



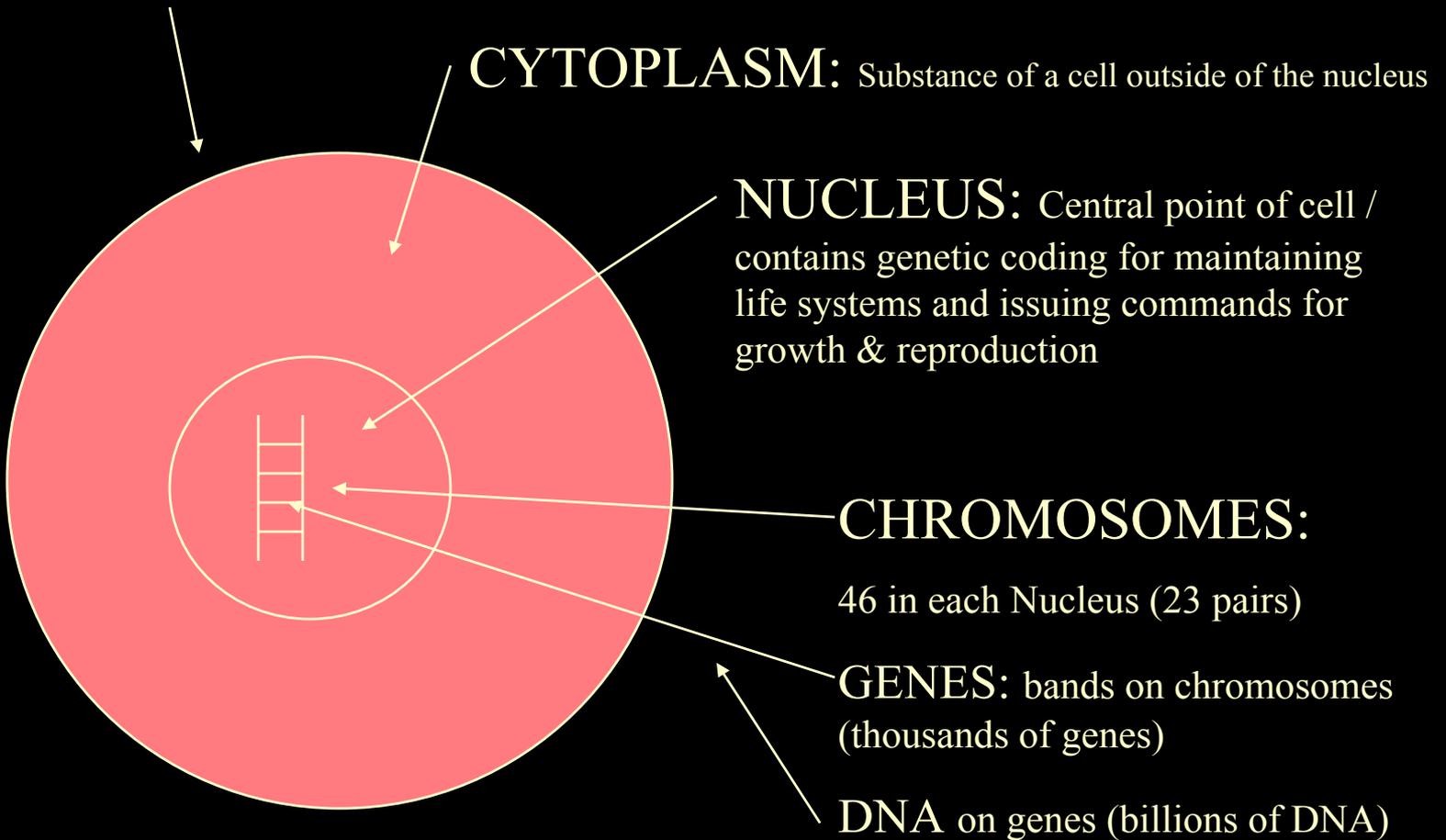
# **GENETICS & HEREDITY**



- ◆ **GENETICS** - The study of the way animals & plants pass on to their offspring such as:
  - ◆ eye color, hair color, height, body build, blood types, intelligence, gender, etc.
- ◆ **HEREDITY** - Characteristics that a child receives from both parents



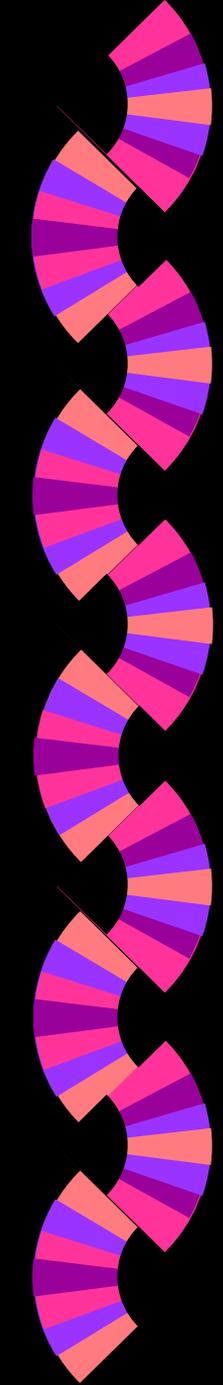
◆ **CELL:** Basic unit of all living matter (Adult = over 10 trillion cells)





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- ◆ How many chromosomes are there in each cell?
- ◆ 46 CHROMOSOMES or 23 PAIRS
  
- ◆ How many chromosomes are in Reproductive (egg & sperm) or Germ cells?
- ◆ 23 CHROMOSOMES
  - (combined = the 46 chromosomes)



# *CELL DIVISION*

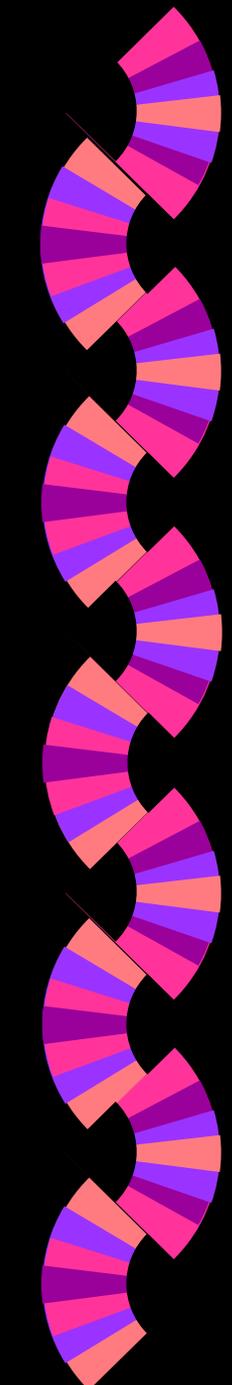
- ◆ **MITOSIS:** Cell divides by copying the DNA - cell splits - new cell with normal number of chromosomes (Cell growth & repair)
- ◆ **MEIOSIS:** Creates 1/2 sets of chromosomes
  - Women = 23      Men = 23      Combined = 46



- ◆ Female Sex Cells **XX** (Ovum or Egg)
- ◆ Male Sex Cells **XY** (Sperm)
- ◆ Baby Girl = **XX**    Baby Boy = **XY**
  - Conception is the union of an OVUM and the SPERM
- ◆ **Gender is determined by the father!**
  - Someone should have told King Henry VIII!

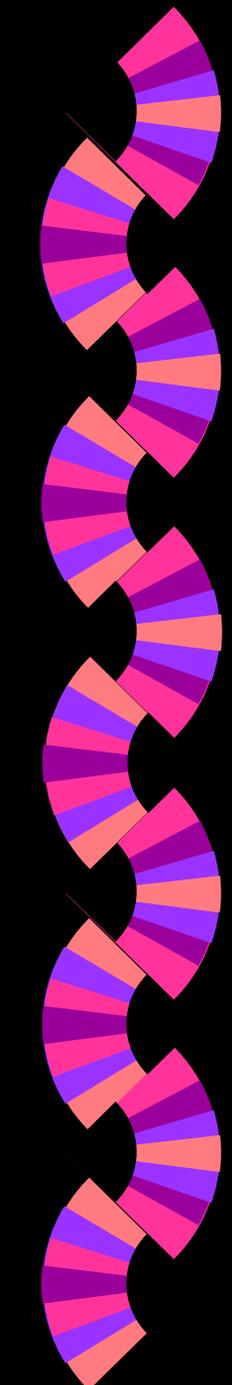


- ◆ **DOMINATE Gene:** More powerful - trait seen in person
- ◆ **RECESSIVE Gene:** Weaker and hides in the background. Trait can only determine when two of them are present - may show up in future generations.
- ◆ **CARRIER:** Has a recessive gene that is not visible
- ◆ **SEX-LINKED:** Mother passes the recessive X to son
  - Color-blind male receives the trait from his mother.
  - The mother is usually not color-blind herself.
- ◆ **B = BROWN eyes (dominate)**                      **b = BLUE eyes (recessive)**
- ◆ BB = BROWN eyes
- ◆ bb = BLUE eyes
- ◆ Bb = BROWN eyes but carry the recessive BLUE eye gene



# *MULTIPLE BIRTHS*

- ◆ **ZYGOT**: the cell that is formed when a sperm fertilized an egg (ovum)
- ◆ **MONOZYGOT**: Identical Twins 1 Egg + 1 Sperm
  - Fertilized ovum splits into 2 identical cells - Always the same gender
- ◆ **DIZYGOT**: Fraternal Twins 2 Eggs + different Sperm
  - Will look different - May be different or the same gender
- ◆ **MULTIPLE BIRTHS**: More than 2
  - May be identical, fraternal or both - May be different or the same gender
- ◆ **CONJOINED (Siamese) TWINS**: Ovum splits apart, but the separation is not completed. Babies are joined at some part of their bodies.



## *What 4 FACTORS may contribute to Multiple Births?*

- ◆ 1) History in the family
- ◆ 2) Increased hormones naturally
  - More than 1 egg released
- ◆ 3) Fertility Drugs
  - More than 1 egg released
- ◆ 4) Age 32-36
- ◆ Likelihood of multiple pregnancies in the United States
  - Twins: Blacks- 1 in 73      Whites 1 in 93
  - Triplets: 1 in 10,000
  - Quadruples: 1 in 620,000



- ◆ Sex - Linked or X - Linked Defect: When an X-gene from the mother is faulty. There is a 50/50 chance of the child inheriting the disorder.
- ◆ Syndrome: When a group of signs and symptoms occur together and characterize a particular problem.
- ◆ Congenital Malformation: A condition that is present at birth.
- ◆ Multi-factorial Defects: Interaction of genes with other genes OR with environmental factors.
- ◆ Chromosomal Error: The fertilized egg cell that contains chromosomes in an abnormal number, structure or arrangement.