

IS IT POSSIBLE FOR A CELL TO LIVE FOREVER?

- https://www.youtube.com/watch?v=22IGbAVWhro&ab_channel=TED-Ed

VIDEO

Starfish:

https://www.youtube.com/watch?v=AaN6uRvfPLY&ab_channel=NZMarineStudiesCentre



BIOLOGY III

1. TYPES OF ASEXUAL REPRODUCTION
 2. MITOSIS
- 

TYPES OF ASEYUAL REPRODUCTION

There are a variety of ways that organisms are able to reproduce through asexual reproduction.

Video:

https://www.youtube.com/watch?v=Mxmu3phxSHw&ab_channel=MooMooMathandScience

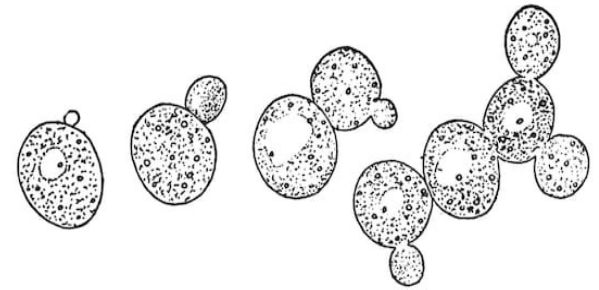
BUDDING

- Cells grow a bud that pinches off to become a separate cell
- The new cell is smaller than the original cell at first
 - Eventually grows into the same size as other cells

Example:

Yeasts are unicellular eukaryotic micro-organisms.

- Commonly used to make dough, bread, pretzels, soy sauce, cheese
- Yeast reproduce through a process called budding

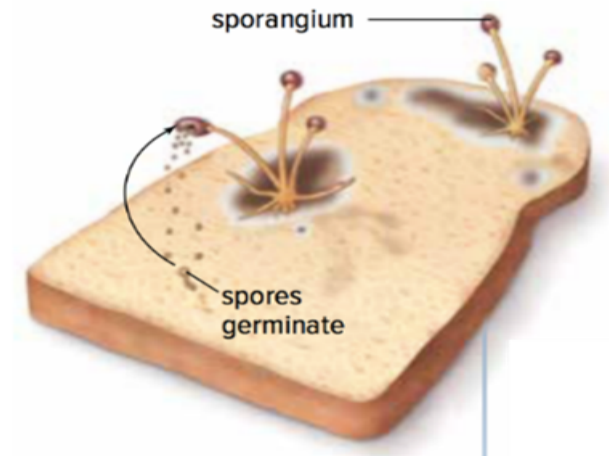


shutterstock.com • 1409644625

SPORES

Moulds are composed of many eukaryotic cells

- Reproduce by asexual reproduction using spores
 - Spores are a type of reproductive cell that is able to develop into a new individual
- Moulds form spores that are genetically identical to the mould cells they come from
 - Spores are released into the air from a structure called a sporangium
 - When a spore lands in a favourable environment (warm, moist), it grows and divides by mitosis and cytokinesis

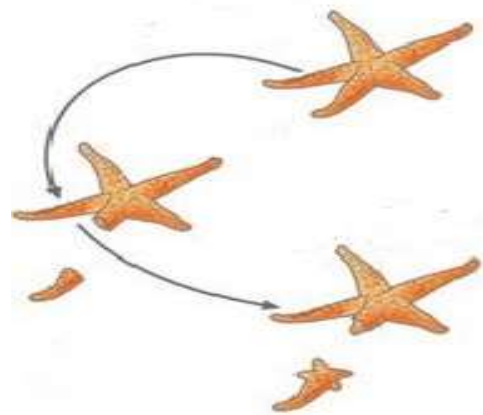


<https://www.youtube.com/watch?v=4ro8sPOgCBg>

FRAGMENTATION

Fragmentation occurs in many plants and animals (such as coral, sponges, and starfish)

- Organisms break into two or more fragments that develop into a brand new individual

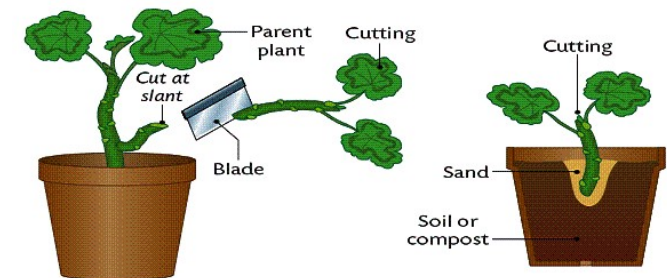


Video:

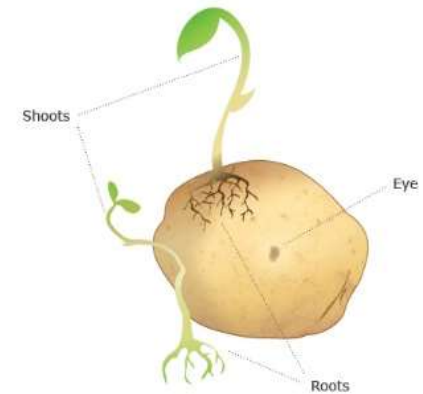
https://www.youtube.com/watch?v=mI2xsf5g3Bo&ab_channel=DeepLook

VEGETATIVE PROPAGATION

- Plants are able to reproduce both through asexual and sexual reproduction.
 - New plants grow from a portion of the roots, stems, or leaves from an existing plant
 - New plants are able to sprout from the stems, roots, or leaves of a parent plant
 - New plants are clones (copies) of the parent plant



EXAMPLE - POTATOES



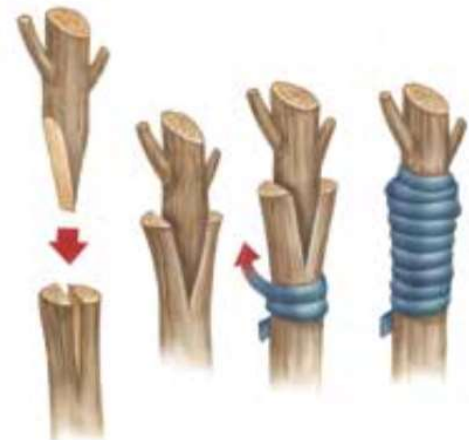
- New roots and shoots grow from the eyes of a potato
- If you plant a potato with this new growth, a potato plant will develop
- The new plant will be identical to the parent plant

VEGETATIVE PROPAGATION

Artificial vegetative propagation uses techniques to produce plants with specific characteristics

■ Example: Grafting

- A bud, stem, or root is cut from one plant and joined to another
- When this happens, the tissues of the cutting get integrated into the tissue systems of the base plant over time
- Used to produce trees with high-quality fruit or resistance to disease



BRAIN BREAK: ROCK PAPER SCISSORS CHALLENGE

- Stand up and face your partner
- On the count of 3, choose one of the following poses:
 - Rock: feet together
 - Paper: feet spread apart
 - Scissors: feet in a criss-cross pattern
- Paper beats rock; Rock beats scissors; Scissors beats paper
- First player to win 5 rounds wins

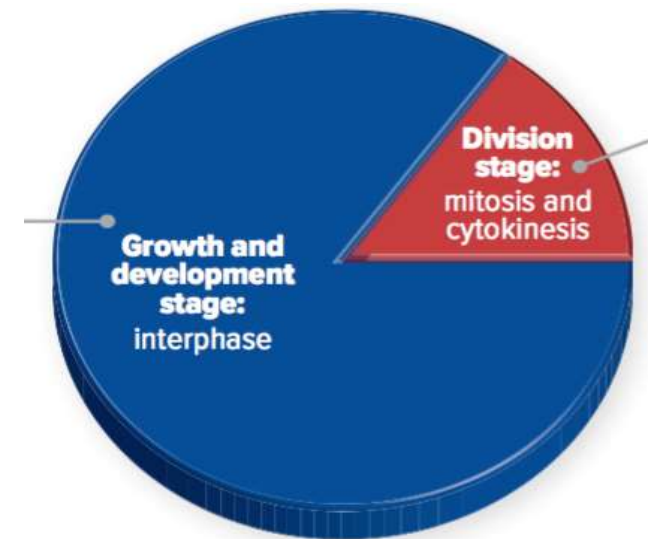
MITOSIS AND THE CELL CYCLE

Why do eukaryotic cells want to reproduce?

- Replace older cells
- Replace damaged cells
- Produce new offspring in single-celled organisms (amoebas)

REPRODUCTION AND THE CELL CYCLE

- Eukaryotic cells reproduce by a series of events called the cell cycle
- The cell cycle has two stages that has different events:
 - **Growth and development**
 - Interphase
 - **Cell division**
 - Mitosis (PMAT)
 - Cytokinesis



GROWTH AND DEVELOPMENT

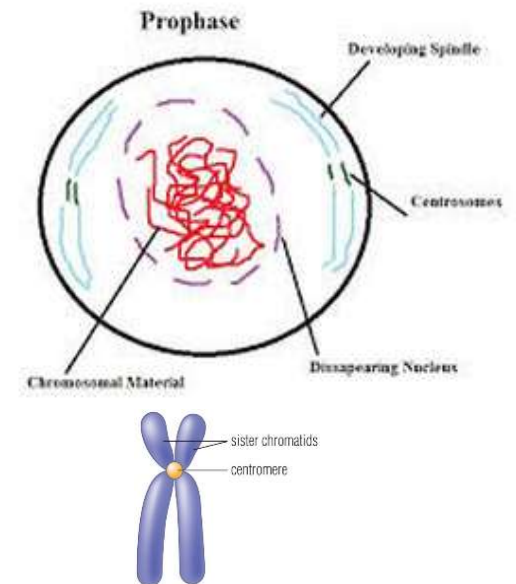
Interphase

- The cell grows larger and doubles the number of organelles it contains
- DNA in the nucleus is copied
- Creates a structure called the centrosome
 - The centrosome helps to provide structure to the cell and aids during cell division (it pulls the chromatids apart)

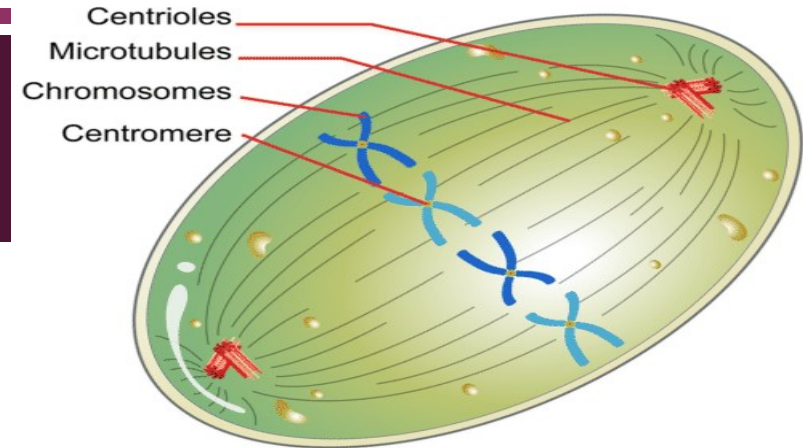
CELL DIVISION

Phase I: Prophase

- Nuclear membrane begins to disappear
- DNA condenses into duplicated chromosomes
 - Each chromosome contains two copies of the same DNA
 - As there are two copies of DNA, they are connected and create a structure called a sister chromatid
- Spindle fibres begin to form. They grow between the centrosomes as they move apart.



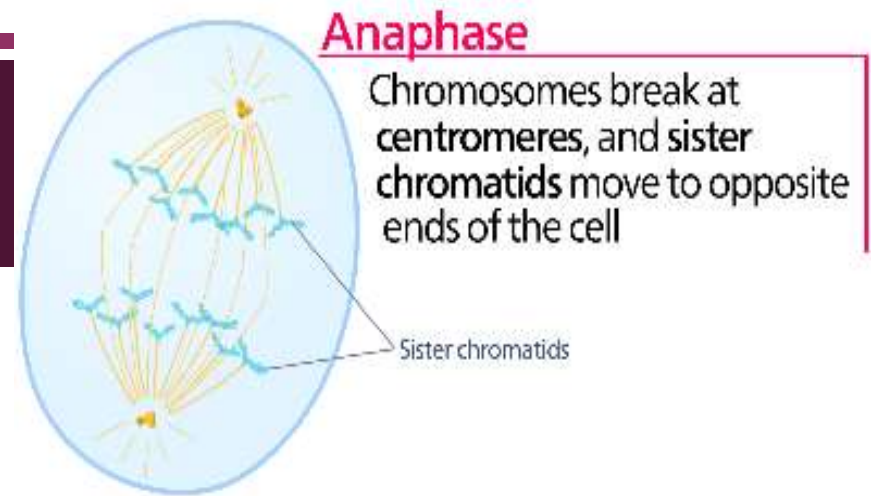
CELL DIVISION



Phase 2: Metaphase

- Structures called spindle fibres guide chromosome movement by attaching to the centromere
- Chromosomes line up along the middle of the cell

CELL DIVISION



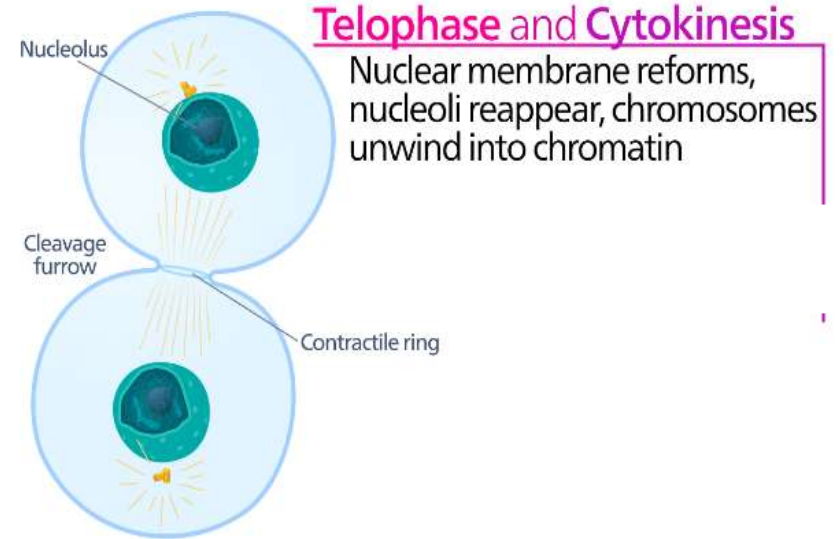
Phase 3: Anaphase

- Copies of DNA are separated and go to each end of the cell
 - The sister chromatids get pulled apart to each end of the cell

CELL DIVISION

Phase 4: Telophase

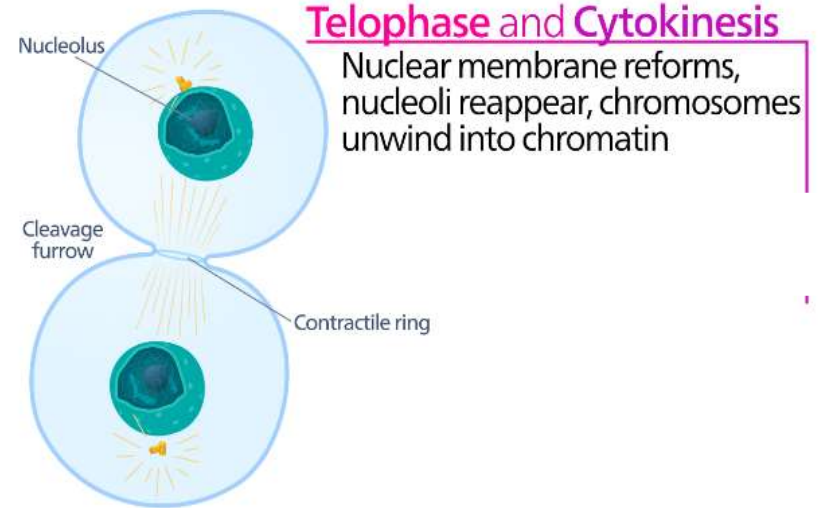
- Two nuclei form
- The spindle fibres disappear and the chromosomes start to decompress
 - Each nucleus contains a complete copy of the cell's DNA



CELL DIVISION

Cytokinesis

- Cytoplasm and organelles are divided
- The cell begins to pinch in the middle and pull apart in order to form two separate cells
- The cells then begin interphase once cytokinesis is complete



CELL DIVISION

1 Interphase

- The cell grows and the number of organelles increases.
- The DNA in the nucleus is copied.

2 Phase 1 of mitosis (prophase)

- The nuclear membrane begins to disappear.
- DNA condenses into duplicated chromosomes. Each contains two copies of the same DNA.

3 Phase 2 of mitosis (metaphase)

- Structures called spindle fibres guide chromosome movement.
- Chromosomes line up along the middle of the cell.

4 Phase 3 of mitosis (anaphase)

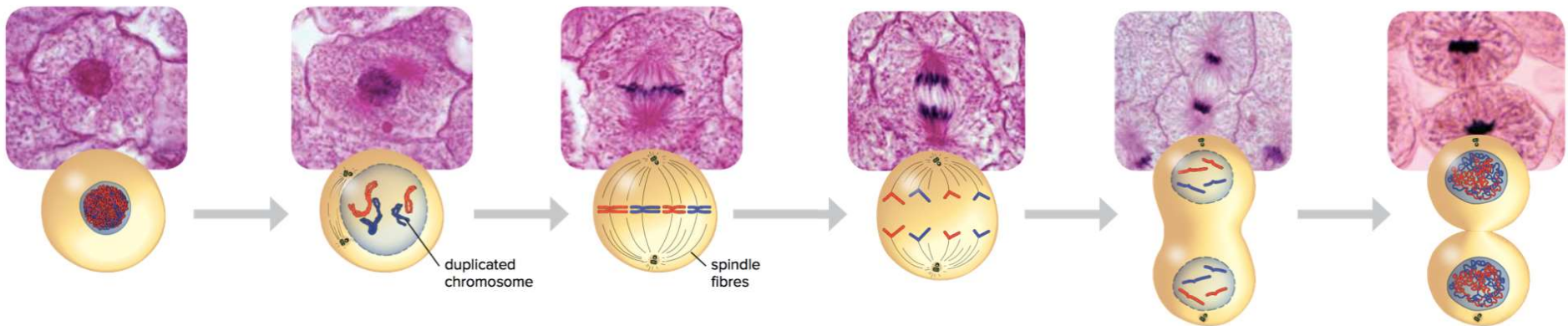
- The copies of DNA are separated and go to each end of the cell.

5 Phase 4 of mitosis (telophase)

- Two nuclei form and each nucleus contains a complete copy of the cell's DNA.

6 Cytokinesis

- The cytoplasm and organelles are divided, and two separate cells form.
- The cells then begin interphase.





VIDEO

https://www.youtube.com/watch?v=f-ldPgEfAHI&ab_channel=AmoebaSisters

BRAIN BREAK

With one hand, draw a large triangle shape while at the same time with the other hand, draw a large circle shape. Do both of these at the same time as fast as possible.

PRACTICE

Workbook:

- Pg 16, 17, 19-22 (#1-23)