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## Cell growth and division answer key

Unit overview As cells grow they reach two limits: DNA and exchange limits. As a cell grows, DNA cannot produce enough to maintain the cell. In addition, as a cell grows, its volume increases faster than its surface, meaning it cannot maintain material exchange at cell size. Therefore, to solve these growth problems, the cell is divided. Proliferating cells undergo a cell cycle that consists of phases G1, S, G2 and M. The resting cells are in G0. The cell cycle is controlled by cyclins and CDKs, when the circumstances are not correct, cell cycle checkpoints can be activated to restrict the cell cycle. Mitosis is cell division, with accurate replication of cell DNA into a new clone cell. Mitosis has four stages: prophase, metaphase, anaphase and telophase. All these steps lead to the separation of duplicate DNA to give them to the new cell. After mitosis, cytokinesis divides cell membranes and cytoplasm into two new identical cells. There are 4 main control points of the cell cycle: G1 control point, intra-S phase control points, G2 control points and spindle control points. These are regulated by cyclins and kinases. When cell cycle checkpoints break down or the cell cycle goes wrong, cells can undergo apoptosis or become cancerous. Great ideas and lasting understandings Cells in multicellular organisms are repeatedly divided to make more cells for growth and repair. During embryonic development, a single cell results in a complex, multicellular organism through the processes of cell division and differentiation. Essential Questions Why do most cells spend most of their shelf life on G0? Why do somatic cells suffer mitosis from other cell types? If the cell cycle is not controlled, why do tumors develop? Why are stem cells able to differentiate into specialized tissues? Standard and H.B.2D.1 Build models to explain how cell division and cell differentiation processes produce and maintain complex multicellular organisms. H.B.2D.2 Develop and use models to exemplify changes that occur in a cell during the cell cycle (including changes in cell size, chromosomes, cell membrane/cell wall, and the number of cells produced) and predict, depending on models, what could happen to a cell that does not progress through the cycle correctly. H.B.2D.3 Build explanations about how checkpoint systems monitor the cell cycle communicate the possible consequences of the continuous cycle of abnormal cells. H.B.2D.4 Build scientific arguments to support the pros and cons of biotech applications of stem cells using examples of plants and animals. Page 2 THE ROUTE: We are proud to have a lot of recognition in the district's latest newsletter, The Path. Click here to see the latest edition. GRADUATION 2021: Please check your calendar. Graduation 2021 will be held on Friday, June 11 at 8:00pm here at Aiken Aiken School. HOLIDAY CARE PACKAGE UNIT: Ms. Ghrist's 5th period class is having a Christmas care package for the holiday season. Please bring clothing, non-perishable food, face mask, water and/or toiletries. Place the items in a trash can labeled throughout the school. The last day to donate is December 18. HYBRID LEARNING CONTINUES: Hybrid hours with blue and red cohorts continue until January 15. FCCLA FOOD AND CLOTHING DRIVE: FCCLA sponsors a non-perishable food and clothing unit. Clothes and food can be left to Mrs. Gorthy in room D101 from 11:30am - 1:00pm: Monday to Friday. PET FOOD AND TOY UNIT: Ms. Ghrist's 4th period health science class sponsors a pet meal and toy trip. If you are interested in donating items to give to animal shelters around Aiken County visit the posters around the school or the AHS INSTAGRAM page. SPACE MEETING: There will be a Spanish Meeting on Monday, December 14th at 3:45 p.m. to make Chopped Paper. Please meet in the Foreign Language Room. TRACK AND FIELD INTEREST MEETING: Want to be better, faster and stronger? Join the athletics team at Aiken High School. Interest meetings will be held on Monday, December 14 and Wednesday, December 16 at 3:45pm - 4:15pm at the cafeteria. If you have any questions, please contact Mr. Hostetler. VISUAL ARTISTS AND PERFORMING: Applications for the ACGATEWAY summer arts program are now available through the district's website under talent and talent. Macgregor on E110 if you have any questions. Page 3 2020-21 School Year Calendar: Aiken County Public School District Calendar 2020-21 (PDF) PLEASE NOTE THAT THIS IS AN UPDATED CALENDAR. During a special meeting called the Aiken County Board of Education virtual meeting held wednesday, July 29, 2020, our board members approved a new start date of Monday, August 31, 2020, for the 2020-21 school year. During the meeting meeting meeting, members also approved revisions to the 2020-21 school calendar. In order to accommodate the new start date and not affect the school district's traditional two-week Christmas vacation and pre-scheduled dates for high school graduations, these reviews included the following changes: - Convert Labor Day holidays (September 7) and Monday, January 4, 2021, to regular school days. - Convert a scheduled fall break (9-13 November) coinciding with the Golf Masters Tournament to regular school days. Previously a regularly scheduled meeting on Tuesday, May 12, 2020, the Aiken County Board of Education approved a review of the 2020-21 academic calendar. The district administration recommended a calendar review in an effort to be as accommodating as possible to our staff members, students and families who are financially affected by the Master's Golf Tournament, which moved from April to November 2020, due to public health recommendations related to coronavirus. Please note that the School Year Calendar is subject to change. The Aiken County Board of Education will finalize any decisions for necessary updates throughout the school year, and any changes made will be shared in acpsd.net. THANK YOU for your patience, understanding and continued support as we continue to browse these unprecedented times in public education. If you're seeing this message, it means we're having trouble uploading external resources to our website. If you're behind a web filter, make sure that the \*.kastatic.org and \*.kasandbox.org domains are unlocked. Unlocked.

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