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| Name: | Grade: 9 ____ | November 2020 |
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Biology

Chapter 4: Sections 4.1 – 4.2 – 4.4

Chapter 5: Sections 5.1 & 5.2

Science
assessment is
on December
7th, 2020.

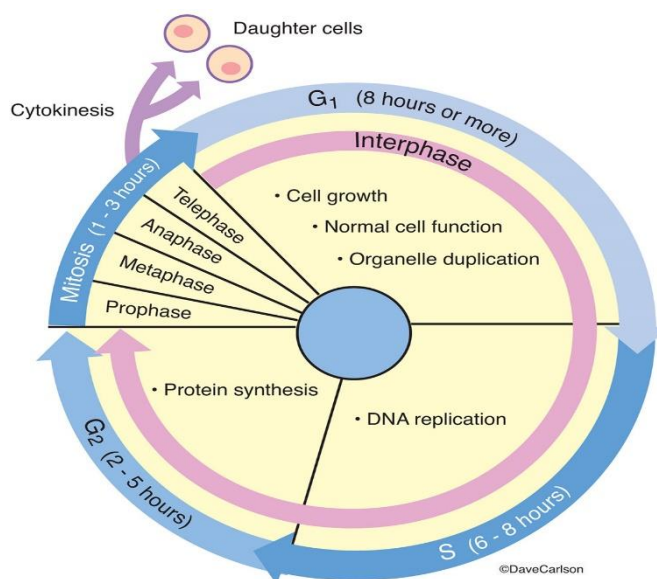
| Key Terms | Definition |
|----------------------------|--|
| Cell cycle | It is the cycle of cell division in which cell undergoes through different stages and finally divides. |
| Mitosis | It is the division of the cell nucleus and its organelles. |
| Cytokinesis | It is a process in cell division which divides the cell cytoplasm. |
| Chromosomes | It is a long thread of DNA carrying genetic information in the form of genes. |
| Centromere | The central part of a chromosome through which sister chromatids are attached together. |
| ATP | It is an energy molecule that provides energy for the cell functions. |
| Chemosynthesis | It is a process by which some organisms use chemical energy to make food. |
| Photosynthesis | It is a process by which plants make their own food. |
| Cellular respiration | It is a process by which glucose is broken down to release ATP (energy). |
| Light dependent reaction | It is a reaction which requires light and occurs in thylakoid. |
| Light independent reaction | It is a reaction which does not require light and occurs in stroma. |

Chapter 5 Section 5.1

THE CELL CYCLE

It is the cycle of cell division in which cell undergoes through different stages and finally divides.

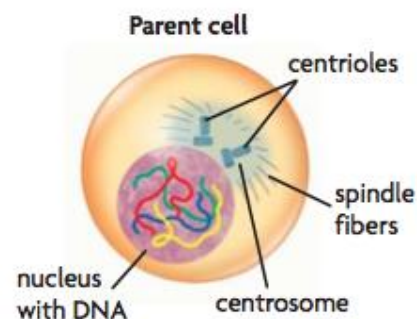
- **G1 phase (G1):** During gap 1, cell carries out its normal functions. It increases in size and organelles increase in number. A cell spends most of its time in G1 or gap 1.
- **S phase (S):** During S phase, the cell makes a copy of its nuclear DNA. By the end of this stage, the cell nucleus contains two complete sets of DNA.
- **G2 phase (G2):** In this stage some additional growth occurs and cell gets ready for division.
- **M phase (M):** A nuclear division (mitosis) followed by a cell division (cytokinesis) occurs in this stage.



Section 5.2 Mitosis and Cytokinesis

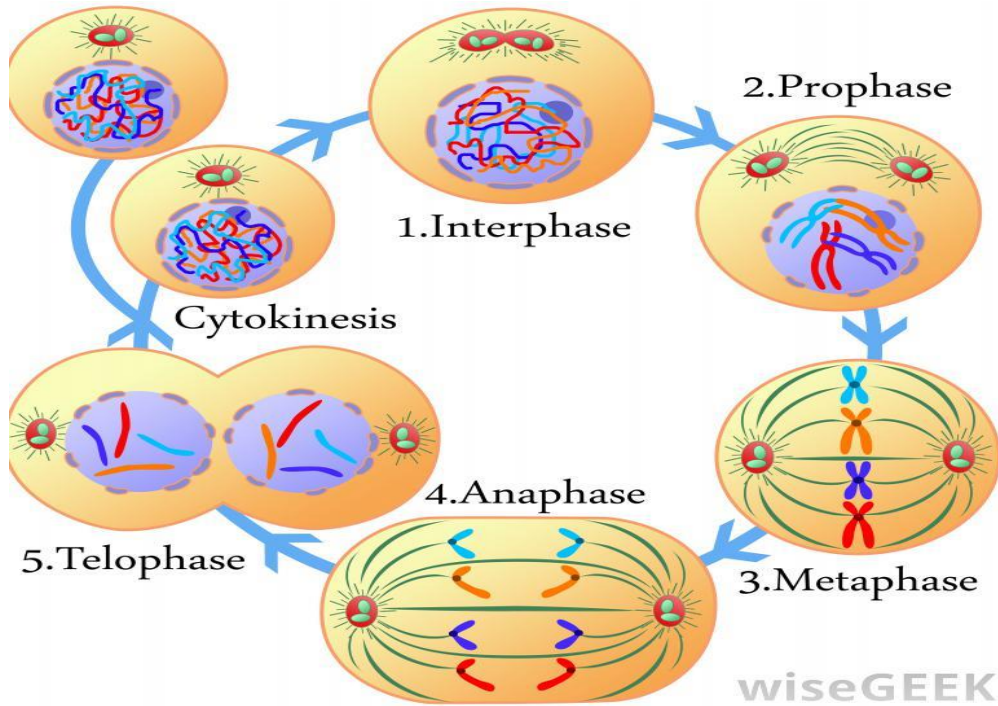
MITOSIS

Mitosis is a part of cell cycle during which nucleus divides to make new daughter cells which are identical to the parent cell.

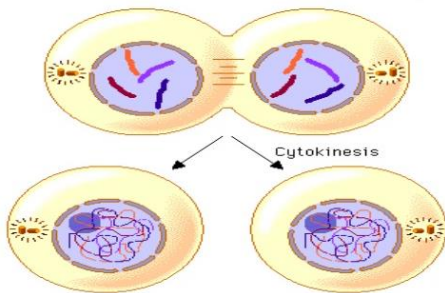


| <u>Stages</u> | <u>Activities</u> |
|---------------|--|
| Interphase | Cell undergoes normal activities. It grows double to its size and produces more organelles for the division. |
| Prophase | The chromatin in the nucleus of a cell condenses and becomes visible under microscope. Chromosomes are formed. |
| Metaphase | Chromosomes line up in the middle of the cell. |
| Anaphase | The chromatids separate. They are pulled to opposite sides of the cell. |
| Telophase | A new nuclear membrane forms around each set of chromosomes. |
| Cytokinesis | The cytoplasm starts to divide to make two diploid daughter cells. |

MITOSIS

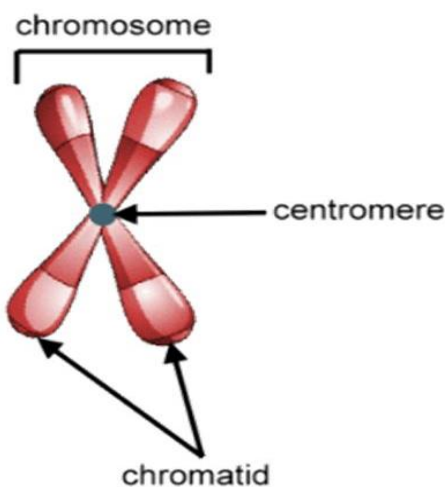


Cytokinesis:



Cytokinesis is the part of the cell division process during which the cytoplasm of the cell divides into two daughter cells.

Parts of a Chromosome

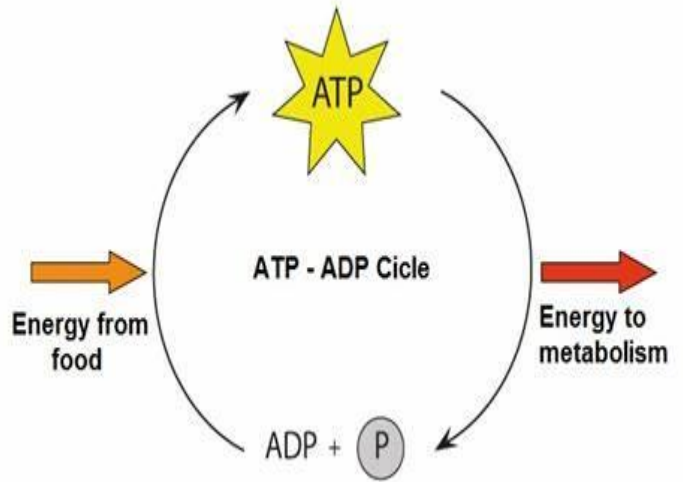


- **Chromatid**: one of the parallel strands of a chromosome.
- **Centromere**: where sister chromatids are held together and spindle fibers attach.

Chapter 4 Section 4.1

Chemical energy and ATP

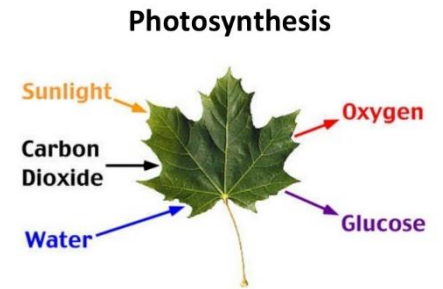
The energy used for all cell functions is called ATP. There is a cycle of this energy production in the body cells. ATP is converted into ADP and the ADP is converted back to ATP.



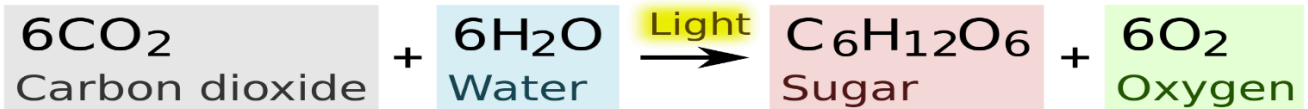
- Adenosine tri phosphate (**ATP**) -----
-----wallet full of money
- Adenosine di phosphate (**ADP**) -----
----- empty wallet

Section 4.2 Overview of Photosynthesis

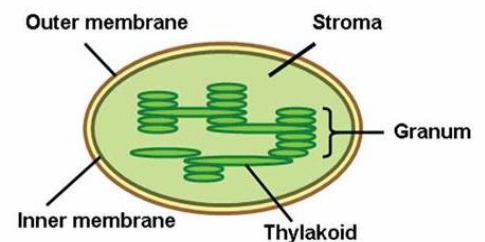
Photosynthesis: It is a process by which plants make their own food. The plants take sunlight, water from the soil and carbon dioxide from the air to produce food (glucose) and release oxygen.



Photosynthesis occurs in the chloroplast of all plant cells. It occurs in two steps.



Light dependent and light independent reactions:

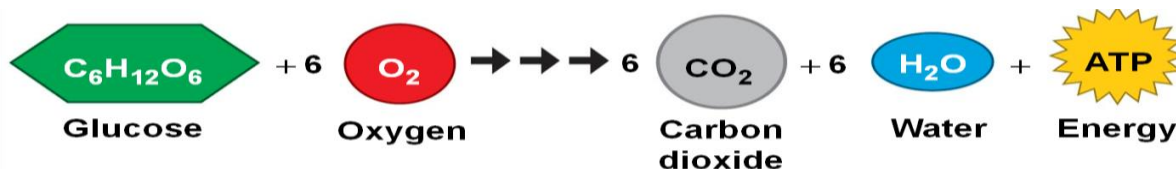
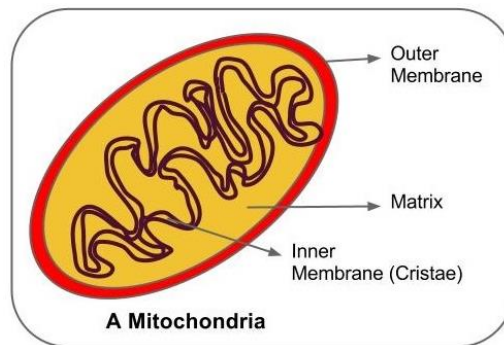


| Light dependent reaction | light independent reactions |
|--|---|
| It requires light. | It doesn't require light. |
| It occurs in thylakoids. | It occurs in stroma. |
| The product is oxygen and ATP. This ATP is used for light independent reaction. | The product is glucose which is used by plants. Glucose: C₆H₁₂O₆ |

Section 4.2 Overview of Cellular respiration

Cellular respiration: It is a process by which glucose is broken down to release ATP (energy). The cells use glucose and oxygen to produce ATP, water and release carbon dioxide.

Cellular respiration occurs in the mitochondria of all cells. It occurs in three steps.



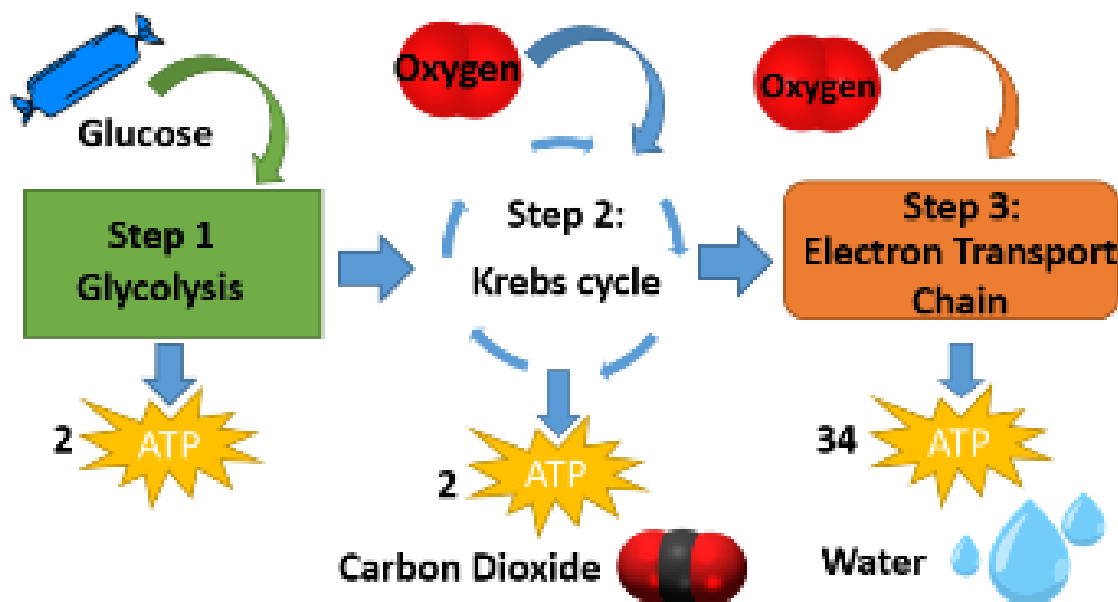
Steps of cellular respiration:

Glycolysis: The cells breakdown glucose into 2 three carbon molecules. It occurs in cytoplasm and produces 2 ATP.

Krebs cycle:

ATP and oxygen is used to produce 2 ATP and carbon dioxide. It occurs in matrix.

Electron Transport Chain: It occurs in inner membrane and uses 2ATP and oxygen to produce 34 ATP and water. These 34 ATP are used by living cells to carry out their functions.



Practice these questions:

1. _____ is a process in cell division which divides the cell cytoplasm.
2. Cellular respiration occurs in the _____ of all cells.
3. The electron transport chain produces _____ ATP molecules.
4. Light dependent reaction occurs in _____ of chloroplast.
5. Light independent reaction occurs in _____ of chloroplast.
6. Glycolysis occurs in _____ of the cell.
7. ADP coverts to _____ when one phosphate (P) is added to it.
8. In _____ stage some additional growth occurs and cell gets ready for division.
9. During _____, the chromatids separate. They are pulled to opposite sides of the cell.
10. _____ is the central part of a chromosome through which sister chromatids are attached together.
11. The 2nd stage of cellular respiration which occurs in matrix is called _____.
12. _____ is a process by which plants make their own food.
13. The products of cellular respiration are _____, carbon dioxide and water.
14. _____ is a process by which some organisms use chemical energy to make food.
15. A cell spends most of its time in _____ stage.

Answer key:

| | | | |
|----------------|--------------------|-----------------|--------------------|
| 1: Cytokinesis | 2: Mitochondria | 3: 34 ATP | 4: thylakoid |
| 5: stroma | 6: cytoplasm | 7: ATP | 8: G2 stage |
| 9: anaphase | 10: Centromere | 11: Krebs cycle | 12: Photosynthesis |
| 13: ATP | 14: Chemosynthesis | 15: G1 stage | |