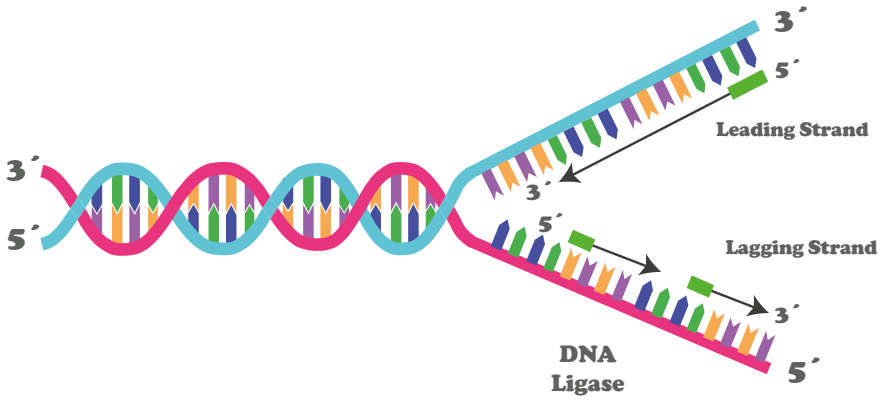
CONCEPT: TELOMERES AND TELOMERASE

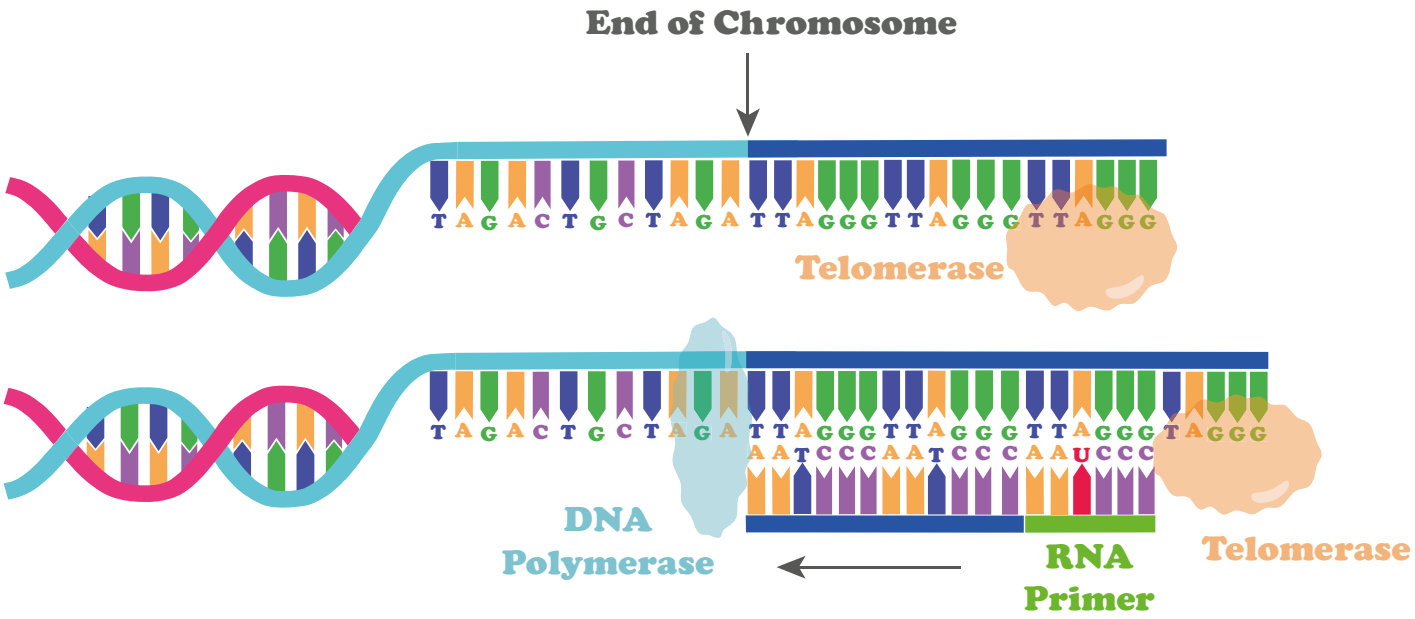
- The ends of chromosomes (**telomeres**) are replicated _____
  - □ In the leading strand, replication continuous all the way to the end
  - □ In the lagging strand, primers are required to create Okazaki fragments – but what about after the last primer?
    - If the end was replicated normally the chromosome would shorten after each replication

EXAMPLE:



- **Telomerase** is the enzyme responsible for replicating the telomeres on the lagging strand
  - □ Telomerase _____ onto the 3' end of DNA molecules
    - Telomerase contains a short RNA molecule that reads 3' AAUCCC 5' – this is a template for replication
      - Called **reverse transcription** when RNA is used as a template for DNA
  - □ Telomerase then repeatedly adds 5' TTAGGG 3' onto the end of the telomere
    - This prevents the telomere ends from shortening
  - □ Telomeres contain lots of TTAGGG repeats

EXAMPLE:



□ Different cell types contain different _____ of telomerase

- *Germ cells* have a lot of telomerase

- *Somatic cells* have little to no telomerase

□ In somatic cells, the telomeres continue to get shorter, until the cell dies