

### Genetics

- Zacharias Janssen invented the first optical compound microscope in 1595
- In 1665 Robert Hooke used a light microscope to look at non living cork cells and therefore coined the term cells
- Anton van Leeuwenhoek made microscopes w/ 10x power and observed the first living organisms which he called animacules.

### Cell Theory an Shit

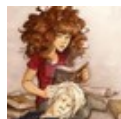
- **Properties of cells** 1) Life is the most basic property of cells 2) Cells are the smallest units of life 3) Cells are highly complex and organized.
- **Cell Theory** 1) All organisms are made of one or more cells 2) Cell is the basic unit of life 3) Cells can only arise from a preexisting cell. (This theory was created in the 1800s by three German scientists.

### Organisms

- |   |  |
|---|--|
| <b>Unicellular Organisms</b> - have just one cell such as amoebas but have problems functioning when they get too big and they don't have a nervous system nor muscles. | <b>Multicellular-</b> have more than one cell type and each cell type has a different and important role in your body. |
|---|--|

**Prokaryotes** - do not have a true Nucleus

**Eukaryotes**- Have true nuclei



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### Cloning

- |  |   |
|--|---|
| <b>Somatic Cell Nucleus Transfer</b>   | <b>Gene Cloning</b>   |
| Remove the nucleus of a body cell (somatic cell) and place it into an egg cell which has had its nucleus removed | Isolate the gene of interest and Make copies of the gene using a smaller organism (bacteria or yeast) |
| Stimulate the modified egg cell with its new nucleus to divide and develop into a new individual                 | Transfer the gene into another organism   |

### Mitosis vs Meiosis

- |  |                         |
|--|-------------------------|
| <b>Meiosis</b>   | <b>Mitosis</b>          |
| Interphase I   | Interphase              |
| Prophase I   | Prophase                |
| Metaphase I  | Metaphase               |
| Anaphase I   | Anaphase                |
| Telophase & Cytokinesis I  | Telophase & Cytokinesis |
| Repeat all steps again except for Interphase where the DNA is duplicated |                         |

### Deoxyribonucleic acid = DNA

- Humans have 23 chromosomes (46 in total)
- Karyotype is a DNA chart with Homologous pairs (1 from mum 1 from dad)
- A chromosome is made up of two chromatid
- DNA is made of 4 base compounds (ACTG)

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### Flower Reproduction

- |                            |                          |
|----------------------------|--------------------------|
| <b>Female Flower Parts</b> | <b>Male Flower Parts</b> |
| Pistil                     | Stamen                   |
| Stigma                     | Anther                   |
| Style                      | Filament Pollen          |
| Ovary                      |                          |
| Ovules                     |                          |

### Matter is Anything that Takes up Space

- Mass** is the amount of matter in something
- Volume** is the amount of space taken up by something
- Density** is the mass of an object that takes up a certain volume. It is calculated by dividing the mass of an object by its volume

### Everything's a Chemical

- Everything in the world that isn't energy is a chemical or contains chemicals**

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