

How do living things Sexually Reproduce?

- Besides animals, what other things reproduce sexually?



Think of a family that has both biological parents and has 2 or more children

- #1 Consider what the parents look like, what the children look like
- #2 What features do they have in common? What are different characteristics?
- #3 How do you think we end up with our characteristics?
- #4 Why do you think offspring from the same parents look different?

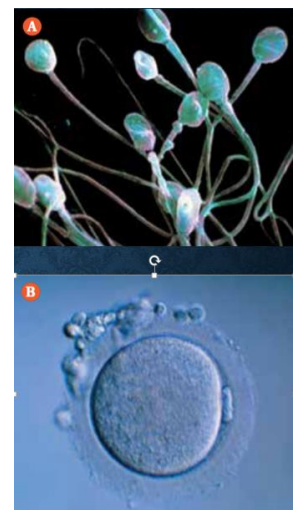
Sexual Reproduction

Animals and many other living things reproduce _____

- When living things reproduce sexually, the offspring is _____
- Half of the offspring's DNA comes from the _____ parent, and the other half from the _____ parent.
- The cells contributed by the male and female are the sex cells or _____

Sexual Reproduction Involves Sex Cells

- Gametes:
 - Male or female _____



- Male gamete
 - _____ produced in testes
- Female gamete
 - _____ produced in ovaries

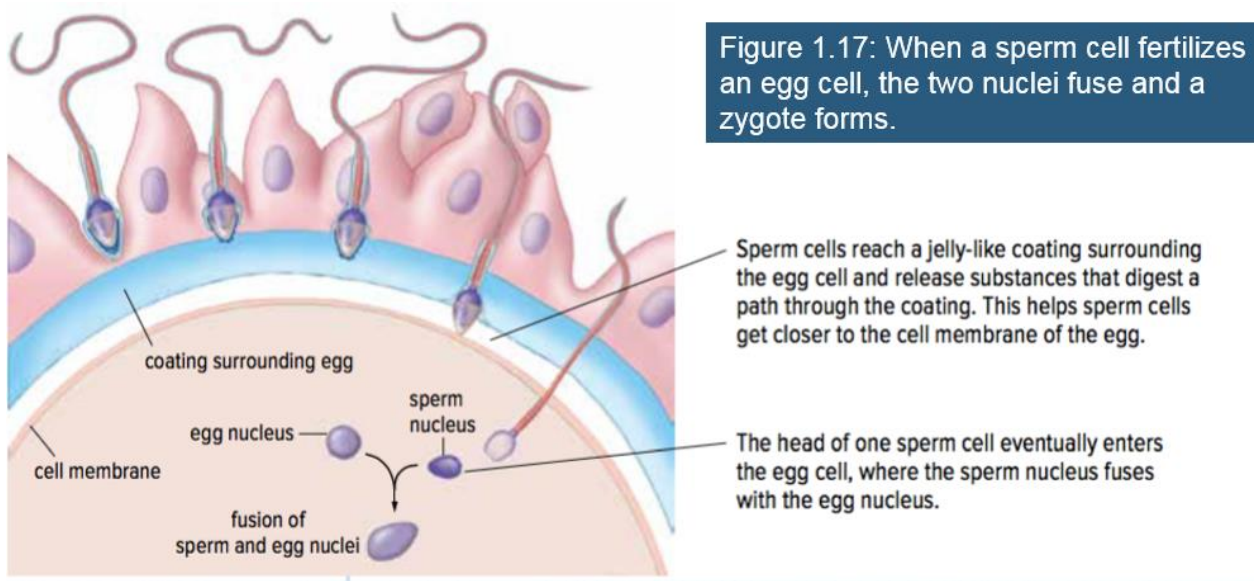
Sex Cells

- Central event of sexual reproduction:
 - _____ between the gametes (sperm and egg)
 - Sperm and egg (and their genetic information) _____ to produce a new _____ cell that develops into an offspring

Fertilization: the process in which male and female gametes _____

Internal Fertilization

- Some organisms like Humans carry out _____ fertilization, in which fertilization occurs _____ the female.
 - Nuclei of two gametes _____ together to form a single cell called a _____
 - Zygote contains _____ information from the sperm cell and egg cell



External Fertilization

- Some species, like salmon, carry out _____ fertilization.
- In this process, the female deposits _____ eggs and males release _____ over the eggs



Activity! Comparing Internal and External Fertilization

Question!

- **How do we reproduce sexually but still keep the same number of chromosomes in our cells**

Chromosomes

- Each species has a _____ of chromosomes in its cells.
 - Gold Fish = 94
 - Fruit Flies = _____
 - Humans = 46

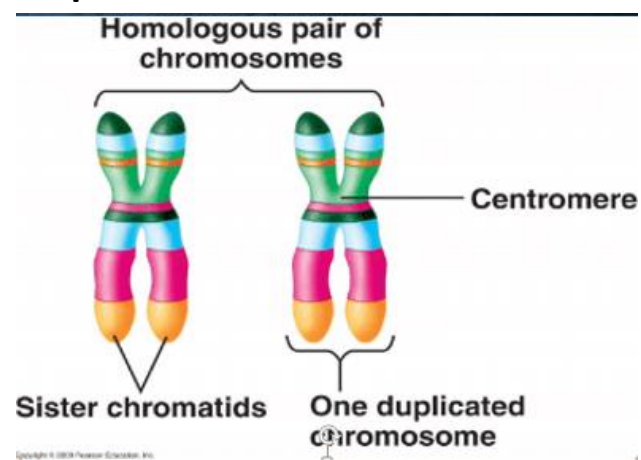


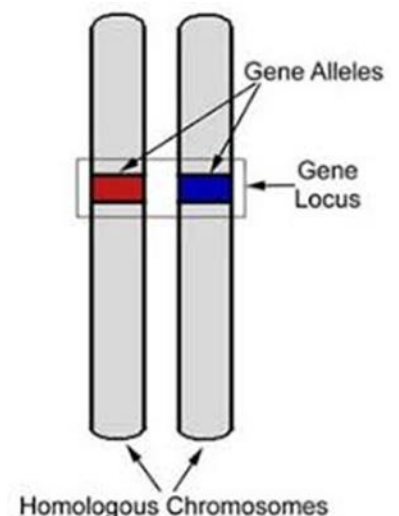
Figure 1.18: In a pair of homologous chromosomes, the female parent contributes one chromosome, and the male parent contributes the other.

Chromosome Number

- Humans have _____ chromosomes that are organized into _____ pairs
- Chromosomes that are paired are called _____ chromosomes
- During fertilization, each parent contributes _____ chromosome of each pair
- Homologous chromosomes have similar features and carry _____ genetic information

Versions of a Gene

- _____: different forms of the same gene
 - *Eg. A homologous chromosome will have _____ different alleles for the same gene*

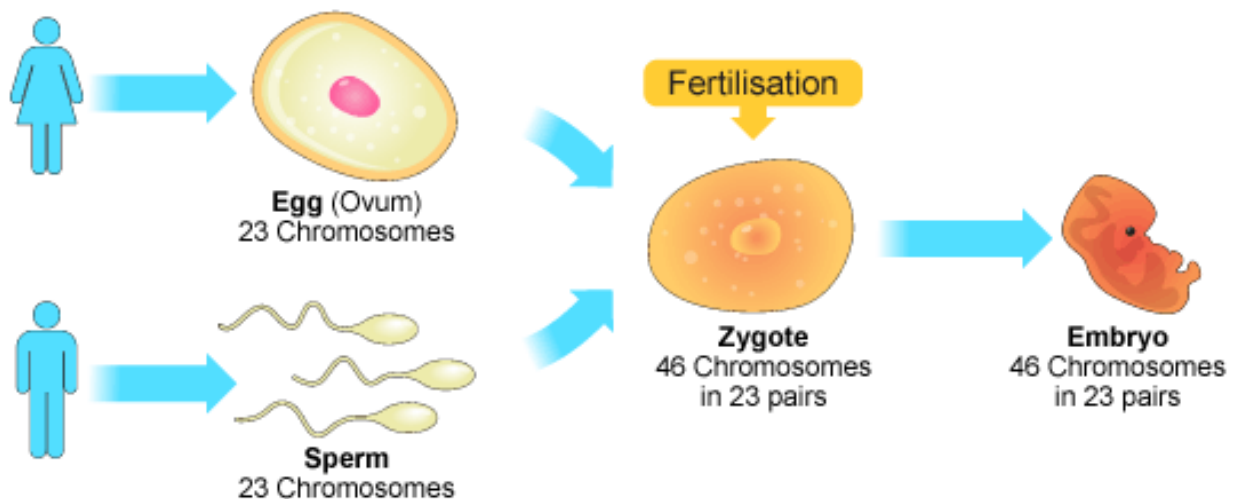


If sexual reproduction involves the fusing (combination) of genetic material from two individuals, then why doesn't the offspring have twice the number of chromosomes as their parents?

- Activity: Halves of a Whole

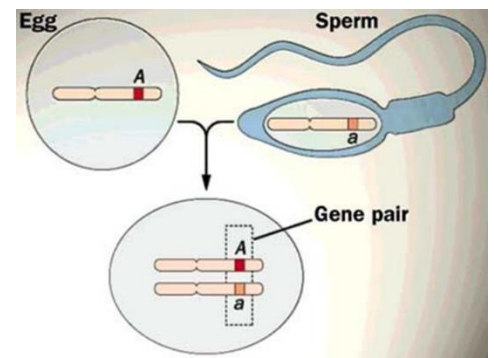
Sexual Reproduction

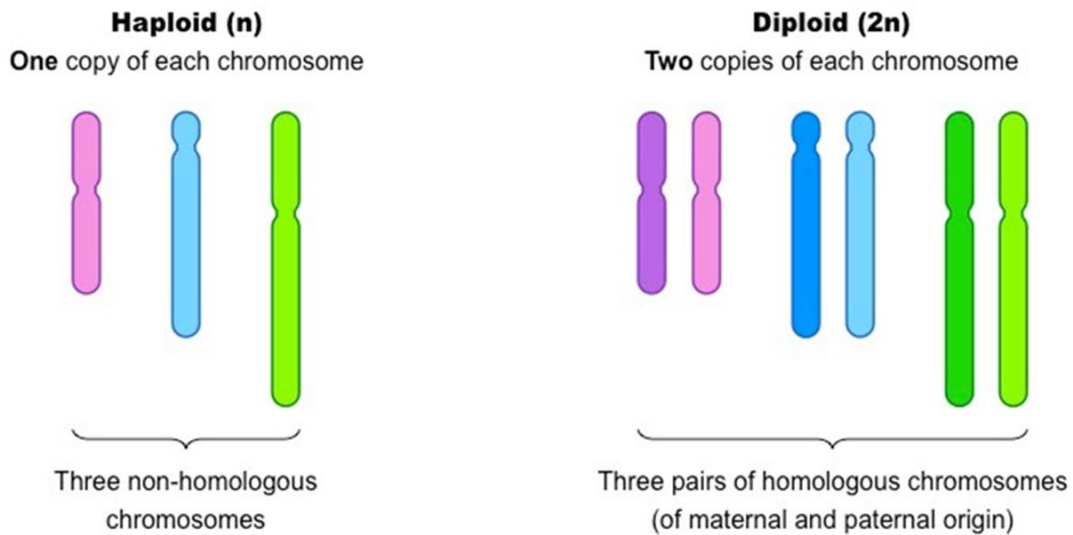
- Since gametes combine in sexual reproduction, each gamete must have _____ the number of chromosomes than other body cells.
- This ensures the correct number of chromosomes in each _____ from generation to generation.



Haploid and Diploid

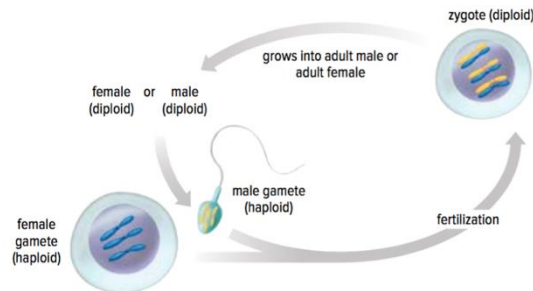
- Cells with half the normal number of chromosomes are called _____
 - _____ (egg and sperm) are **haploid** cells
- Our body cells have the _____ number of chromosomes, so they are called _____ cells





Fill In The Blank

- Using pg 49 in your textbook fill out and colour the diagram



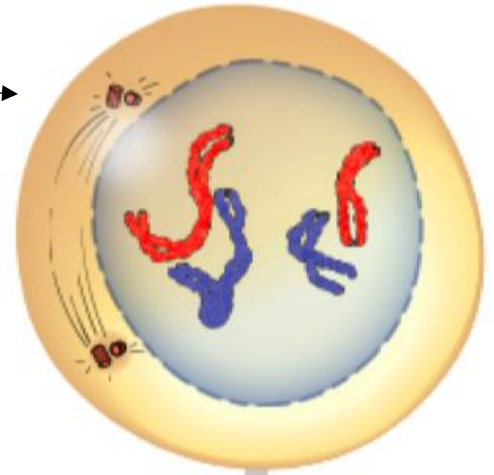
How do diploid organisms produce haploid gametes?

Meiosis

- Cells that produce gametes undergo a type of _____ called *meiosis*
- **Meiosis:**
 - a diploid cell divides _____ to produce _____ haploid cells
- Offspring are genetically _____ from parents and from one another (gametes from parents are not genetically the same)
- Process of _____ the homologous chromosomes

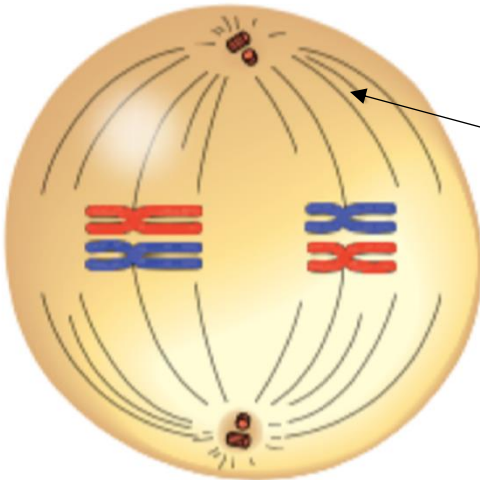
Meiosis: Prophase I

- Nuclear membrane begins to disappear
- DNA condenses into duplicated chromosomes
- _____ chromosomes are paired



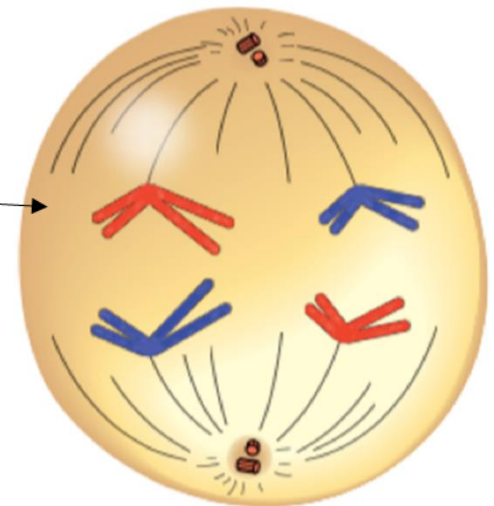
Meiosis: Metaphase I

- Spindle fibres guide chromosome movement
- Homologous chromosome pairs line up along the _____ of the cell



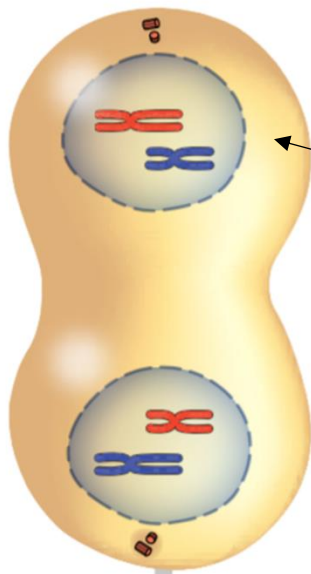
Meiosis: Anaphase I

- Homologous chromosome _____ and go to each end of the cell



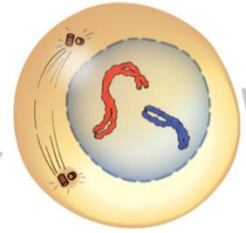
Meiosis: Telophase I

- Two nuclei form
- Each nucleus contains a _____ of the cell's DNA
- Cell divides, forming _____ cells



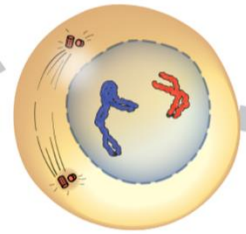
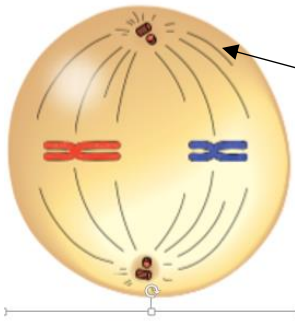
Meiosis: Prophase II

- Nuclear membrane begins to disappear
- DNA exists as _____



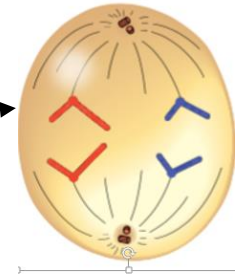
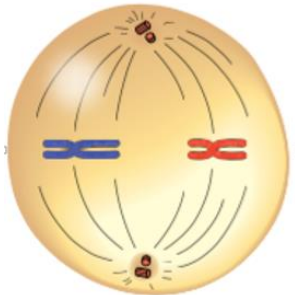
Meiosis: Metaphase II

- Chromosomes line up along the middle of the cell



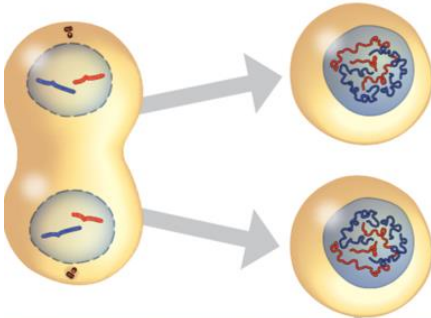
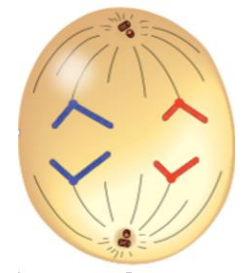
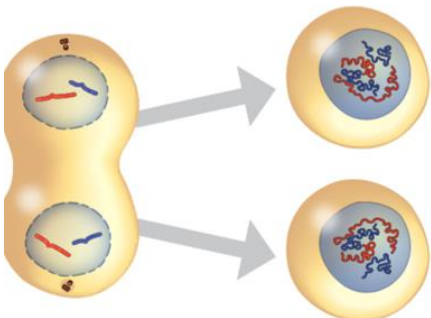
Meiosis: Anaphase II

- Copies of DNA are separated and go to each end of the cell



Meiosis: Telophase II

- Four nuclei form
- Cell divides, forming _____ new cells
- Each cell contains half of the original _____



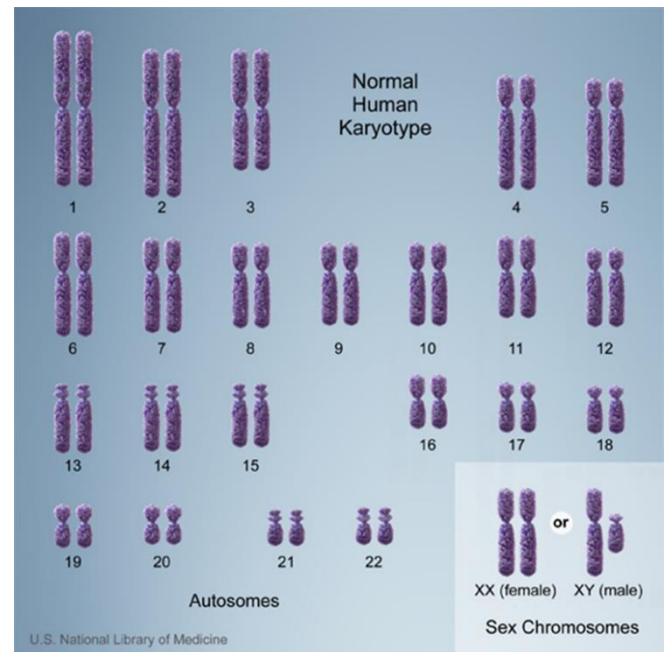
- “It’s in the Cards”
- Mitosis Vs Meiosis:
 - How is meiosis similar to mitosis?
 - How is it different?

Karyotype

- The _____ of an organism’s chromosomes from one body cell

Sex Chromosomes

- Sex chromosomes determine the _____ of an individual
- Control the primary and secondary sexual characteristics of _____ -
- Consist of an ____ chromosome and ____ chromosome

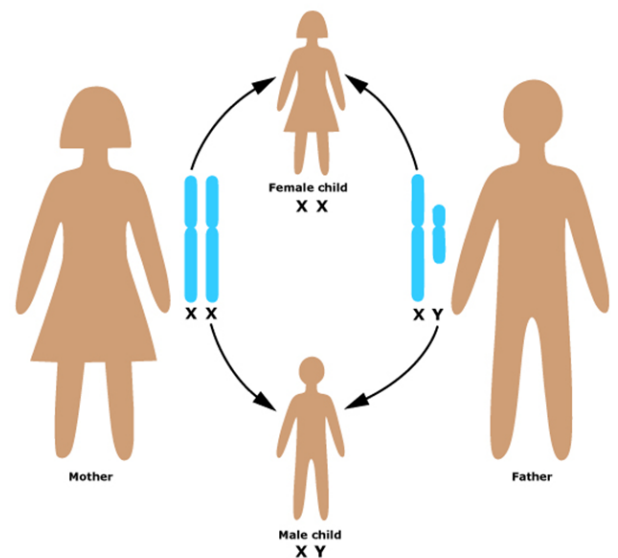


Females

- Have two ____ chromosomes
- Meiosis
 - Can only produce gametes with an ____ chromosome
 - All ____ have one X chromosomes

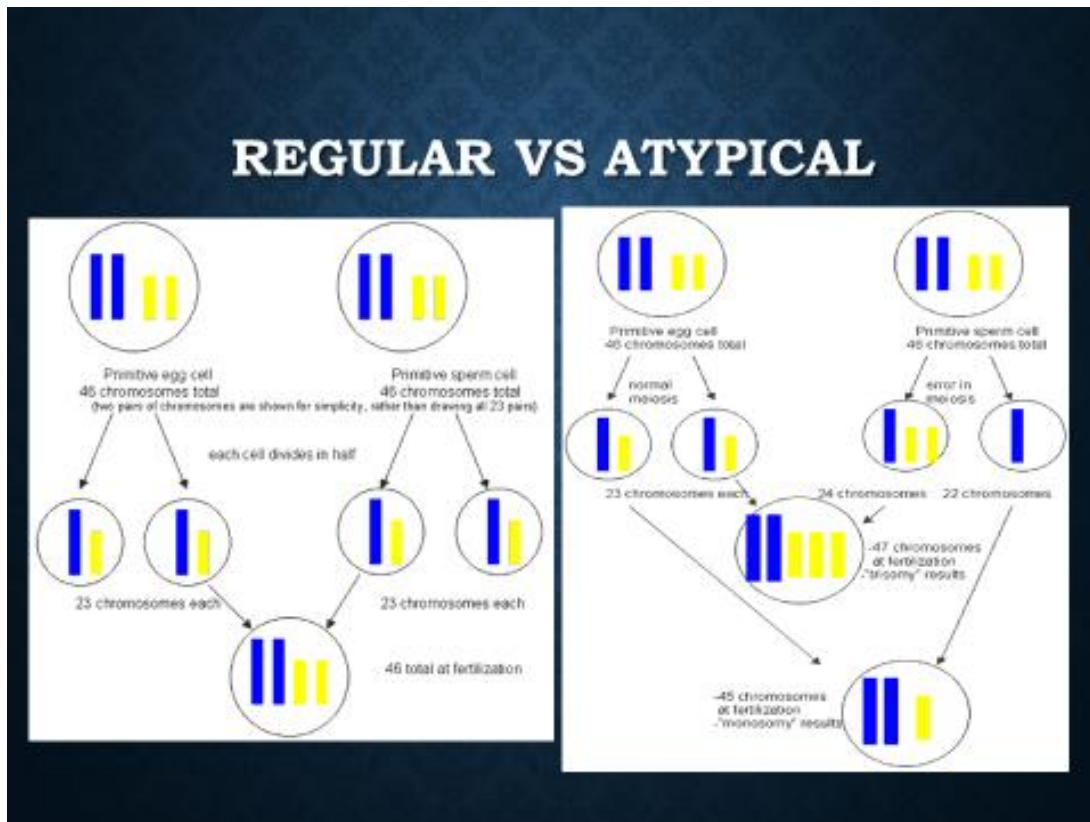
Males

- Have one ____ chromosome and one ____ chromosome
- Meiosis
 - Can produce gametes with either Y chromosome or X chromosomes
 - ____ of the sperm will have X and other ____ will have Y



What happens when Meiosis goes wrong???

- Occasionally _____ in meiosis can occur
- Many of these errors result in gametes that do not _____
- However if they do survive and reach fertilization they will produce a _____
- Since every cell in an offspring is produced from _____ zygote cell, all of the cells in the offspring will contain the _____



- What can this result in?
 - Down Syndrome
 - 47 chromosomes
 - Sex Chromosome Disorders
 - Turners Syndrome
 - Female born with only one X chromosome
 - Do not develop at puberty/cannot reproduce
 - Klinefelter Syndrome
 - Males born with two X chromosomes
 - Cannot reproduce