

Cell Reproduction: Mitosis & Meiosis

I. The Chromosome

A. consist of 2 strands of chromatin coiled around proteins and joined together by a centromere

B. chromatin are long strands of DNA, one being the original and the other being the replicated one

II. The Chromosome Numbers

Do all organisms have the same number of chromosomes? Do the more “intelligent” organisms have more chromosomes than the less intelligent? Does size of organism determine chromosome numbers?

<u>Organism</u>	<u># of Chromosomes</u>
humans	_____
mosquito	_____
corn	_____
goldfish	_____
fruit fly	_____
carrots	_____

III. Cellular Division

A. Why do cells divide?

1. reproduction, single celled organisms increase population
2. growth, multi-cellular organisms begin as a single cell
3. maintenance, repair and replace damaged or worn out cells, stomach replaces entire lining every 2-3 days
4. body part replacement, reptiles, amphibians, etc.
5. DNA overload

6. surface area to volume ratio too small, let's compare surface to volume for cubes

dimensions	surface area, cm ²	volume, cm ³	s. a./v.
1x1x1	6		
2x2x2	24		
3x3x3	54		
4x4x4	96		
5x5x5	150		
6x6x6	216		
7x7x7	294		
10x10x10	600		

IV. Eukaryotes

A. The Cell Cycle

1. G1 phase, cell grows in size
2. S phase, DNA replicates
3. G2 phase, cell begins preparation for cell division
4. M phase
 - a. mitosis, nucleus divides
 - b. cytokinesis, cytoplasm divides and two daughter cells that are genetically identical are produced
6. G1, S, & G2 phases are collectively called Interphase

B. M Phase: Mitosis contains 4 major events followed by cytokinesis

1. Prophase: Occupies 60% of mitosis

a. Early Prophase

1. _____
2. _____
3. _____

b. Middle Prophase

1. _____
2. _____
3. _____

c. Late Prophase

1. _____
2. _____
3. _____

2. Metaphase

- a. _____
- _____

- b. _____

3. Anaphase:

a.

b.

4. Telophase:

a.

b.

c.

d.

e.

e.

MITOSIS IS COMPLETE

C. Cytokinesis: Division of cytoplasm

1. animals: cell membrane pinches together until complete separation

2. plants: a cell plate is formed in the middle; golgi apparatus migrate to this area and fuse together to form cell plate