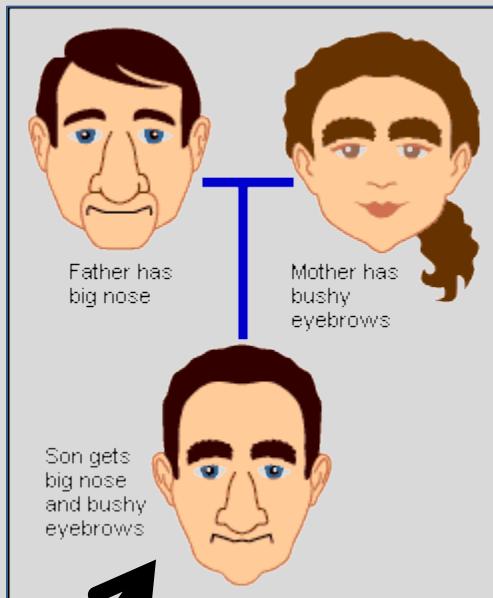


## REVIEW: Sexual Reproduction

### Sexual Reproduction:

- ✓ GENES come from 2 PARENTS
- ✓ Offspring are a COMBINATION of mom & dad's GENES



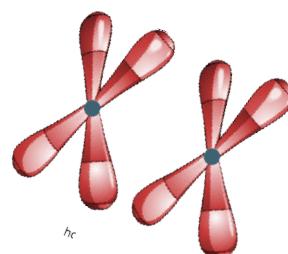
### Offspring

- ✓ RESEMBLE their PARENTS
- ✓ Not identical because of combination of genes.

★ **Sexual Reproduction = MEIOSIS = production of sex cells**

### Homologous Pairs

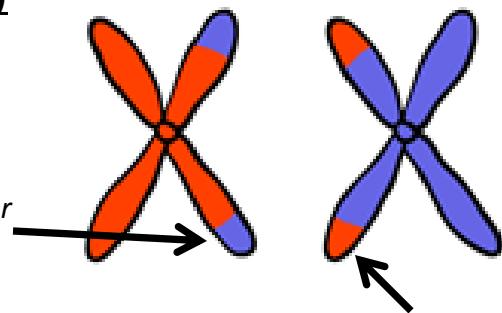
- ✓ CHROMOSOMES that CODE for the SAME TRAIT
- ✓ Each PAIR has ONE from mom and ONE from dad



## Genetic Recombination (“Crossing Over”)

- ✓ SWAPPING of GENES
- ✓ Results in genetic diversity

*Some genes from the mother attach to the chromosome of the father.*



*Some genes from the father attach to the chromosome of the mother.*

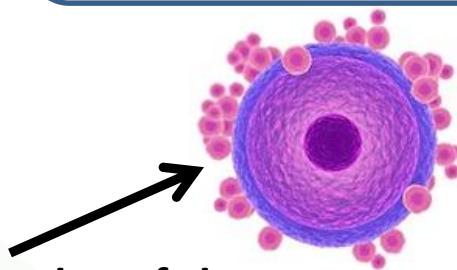
### In the male...

- ✓ MEIOSIS occurs in the testes
- ✓ Makes sperm cells



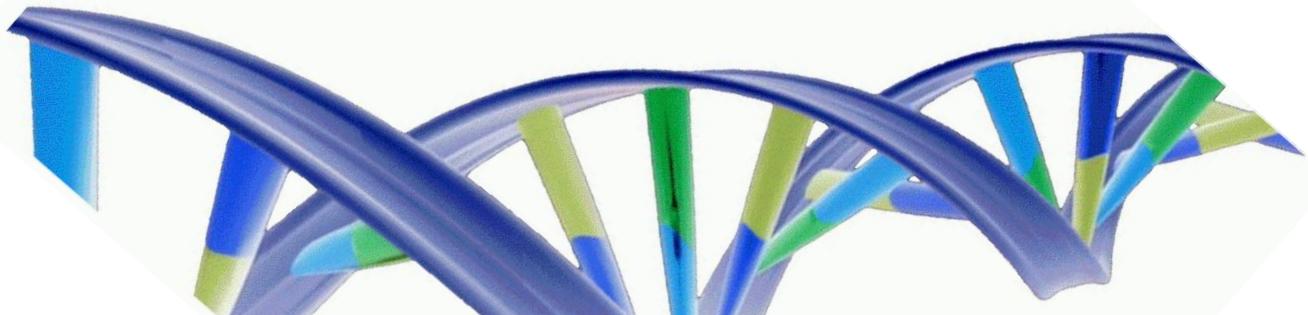
### In the female...

- ✓ MEIOSIS occurs in the ovaries
- ✓ Makes egg cells



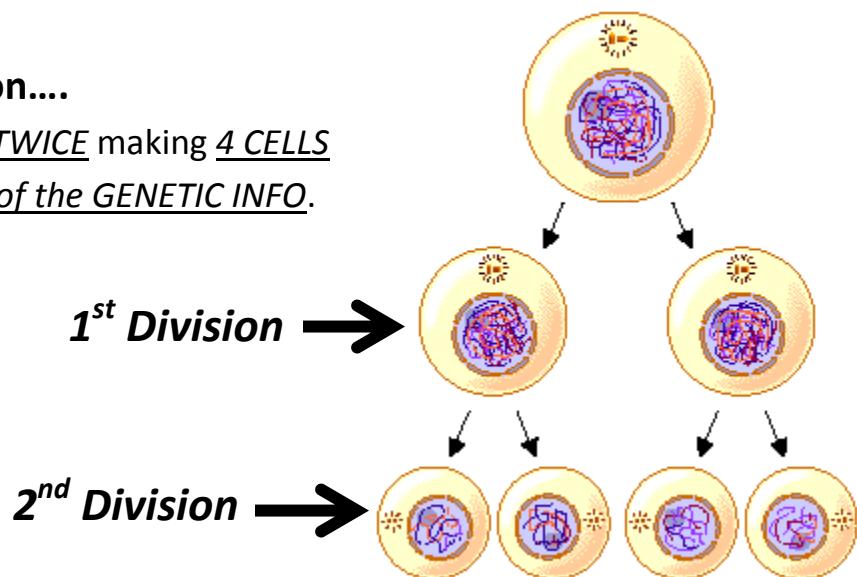
**Each has  $\frac{1}{2}$  the diploid number of chromosomes**

**Before MEIOSIS can occur → DNA must REPLICATE**



**After replication....**

- ✓ Cell SPLITS TWICE making **4 CELLS**
- ✓ Each has  $\frac{1}{2}$  of the GENETIC INFO.



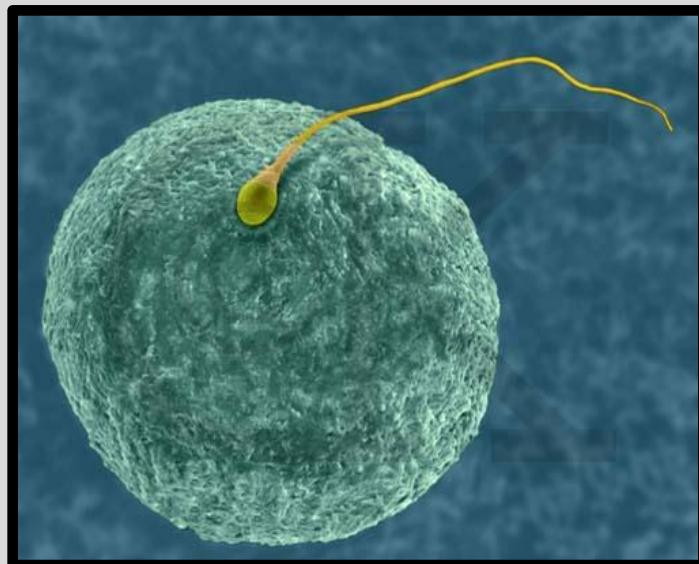
**Diploid**

- ✓ Normal amount of chromosomes

**Haploid**

- ✓ HALF the number of normal chromosomes

**Fertilization occurs** → cell now has normal number of chromosomes



## Non-Disjunction

- ✓ Homologous chromosomes FAIL to SEPARATE
- ✓ causes an ABNORMALITY

ex: *Down Syndrome* (an extra copy of the 21<sup>st</sup> chromosome)

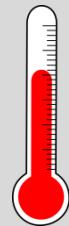
## Male Reproductive System

### 1. Testes

- ✓ where sperm are produced

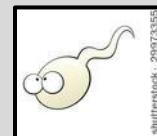
### 2. Scrotum

- ✓ Holds testes away from body
- ✓ Keeps testes cooler than rest of body
- ✓ TEMPERATURE very important to sperm production



### 3. Sperm

- ✓ TRANSPORT genetic information



### 4. Vas Deferens

- ✓ TUBE that transports sperm out of body



Vasectomy = cut vas deferens to prevent sperm from leaving the body

### 5. Prostate Gland

- ✓ PREVENTS urine from mixing with sperm

**6. Urethra**

- ✓ Part of REPRODUCTIVE & EXCRETORY systems
- ✓ Passage of semen and urine out of body

**7. Penis**

- ✓ Allow for internal FERTILIZATION

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## **Female Reproductive System**

**1. Ovary**

- ✓ Produces EGGS

**2. Oviduct (Fallopian Tubes)**

- ✓ Site of internal FERTILIZATION



**FERTILIZATION takes place in the OVIDUCT**

**3. Uterus**

- ✓ Embryo implants and develops



**IMPLANTATION of the embryo takes place in the UTERUS**

**4. Cervix**

- ✓ Dilates to allow baby to pass through during labor

5. Vagina

- ✓ Birth canal
- ✓ Where baby passes out of body.
- ✓ Where sperm is deposited

## ★ **Hormones REGULATE Reproduction** ★

Male Hormones

*Testosterone*

(stimulates development)

Female Hormones

*Estrogen & Progesterone*

(thickens uterus lining)

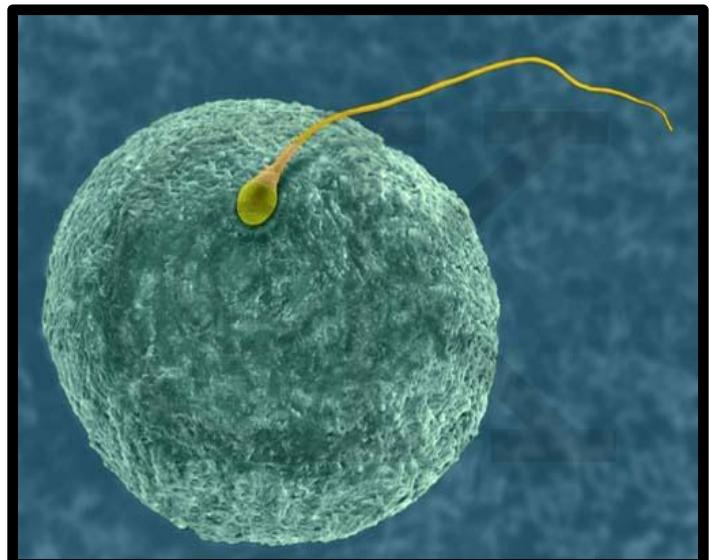
Menstruation occurs when NO FERTILIZATION has occurred



*Sheding of the uterine wall*

### Fertilization

- ✓ when SPERM meets the EGG to form a ZYGOTE
- ✓ Takes place in the OVIDUCT
- ✓ Called the UNION



## Fraternal Twins

- ✓ from 2 ZYGOTES
- ✓ 2 EGGS & 2 SPERM



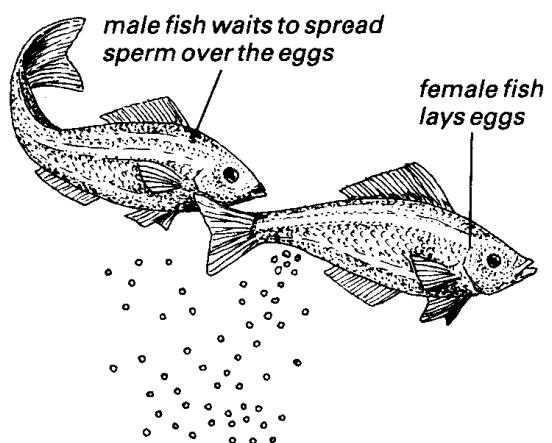
## Identical Twins

- ✓ From 1 EGG
- ✓ Zygote SPLITS
- ✓ Exactly the SAME DNA



## External Fertilization

- ✓ OUTSIDE the body
- ✓ in aquatic animals



## Internal Fertilization

- ✓ INSIDE the body
- ✓ in mammals



### Marsupials

- ✓ offspring *born in IMMATURE state*
- ✓ get *nutrients from mother's MILK*
- ✓ KANGAROOS



**ZYGOTE** grows into an **EMBRYO** by **MITOSIS** (cleavage)

### Differentiation

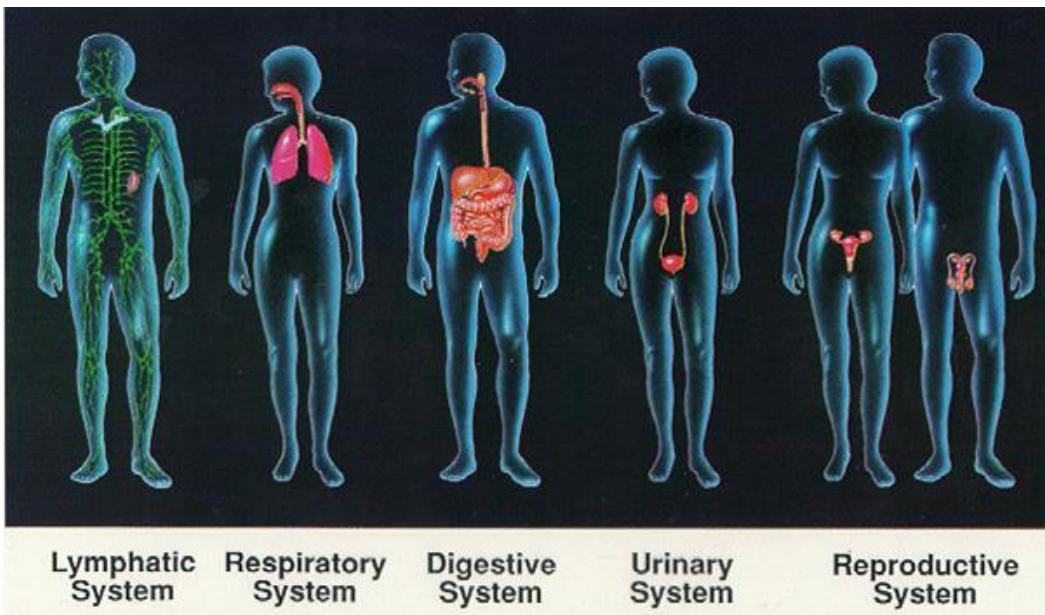
- ✓ cells become *SPECIALIZED TISSUE*
- ✓ controlled by *HORMONES, GENES, CELL LOCATION*
- ✓ *GENETIC CODES* are *TURNED-ON*.

**Differentiation**

*results in*

development of

**Body Systems**



### Placenta

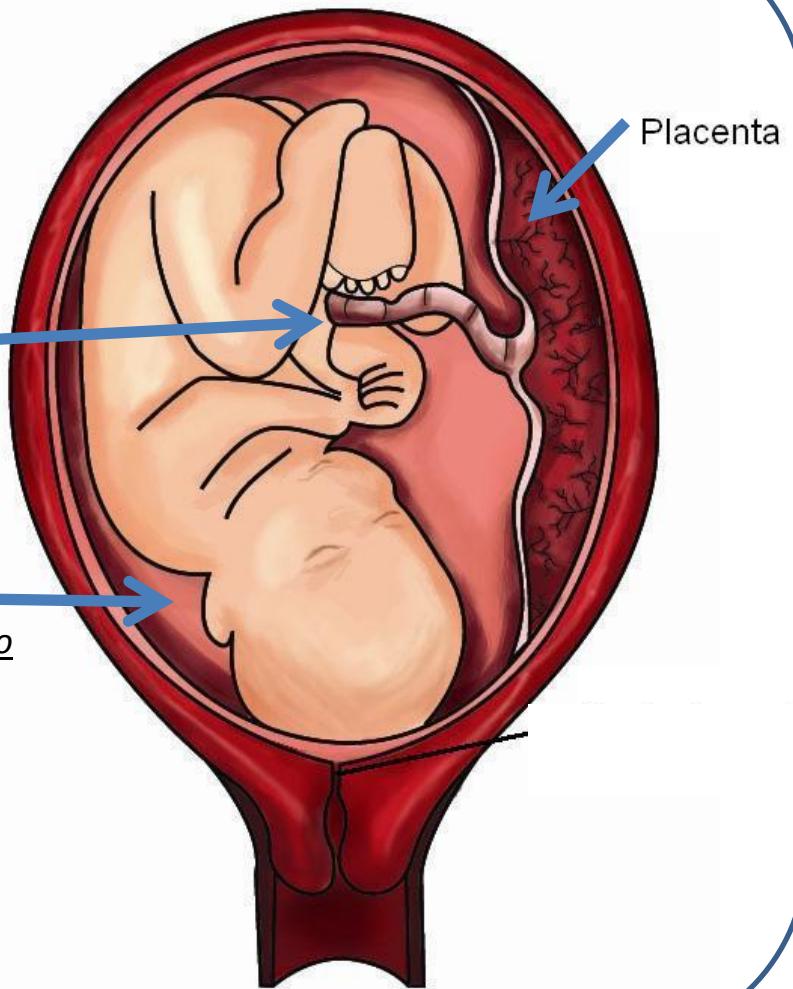
- ✓ Allows EXCHANGE of materials between MOTHER and FETUS
- ✓ No blood mixes

### Umbilical Cord

- ✓ CONNECTS placenta to embryo

### Amnion

- ✓ Membrane that surrounds embryo
- ✓ PROTECTS embryo



### Amniocentesis

- ✓ Fluid taken out
- ✓ Detects genetic mutations

