DNA Replication

Super basic big idea (it is much more complicated than this)

- http://www.youtube.com/watch?v=z685FFqmrpo

Replication

Replication: The process of duplicating (copying) DNA

This must take place before cell division.

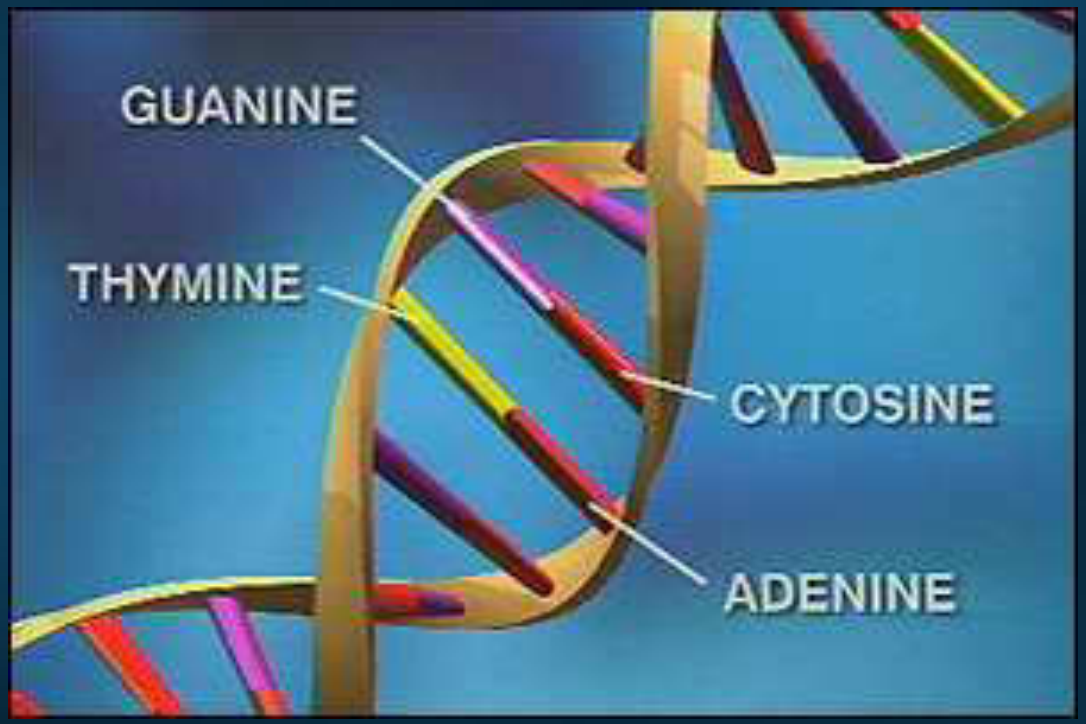
Why is there DNA replication?

One copy will power the original cell, the other will be for the new cell.

What do we have at the end of replication?

- Two identical strands of DNA
- This is a **semi-conservative** process (each new stand is composed of half of the original strand and half newly added nucleotides)

Remember: DNA is made out of two strands. They are complementary to each other (bases on one strand determines the sequence on the other)



Base Pairs:
Adenine (A) – Thymine (T)
Guanine (G) – Cytosine (C)

- Practice Strands

If one side of the DNA strand reads….

GACTCGATCCCG

What will the other be?

Examples:

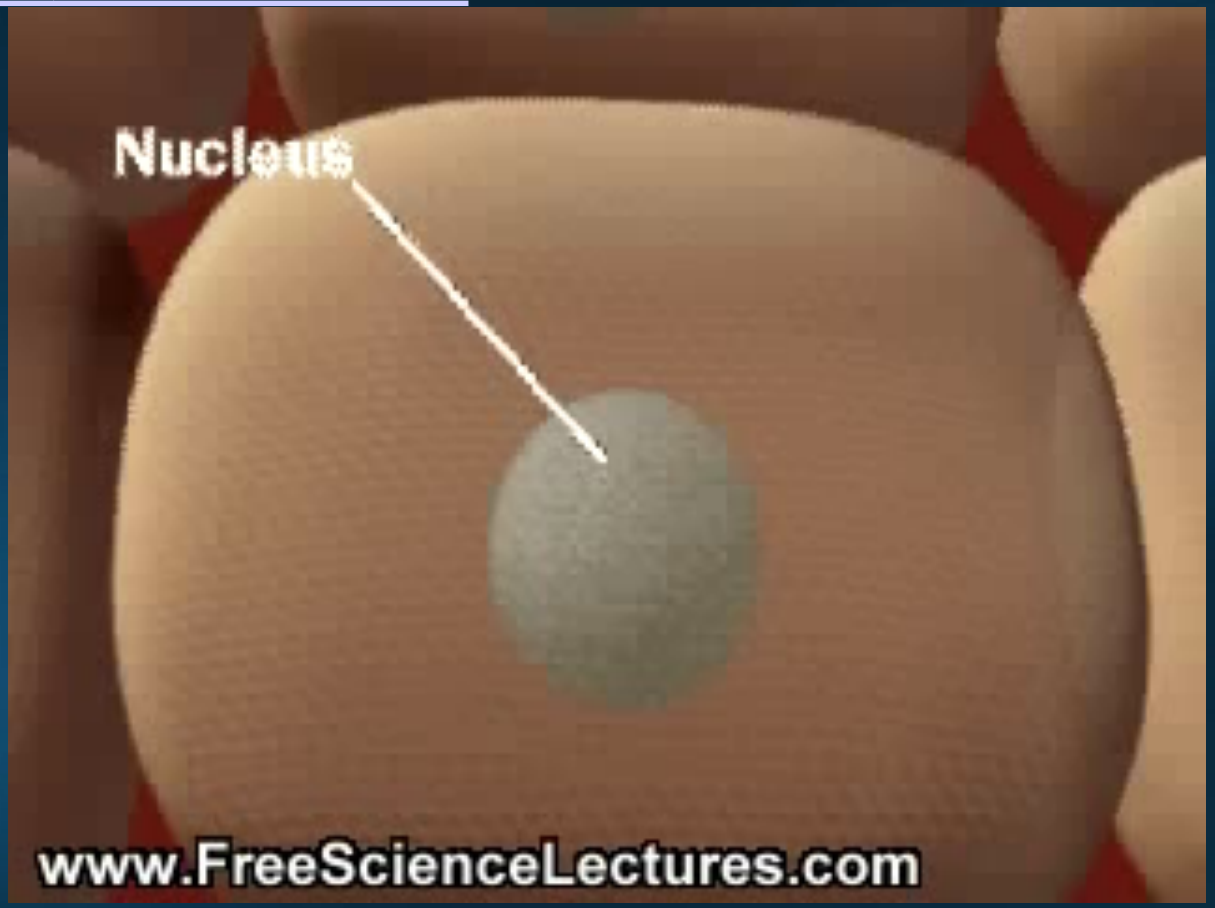
(Write down both the original strand given and the complementary strand)

#1 – CCGATAGCA

#2 - ATCGAATCA

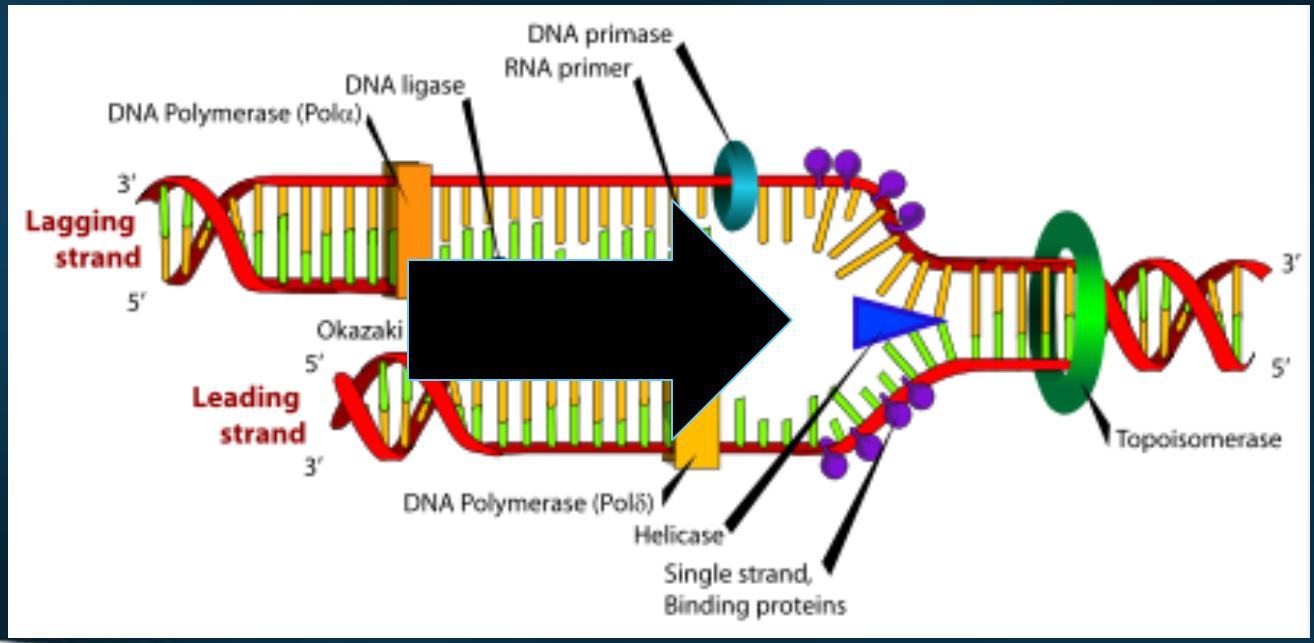
DNA Replication Clip

http://https://www.youtube.com/watch?v=TEQMeP9GG6M



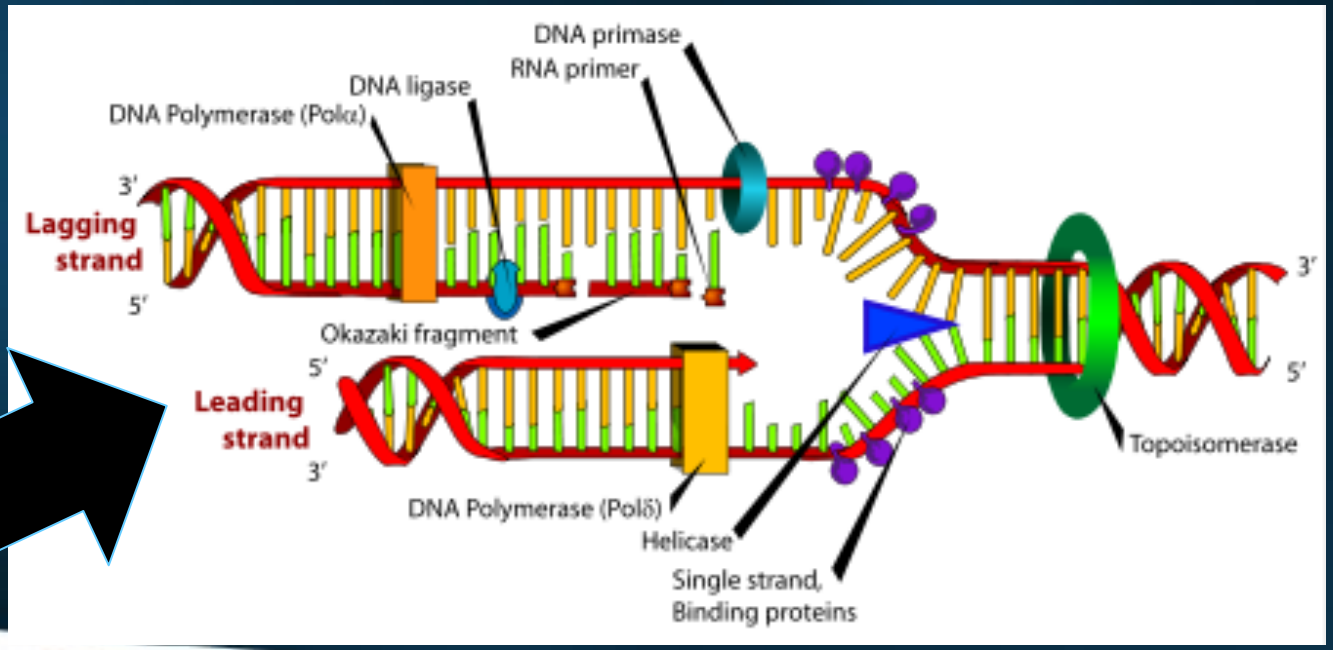
Steps in Replication

1. DNA Helicase unwinds the DNA (like a zipper unzipping) and creates a replication fork, it does this by dissolving the hydrogen bonds



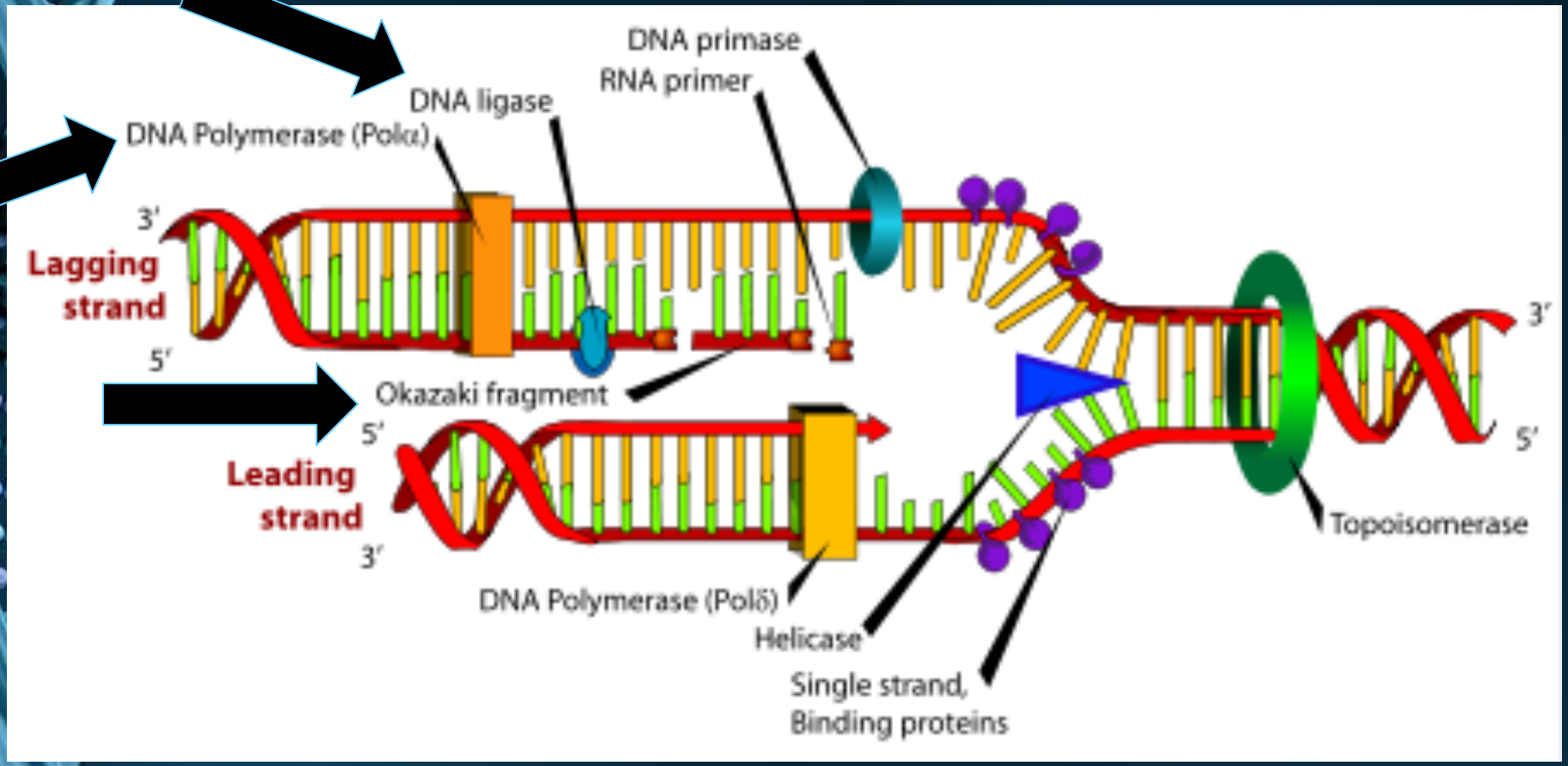
Steps in Replication

2. DNA polymerase adds the complementary bases. The DNA polymerase travels from the 3’ end to the 5’ end. This is the leading strand.



Steps in Replication

3. DNA polymerase adds the complementary bases to the other side of the ladder, travels in the opposite direction. It completes the strand in several fragments called Okazaki Fragments. These fragments are bound together by DNA ligase.


DNA primase
RNA primer
DNA ligase
DNA Polymerase (Polα)
3′
Lagging strand
5′
Okazaki fragment
5′
Leading strand
3′
DNA Polymerase (Polδ)
Helicase
Single strand, Binding proteins
Topoisomerase
3′
5′

DNA Replication Clip

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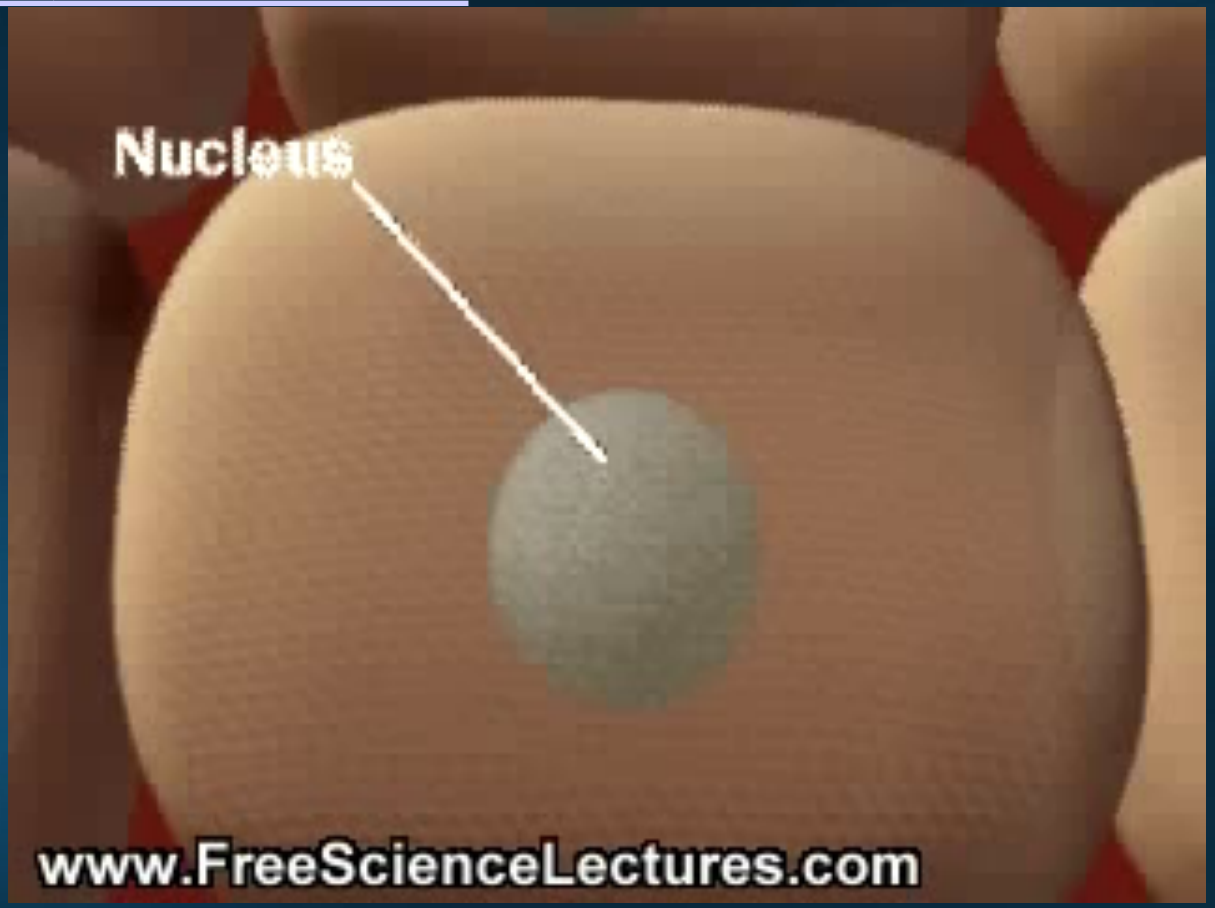

Top 5 Biology Music Video

- http://youtu.be/dIZpb93NYIw