Unit 7 Expectation Sheet: DNA Replication & Cell Cycle

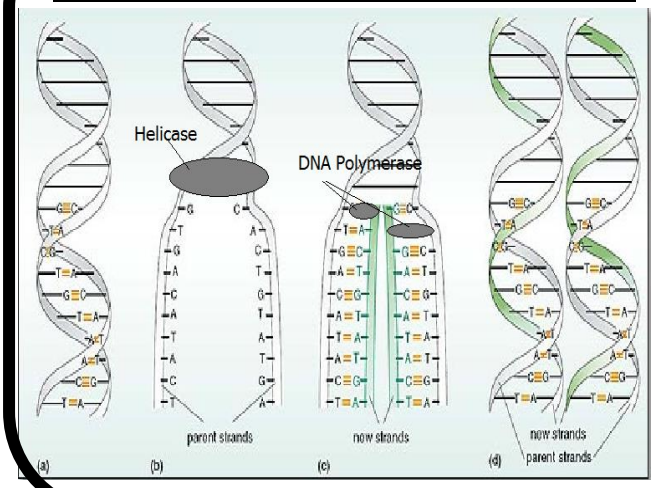
NAME: _____

Test is 12/13/18

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

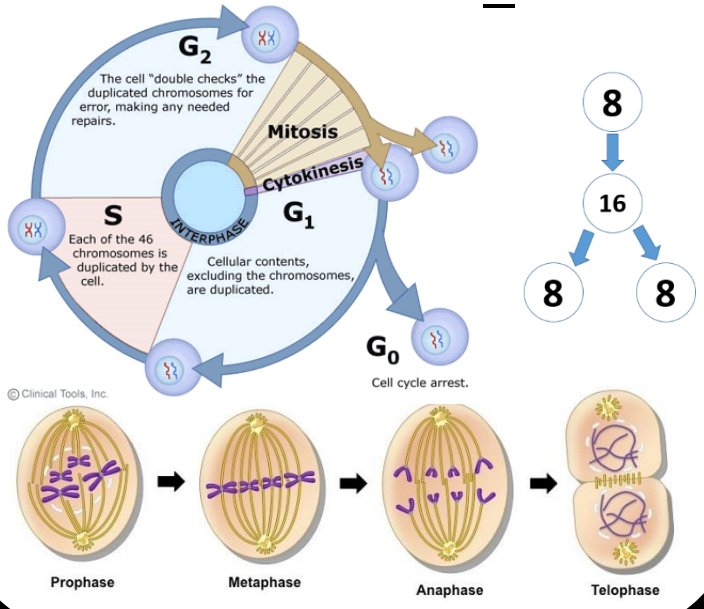
Steps of DNA replication:

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.

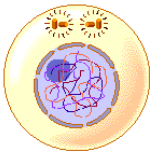
Parent-Strands

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



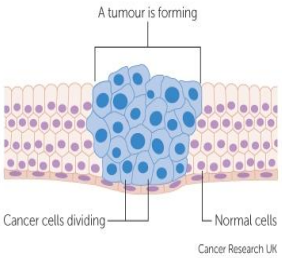
Steps in the Cell Cycle:



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

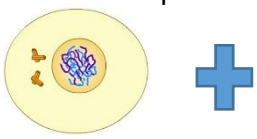
1. Traits are determined by the genetic code, what part of the DNA actually carries the code? _____
2. What is semi conservative DNA? _____
3. What is anti-parallel DNA? _____
4. Write the complimentary bases for the following strands:

   3' ATC CGG GCA TTC GCC 5' _____

   5' TTA GTA CCC TAG GGT AAC 3' _____

5. Fill in the steps to this cellular process:

Cell Cycle =



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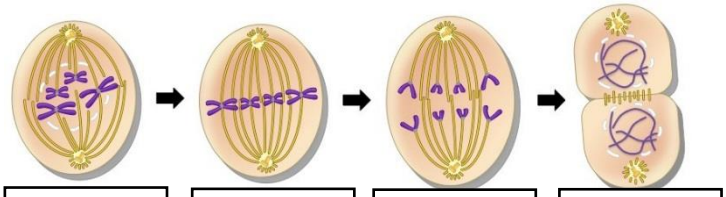


What happens at the very end of mitosis to split the cells?

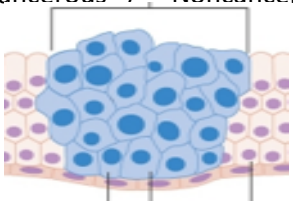
6. In which stage does DNA replicate? _____
7. What process is DNA preparing for when it replicates? _____
8. Why does DNA replicate before cell division? _____
9. Which enzyme unzips DNA? _____
10. Which enzyme adds new nucleotides to the original "parent" strands?

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

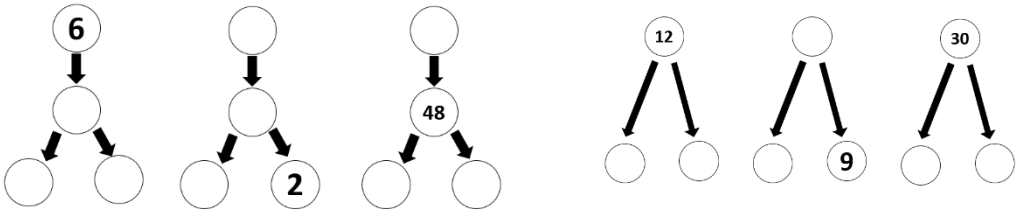
    _____

WHAT TYPE OF CELL ARE THESE?

(Cancerous / Noncancerous)



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



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

A B C D E

18. *Circle the Answer that describes what is happening in each of the following stages of the cell cycle:*

Interphase: DNA is **(REPLICATING / UNWINDING / SEPERATING)**

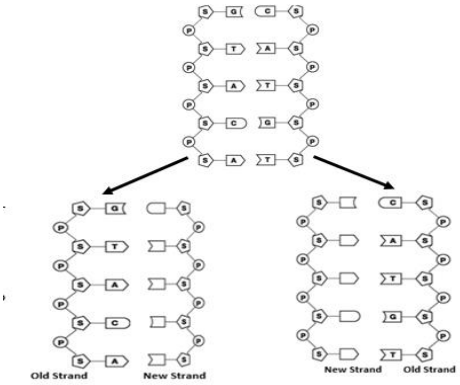
Prophase: The **(RIBOSOMES / CELL MEMBRANES / CHROMATIN)** is condensing into chromosomes and the nucleus is **(DISAPPEARING / GETTING BIGGER / DOUBLING)**

Metaphase: The chromosomes are migrating to the **(TOP / MIDDLE / BOTTOM)**

Anaphase: Chromosome get **(PULLED APART / PUSHED TOGETHER / DISAPPEAR)**

Telophase: The cell starts to **(GROW BIGGER / DIVIDE / SHRINK)** and the nucleus **(REAPPEARS / DISAPPEARS)**

Use the image to left to answer the following questions.



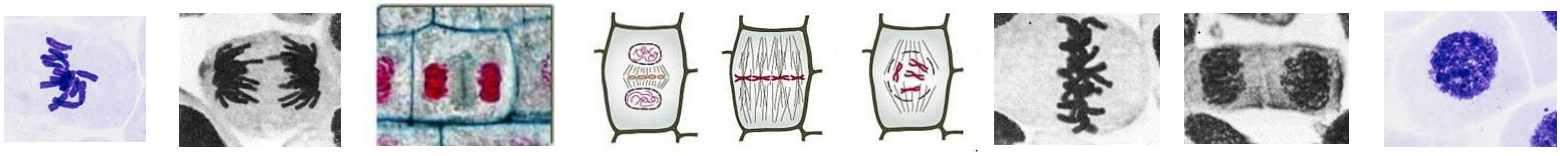
19. How do the 2 new DNA strands compare to each other?

_____

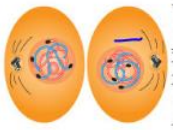
20. What is meant by DNA being a "Semi-Conservative" model?

_____

21. Use the following terms to fill in a – m below: **Prophase, Telophase, Anaphase, Metapahse, Interphase, Cytokinesis**



A **B** **C** **D** **E** **F** **G** **H** **I**



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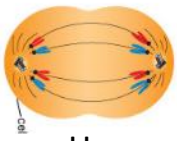

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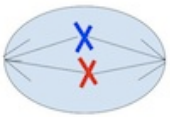

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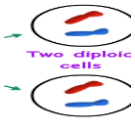

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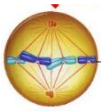

M

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____
g. _____

h. _____
i. _____
j. _____
k. _____
l. _____
m. _____