

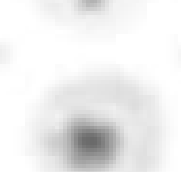
Continue

Homologous chromosomes exist in pairs. Sister Chromatids are identical condensed cells and non-sister chromosomes are not attached sister chromosomes.

1. How does the genetic material of sister chromatids compare to each other?
Sister Chromatids are identical condensed cells, the chromosomes are attached at the centromere.
2. If a cell has 22 sister chromatids, how many highlighted chromosomes does it have?
How many sets of homologous does this represent?

46. Mitosis and Cytokinesis

1. During which stage of mitosis do the sister chromatids separate?
Anaphase
2. Division of the cytoplasm is called _____.
Cytokinesis
3. Label the stage of mitosis pictured and indicate the proper order to which it occurs in the cell cycle by numbering the stages 1-5.

	Stage of Mitosis	Order
	Prophase and Condensed	1
	Metaphase	2
	Anaphase	3
	Telophase	4
	Cytokinesis	5

4. Refer to Question 1 in the lab. With the "Stages of Mitosis and Condensed" diagram from the end of the document found on an earlier slide, as you go through the demonstration, drag each the labels into the at the end of each stage. Top and side view. Then prepare an image of your diagram and include it with the lab report.

NAME: _____ Living Environment Date _____

Virtual Lab: The Cell Cycle and Cancer Worksheet

Go to the following website and complete the Virtual Lab:

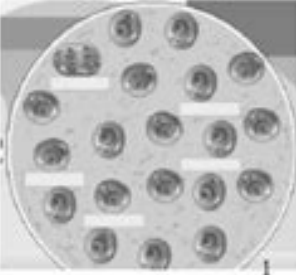
http://www.glencoe.com/sites/common_assets/advanced_placement/moder10e/virtual_lab_s_2CR/labz/BL_03/

Purpose: In this investigation you will explore the similarities and differences between the cell cycles of normal cells and cancer cells.

- Objectives:**
- Identify the various phases of the cell cycle.
 - Compare and contrast the cell cycles of normal and cancer cells.

- Procedure:**
- Click the monitor to watch the video about the cell cycle.
 - Now click the information button to learn about cancer and answer the following questions:
 - What is the factor which encourages cells to divide?
 - Name one type of mutation which could result in cancer.
 - Give two unique characteristics of cancerous cells.

- Click on the microscope to begin learning about the phases of mitosis.
- Click and drag the label at the top of the screen to match the corresponding cell under the microscope. Once you have labeled the cells, click "check" to see if you are right.



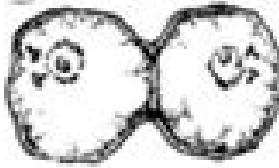
Lab # ? Mitosis: Cell Division

Purpose: Observing the stages of cell division in both plants and animals allows us to recognize those stages and to distinguish between cell division in plant and animal cells.

Method: You will be observing onion root tip tissue and white fish blastulas under the microscope. Your aim is to find and draw the stages in consecutive order. Labeling and explaining each picture will allow you to experience cell division, mitosis, first hand. Your textbook will serve as a resource to help you find and label the stages and relevant cell parts well.

Vocabulary:

mitosis	centriole	cytokinesis
meiosis	chromosome	cell plate
chromatin	chromatid	cell cycle



Materials: onion root tip slides microscope
whitefish blastula slides colored pencils

Hypothesis: What phase (prophase, metaphase, anaphase, telophase, interphase) do you expect cells to spend the greatest % of time performing?

- Procedure:**
- Obtain one of the two types of slides and focus on low and then medium power.
 - Locate the first stage of mitosis and center it in your field. Switch to high power and focus. Draw the cell. Get a signature from the teacher of your drawing.
 - Repeat until you have all 4 stages of mitosis (prophase, metaphase, anaphase, and telophase) drawn. Also find and draw interphase.
 - Once you have completed your first set of drawings, you will need to calculate the approximate amount of time the cells spend in each phase.
 - Find a good representative section of your sample under low power. Then focus under high power. Make sure that the entire field contains cells.
 - Count the total number of cells in the field. **Record this number in a table.**
 - Without changing the field, count the total number of cells in each of the 5 phases as well. **Record those numbers.**
 - To determine the approximate proportion of time an average cell spends in each of the phases, divide the number of cells in each phase by the total number of cells in the field of view. Show your calculations in the table. Convert the decimal to a percent and record.
 - Switch to the other type of slide. Make all 5 of your drawings for that slide type and be sure to obtain a signature on each.
 - Find the % of time spent in each phase for that slide type by sharing information with your lab partner.
 - Be sure that you and your lab partner have entered your team's data into the lap tops at the front of the room. This is where we will be compiling class data for both types of cells.

Analysis: Graph the class data. Your graph(s) should show the average % of time a cell spends in each of the 5 phases. Make sure your graph(s) is/are complete with all the info needed to accurately display data.

Name _____

OBSERVING MITOSIS LAB

Background:

In a growing plant root, the cells at the tip of the root are constantly dividing to allow the root to grow. Because each cell divides independently of the others, a root tip contains cells at different stages of the cell cycle. This makes a root tip an excellent tissue to study the stages of cell division.

Materials:

microscope prepared slides of onion (allium) root tips

Procedure:

1. Get one microscope for your lab group and carry it to your lab desk with two hands. Make sure that the low power objective is in position and that the diaphragm is open to the widest setting.

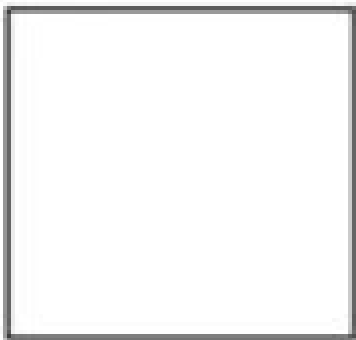
2. Obtain a prepared slide of an onion root tip (there will be three root tips on a slide). Hold the slide up to the light to see the pointed ends of the root sections. This is the root tip where the cells were actively dividing. (The root tips were freshly sliced into thin sections, then preserved when the slide was prepared.)

3. Place the slide on the microscope stage with the root tips pointing away from you. Using the low-power objective to find a root tip, and focus it with the coarse adjust until it is clearly visible. Just above the root "cap" is a region that contains many new small cells. The larger cells of this region were in the process of dividing when the slide was made. These are the cells that you will be observing. Center the image, then switch to high power.

4. Observe the box-like cells that are arranged in rows. The chromosomes of the cells have been stained to make them easily visible. Select one cell whose chromosomes are clearly visible. (If you need to change the focus when using high power, remember to only use the fine adjust!)

5. Sketch the cell that you selected in the box on the right.

6. Look around at the cells again. Select four other cells whose internal appearances are **different** from each other and the first one that you sketched. Sketch them in the boxes below.



2. Record each image of a cell in a table. Be sure to include the stage of the cell cycle. Label each image with the name of the cell and the stage of the cell cycle.

4b. Mitosis and Cytokinesis

3. During which stage of mitosis do the chromosomes line up in the center? Metaphase

4. What happens during cytokinesis? The cell membrane and cell wall pinch inward to form two daughter cells.

5. Label the image of a cell in the table and indicate the stage of the cell cycle in which it is in. Be sure to include the name of the cell and the stage of the cell cycle.

	Stage of Mitosis	Order
	Prophase	1
	Metaphase	2
	Anaphase	3
	Telophase	4
	Cytokinesis	5

6. Label the image of a cell in the table and indicate the stage of the cell cycle in which it is in. Be sure to include the name of the cell and the stage of the cell cycle.

7. Label the image of a cell in the table and indicate the stage of the cell cycle in which it is in. Be sure to include the name of the cell and the stage of the cell cycle.

8. Label the image of a cell in the table and indicate the stage of the cell cycle in which it is in. Be sure to include the name of the cell and the stage of the cell cycle.

Food as Batteries - Anytime food is involved in an experiment, students pay attention. In this lesson students will use various fruits to try to create enough energy to light a light bulb. Growing Bacteria - Bacteria grow all around us. Learning about it can be fun and fascinating. In this lesson students will observe the growth of bacteria over a week's period. How Full Can You Go? - The student will be able to fill a graduated cylinder to the top without it overflowing using three different measuring cups and/or spoons. Making Crystals - Making crystals is fun and easy. Students will enjoy watching their crystals form as they note the changes they see in a daily journal. Moon Craters - Most craters on the moon are made when a meteorite hits the surface. In this lesson students will make craters using small round objects dropped into powder. They will be able to study the way the craters look and how big they are in relation to the size of the object. A Trip Through the Colonies - Students will gain an understanding of life in colonial America through summarizing information, choosing a theme, selecting evidence supporting the theme, finally creating a news story on the theme. Air Movements - Explain why different latitudes on Earth receive different amounts of solar energy. Alternative Energy Sources - The learner will be able to discuss advantages and disadvantages of using alternative energy resources. The learner will be able to describe how important water is to living things. Atomic Structures - Explaining the makeup of an atom and being able to describe in paragraph form what makes up an atom, how and why it can change. Atoms - Summarize how models of the atom have changed over time. Bad Neighbors - Students will identify how one organism can affect an entire ecosystem. Biomes of the United States - We look at all the differences in the entire USA. Bottle Rocket Experiment - Use Newton's Laws during building and launching of bottle rockets. Careers Inside the Cell - Students will illustrate a typical cell and its parts. Cell Analogies - Students will be able to effectively engage in the lab by using their scientific reasoning skills to create different analogies about different cell parts. Chicken or the Egg? - Cells perform specific functions are group together to make tissues. Condensation - The Water Cycle - Be able to name and condensation explain the stages of the water cycle. Earth's Mantle Convection - The student will make predictions based on prior knowledge. Evolution! - For students to be able to recognize how DNA can be used to support evolution. Earth Day - To incorporate community/family involvement as interaction that will help children learn. Earth's and Its Many Layers - To understand that the Earth has different layers that are made of gases, water, soils and minerals. Electricity - Introduction - Students understand that moving charges transfer electricity. Electricity and Magnetism - The goal is for students to learn how magnetic poles interact. Evidence and Investigation - To learn about the process of investigating a criminal case involving human activity. First Face Transplant - The overall goal of this lesson is to have students understand the procedure of a 'face transplant,' the emotional difficulty and struggle the patient went through. Force and Motion - Describe or compare motions of common objects in terms of speed and direction. Forensic Science and S. M. - To introduce the concept that the Scientific Method is used on a day to day basis by some who we may not perceive as scientists, such as forensic investigators. Garbology: Whose Trash Is It? - Students will apply their understanding of the scientific method to a study of garbology by developing a hypothesis about what information they should gain from sorting through a garbage bag, making and recording observations of garbage contents. Genetics and Heredity - Determine the genotypes and phenotypes of offspring that could result from a given pair of parental genotypes. Geological Cycles - The learner will build an understanding of geological cycles, forces, processes and agents which shape the lithosphere. GT Lesson Plan - The students will learn about Earth's interior and the consistency of each layer. Students will learn about the movement of Earth's plates. Gravity and Forces - Those students who do not meet 80% mastery will correct their tests over the weekend and retest on Monday. Homeostasis - Students will explain how organisms maintain stable internal conditions and adapt to the environment. How Are Cells Setup? - Students should be able to differentiate between plant and animal cells. Human Organ Systems - Students should understand the interrelationship between the eleven human organ systems. Human Organ Systems PowerPoint - Every student will create a PowerPoint presentation and poster on a specific human system. Infectious Disease - To analyze the dangers of infectious disease and how quickly they can spread from one person to another. Introduction to the Environment - Students will have a better understanding and appreciation of the environment through various lessons focusing on factors that affect the environment. Introduction to Meiosis - Students will recall the phases of mitosis in order to figure out the phase of meiosis. Introduction to Volcanoes - The goal of this lesson is to get to know the students and to understand their prior knowledge about volcanoes. Investigating Chemical Changes - Students will be able to take what they have learned about Chemical Changes and be able to predict what will happen, observe what does happen and infer what would happen if they were to change the procedure. Lab Station Week - My goal is for them to understand properties of matter, and what they are. I would like for them to understand what is matter and what is not matter and how to tell the difference. Levels of Organization - Compare and Contrast Levels of Organization including cells, tissues, organs, organ systems, and organisms. Machines that turn - We will be looking at ways of calculating the mechanical advantage of these and the velocity ratio of gears in particular. Magnetism - Recognizes the magnetic and non-magnetic materials Identifies the laws of magnets. Newton's Law of Motion - Identify situations that illustrate each Law of motion. Nonrenewable energy sources - They should also be able to explain what a fossil fuel is made of and what three types of fossil fuel is present. Owl Pellets - Students will be able to examine owl pellets and what their diet consisted of, specifically rodents. Parts of the Cell - Explain the function of each part of a eukaryotic cell, through drawings on the board. Phases of Matter - To understand the three states of matter and the properties associated with each state. Planet Brochures - Looking at the solar system with the help of an Internet connection. Producing Sound - First the information is imparted and then an experiment is performed to reinforce the concept. Reproduction and Heredity - Students will compare and classify the reproduction and heredity of organisms. Rock Cycle - For the students to be able to label the parts of the rock cycle in good detail. Rocks and Minerals - Minerals have specific physical properties that allow us to identify them. Steps in the Scientific Method - The student will be able to apply all the steps in the scientific method to an experiment given to them by their teacher. Structure and Function of Body - Students will be able to understand the relationship that the sun and earth have as well as the moon and earth and be able to apply that knowledge into making predictions about the day and the seasons. Sun Supplies Atmosphere's Energy - Students will be able to identify the percentage of energy that is reflected and absorbed by the earth, clouds, and atmosphere and way this absorption and reflection is important to us. Temperatures Around the World - Students see how those temperatures changed throughout the seasons, and how the patterns of change differ depending on where in the world you are. The Greenhouse Effect - These gases form a layer which lets sunlight through, but traps the heat in. The Life Cycle of Plants - Students will be able to identify different stages of plant life cycles. The Plant Kingdom - To learn what a plant is, the origin of plants, how plants live on land, and the plants life cycles. The Structure of an Atom - To investigate and understand the modern and historical models of atomic structure. The Thinking Cap - The brain processes information from the senses in different areas of the brain. Transfer of Heat - Students will be able to define conduction, insulators, convection and radiation. Types of Volcanic Landforms - Student groups become experts on one type of volcano and teach the class about their volcano. Using the Microscope - The students will do a series of measurements and manipulation to become more familiar with the microscope. Vascular System of Plants Lab - The goal is to observe how a vascular system distributes water and nutrients throughout a plant. Vertebrates I - The student will identify the organs of a frog. Wave Introduce/Review - Students will begin to understand (be introduced to) key concepts and vocabulary associated with electromagnetic waves. Weather Forecasting - To gain an understanding of how to forecast weather, the students will be able to use weather reports for their personal benefit. What Happens When You Eat? - To help students understand how food is digested in the human body. What's In a Cell - Students will gain an understanding that all animals have something in common-cells. What is Energy? - The student should gain a better understanding of the flow of energy in a food chain and be able to represent the natural world using a model. What is Inside a Cell? - In this lesson, students will gain an understanding of the components of a cell. They will match definitions of organelles with the organelle name, research the organelle's form and function, and contribute to a class drawing of a cell by depicting a specific organelle within the composite cell. What is Life Science? - Living things are described as being made of cells, having organization, and having the ability to grow, reproduce, and respond to stimuli. Next 50 Grade 6 - Grade 8 Science Lesson Plans

Careers Inside the Cell - Students will illustrate a typical cell and its parts. ... Condensation - The Water Cycle - Be able to name and condensation explain the stages of the water cycle. Earth's Mantle Convection - The student will make predictions based on prior knowledge. Evolution! - For students to be able to recognize how DNA can be used to support evolution. Earth Day - To ... Here, we report the isolation of a self-renewing and multipotent human skeletal stem cell (hSSC) that generates progenitors of bone, cartilage, and stroma, but not fat. Self-renewing and multipotent hSSCs are present in fetal and adult bones and can also be derived from BMP2-treated human adipose stroma (B-HAS) and induced pluripotent stem cells (iPSCs). Gene ... 14/04/2022 - The mechanisms by which alterations in FH lead to hereditary leiomyomatosis and renal cell cancer (HLRCC) are currently under investigation.Biallelic inactivation of FH has been shown to result in loss of oxidative phosphorylation and reliance on aerobic glycolysis to meet cellular energy requirements. Interruption of the Krebs cycle because of reduced or absent ... Cell culture is the process by which cells are grown under controlled conditions, generally outside their natural environment. After the cells of interest have been isolated from living tissue, they can subsequently be maintained under carefully controlled conditions. These conditions vary for each cell type, but generally consist of a suitable vessel with a substrate or medium that supplies ... Secretory Vesicle: Cell secretions - e.g. hormones, neurotransmitters - are packaged in secretory vesicles at the Golgi apparatus. The secretory vesicles are then transported to the cell surface for release. Cell Membrane: Every cell is enclosed in a membrane, a double layer of phospholipids (lipid bilayer). The exposed heads of the bilayer are "hydrophilic" (water loving), meaning that ... The Overview of the Cell Cycle is excellent. The information is told like a story; very effective." -Hao Nguyen "The cell cycle overview in the beginning sets up the rest of the Chapter quite well. The level of detail between molecular mechanism and cellular processes or behavior of macromolecules throughout the cell cycle is well balanced ... Finish your lab report with the information you have so far. Score your lab report. (source-cc by-nc) Record your score out of 20. Lesson 180. Take your final exam. If you skipped a question, go back and try it. You should always at least try. Score your exam. There should be 97 total points. Add 3 points to your total if you answered every ... Summer School. Mix and match HMH programs for a summer school curriculum that drives student growth. Easy-to-implement and effective. Section 1: Cell Structure. Living cell characteristics. A living cell, as opposed to a non-living cell, will demonstrate and perform certain characteristics which enable it to survive. It requires energy to allow it to carry out it's many functions, including cell division, adapting to surroundings and being self-sufficient.

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