

topic 1

Pre-Class Reading Assignment

1. Read pgs 558 (from chromosome structure) – 559
2. Define the following terms
 - a. Chromatin
 - b. Centromere
 - c. Sister chromatids

Topic 1 – Ploidy and Chromosomes

There are two types of cell reproduction

- Mitosis – three uses

- method of reproduction (in some species)
- method of growth (increasing cell numbers)
- method of cell replacement (repair)

- Meiosis – used only for producing the gametes

- In humans, the sperm and egg

Chromosomes

Genetic information of a cell is contained in the DNA found in the nucleus of the cell.

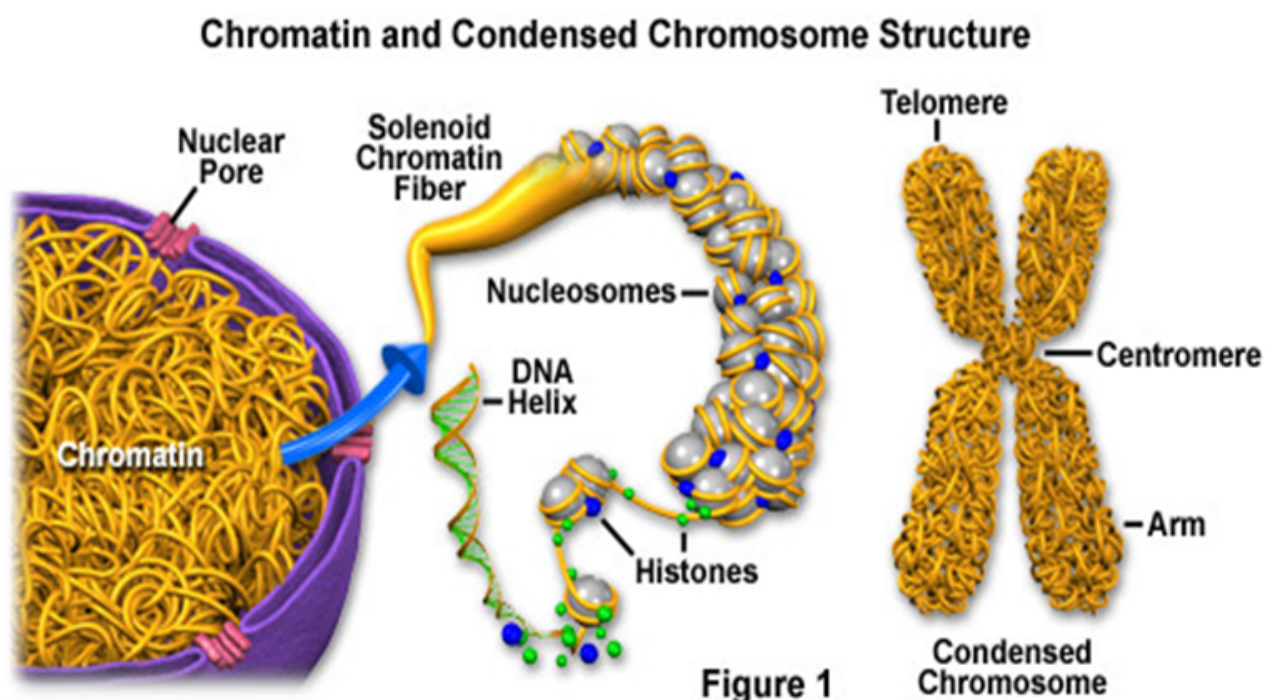
- DNA – deoxyribonucleic acid; strands of genetic material

- Histones – proteins that tightly wrap DNA

- Chromatin – tightly wrapped DNA; uncoiled chromosomes

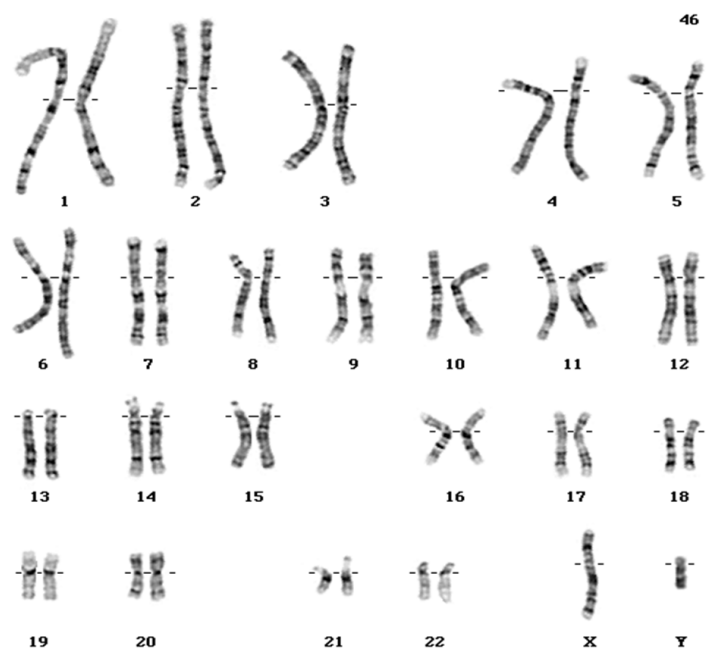
- Chromosomes – a length of compacted, bundled DNA

- Our somatic cells have 46 chromosomes
- Human gametes (sperm and egg) have 23 chromosomes



Chromosomes in the nucleus

- In most organisms, chromosomes are found in pairs
- Each chromosome in a pair is **similar** to the other but not an exact copy
- In humans, one chromosome in the pair came from the father, and the other from the mother
- A pair of chromosomes is said to be a **homologous** pair.
- Of our 23 pairs of chromosomes ($23 \times 2 = 46$)
 - o 22 pairs are called **autosomes**
 - Not involved in sex determination
 - o 1 pair are called **sex chromosomes**
 - Involved in sex determination



Ploidy

- **Ploidy** is the number of sets of chromosomes in a biological cell.
- Human sex cells (sperm and egg) have one complete set of chromosomes from the male **or** female parent.
- Sex cells, also called **gametes**, combine to produce **somatic** cells.
- Somatic cells, therefore, have 2 copies of each chromosome.
- A **haploid** cell has 1 copy of each chromosome.
- A **diploid** cell has 2 copies of each chromosome.
- An organism that is **polyploid** has more than 2 copies of each chromosome

