

Mitosis & Meiosis Study Guide

Name: _____

1. Genes are short segments of DNA and are located in the _____ of a cell.

~chromosomes

2. What is the process by which the number of chromosomes is reduced by half to form sex cells?

~meiosis

3. Fertilization is an important step in animal reproduction. What happens during fertilization?

~The sperm and egg cell join to create a new living thing.

4. The process by which a cell creates an exact copy of itself, allowing an organism to grow is known as:

~mitosis

5. What is mitosis?

~how cells reproduce

6. What are genes?

~Segments of DNA that code for physical characteristics.

7. In the offspring pictured to the right, what percentage of genes comes from the female parent?

~50% (half)



8. How does your body grow as you get older?

~Your cells divide, producing new cells.

9. When sex cells combine to produce offspring, how many chromosomes will each sex cell contribute?

~Half the number of chromosomes in the body cells.

10. In mitosis, how does the number of chromosomes in a daughter cell compare to the number of chromosomes in a parent cell?

~The daughter cell has the exact same number of chromosomes as the parent cell.

11. How does a sperm or egg cell differ from all the other cells in your body?

~Sperm and egg cells contain only half the number of chromosomes as other cells.

12. In frogs there are 26 chromosomes in a fertilized egg. How many chromosomes are in the egg and sperm cells before fertilization?

~13 chromosomes in the egg cell and 13 chromosomes in the sperm cell.

13. If an organism reproduces asexually, as in budding, how will the offspring compare genetically to the parent?

~The offspring will be genetically identical to the parent.

14. How do mitosis and meiosis differ with regards to daughter cells?

~Mitosis produces 2 identical daughter cells, while meiosis produces 4 genetically different cells.

15. What type of reproduction results in offspring that are genetically identical to the parent?

~**asexual reproduction (budding, fragmentation, binary fission)**

16. Living things continue their species through sexual and/or asexual reproduction. Which of the following is true for both sexual and asexual reproduction?

- Sperm and egg cells are needed.
- Offspring is an exact copy of the parent.
- Genetic information is passed from parent to offspring.
- They only occur in animal species.

17. Most cells in the body of a fruit fly contain 8 chromosomes. In some cells, only 4 chromosomes are present. The cells with only 4 chromosomes were formed by what process?

~**meiosis**

18. Which picture shows the process of cellular division results in daughter cells that are genetically identical to each other and to the parent cell. Name the process.

~**Picture A: mitosis**

19. Organisms can reproduce in one of two ways – sexually or asexually. Amoeba are examples of organisms that reproduce asexually. When amoeba reproduce, they replicate their DNA and then divide in half. Therefore,

- none of the offspring's genes are identical to those of the parent.
- all of the offspring's genes are identical to those of the parent.
- half of the offspring's genes come from the parent.
- very few of the offspring's genes come from one parent.

20. Cows have 60 chromosomes. A calf received one set of chromosomes from its mother and another set of chromosomes from its father. How many chromosomes did each parent contribute?

mom – **30 chromosomes**

dad – **30 chromosomes**

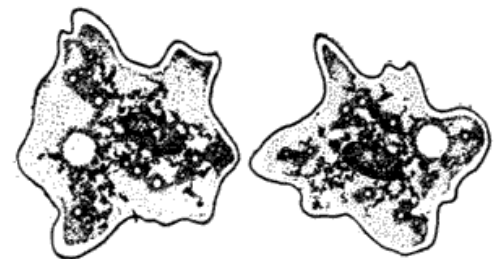
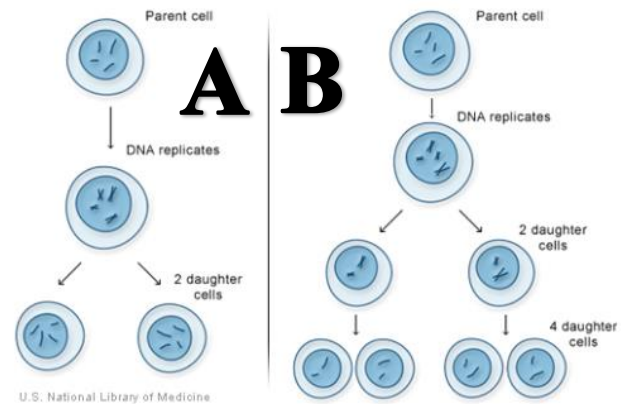
21. Which of the following is true of the daughter cells produced during meiosis?

- The genetic information in the parent cell is removed completely.
- The genetic information in the parent cell is copied exactly and passed to daughter cells.
- The genetic information is reduced to form daughter cells with half the number chromosomes as the parent cell.
- The genetic information is multiplied to form daughter cells with double the number of chromosomes as the parent cell.

22. When offspring show characteristics of both parent organisms, it is a result of what type of reproduction?

- sexual reproduction – the joining of a sperm and egg cell.
- budding – a piece of an organism breaks off and grows a new living thing.
- binary fission – a unicellular organisms splits in two.
- cloning – cells from an organism are used to grow a new organism.

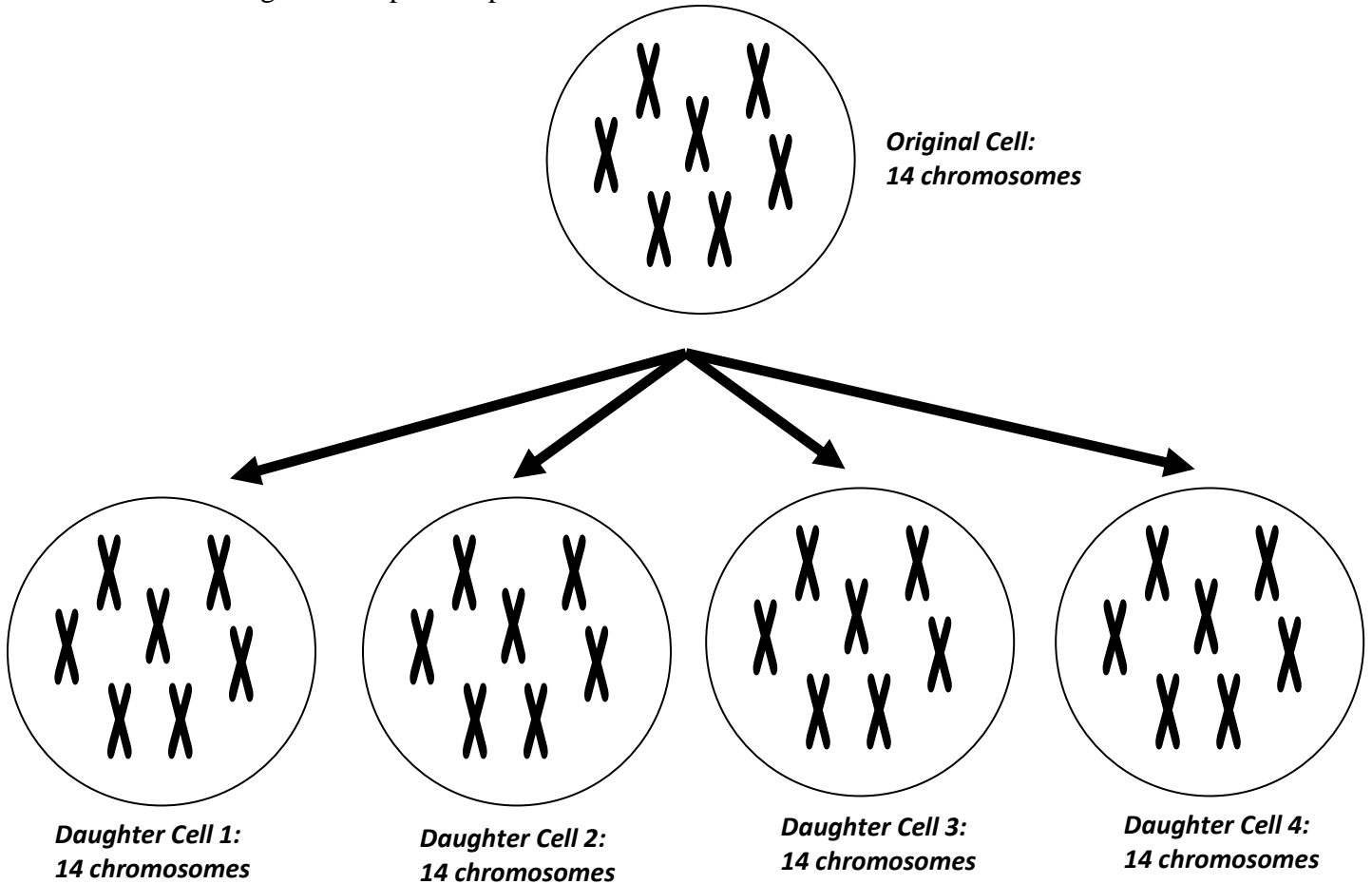
23. Draw the sex cells that can unite to produce a normal human offspring.



24. Which picture shows the result of the original cell dividing to create cells with HALF the number of chromosomes as the original cell?



25. What is wrong with the process pictured below?



~If it were mitosis, there are too many daughter cells.

~If it were meiosis, there are too many chromosomes in each daughter cell.