How Do Cells Divide and Reproduce?

Name: _____ Date: _____

How Do Cells Divide and Reproduce?

- God designed _____ different _____ involving cell division that allow cells to reproduce.
- One makes new cells for routine _____ and _____.
- The other enables the organisms to _____ _____.

Mitosis

- _____ describes how body cells grow and reproduce.
- During this process, _____ that contain the organism's DNA are copied in the nucleus.
- DNA carries God's instructions for an organism's _____.
- _____ is the dividing of the cytoplasm of the cell, which produces two daughter cells.

Mitosis: Step-by-Step

- _____ (_____): The cell has two chromosomes. The chromosomes are copied, just before the cell starts to divide.
- _____ (_____): The chromosomes condense and become tightly wound. The chromosomes are X-shaped. Each side of the X is a copy of the other side. They are attached at a knot like point. The nucleus membrane disappears.
- _____ (_____): A network of fibers develops in the cytoplasm. The chromosomes line up in the center of the cell. The fibers attach to each side of the X-shaped chromosomes.
- _____ (_____): The fibers pull apart the duplicated chromosomes, moving one strand to each side of the cell.
- _____ (_____): A new nucleus starts to form around each set of chromosomes.
- _____ (_____): The cytoplasm pinches in, and two separate cells form during the process of *cytokinesis*. The two cells are identical to the original cell.

Mitosis: Number of Chromosomes

- Chromosomes contain specific _____ _____ needed by the organism, whether it is a frog, a fungus, or a sunflower.
- It is important that each new cell has the _____ codes as the _____ cell.
- Each species of organism has a _____ _____ of chromosomes in its body cells.
- At the end of cell division, the _____ of each new cell must have the same _____ of chromosomes as the original cell.
- A potato cell has _____ chromosomes before it divides.
- After mitosis, there are _____ new cells.
- Each new cell has _____ chromosomes.

Organism	**Number of Chromosomes**
Mosquito	
Lettuce	
Humans	
Horse	

Meiosis

- _____ is the process of cell division that occurs in sexually reproducing organisms.
- Two consecutive _____ _____ (meiosis I and meiosis II) take place producing _____ daughter cells.
- The daughter cells are called _____, or sex cells.
- Each gamete has _____ the number of chromosomes as the _____ cell.
- Gametes from each parent combine to produce the _____.
- During meiosis, the cell divides _____.
- Multiplying dividing steps are necessary to reduce the number of chromosomes to half the number of a _____ body cell.
- In humans, gametes have _____ chromosomes compared to _____ chromosomes in the body cell.

Meiosis: Step-by-Step

- Interphase (Preparation)
  - Inside this nucleus, there are two _____.
  - The chromosomes are _____ and they condense.
- Division 1 (Meiosis I)
  - Step A: The chromosomes line up in _____ pairs. They condense and become tightly wound. The matching pairs exchange _____.
  - This produces chromosomes that are _____ identical to those in the original cell
  - Step B: A network of fibers form and separate the pairs. The two cells form, each with two _____ chromosomes.
- Division 2 (Meiosis II)
  - Step A: As the second division beings, the nucleus breaks _____. The X-shaped chromosomes line up in the _____ of the cell.
  - The network of fibers forms and attaches to the _____.
  - Step B: The two strands of each chromosome are _____ and pulled away from each other to _____ ends of each cell.
  - Step C: A new _____ forms in each new cell. They are now _____ separate cells. Each cell has half the number (two) of chromosomes that were in the original cell.

When Gametes Join

- The chromosomes in body cells and gametes carry DNA that controls the _____ in an organism.
- Humans have _____ chromosomes in each of their body cells.
- Human chromosomes are _____ pairs of chromosomes.
- The chromosomes in a pair contain the same type of _____, but one chromosome came from each _____.
- Through the process of meiosis, each human _____ will contain just 23 chromosomes.
- Each human _____ will contain the other 23 chromosomes.