

Review – Asexual and Sexual Reproduction

Name: KEY Date: _____ Block: _____

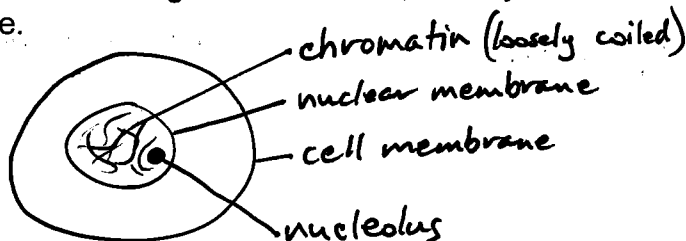
Please use all your notes and practice sheets, plus this unit review to help you study for the Asexual and Sexual unit test.

Section 1 – Cell Cycle

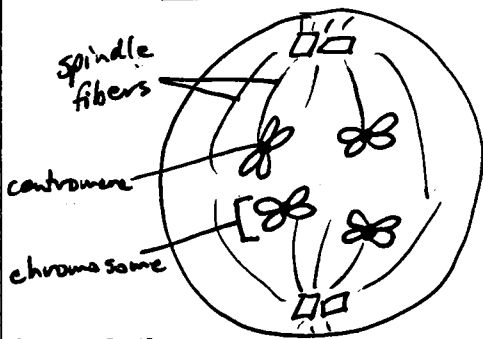
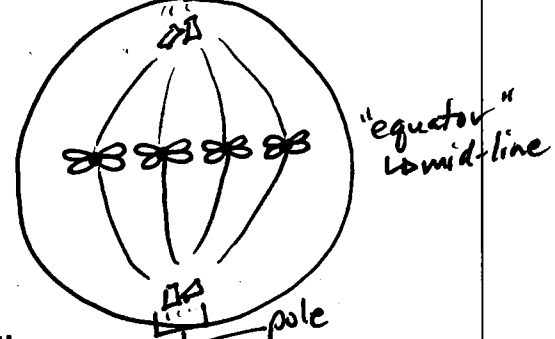
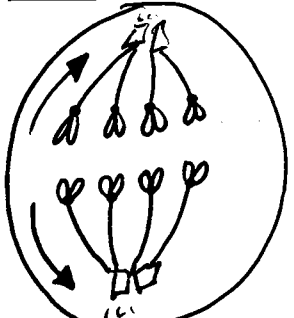
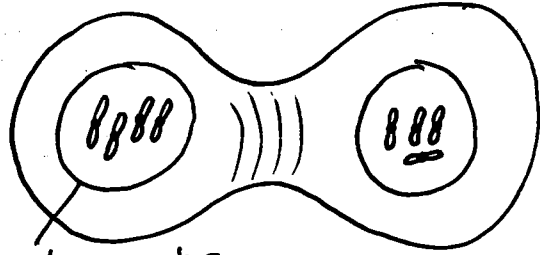
1. What is the purpose of reproduction? The production of offspring by asexual or sexual processes.
2. List the three stages of the cell cycle and describe the main functions of each.

Stage	Description of main functions
Interphase	① Cell carries out normal functions and grows ② Replicates/duplicates DNA "GROWTH and DEVELOPMENT"
Mitosis	① Nucleus contents duplicated and divided into 2 new nuclei. "DIVISION STAGE #1"
Cytokinesis	① Separation of two nuclei and cell contents into two, separate daughter cells. "DIVISION STAGE #2"

3. a) When does DNA replication occur in the cell cycle? Interphase
 b) Why is DNA replication so important? So that each daughter cell receives the exact same copies of DNA (genetic info/material)
4. Draw a diagram of the cell when it is in the Interphase stage of the cell cycle. Label your diagram with the following terms: nucleus, loosely coiled chromatin, and nuclear membrane.

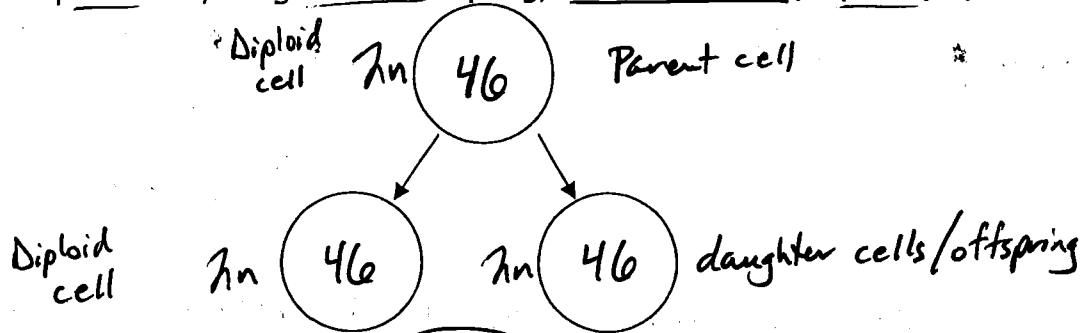


5. In the boxes found below:
- name and draw each phase of **MITOSIS**
 - describe what is happening in the phase

<p>Phase 1: <u>PROPHASE</u></p>  <p>Description:</p> <ul style="list-style-type: none"> - nuclear membrane disappears - spindle fibers form and attach to chromosomes at centromere. - centrioles move to opposite poles. 	<p>Phase 2: <u>METAPHASE</u></p>  <p>Description:</p> <ul style="list-style-type: none"> - tugging action of spindle fibers pulls the X-shaped chromosomes into a single line across the <u>middle</u> of the cell <p style="text-align: center;">(M)</p>
<p>Phase 3: <u>ANAPHASE</u></p>  <p>Description:</p> <ul style="list-style-type: none"> - spindle fibers contract and shorten. - this pulls the centromere apart and sister chromatids move to opposite poles <p>(A) → "Apart ≠ Away"</p>	<p>Phase 4: <u>TELOPHASE</u></p>  <p>nuclear membrane</p> <p>Description:</p> <ul style="list-style-type: none"> - spindle fibers start to disappear - nuclear membrane forms around each set of chromosomes - two new nuclei in one cell

6. Define **asexual reproduction**: Offspring produced from a single parent.

7. a) Fill in the diagram below about **asexual reproduction** with the following words: parent cell, daughter cell/offspring, 46 chromosomes, diploid (2n)



b) Are the offspring genetically **identical** OR **not identical** to the parent cell?

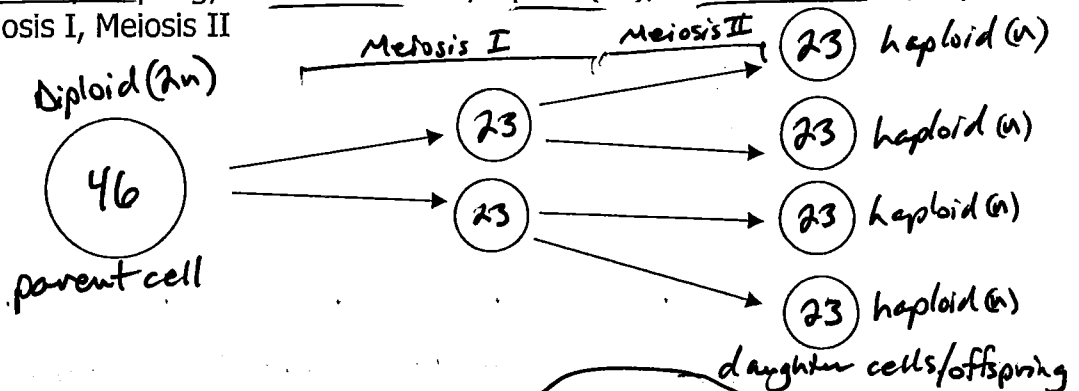
c) How do the chromosomes in the parent cell compare to the number of chromosomes in the daughter cells? The # of chromosomes in

the parent cell equals the # of chromosomes in daughter cells.

Section 2 – Meiosis and Gamete Formation

1. What is the purpose of meiosis? To produce gametes (sex cells) with 1/2 the # of chromosomes as body cells.

2. a) Fill in the diagram below about **meiosis** with the following words: parent cell, daughter cell/offspring, 46 chromosomes, diploid (2n), 23 chromosomes, haploid (n), Meiosis I, Meiosis II

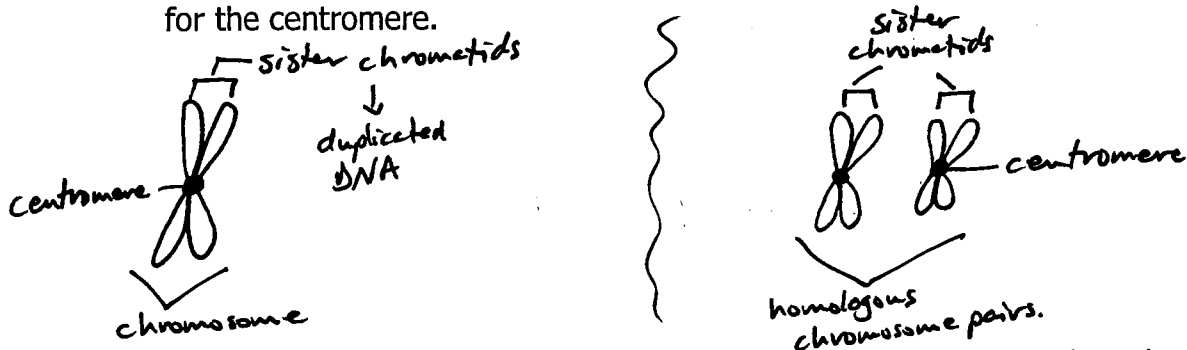


b) Are the offspring genetically **identical** OR **not identical** to the parent cell?

c) How do the chromosomes in the parent cell compare to the number of chromosomes in the daughter cells? The # of chromosomes in

the daughter cells is 1/2 the # of chromosomes in the parent cell.

3. a) Chromosomes are X shaped during both mitosis and meiosis. Draw and label sister chromatids and homologous chromosomes. Make sure to include the label for the centromere.

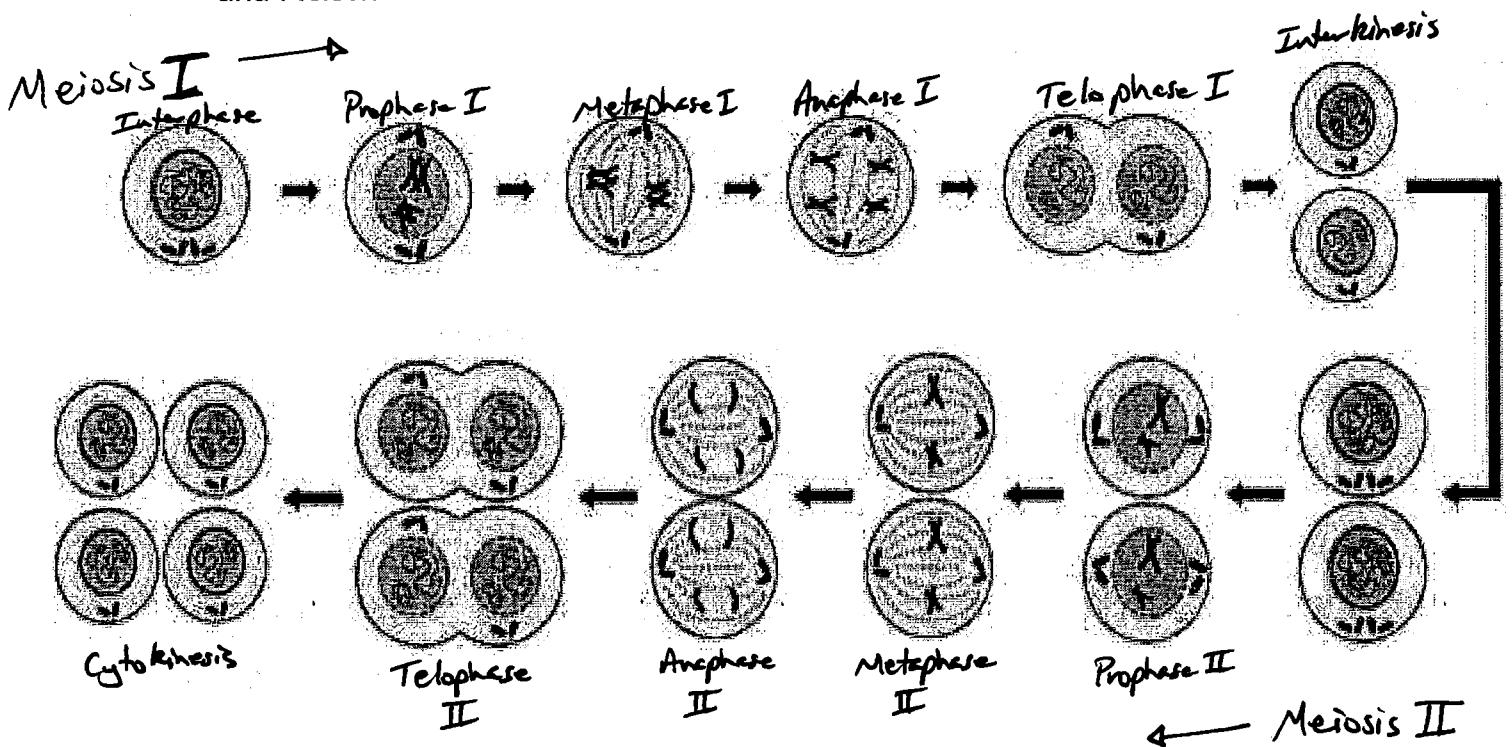


- b) Explain the similarities and differences between sister chromatids and homologous chromosomes.

Similarities – sister chromatids are duplicated DNA. Each pair of the homologous chromosomes are also made up of sister chromatids (duplicated DNA)

Differences – homologous chromosomes are a pair of matching chromosomes similar in height & function (but not exactly same) whereas sister chromatids are genetically identical.

4. Label the following diagram with all the phase names of meiosis, as well as Meiosis I and Meiosis II.

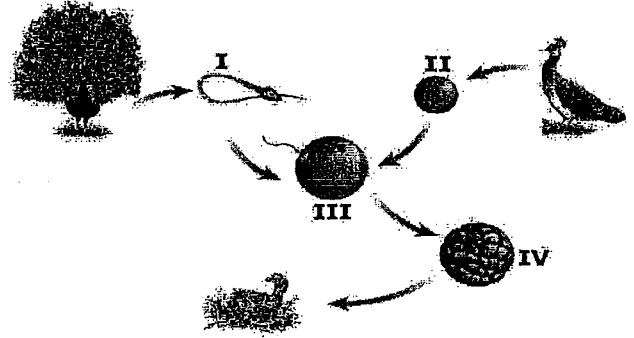


Section 3—Sexual Reproduction YOU WILL NOT BE RESPONSIBLE FOR THIS MATERIAL....DUE TO THE TIME LINE WE HAVE, I AM OMITTING THIS SECTION.

1. Define **sexual reproduction**: _____

2. What are the three stages of sexual reproduction? _____

3. This is a diagram on the process of fertilization. Explain what is happening and make sure to include the following terms in your explanation: gamete cells (egg/sperm), haploid (n) cell, diploid ($2n$) cell, fertilization, zygote, mitosis, embryo.



4. What needs to occur once an egg is fertilized by a sperm in order for the zygote to grow?

5. a) Provide an example how sexual reproduction by **internal fertilization** provides an advantage over **external fertilization**. _____

b) Provide an example how sexual reproduction by **internal fertilization** provides a disadvantage over **external fertilization**. _____

Section 4 – Differences between Meiosis and Mitosis

1. What is the main advantage sexual reproduction has over asexual reproduction?

There is more genetic diversity ... therefore, greater chance of survival and evolution.

2. Fill in the information, about mitosis and meiosis in the table below.

	Mitosis	Meiosis	
How many stages are involved in the process?	1	2	
Draw a picture of the cell in Metaphase <ul style="list-style-type: none"> Label sister chromatids and homologous chromosomes 	Sister chromatids 	Metaphase I homologous chromosomes 	Metaphase II sister chromatids
Draw a picture of the cell in Anaphase <ul style="list-style-type: none"> State what type of chromosome is moving towards the poles 	splitting sister chromatids @ centromere 	Anaphase I homologous chromosomes move to poles 	Anaphase II sister chromatids separate to poles
How many daughter cells are produced in total?			
Genetically identical or non-identical offspring?	IDENTICAL	NON-IDENTICAL (genetically different)	
Relate the # of chromosomes in the parent cell to offspring	same # of chromosomes	daughter cells 1/2 # of chromosomes	
Are the final daughter cells diploid (2n) or haploid (n)?	Diploid (2n)	Haploid (n)	
What type of cells does the process produce?	Body cells (somatic)	(Egg, sperm, gametes) Sex cells	