

Name key

Date

CELL DIVISION WORKSHEET

1. Describe any observations made regarding differences and similarities between plant (onion root) and animal (white fish) cells in regard to each of the phases of mitosis.

Some similarities between plant and animal cells in regard to each phase of mitosis are that chromosomes condense during prophase, in prometaphase the nuclear envelope breaks down, in metaphase the chromosomes align at the equator, in anaphase chromosomes move towards opposite poles, and in telophase the nuclear envelope forms again while chromosomes condense, and the spindle breaks down. Some differences are centrosomes are essential in animal cell division, but not present in plant division. In animal cells the cleavage furrow occurs more towards the center, but in plant cells the cell grows outward instead of inward.

2. In the modeling meiosis portion of the lab, describe how the new nuclei formed in meiosis I as being diploid ($2n$) or haploid (n).

At the end of meiosis there are 2 haploid cells. They are called haploid because they have half the chromosomes of a diploid cell.

3. Explain how crossing over changed the structure of the sister chromatids in the new nuclei in meiosis I.

Crossing over changed the structure of the sister chromatids in the new nuclei in meiosis I because a crossover is a cross connection that forms from breakage and rejoining between sister chromatids.

4. What are the total number of cells at the end of meiosis II?

At the end of Meiosis there are a total of 4 cells.

5. Based on the model in class, how many chromosomes are in each daughter cell at the end of meiotic cell division?

Based on the model in class, there are 23 chromosomes in each daughter cell at the end of meiotic cell division.

6. Based on the model in class, how many chromosomes were present per cell when the entire process began?

Based on the model in class, there were 48 chromosomes present per cell when the entire process began.

7. Based on the model in class, how many of the cells formed by the meiotic division are genetically identical?

Based on the model in class, 0 cells formed by meiotic division are genetically identical.

8. Explain the results obtained in meiotic cell division in terms of independent assortment and crossing over.

Meiotic cell division results in 4 daughter haploid cells, each with only half the number of chromosomes as a diploid cell. Independent assortment is the random formation of combinations of chromosomes. If this didn't occur, then the offspring would be identical to the parents. Crossing over is when two chromosomes of a homologous pair exchange equal segments with each other. Crossing over enhances the number of possibilities.