

Science 9 Cell Theory and Mitosis

- Intro
 - Ask students, "Have you ever wondered how a cut heals? Or why hair and nails keep growing?"
 - What do you think happens?
 - Ask students, "Do you know/remember what a cell is?"
 - Explain that skin, hair and nails are all made up of cells.
 - Cells reproduce through cell division to grow and replace damaged cells
 - Introduce the day's topic, "today we will be learning..."
 - Development of cell theory and mitosis
- Developing theory
 - Bill nye intro <https://www.youtube.com/watch?v=Dlbh6024R1c> spontaneous generation
 - Up to 1:30
 - Spontaneous generation definition
 - **"living organisms appear from non-living material."**
 - Invention of microscope - (1595)
 - See new things
 - Robert Hooke (1665) and Antoni van Leeuwenhoek (1674) saw "tiny rooms" - cells
 - Microscope improvements ~160 years later
 - See cell structures
 - Modern theory (3 parts)
 - All living things are made up of cells
 - Cells are the basic unit in living things (building blocks)
 - All cells come from other cells
- Cell cycle (cell cycle diagram): the process where a cell grows, duplicates and divides to provide new cells
 - Interphase
 - Mitosis
 - Cytokinesis
- Interphase
 - Longest Phase
 - Cell performs normal functions and prepares for division
 - DNA is Duplicated & condenses
- Mitosis: nucleus divides, has 4 stages
 - (cells alive animation)https://www.cellsalive.com/mitosis_js.htm
 - Prophase

- Chromosomes condense, nuclear membrane dissolves, mitotic spindles form.
- Metaphase
 - Double Chromosomes line up in middle being pulled by the spindle, Nuclear Membrane completely gone,
- Anaphase
 - Chromosome pairs separate and are pulled to opposite sides, chromosomes have same genetic info
- Telophase
 - Chromosomes arrive, new nuclear membranes form, spindles dissipate
- Cytokinesis
 - Last phase. Separation, Cell membrane pinches or new wall forms to divide cells, cycle then begins again with new daughter cells.

DAY 2

- Discussion review
 - What did people use to think about how life was produced? (life appeared from non-living material)
 - What was this theory called? (spontaneous generation)
 - What event/technological advancement changed what people thought? (microscope)
 - What is the modern cell theory? 3 parts?
 - All living things are made up of cells
 - Cells are the basic unit of living things (building blocks)
 - **All cells come from other cells**
 - What is cell division and why is it important?
- Address mistake
 - Draw diagram of cell with relevant structures
 - Nuclear membrane/envelope, chromosomes, centrioles, spindle fibres (mitotic spindle, microtubules)

- Rap video (Mr w mitosis rap)
 - Song describes cell cycle and stages of mitosis
 - See if you can recognize any key terms or things that we went of yesterday
 - Were there any tools to help you remember/understand the stages of mitosis?
- Cell cycle review and drawing
 - Write the 6 parts of the cycle on the board and leave space to draw diagrams.
 - Use prefixes and word parts to remind students
 - Cyto(cell) -kinesis(movement)

- What are the 3 main phases of the cell cycle?
- What happens at each part?
- What are the stages of mitosis?
- Show cells alive animation
 - Did we miss anything in our drawings?
- What is DNA? What does it do?
 - Controls cell and makes sure that the cell only reproduces when needed
- What happens when a mistake is made and the cell keeps growing and reproducing?
- Sensitivity, who has been affected?
- <https://www.youtube.com/watch?v=BmFEoCFDi-w> “how do cancer cells ...”
 - Tumours form
 - Clump of cells
 - 2 types of tumour
 - Benign and malignant
 - Benign: grow quickly and physically crowd other cells or organs
 - Malignant: grow quickly and invade and damage other cells
 - Causes of cancer: mutation or carcinogen
 - Mutation: mistake in copying
 - Carcinogen: things in the environment that can damage cell DNA and cause cancer
 - DNA mistake demo 1 min?
 - 1AAATTTTCGTCTGTACTACGG2TACCTAGCGCATCAGTCAGT
- Check and reflect p 15 #1-10