Honors Biology Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

NDHS Per: \_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_

**Cellular Division**

Cell Division: basis for the continuity of life

Functions:

1. - making of new individuals ( ) -

- generation of gametes ( ) -

2. - more cells - bigger organism

3. - new cells to fix old or damaged cells

Focus of Cellular Division is

-

Followed by

-

**Mitosis**:

- each new cell ( ) receives and identical set of genetic material from the old cell ( )

-forms (body cells)

**Meiosis**:

- daughter cells receive the amount of genetic material from the parent cell

- forms (sex cells)

Division of the nuclear material involves the separation of condensed DNA

CHROMOSOMES: “\_\_\_\_\_\_\_\_\_\_\_\_\_” condensed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

- each species has a particular number

SOMATIC Cells: of each chromosome ( ) -

GAMETES: of each chromosome ( ) -

Structure of Chromosomes:

Chromosome contains of the same genetic material

- each set --> set of sister

- linked by - narrow waste

- helps identify different chromosomes -

**MITOTIC CELL CYCLE**:

- separtion of chromosomes into  daughter cells

Two phases:

Interphase: % of cell cycle

Mitotic Phase:

INTERPHASE:

- made up of three distinct sub-phases

1. G1 -

2) S -

3) G2 -

**Gap 1**:

**Synthesis**:

**Gap 2:**

MITOSIS ( ):

1) :

- chromatin

- nuclear

- nucleolus

- centrioles (in animals)

* microtubules

2) :

"meta" means " "

* chromosomes are lined up in the

from the centriole pairs

* - central line in the cell where the chromosomes move due to

3) :

- separation of via the shortening of

microtubules

- each chromatid now considered a chromosome

(each has the same genetic infomation as the other chromatid)

- cells are genetically

4) :

- daughter nuclei begin to

- each cell has

- nuclear envelope begins to

- chromosomes

- nucleoli reform

- beginning of

MAKING SENSE OF CHROMOSOME NUMBERS

Ex: 10 Chromosomes

Recently divided daughter cell - 10 chromatids

synthesis of DNA – 20 sets of chromatids = 10 Chromososmes

10 Chromosomes of duplicated DNA in sister chromatids

separate into 2 sets of 10 chromatids for new daughter cells

**CYTOKINESIS**:

division of the

Animal cells: use of

- ring of and

- contract and pull the the cell membrane in - like a draw string Ex: clay and string

Plant Cells: use of

- vesicles from the fuse at the

build new cell wall

Ex: dividing a room with a wall

**MEIOSIS**

Meiotic Cell Cycle: reduction of chromosomes

# Major Processes

1. Replication of
2. Pairing of ( )
4. Separation of
5. Separation of

**2 Phases of Meiosis**:

**Meiosis I**: Separation of

* each chromosome has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* chromosomes that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + - Humans: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Interphase I**: Like mitosis: Replication of DNA - forms sister

**Prophase I**:

Like mitosis except

1. Longer:

1. : Pairing of homologous chromosomes

* each made of sister chromatids
* - makes - four chromatids

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of homologous pairs 🡪
2. leads to

* chromatids

- happens in the same place

**Metaphase I**:

Like mitosis except

- microtubules only attach to one side of kinetochore

**Anaphase I**:

Separation of : sister chromatids

**Telophase I and Cytokinesis**:

may or may not reform nucleus and nucleolus

cell divides and forms (only a half set)

**Interphase II**: ????????

**Prophase II**:

spindle reforms

**Metaphase II**:

line up along metaphase plate

**Anaphase II**:

separation of

**Telophase II/Cytokinesis**:

nuclei form and cells divide

Result of Meiosis II: 4 haploid cells – each has half of the genetic material of the parent cell

**COMPARISON OF MITOSIS AND MEIOSIS**

Mitosis:

Meiosis: