNA (Helps to build the POLYMER, the big molecule)
4. Primase The initializer. Makes the primer so DNA polymerase knows where to start. Is actually a piece of RNA (Primary means first, prime)
5. Ligase The gluer. ligaments hold bones together
6. Where does the process start?

origin

13. List four steps below

I.

II.

III.

IV.

1. What do we mean when we say the two DNA strands are antiparallel?

They are in different directions

1. Label the Carbon atoms on the deoxyribose sugar molecules.
2. Sketch the segment of DNA strand below, labeling the phosphate, the sugar, and the nitrogenous (or nitrogen) base.
3. DNA is short for deoxyribonucleic acid. Break down this term.

Deoxyribose sugar

Nucleic acid—The type of molecule that is DNA

1. DNA polymerase only works from the 5’ to 3’ direction.
2. Which strand (the leading or lagging strand) takes longer to build?

lagging

1. Who are the Okazaki fragments named for?

Reiji Okazaki (Japanese molecular biologist)

1. Why is DNA replication called semi-conservative replication?

The new strands contain one old strand and one new strand

1. A mistake in the DNA replication process could result in an incorrect

protein. (or no protein)

1. Which enzyme has editing abilities to avoid mistakes in the replication process?

DNA polymerase