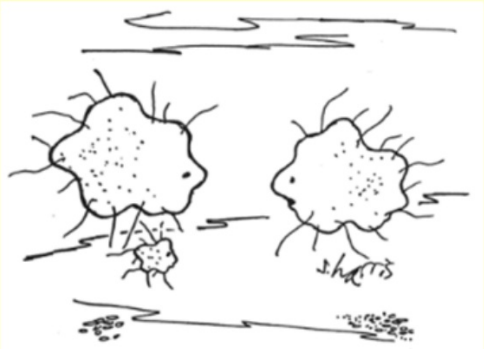
Cell Reproduction

- All cells come from preexisting cells
- Cell division results in 2 daughter cells that are identical to the original parent cell
- Chromosomes are the carriers of genetic information
- Chromatin long strands of DNA wrapped around proteins (DNA + protein)

Why do cells reproduce?

- Because the volume (inside) of a cell increases in size faster than the surface area (outside)
- For organism growth , repair, and replacement of dead cells



"He looks just like you.
But he looks just like me, too."

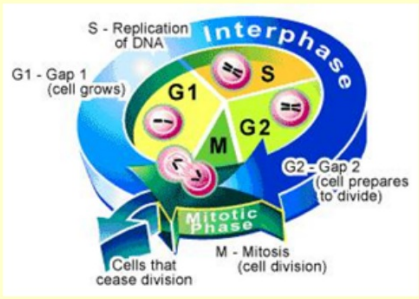
Why do cells reproduce?

Like all living things, cells must be able to grow and reproduce

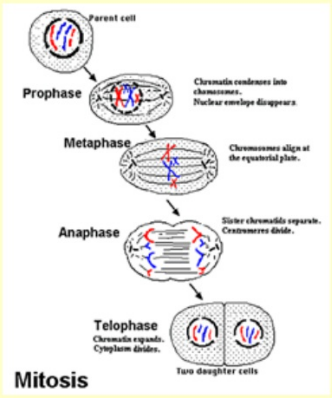
They grow and reproduce during the cell cycle, which is a sequence of growth and division of a cell.

The cell cycle is divided into two main parts:

A. Cell growth: Interphase
   1. G_1 phase
   2. S phase
   3. G_2 phase



B. Cell division:



1. Mitosis (a.k.a. M-Phase)
   1)Prophase 2) Metaphase
   3)Anaphase 4)Telophase

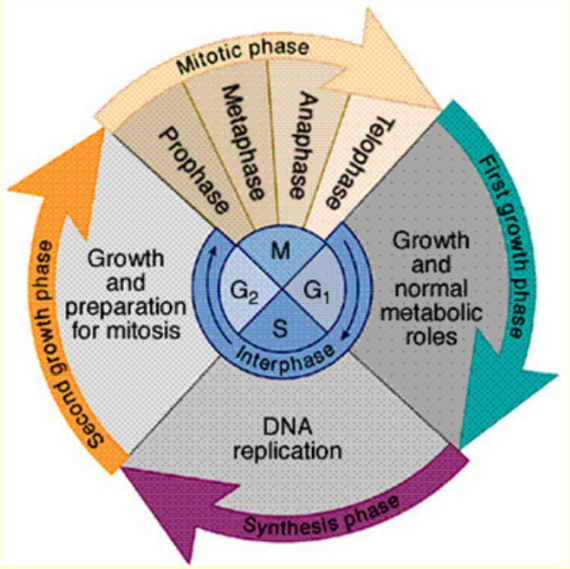
2. Cytokinesis

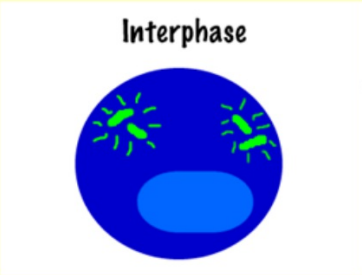
Stage	What happens?!
Growth 1 (G1)	cells grow and synthesize proteins. Carry out normal cell activities
Synthesis (S)	DNA is synthesized
Growth 2 (G2)	cells grow to prepare for division
Mitosis (M)	stages of cell division
Cytokinesis	cell splits to become two seperate cells

http://highered.mheducation.com/sites/0072495855/student_view0/chapter2/animation__mitosis_and_cytokinesis.html

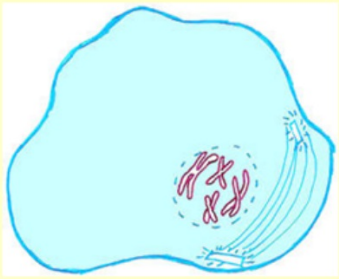
Mitosis:

- When the nucleus divides and includes four stages
- The division of DNA

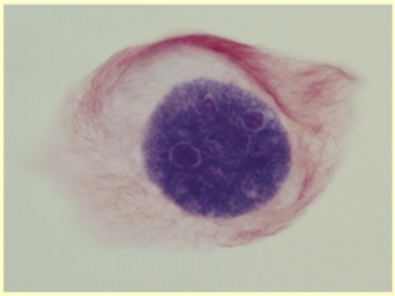




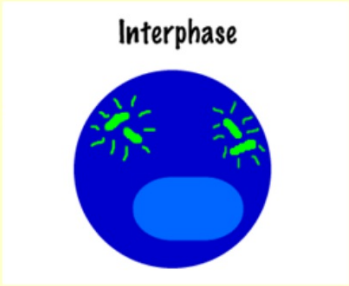
1. Prophase:

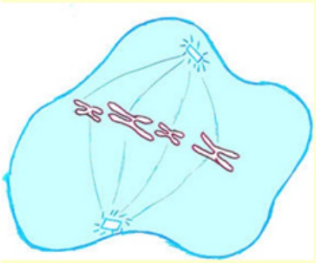


1. The chromatin coils up, shortens, and thickens to form chromosomes.
2. The nuclear membrane disappears.
3. Centrioles split and move to opposite ends of the cell.
4. Spindle fibers start to form from the centrioles.

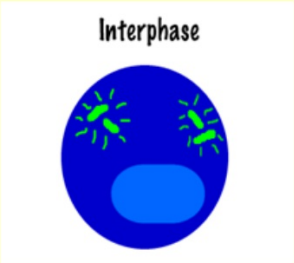


2. Metaphase:

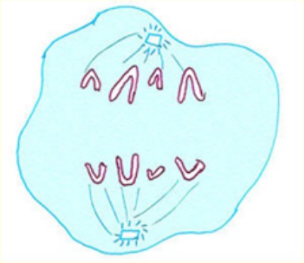




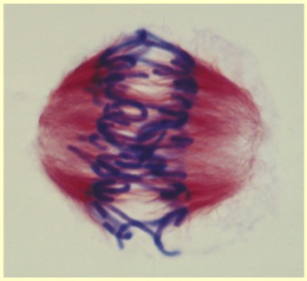
1. The chromosomes line up in the Middle of the cell.
2. The chromosomes attach to the spindle fibers by structure called the centromere.



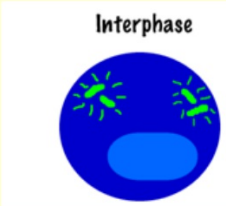
3. Anaphase:

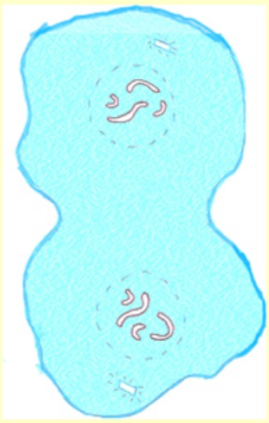


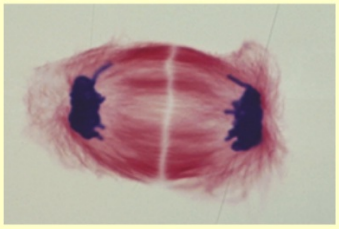
1. The chromosomes separate into individual chromosomes called chromatids.
2. They are pulled to opposite ends of the cell as the spindle fibers get shorter.



4. Telophase:



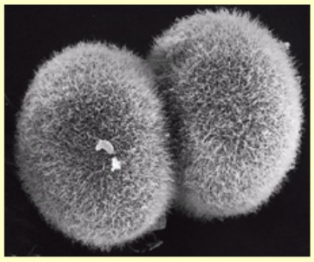


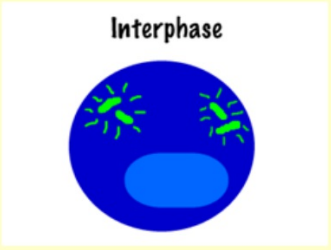


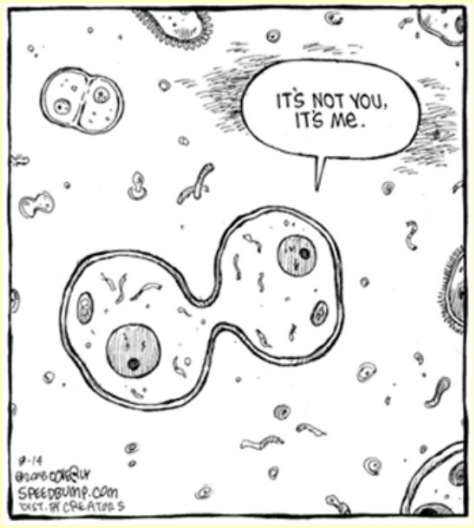
1. The chromatids have reached opposite ends of the cell and they start to unwind back into chromatin.
2. The spindle fibers disappear.
3. A new nuclear membrane forms around each set of DNA to form two new nuclei
4. The cell membrane begins to pinch.

Cytokinesis: the cytoplasm divides

- In animal cells, the cell membrane pinches in half and gradually separates the cytoplasm.
- NOW, There are two new daughter cells identical to each other and to their parent cell.







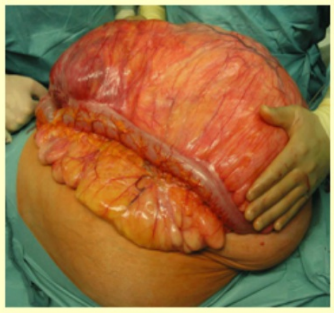
The cell cycle is complete!

And will begin again with interphase.

https://www.youtube.com/watch?v=LEpTTolebqo

Cancer

- Abnormal Cell Growth
- Almost all cancer is caused by mutations of DNA



http://www.youtube.com/watch?v=LEpTTolebqo