

HONORS BIOLOGY CHAPTER 8 STUDY GUIDE

Name _____ Period _____

READ pp. 126-7 Cell Division

On the blanks write AR for asexual reproduction and SR for sexual reproduction:

1. _____ requires two parents
 2. _____ the offspring are identical to the parents
 3. _____ parents are gametes
 4. _____ have a single parent
 5. _____ growing a plant from a plant clipping
 6. _____ growing new skin cells
 7. _____ forming a zygote
8. What is the difference between **mitosis** and **binary fission**?
9. How can the two daughter cells be identical if the cells split into two cells?

READ p. 128 Eukaryotes and Prokaryotes

1. Fill in the chart comparing eukaryotic and prokaryotic cells.

	PROKARYOTIC CELLS	EUKARYOTIC CELLS
Relative size		
Typical cell number of genes		
Relative number of chromosomes		

2. Match the chromosomal terms:

a. _____ structure joining two sister chromatids	A. sister chromatids
b. _____ loose DNA + protein	B. chromosome
c. _____ two copies of identical of DNA molecules + protein	C. centromere
d. _____ single strand of DNA and its protein	D. chromatin
e. _____ identical offspring after cell division	E. daughter cell

READ p. 129 Cell Cycle

1. What is an ordered sequence of events that extend from the time a cell is first formed to the time the parent cell divides into two cells? _____
2. What is another name for the growing stage? _____
3. What is another name of the stage where everything doubles and divides? _____
4. Write "I" for interphase, write "M" for mitotic phase, and "C" for cytokinesis:
 - a. _____ cytoplasm divides in two
 - b. _____ high metabolic activity
 - c. _____ additional chromosomes are duplicated
 - d. _____ about 10% of the total time of the cell cycle
 - e. _____ about 90% of the total time of the cell cycle
 - f. _____ contains the G1, S, and G2 phases

READ pp. 130-131 Mitosis

Write "P" for prophase, write "PM" for prometaphase, write "M" for metaphase, write "A" for anaphase, and "T" for telophase.

1. _____ centromeres are lined up at the equatorial plate
2. _____ nuclear envelope forms around the two daughter cells about to form
3. _____ nuclear envelope breaks apart
4. _____ chromatin condenses and visible chromosomes appear
5. _____ centrioles begin to move away from each other
6. _____ centromeres of the sister chromatids break apart
7. _____ this is the phase that is the reverse of prophase
8. _____ sister chromatids form and are attached to centromeres
9. _____ motor proteins powered by ATP move the single chromosomes to the poles
10. _____ spindle microtubules now attach to the sister chromatids throwing them into a "dance"

READ p. 132 Cytokinesis

1. Sketch how cytokinesis is different in animal cells and in plant cells. Also label the "cleavage furrow" and the "cell plate."

READ p. 133 Anchorage Density

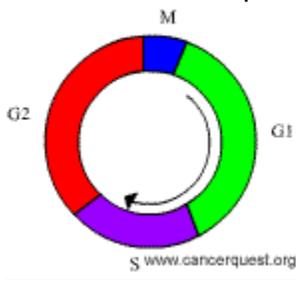
1. What type of cells divide frequently? _____
2. What type of cells do not divide unless the organ is damaged? _____
3. What type of cells do not divide once formed? _____

4. MATCH THE TERMS TO THE CORRECT DEFINITIONS:

- | | |
|---|---------------------------------|
| a. _____ a protein secreted by cells to stimulate other cells to divide | A. VEGF |
| b. _____ stimulates growth of new blood vessels after injury | B. density-dependent inhibition |
| c. _____ promotes rapid growth of connective tissue to seal the wound | C. growth factor |
| d. _____ cells must be in contact with a solid surface to divide | D. anchorage dependence |
| e. _____ crowded cells stop dividing | E. plate-derive GF |

READ p. 134 Growth Factors

1. What is the purpose of the **cell cycle control system**?
2. What is the purpose of a **checkpoint**?
3. Draw the location of the three checkpoints of the cell cycle. Describe what happens at each checkpoint:



G ₁ _____ _____
G ₂ _____ _____
M _____ _____

4. Which of the checkpoints is probably the most important and why?
5. What does G₀ mean?

READ p. 135 CANCER

Match the cancer terms with the definitions:

1. _____ spread of cancer cells beyond original site
2. _____ cancers that arise from bone and muscle
3. _____ abnormally growing mass of cells
4. _____ cancers from skin or lining of intestine
5. _____ bone marrow cancer
6. _____ abnormal cells remain at the original site
7. _____ mass has spread into neighboring cells and displace normal Function
8. _____ cancer of the lymph nodes

- A. lymphoma
- B. malignant tumor
- C. carcinomas
- D. metastasis
- E. benign tumor
- F. leukemia
- G. tumor
- H. sarcoma

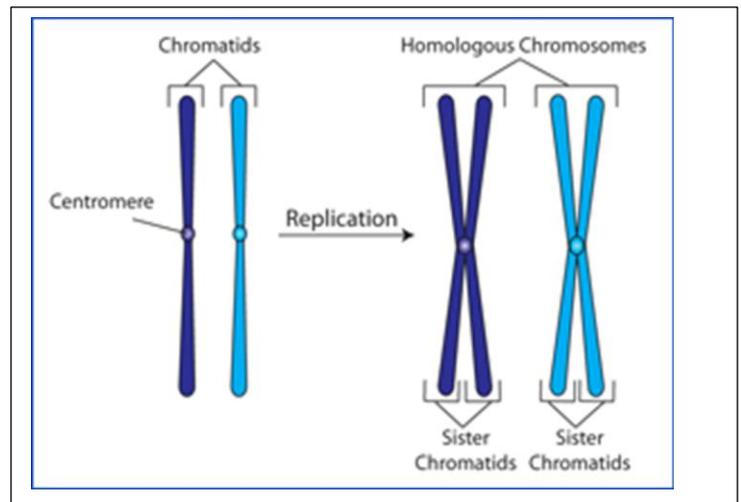
9. How does the cancer drug, Taxol, work?

READ p. 136 MITOSIS OVERVIEW

Mitosis provides for what three purposes (see title)?

READ p. 136-7 MEIOSIS and Crossing Over

1. What is a **somatic cell**?
2. How many chromosomes does a human body somatic cell have? _____
3. How are homologous chromosomes related and different from sister chromatids?



4. What is a **locus** of a chromosome?
5. How are the sex chromosomes different in male and in females?
6. What are autosomes?

READ p. 137 Gametes

Match the terms to the definitions:

- | | |
|-----------------------------------|--------------------------------|
| 1. ____ haploid | A. joining a sperm with an egg |
| 2. ____ diploid | B. sex cells |
| 3. ____ gametes | C. zygote |
| 4. ____ fertilized egg | D. 2n |
| 5. ____ life cycle | E. n |
| 6. ____ double set of chromosomes | F. stages from adult to adult |
| 7. ____ single set of chromosomes | |
| 8. ____ egg and sperm | |

READ pp. 138-9 MEIOSIS

Write the letter that shows the correct phase of each description below:

- | | | | |
|-----------------|------------------|-------------------|------------------|
| I = interphase | A 1 = anaphase I | P2 = prophase II | T2= telophase II |
| P1 = prophase I | T 1= telophase I | M2 = metaphase II | |
| M1= metaphase I | C = cytokinesis | A2= anaphase II | |

- ____ pairs of chromatids migrate to the poles with attached centromeres
- ____ the chromosomes duplicate
- ____ synapsis of the paired chromatids and may result in crossing-over
- ____ 2 chromatids line up at the equator
- ____ 4 chromatids line up at the equator
- ____ centromeres separate as single chromosomes move to each pole
- ____ cytoplasm divides the cell into two
- ____ centrioles move toward the poles as chromatids appear as paired with centromeres
- ____ the nuclear envelope reforms as four daughter cells prepare to form
- ____ pairs of chromatids are at the poles as new nuclear envelopes form

READ p. 140 COMPARING MITOSIS AND MEIOSIS (Fill in the chart)

	Mitosis	Meiosis
Purpose		Make sex cells
Chromosomal number of offspring	haploid	
Number of divisions		two
Yield how many cells	Two	
Have crossing over?		Yes

READ p. 141 Independent Assortment

1. What is the formula for deciding how many possible total combinations of chromosomes that meiosis and form?
2. Calculate the possible number of combinations if the following haploid numbers are given:

$n = 2$

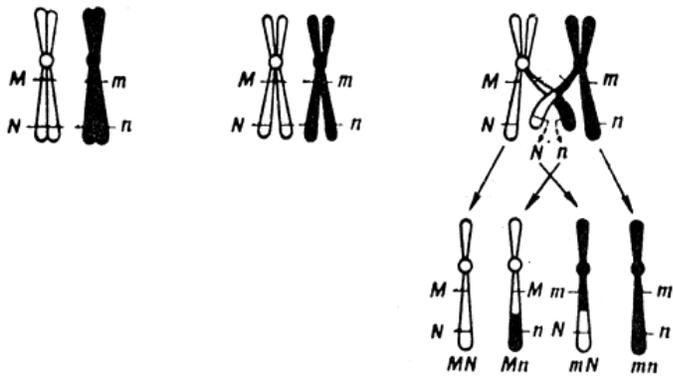
combinations = _____

$n = 4$

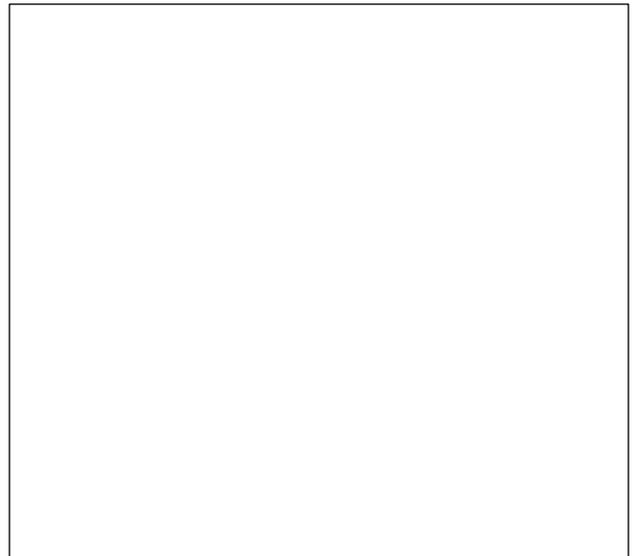
combinations = _____

READ pp. 142-3 Homologous Chromosomes and Crossing-Over

Here is an example of crossing over of homologous chromosomes. You draw your own example.



What are "recombinant genes?"



Draw in the **chiasma** in your diagram above: