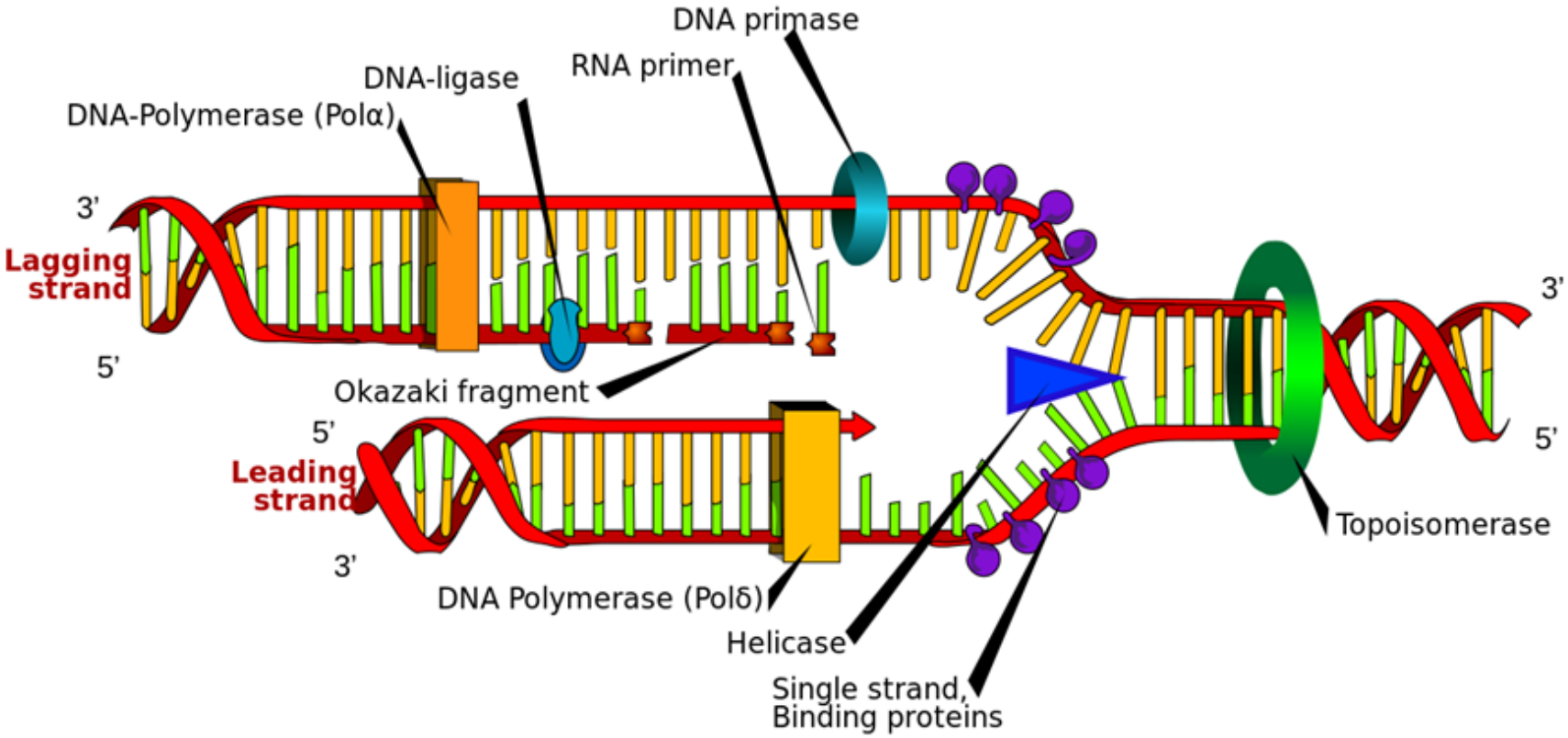
DNA Replication Activity



Step 1 - Prep the Scene

Your work space is acting as the nucleus. That is because DNA does not leave the nucleus. It is on lock down.

- Lay your DNA strand, cut out, in your workspace.
- Cut out the free floating nucleotides and place them in the nucleus.

Step 1 - Prep the Scene

Your cell has been busy completing the G1 phase and doubling it's organelles and creating materials needed for eventual division.

- Imagine your cell entering the S phase. 'Synthesis' and it is ready for DNA replication.

Step 2 - Prep the Supporting Players

In order for DNA replication to occur, it needs some help from 3 different enzymes.

- Cut out the label for 'helicase' and tape it onto the scissors
- Cut the label for 'polymerase' and tape it onto your hand
- Cut out the label for 'ligase' and tape it onto the glue stick

Step 3 - 'Act Out' DNA Replication

In order for DNA replication to occur, it first needs to unwind and unzip. Your paper DNA has already been unwound from its double helix shape.

- Use the 'helicase' (Scissors) to unzip the DNA creating two halves

Step 3 - 'Act Out' DNA Replication

The nucleus houses free floating nucleotides. The enzyme polymerase works its way down the DNA 'halves' matching up the free nucleotides up with the split DNA.

- Use the 'polymerase' (your hand) to match up the free floating nucleotides to your DNA halves.

Step 3 - 'Act Out' DNA Replication

The enzyme ligase works to bind the nitrogenous bases (and nucleotides) together.

- Use the 'ligase' (glue stick) to bind the nucleotides together.

Step 4 - Watch in amazement as you just created to exact copies of the DNA

When finished, you should notice that you just made two exact copies of DNA.

- This is just a tiny example because the haploid human genome (23 chromosomes) is estimated to be about 3.2 billion bases long and to contain 20,000–25,000 distinct protein-coding genes.