Mitosis and Meiosis

Mitosis

* If a cell wants to make a duplicate of itself, it first must copy its \_\_\_\_\_\_\_\_\_(part of a chromosome).
* The copies then must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into two sides of the cell.
* The cell then splits in \_\_\_\_\_\_\_\_\_. Part of each parent is carried to the \_\_\_\_\_\_\_ new cells.
* Types of cells that undergo mitosis: Write in your ISN

Meiosis

* As in mitosis, if a cell wants to make a duplicate of itself, it first must copy its \_\_\_\_\_\_ (part of a chromosome).
* Results in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells (sperm, eggs, etc).
* Part of each \_\_\_\_\_\_\_\_\_\_\_\_ is carried to the \_\_\_\_\_\_\_\_\_\_\_\_\_ new cells.
* Meiosis has evolved to solve a problem.
* The problem is this: some organisms have sex with other organisms – that is, they combine their genes together (creating genetic diversity).
* Why would this be a problem? Answer in your ISN

This may help you remember these terms:

* MITosis takes the cell and Makes It Two (diploid)
* Meiosis has to do with sex
* From the cell’s point of view:
  + mITosis results in Identical Twins
  + mEioSis results in Egg and Sperm (haploid)

Mitosis and Meiosis

* In Your ISN draw Mitosis and Meiosis

Interphase occurs just before Mitosis begins:

* DNA is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ along with organelles and other cellular components and the cell prepares for division.
* Draw Interphase in your ISN

1st Step in Mitosis: Prophase (Preparation Phase)

* The DNA recoils, and the chromosomes \_\_\_\_\_\_\_\_\_\_\_\_\_\_; the nuclear membrane \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and the mitotic spindles begin to form.
* Draw Prophase in your ISN

2nd Step in Mitosis: Metaphase (Organizational Phase)

* The chromosomes line up the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the cell with the help of spindle fibers attached to the centromere of each replicated chromosome.
* Draw Metaphase in your ISN

3rd Step in Mitosis: Anaphase (Separation Phase)

* The chromosomes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the middle and the sister chromatids are \_\_\_\_\_\_\_\_\_\_\_\_\_ by the spindle fibers to opposite poles of the cell.
* Draw Anaphase in your ISN

4th Step in Mitosis: Telophase

* The chromosomes, along with the cytoplasm and its organelles and membranes are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This diagram shows the end of telophase.
* Draw Telophase in your ISN

Draw Mitosis in the two types of cells in your ISN

After Mitosis: Cytokinesis

* The actual splitting of the daughter cells into two separate cells is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and occurs differently in both plant and animal Cells.

Remember

I P M A T C

Meiosis

Look that the diagram provided up front. What do you notice about the diagram? Write in your ISN

***Wait, Wait, Wait!!! Let’s talk about Chromosomes First!! Stop me here!!***

Meiosis Interphase

* Meiosis is preceded by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The chromosomes have not yet \_\_\_\_\_\_\_\_\_\_\_\_.
* Draw Interphase in your ISN

Prophase I

* The chromosomes are completely condensed. In meiosis (unlike mitosis), the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pair with one another
* Draw Prophase I in your ISN

Metaphase I

* The nuclear membrane dissolves and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ attach to the spindle fibers. They are preparing to go to opposite poles.
* Draw Metaphase I in your ISN

Anaphase I

* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ move to opposite ends of the cell.
* Draw Anaphase I in your ISN

Telophase I & Cytokinesis

* The cell begins to divide into \_\_\_\_\_\_\_\_\_\_\_\_\_\_ daughter cells. It is important to understand that each daughter cell can get any combination of maternal and paternal chromosomes.
* Draw Telophase in your ISN

Prophase II

* The cell has divided into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ daughter cells.
* Draw Prophase II in your ISN

Metaphase II

* As in Meiosis I, the chromosomes line up on the spindle fibers.
* Draw Metaphase II in your ISN

Anaphase II

* The two cells each begin to divide. As in Meiosis I, the chromosomes move to opposite ends of each cell.
* Draw Anaphase II in your ISN

Telophase II & Cytokinesis

* With the formation of four cells, meiosis is over. Each of these prospective germ cells carries half the number of chromosomes of somatic cells.