RE9.2

Observe and describe the significance of cellular reproductive processes, including mitosis and meiosis.

Indicators for this outcome

(b) Construct a visual, dramatic, or other representation of the basic process of cell division as part of the cell cycle, including what happens to the cell membrane and the contents of the nucleus.

(c) Recognize that the nucleus of a cell determines cellular processes.

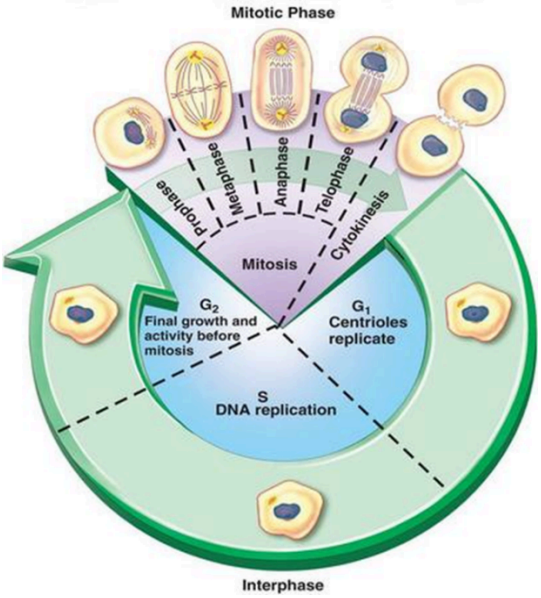
(e) Explain how the cell theory accounts for cell division.

(f) Compare binary fission, mitosis, and meiosis, and distinguish between cell division processes during meiosis and mitosis including the creation of diploid and haploid cells.

(g) Relate cancer to cellular processes.

The Cell Cycle

The Cell Cycle



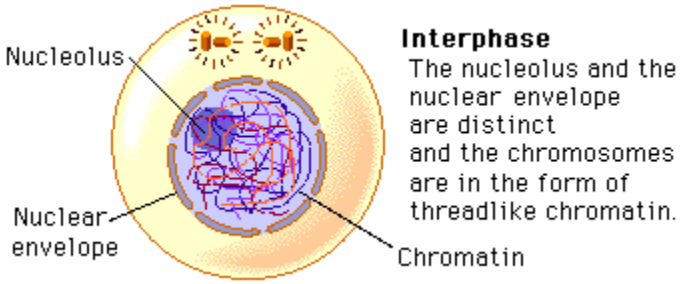
- The Cell Cycle is the cell's _____ _____
- The phases of the cell cycle involve growth, carrying out normal functions, and replicating organelles
- DNA must be duplicated before division can occur
- Cell division will occur once the cell is at full _____ and the DNA has been replicated

The Cell Cycle has 5 main stages:

1. Gap 1: Cell _____ and normal functions
2. DNA Synthesis: _____
3. Gap 2: Additional Growth
4. Mitosis: Division of the _____
5. Cytokinesis: Is a part of cell division that is separate from mitosis

INTERPHASE

- Interphase _____ the cell to divide
- During interphase, the cell _____, carries out normal functions and the DNA is _____.
- Chromosomes condense before Mitosis
- DNA wraps around proteins that condense it



THE STAGES OF MITOSIS

- Mitosis divides the cell's nucleus in four phases:
  - _____
  - _____
  - _____
  - _____

THE STAGES OF MITOSIS

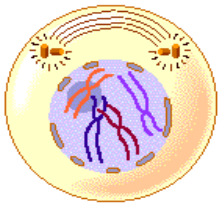
LABEL THE DIAGRAMS BELOW

- **PROPHASE**

_____

_____

_____

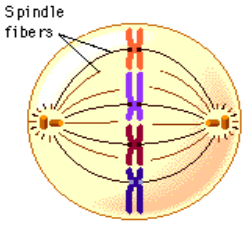


- **METAPHASE**

_____

_____

_____

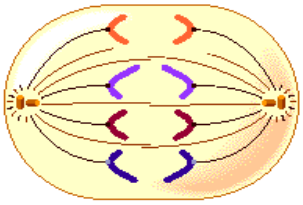


- **ANAPHASE**

_____

_____

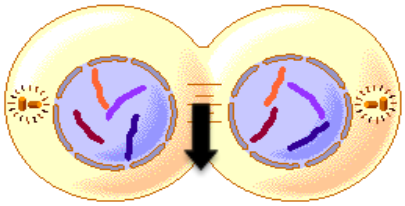
_____



- **TELOPHASE**

_____

_____



CYTOKINESIS

- Complete separation of the _____

Results

- All cells produced this way have the same number of chromosomes as the parent cell
- The DNA is identical to the parent cell

Cancer

- Under normal conditions, instructions in a cell's DNA control its rate of cell division.
- What happens if cells begin to divide uncontrollably? The result is cancer.
- Cancerous cells interfere with surrounding cells and disrupt their normal functioning.

Reflection

1. In your own words, describe the **cell cycle**. Make sure to include a description of each phase.

2. What is the difference between Mitosis and Cytokinesis?

3. Describe the **4 stages of Mitosis**. Include a **diagram** of each phase.

Cell Division and Cancer

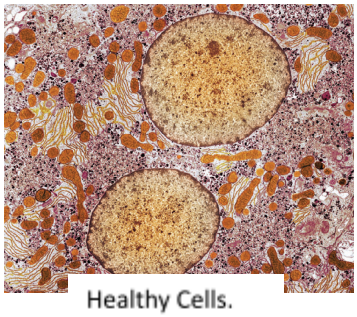
Normally a cell's DNA controls the cell cycle and ensures that cells reproduce only as needed. It also makes sure that the cells die as they age or if they are damaged. Sometimes, the complicated process of cell division encounters or creates errors in the duplication of chromosomes. Using your research skills, answer the following questions.

- How can **Cancer** be defined? What is a **tumor**?

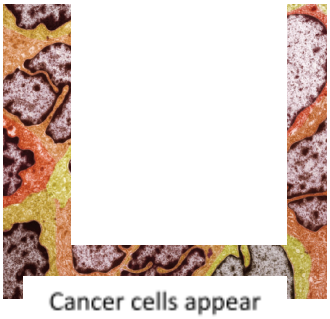
- What is the difference between a **benign** and **malignant** tumor?

- What are some of the believed causes of cancer? Are there any proactive measures we can take to prevent cancer?

- Discuss the three most common methods of cancer treatment from a modern medicine and analytical standpoint.



Healthy Cells.



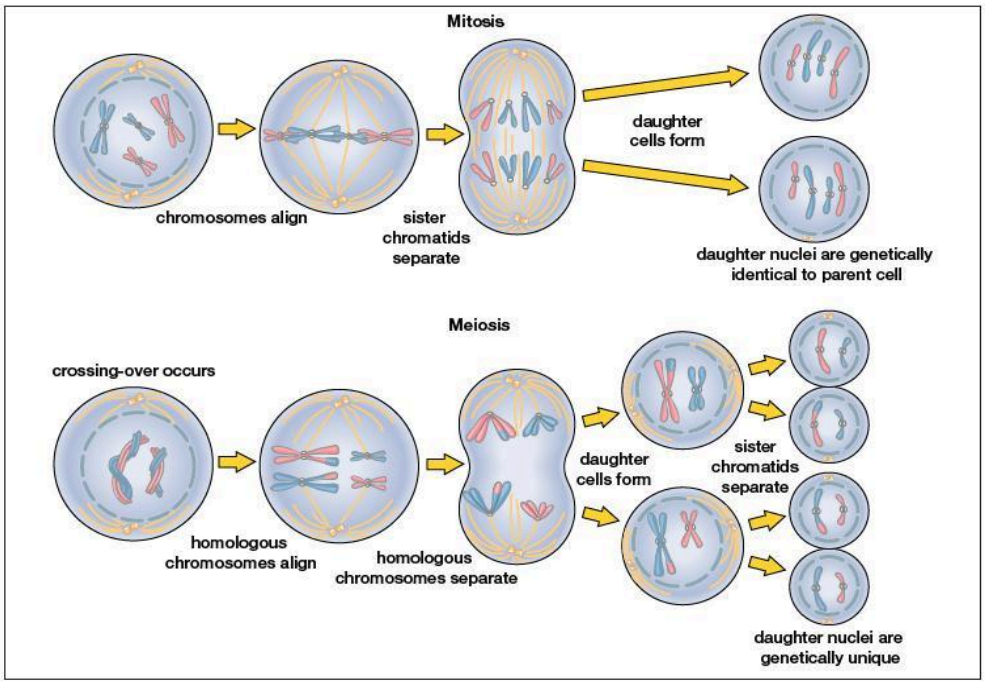
Cancer cells appear differently and often cell division is affected.

The beams of radiation are carefully aimed at the cancer cells to reduce damage to the surrounding healthy cells.

Meiosis

- Meiosis is a special kind of **cell division** that produces sex cell or _____.
- Gametes have _____ the number of chromosomes that would be found in all other body cells.
- Meiosis only occurs in **sexual reproduction**.
- The goal is to go from _____ □ _____
- Meiosis follows a similar pattern to Mitosis, but there are _____ divisions that take place instead of 1.

- Sex cell divide to produce **gametes**:
  - **Male** – _____
  - **Female** – _____
- This process takes place in the male and female sex organs or _____:
  - **Male** – _____
  - **Female** - _____


Mitosis
chromosomes align
sister chromatids separate
daughter cells form
daughter nuclei are genetically identical to parent cell
Meiosis
crossing-over occurs
homologous chromosomes align
homologous chromosomes separate
daughter cells form
sister chromatids separate
daughter nuclei are genetically unique