Unit 7 Review Sheet: DNA Replication & Cell Cycle

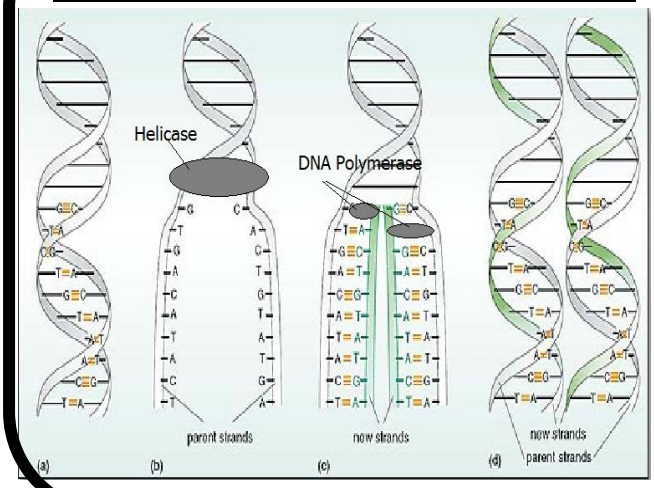
NAME: _____

Test is 12/12/19

Can you do the following?

Explain the process and importance of DNA replication, when it occurs in cell cycle and why it occurs.
Sequence the stages of the cell cycle – Interphase's stages and Mitosis' stages and what occurs in each.
Explain the purpose of the cell cycle, identify factors that cause mutations that disrupt the cell cycle.

DNA REPLICATION



DNA Replication is so IMPORTANT!

- This is how new cells get the same genetic material as their parent cells.
- **Growth and development of new identical cells**
- **Cellular repair** allows the organism to heal from an injury and cells to grow back

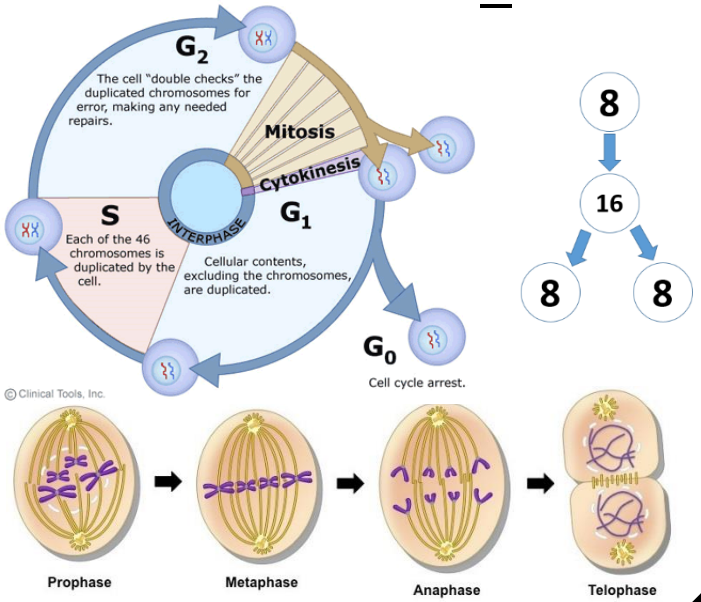
Steps of DNA replication:

1. **Parent Strand**
2. Enzyme **Helicase** unzips the DNA strand by breaking the hydrogens bonds.
3. Enzyme **DNA Polymerase** comes in next and binds the free floating nitrogenous bases to their complimentary bases.
4. **Two** new **semi-conservative identical strands** are formed.

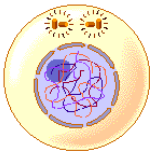
Parent-Strands

They are considered **semi-conservative** (one-new & one-old). Meaning one strand of the DNA is older while the other strand is a newly constructed one.

CELL CYCLE



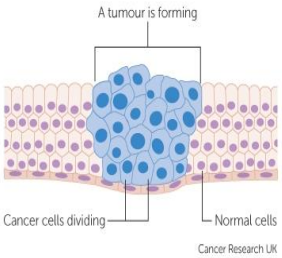
Steps in the Cell Cycle:



1. **Interphase**
   a. G_1 Phase
   b. S Phase: (DNA REPLICATION)
   c. G_2 Phase
2. **Mitosis**
   a. Prophase: Chromosomes get dense, nucleus disappears.
   b. Metaphase: Chromosomes come to the center.
   c. Anaphase: Chromosomes separate to the poles by **spindle fibers**
   d. Telophase: Cell starts form a cleave furrow in the middle to start separation. (Cytokinesis at end of telophase)
3. **Cytokinesis:** Two newly separated daughter cells.
4. **G_0 Phase:** Resting Period (cells that never go to **G_0** create tumors)
5. **Cell goes back into G_1 Phase** and starts the process all over again. (Unless it turns into cancer)

CANCER

- Exposure to carcinogens such as pollutions and radiations will cause mutation.
- The **Result of uncontrollable cellular division.**
- Cells cannot stop dividing.
- The cell never goes into the G_0 Phase and never rests.



Review Sheet
DNA Replication & Cell Cycle

_____

NAME:

_____

PERIOD

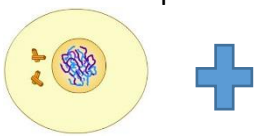
1. Traits are determined by the genetic code, what part of the DNA actually carries the code? _____
2. Write the complimentary bases for the following strands:

   3’ ATC CGG GCA TTC GCC 5’ _____

   5’ TTA GTA CCC TAG GGT AAC 3’ _____

3. Fill in the steps to this cellular process:

Cell Cycle =



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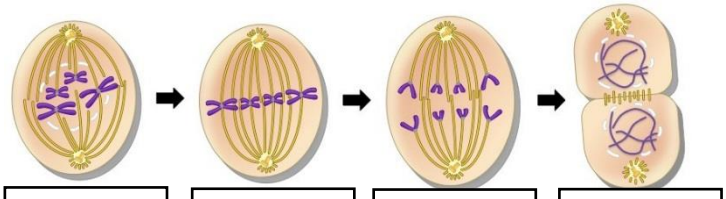


What happens at the very end of mitosis to split the cells?

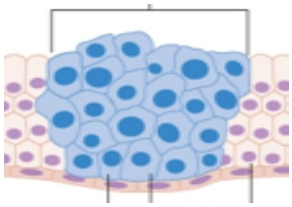
4. In which stage does DNA replicate? _____
5. What process is DNA preparing for when it replicates? _____
6. Why does DNA replicate before cell division? _____
7. Which enzyme unzips DNA? _____
8. Which enzyme adds new nucleotides to the original “parent” strands?

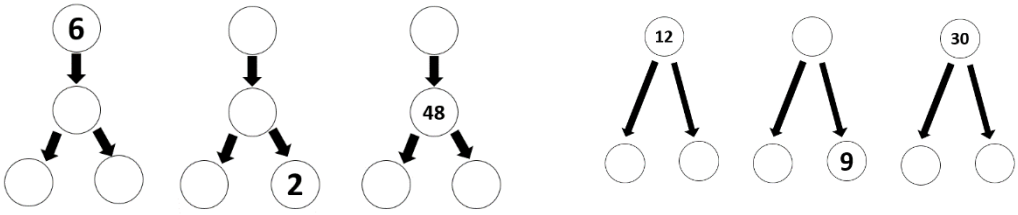
   _____
9. The end result of replication is _____ _____ _____
10. Cancer cells do not enter the Go phase (the resting period), what do they do?

    _____
11. Fill in the chromosomal number for each cellular division if mitosis occurred.

WHAT TYPE OF CELL ARE THESE?

(Cancerous / Noncancerous)

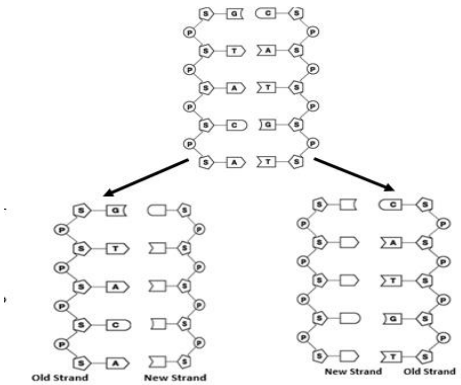




12. How do the daughter cells compare to each other after mitosis? _____
13. How do the daughter cells compare to the original cell after mitosis? _____
14. How many times did the cell divide during mitosis? _____
15. Put the following mitosis phases in the correct order. _____, _____, _____, _____, _____

A B C D E

Use the image to right to answer the following questions.



16. How do the 2 new DNA strands compare to each other?

    _____
17. What process is this?

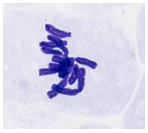
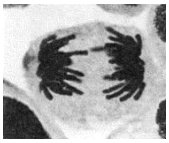
    _____

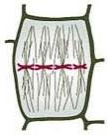
Name: _____ **Test Date:** 12/12/19

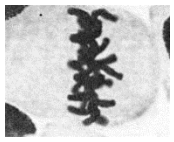
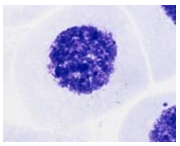
"I CAN . . ." Review Sheet:

For # 1-3 use the following: **Prophase (P), Telophase (T), Anaphase (A), Metapahse (M), Interphase (I), Cytokinesis (C)**

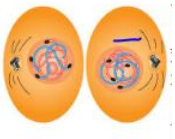
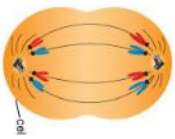
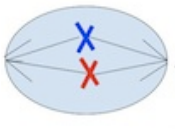
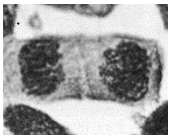
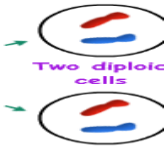
1. List the stages of interphase in order.
2. List the stages of mitosis in order.
3. Identify the stages of the cell cycle in the images below:



_____ _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

4. Define cell cycle.
5. Define interphase.
6. Define mitosis.
7. Define cytokinesis.
8. Explain what happens during the 3 stages of interphase:

   G1 - _____ S - _____ G2 - _____

9. Describe how the chromosomes are positioned during -

   Prophase _____

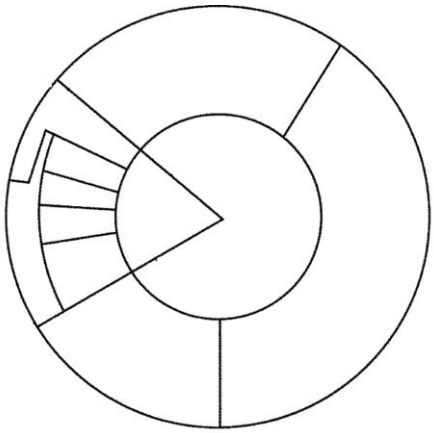
   Metaphase _____

   Anaphase _____

   Telophase_____
10. Explain what happens during cytokinesis.
11. Define DNA synthesis.
12. Describe the final product of DNA synthesis.

13. Explain the importance of the S phase in interphase.

14. Label the diagram of the cell cycle and identify where DNA synthesis occurs by drawing a star.



15. Explain how DNA synthesis is important to cell division.

16. Define somatic cell.

17. Describe the final product of the cell cycle.

18. Explain why organisms need to make new cells.

19. What is a checkpoint's role in the cell cycle?

20. Describe the importance of regulating the cell cycle with checkpoints

21. Define cancer in terms of cell division.

22. Draw a nucleotide and label its three parts.

23. Identify the location of the hydrogen bonds on DNA.

24. Describe the pairing rules of complementary nucleotides.

25. Define enzymes.

26. What enzyme unzips DNA?

27. What enzyme pairs nucleotides to DNA strands during DNA synthesis?