1. What is the **KEY CONCEPT** for section 5-2? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Main Idea: Chromosomes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (shorten) at the start of mitosis.

 2. A chromosome is one long, continuous thread of \_\_\_\_\_\_\_\_\_\_\_\_ that has many genes and regulatory information.

 3. Chromosomes condense at the start of mitosis so that they can be more easily \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between the two nuclei.

 4. Chromosomes are not condensed during all stages of the cell cycle, because proteins need to be able to access \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ during other stages of the cell cycle.

 5. Using Figure 2-2, draw the final stage of how DNA goes from a long stringy form to a tightly condensed form. On the final stage (the condensed, duplicated chromosome), label the chromatid, telomere, and centromere. Be sure to show the supercoiled DNA in your drawing.

Circle the word that best completes the statement.

 6. DNA wraps around organizing proteins called chromosomes / histones.

7. The suffix -tin indicates that something is stretched and thin. Keratin / Chromatin is the loose combination of DNA and proteins that looks sort of like spaghetti.

8. Sister chromatids meet at the centromere / telomere, which looks pinched.

9. The ends of DNA molecules form structures called centromeres / telomeres that help prevent the loss of genes.

Main Idea: Mitosis and cytokinesis produce two genetically \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ daughter cells.

10. Interphase prepares a cell to divide by duplicating / removing its DNA and organelles.

*Write* true *or* false*. If it is false, correct the stage of mitosis (italicized word).*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_11. The nuclear membrane disintegrates (dissolves) during *prophase.*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_12. Microtubules move chromatids to the poles of the cell during *anaphase.*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_13. Chromosomes reach the poles of the cell during *metaphase.*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_14. The cell’s chromatin condenses into chromosome during *prophase*.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_15. The nuclear envelope re-forms during *anaphase*.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_16. Chromosomes attach to spindle fibers and line up along the equator of the cell during *interphase.*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_17. The nucleus reappears during *prophase*.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_18. Centrioles migrate to the poles of the cell during *telophase*.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_19. Chromatids are pulled apart during *anaphase*.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_20. The chromosomes de-condense or unwind during *telophase*.

21. Sketch the four phases of mitosis and one phase of cytokinesis. Add the labels anap*hase, metaphase, prophase, and telophase. Then label*: *centrioles, centromere, sister chromatids, and spindle fibers.*

**Cytokinesis**

**Prophase**

22. Cytokinesis differs between animal and plant cells. In animal cells, the membrane pinches together to form a cleavage furrow. In plant cells, the membrane cannot pinch together because of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Instead, a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is laid down between the two nuclei. This structure develops into the new cell walls and cell membranes.

23. Label/draw on the pictures below: animal cell, plant cell, cleavage furrow (protein belt), cell plate, identical daughter cells, new cell wall.



24. Read STEM Interactions: *Exploring Elephants’ Low Cancer Rates*. Explain the relationship between elephants, TP53, and cancer.

25. Go to your online student edition of the text and go to “interactive review” and then on “self-checks”. Take the 5-2 Self-Check Quiz and record your score below. Write out the most difficult question and answer next to your score.