

TEKS

- 5A** Describe the stages of the cell cycle, including deoxyribonucleic acid (DNA) replication and mitosis, and the importance of the cell cycle to the growth of organisms
- 5B** Examine specialized cells, including roots, stems, and leaves of plants; and animal cells such as blood, muscle, and epithelium
- 5C** Describe the roles of DNA, ribonucleic acid (RNA), and environmental factors in cell differentiation
- 5D** Recognize that disruption of the cell cycle leads to diseases such as cancer
- 6A** Identify components of DNA and describe how information for specifying the traits of an organism is carried in the DNA
- 10C** Analyze levels of organization in biological systems and relate the levels to each other and to the whole system

instructional content:

- ✦ Chromosome structure
- ✦ Limits to cell growth
 - DNA overload and exchange of materials
 - Surface area to volume ratio
- ✦ Cell cycle
- ✦ Mitosis and cytokinesis
- ✦ Regulation of the cell cycle
 - Cell cycle regulators
 - Uncontrolled cell growth
- ✦ Cell differentiation
 - Levels of organization (cell, tissue, organ, system)
 - Stem cells

learning outcomes students will:

- Use all content and scientific process skills learned earlier in the course
- Describe the function of nucleosomes
- Explain the importance of histone proteins in packaging DNA in the nucleus
- Provide several reasons why cells divide
- Calculate surface area to volume ratio of a cell model
- Describe the main events of the cell cycle
- Describe the events in the four phases of mitosis
- Identify stages of mitosis in dividing plant and animal cells
- Draw how a chromosome appears during metaphase and label chromatids and centromere
- Explain how cytokinesis differs between plant and animal cells
- Differentiate between internal and external regulators of the cell cycle
- Explain why cancer is a disease of the cell cycle
- Explain why cell differentiation is an important part of the development of multicellular organisms
- Explain the defining characteristics of a stem cell
- Differentiate between totipotent, pluripotent, and multipotent stem cells



Incorporate scientific process skills during the instruction of all Biology concepts.
Look for this icon at wardsci.com/TEKS for more information on scientific process skills.

Recommended Ward's Science products with item numbers for easy online searching:

science tools:

Onion, Mitosis (ls) ih **917041**
Onion Mitosis (ls) ih & og **932145**
Fish Mitosis (sect) ih **932242**
Fish, Blastodisc (sect) ih **932240**
Fish and Onion Mitosis (sect) ih **932243**
Animal Cell Mitosis and Meiosis Models **821230**
3B® Magnetic Animal Mitosis Model **813051**

instructional resources:

Ward's Diffusion and Cell Size Lab Activity **361241**
Mitosis Manipulatives **148350**
Ward's Plant and Animal Mitosis Flashcards **323375**
Cell Division Posters **332225**
Boreal Plant and Animal Mitosis Study Kit **861212**
Ward's Mitotic Stage Counts Flashcards **323378**
Interactive Whiteboard Science Lesson CD: Mitosis **745162**