**Cell Growth and Reproduction Guided Notes**

1. Two reasons \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cannot continue to grow larger \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:

(a) The larger a cell becomes, the more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the cell places on its DNA. As cell gets bigger, it does not make extra copies of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(b) Cell has more trouble moving enough \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and wastes across the cell membrane.

2. Before it becomes too large, a growing cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ forming two “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” cells. The process by which a cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into two new daughter cells is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. The \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a series of events a cell goes through as it grows and divides.

4. Before the cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, it must first copy its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ information.

Two stages for cell division:

(1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – division of the nucleus

(2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – division of the cytoplasm

5. Reproduction by mitosis is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, because the daughter cells are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ identical to the parent cell.

6. Chromosomes are composed of DNA and proteins and pass \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ information from one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the next. Humans have \_\_\_\_\_\_\_\_\_\_\_\_\_ chromosomes. (23 pairs). One of each pair from mom and one from dad

7. Chromosomes are visible only during cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, when they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into compact, tightly coiled structures.

8. Before cell division occurs, each \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is replicated or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Because of this, each chromosome has two identical “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” chromatids. When the cell divides the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ separate from each other, so that one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ goes into each of the new \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

9. In humans, only chromosome pairs 1-22 reproduce via \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, because these chromosomes include somatic (body) cells. Examples of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells include: muscle, blood, bone, and skin cells.

10. The purpose of mitosis in multicellular organisms is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of damaged tissues. The purpose of mitosis in unicellular organisms is replication (creating a new organism).

11. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the series of events that cells go through as they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Consists of 4 phases:

1. M phase – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and cytokinesis

2. \_\_\_\_\_\_\_\_\_ phase – chromosome replication

3. G1 and G2 phases – “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” of time with intense \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and activity

12. Interphase consists of three phases:

a. G1 phase

b. S phase

c. G2 phase

13. The \_\_\_\_\_\_\_\_\_ phase is a period of activity in which cells do most of their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Cells \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in size and synthesize new \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and organelles.

14. The \_\_\_\_\_\_\_\_\_\_\_ phase is a period in which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are replicated and the synthesis of DNA (DNA replication) occurs.

15. The \_\_\_\_\_\_\_\_\_\_\_\_ phase is the shortest of the three phases of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Many organelles and molecules required for \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are produced. When G2 phase is over, cell is ready to enter \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- phase and begin cell division.

16. Mitosis is the time of cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Mitosis process can last from a few minutes to several days. Four phases included:

a. Prophase

b. Metaphase

c. Anaphase

d. Telephase

17. Prophase is the longest phase of mitosis.

a. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ condenses into chromosomes. b.\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ dissolves.

c. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ move to poles.

d. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fibers form

* Centromere = Center of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = organize spindle, that will help separate chromosomes during division
1. Spindle = microtubules that guide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18. Metaphase is a short phase. Chromosomes line up at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Microtubules connect centromere to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

19. During \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, centromeres split and sister \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ separate to become individual \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

20. During telophase, chromosomes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the nucleus reappears.

21. Cytokinesis = division of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ making 2 new daughter cells

a. Animal cells

* + - Plasma membrane pinches along \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- Forms 2 new cells

b. Plant Cells

* + - Cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ laid across \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- Cell membrane forms around each cell
		- New \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ form

22. Results of mitosis:

* 2 new cells with identical chromosomes as parent cell
* Unicellular organisms
* Organism multiplied
* Multicellular organisms
* Cell growth and reproduction
* Tissue – groups of cells that work together
* Organs – tissues organize in various combos
* Organ Systems – multiple organs

23. Cancer - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ growth resulting from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cell division

a. May be caused by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ factors or by changes of enzyme production

b. Genes are segments of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that control the production of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ portion just before DNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This is the key \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ period.

24. Cancer is a mistake in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Form masses of tissues called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – deprive normal cells of nutrients
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells enter circulatory system and spread – form new tumors
3. 2nd leading cause of death
4. 1st is heart disease

25. Genetic and environmental factors

* Different countries different types
* Environmental:
1. Cigarette smoke

b. Air and water pollution

c. UV rays

d. Viral infections

26. Cancer prevention includes a life healthy lifestyle

* + Diets low in fat and high in fiber
	+ Fruits, veggies, grain products
	+ Vitamins and minerals
		- A,C,E, Calcium
	+ Exercise