**Honors Biology: Chapter 10**

**Cell Growth and Cell Division**

**EQ: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**10-1 Cell Growth**

What are the three major reasons cells go through cell division:

1:

2:

3:

The cells of large organisms are typically\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ than the cells of a small organism. You are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ today than when you were born because you have **\_\_\_\_\_\_\_\_\_ cells**, not because your cells have grown larger.

As cells become larger there are **\_\_\_\_\_\_\_\_\_\_ demands placed on the cell’s \_\_\_\_\_\_\_\_\_**. In addition, the larger cells become **the more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ it is to move enough \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** across the cell membrane (surface area to volume).

**EQ: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**10-2 Cell Division**

Before cells become too large they divide to form two “**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**” cells. Cell division occurs during what is known as the **cell cycle** (see Figure 10-4).

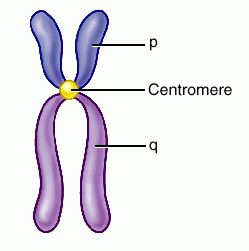
What does the word replicate mean in cell division?

Why must cells replicate their genetic information?

Define the word **Chromosomes** (be sure to briefly describe their structure):

Chromosomes are not visible throughout most of the cell cycle. Once replication occurs the strands of \_\_\_ shorten and become visible as two “sister” **chromatids.**

**What is a centromere?**



All species have a characteristic number of chromosomes, which are organized into **homologous** (near \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) pairs.

Humans: \_\_\_\_\_\_chromosomes in 23 pairs

Potato: 48 chromosomes in 24 pairs

Housefly: 12 chromosomes in \_\_\_\_pairs.

Chicken: 78 chromosomes in \_\_\_\_pairs?

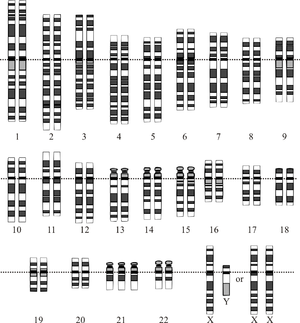
Does it appear that chromosome number is related to the complexity of the organism?

In humans one pair of chromosomes is referred to as the **sex chromosomes**.

Females: \_\_\_ \_\_\_

Males: \_\_\_ \_\_\_

Many genetic disorders are related to the fact that males are missing a piece of their genetic information.



**HW #1: page 243 Sect 10.1 #’s 1, 2, 3.**

**Chapter 10 &11 Cell Division**

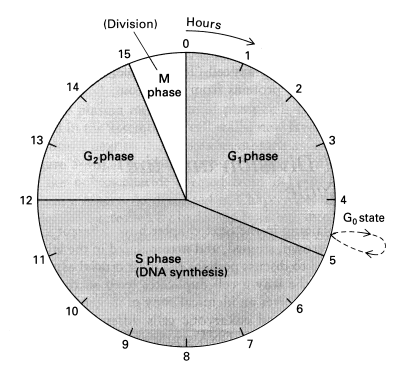
**EQ: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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The life of a cell is divided into \_\_\_\_\_\_\_ phases.

There are two \_\_\_\_\_\_\_\_\_ phases (**G1 and G2**) separated by the **S phase** during which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ occurs.

At the end G2 the cell organizes its genetic information so that each daughter cell will get a copy and then splits in two (**M phase**).

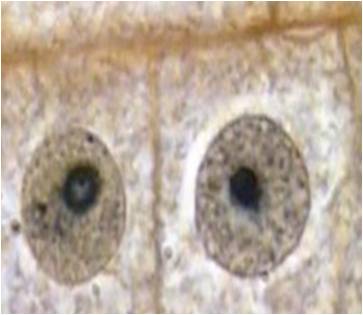


What three parts of the cell cycle are commonly called Interphase?

The M phase is broken into several shorter phases: **P\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, M\_\_\_\_\_\_\_\_\_\_\_\_, A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and T\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

What happens at the end of Telophase?

**Interphase** is essentially the period of time when the cell gets ready for division. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of the genetic material occurs during the end of this stage.



The first and \_\_\_\_\_\_\_\_\_\_\_\_\_\_phase of mitosis is **Prophase**. What two important events occur during this phase?

1.

2.



Microtubules of proteins called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_begin to radiate out from the centrioles and attach themselves to each \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_at the\_\_\_\_\_\_\_\_\_\_\_\_\_\_. By the end of Prophase the nuclear membrane has disappeared.

During **Metaphase** the centromeres \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of the dividing cell (equator).



**Anaphase** begins as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are split and each chromatid is pulled by the spindle fiber to opposite sides of the cell.



During **telophase** the chromatids begin to\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the spindle and centrioles disappear, and the nuclear \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_reforms.



Mitosis end when the genetic information from the daughter cells is separated (**cytokinesis**) into two new \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cells either by the membrane (animals) or the cell plate (plants).

<https://www.youtube.com/watch?v=C6hn3sA0ip0>

**HW #2: page 249 Sect 10.2 #’s 1, 2, 3, 4.**

**Section 11-4 Meiosis (page 275).**

**EQ: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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What are **Diploid** cells?

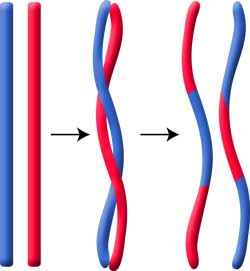
Examples include \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, white blood cells and many others. Cells that are diploid are sometimes referred to as being 2N.

What are **Haploid** cells?

The only examples in humans are the reproductive \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(eggs and sperm). Haploid cells are referred to as being 1N.

Hapolid cells are created in a process called**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

What is crossing over?



What is the great advantage of crossing-over?

Meiosis is essentially going through mitosis twice except \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is skipped the second time (no replication). The end process is to create \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(4 in males; one in females).

**HW #3 page 278 Sect. 11-4 #’s 1, 2, 3, 4.**