AP Biology
Chapter 12 Guided Reading Assignment

Name Answer Key

1. Compare and contrast the role of cell division in unicellular and multicellular organisms. Unicellular organisms → replicates the whole organism.
   Multicellular organism → allows for repair + growth, ~~+ rep~~ of organism.

2. Define the following terms:
   a. Genome – all the DNA in a cell
   b. Chromosomes – DNA molecules are "packaged" into chromosomes
   c. Somatic cells – non-reproductive cell, body cells, 2-sets of chromosomes
   d. Gametes – reproductive cells (sperm + egg), haploid
   e. Chromatin – a complex of DNA + protein that condenses during cell division
   f. Sister chromatids – joined copies of the original chromosome
   g. Centromere – narrow "waist" of the replicated chromosome.
   h. Mitosis – division of the genetic material in the nucleus.
   i. Cytokinesis – the division of the cytoplasm
   j. Meiosis – formation of gametes → yields haploid cells.

3. List the activities of the cell cycle:
   a. Mitotic phase – cell is replicating (mitosis + cytokinesis)
   b. Interphase – cell growth + copying of chromosomes.
   c. G1 phase – cell growth → continues all the way to G2 + metabolism.
   d. G2 phase – cell organelles replicate
   e. S phase – chromosomes duplicate

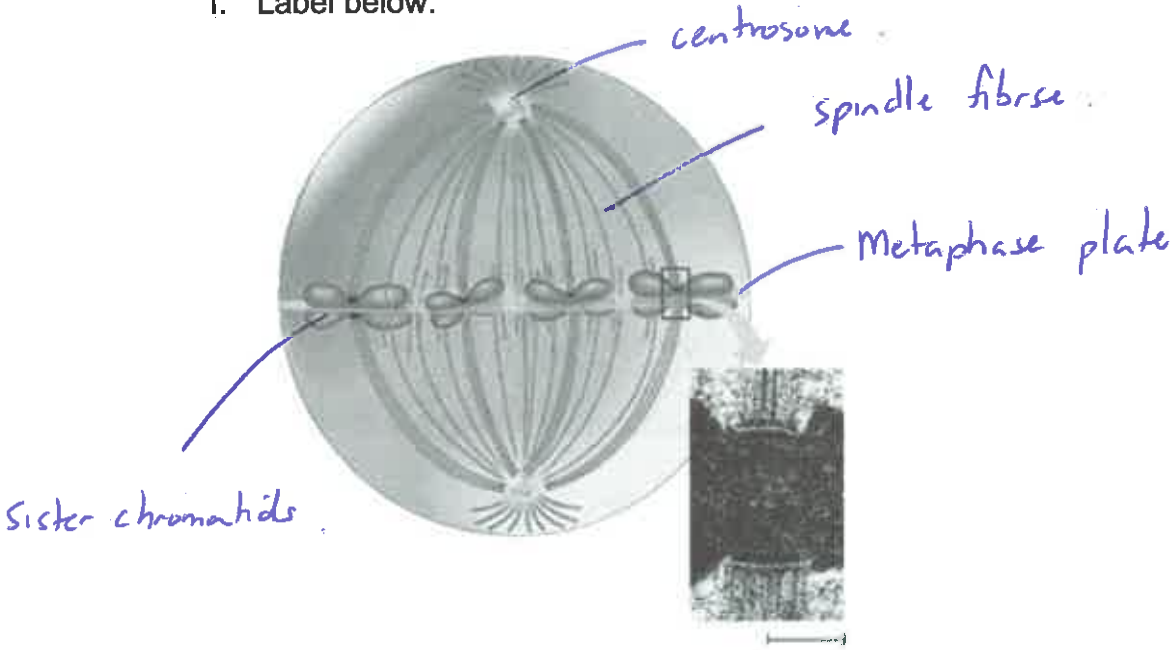
4. Define the following terms:
   a. Mitotic spindle – structure made of microtubles that controls chromosome movement during mitosis
   b. Centrosome – the microtubule organizing centre

c. Microtubule organizing center - MTOC - aka - centrosome → assembles micro tubules

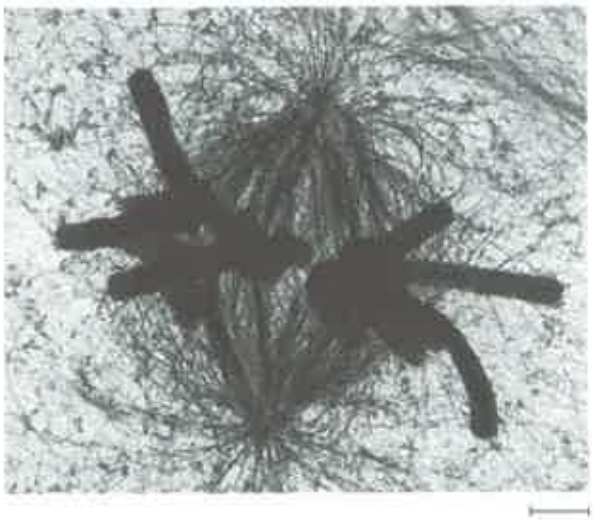
d. Aster - radial array of microtubules that extend from each centrosome.

e. Kinetochore - protein complexes associated w/ centromere, attachment point for microtubules.

f. Label below:



Metaphase.



5. Label the diagram below:

Interphase

Prophase

Pro-metaphase.

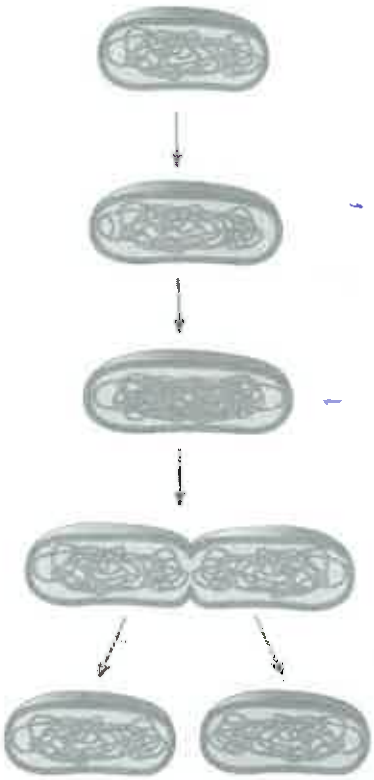
Metaphase

Anaphase

Telophase + Cytokinesis

6. Contrast cytokinesis in plant and animal cells.
In animal cells, cytoplasm divides by cytokinesis. In plants, cell is divided by cell plate formation.

7. Define binary fission and label the diagram below: - binary fission is the process bacteria use to divide



- Chromosome replication begins
- replication continues
- replication finishes
- two identical daughter cells.

8. What is the cell cycle control system and how do checkpoints play into this?
Cell Cycle control is regulated by internal + external signals. Checkpoints are points where the cell cycle stops until a go-ahead signal is recieved.

9. What does MPF stand for and what does it promote?

maturation-promoting factor → triggers a cells' passage past the G_2 checkpoint into M-phase.

10. What is a growth factor? - proteins released by certain cells that stimulate other cells to divide.

11. What is density-dependent inhibition?

- when cells become crowded they stop dividing.

12. What is anchorage dependence?

- when cells must be attached to a substratum in order to divide.

13. Define the following terms:
    a. Transformation
        - when a normal cell is converted to a cancerous cell.
    b. Benign tumor
        - when abnormal cells remain at the original site.
    c. Malignant tumor
        - abnormal cells invade surrounding tissue.
    d. metastasis
        - exporting cancer cells to other parts of the body.