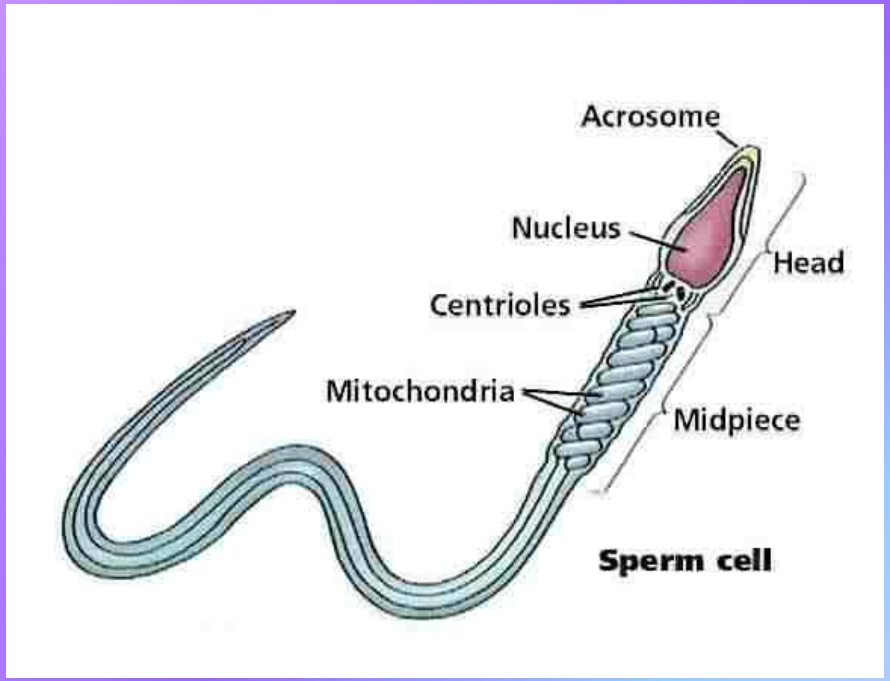
The Male Reproductive System

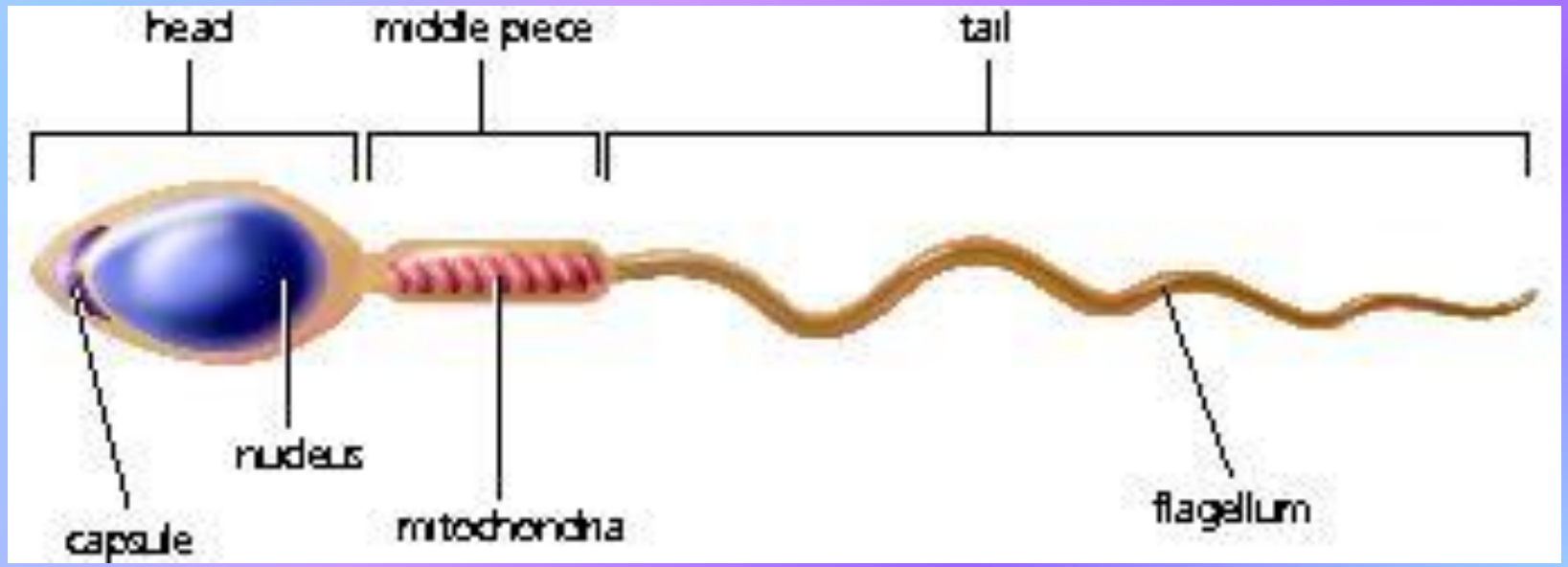
Male Reproductive System

- The male sex cell is a **sperm** cell
- The whole purpose is to **produce** and **deliver** sperm to the egg



Structure of a Human Sperm Cell

- Streamlined, built to move
- Consists of a three parts
- Head: contains the haploid nucleus with 23 chromosomes
  - At the front of the head is an entry capsule packed with chemicals that allow the sperm cell to enter the egg
- Middle: packed with mitochondria which provide the sperm with energy
- Tail (flagellum): propels the sperm


head
middle piece
tail
nucleus
capsule
mitochondria
flagellum

Sex Characteristics

- Human males have both **primary** and **secondary** sex characteristics

Primary Characteristics

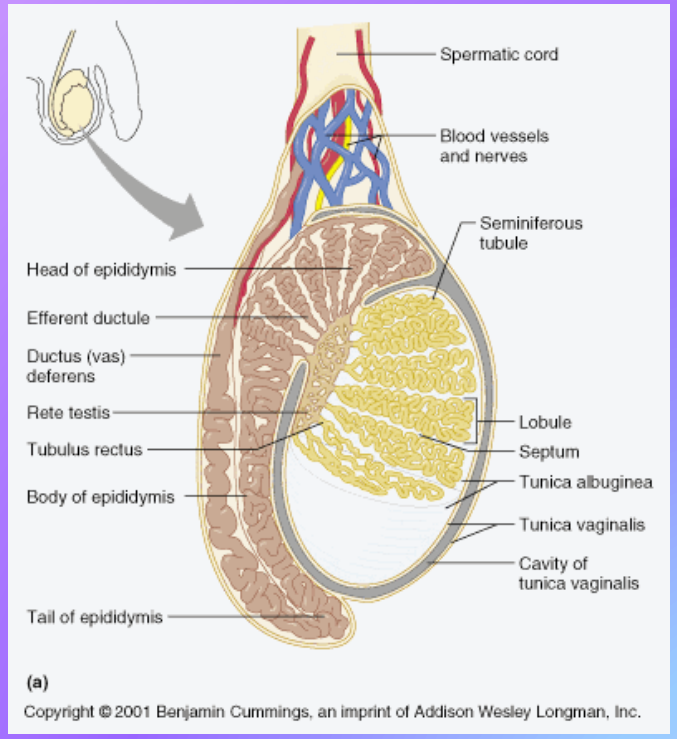
- You are **born** with these
- They include your **reproductive** organs

Secondary Characteristics

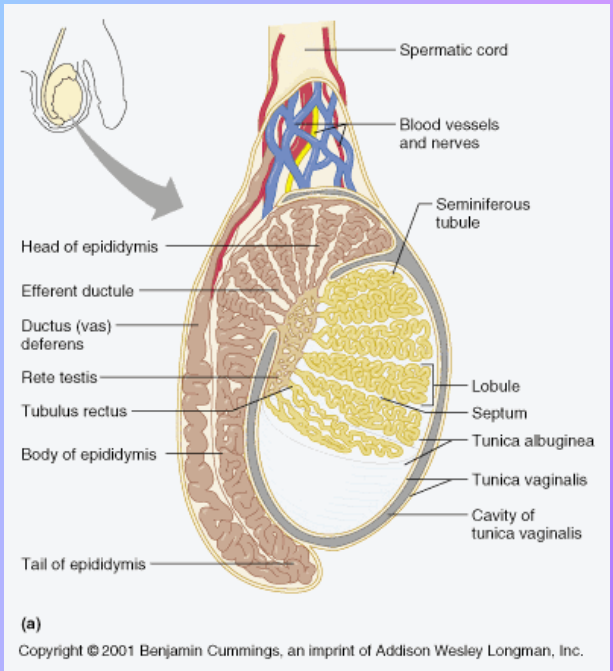
- Develop at **puberty**
- Puberty: The period of development where a person becomes sexually mature and able to reproduce
- In males this occurs between 11 and 13 until around 18
- This occurs when **testosterone** is produced
- Examples
  - Deep voice
  - Body and facial hair
  - Muscle development
  - Growth spurt

Where are Sperm Produced?

- Two testes enclosed in a protective sac (scrotum)
- Sperm start **Diploid** and divide to **Haploid**
- This happens in the **seminiferous tubules**



Sperm!



- The sperm cells move to the **epididymis** to mature for about **65-75** days
- Males produce 300 million sperm every day!!!!
- Testes produce and nourish the developing sperm and also produce testosterone

Male Accessory Glands

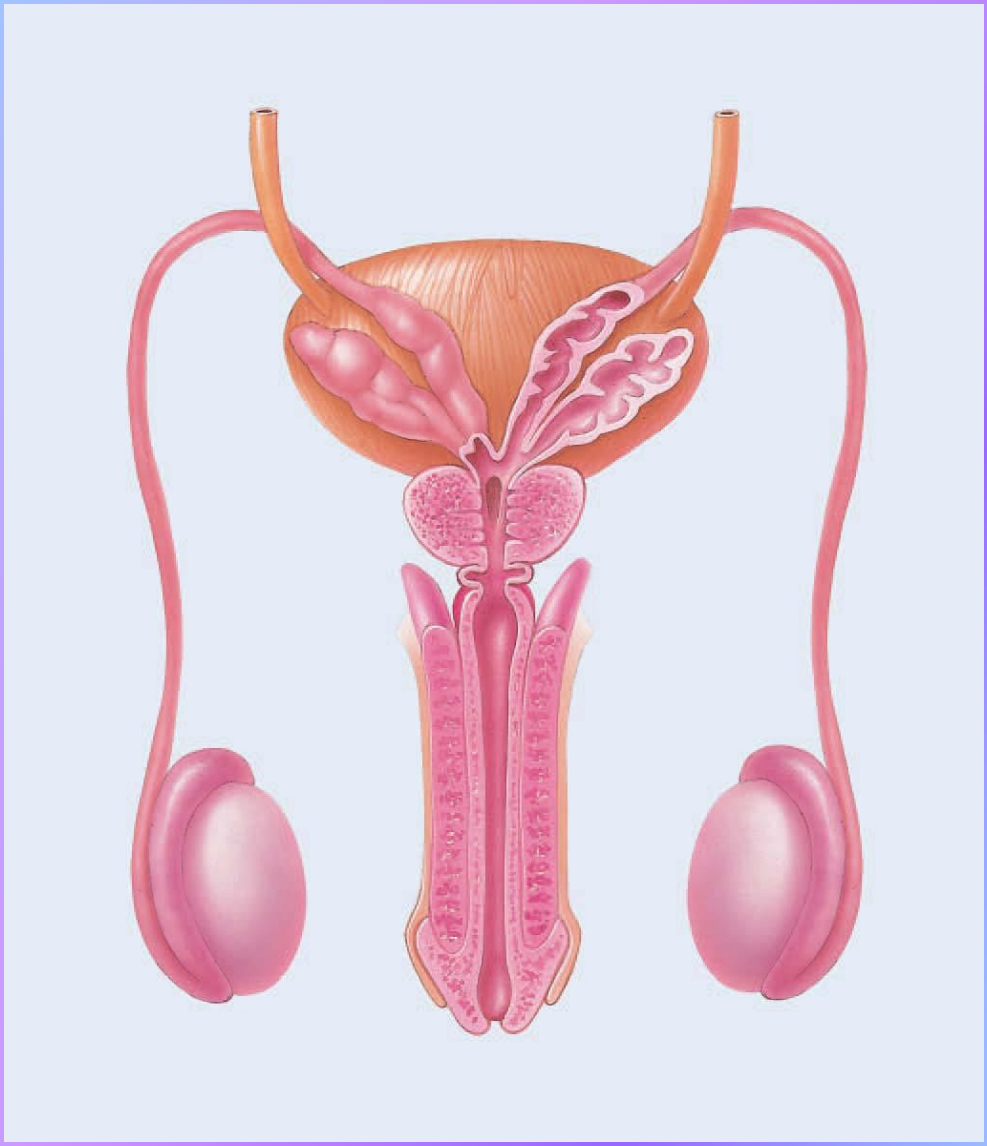
- In order to swim sperm cells need fluid as well as nutrients to provide energy
- The seminal vesicles, prostrate gland, and Cowper's glands are accessory glands that secrete seminal fluid
- Seminal fluid provides sugar for energy, protects the sperm from the acidic female reproductive tract and provides fluid for swimming
- The sperm and the seminal fluid together make up Semen

Sperm Production and Development

- Sperm cells start out as diploid cells on the inside surface of a seminiferous tubule
- They then undergo meiosis to become haploid cells
- In order to develop into sperm they need lots of nutrients (special support cells)
- When the sperm cells are almost mature they have reached the center of the tubule
- They then move to the epididymis where they finish maturing

- Sperm cells have a short life cycle
  - It takes 65-75 days for a sperm cell to mature
  - Each day 200-300 million sperm are produced each day
  - Only one sperm fertilizes the egg but millions die on the way
  - Sperm that is not released die with a few days and are broken down by white blood cells
  - Number of sperm produced decreases with age
  - Only Mature sperm can fertilize and egg

Path of Sperm



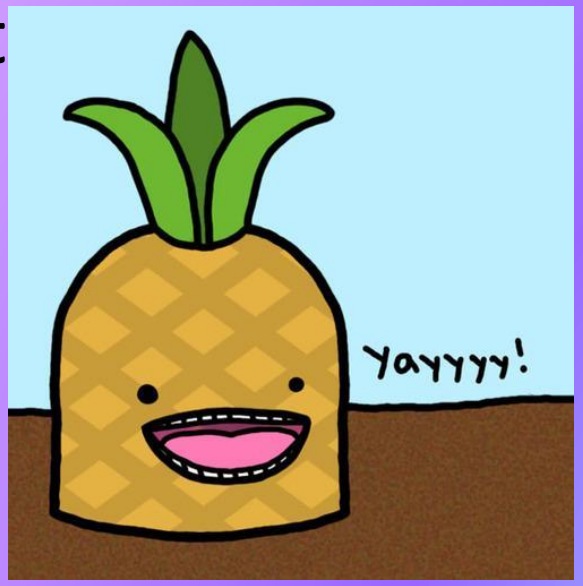
Questions for the BOYS!

What happens to sperm cells that are not used?

- They die within a few days by white blood cells

Name the structures of the male system that sperm does not go through

- Seminal vesicles, Cowper's gland, prostat



What is the name for these structures?

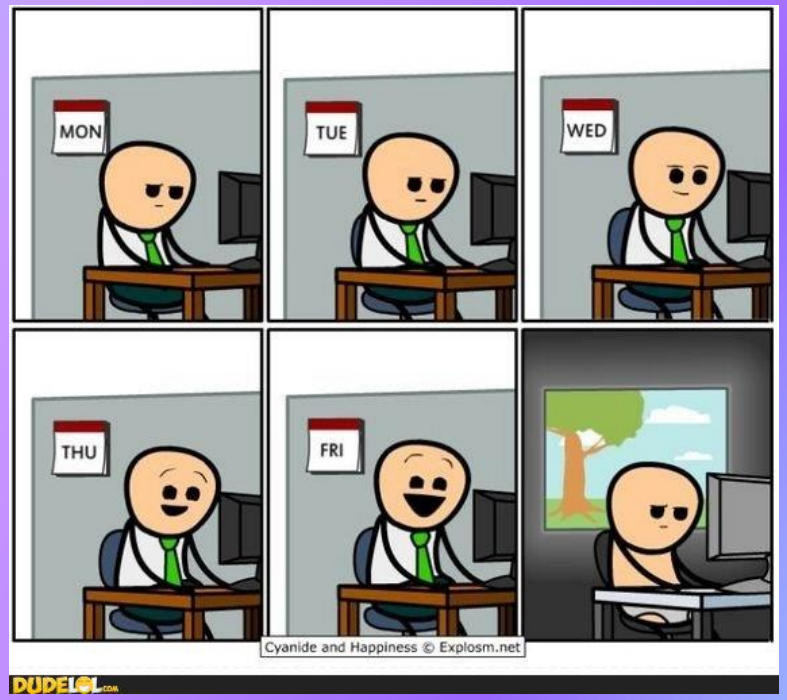
- Accessory Glands

Describe the composition and importance of semen

- Sperm and seminal fluid have sugar which is energy for sperm
- It also protects from acidity and is liquid medium for sperm cells to swim!

Why do you think the male testes are outside the body?

- To keep the testes cool! (this increases sperm production)



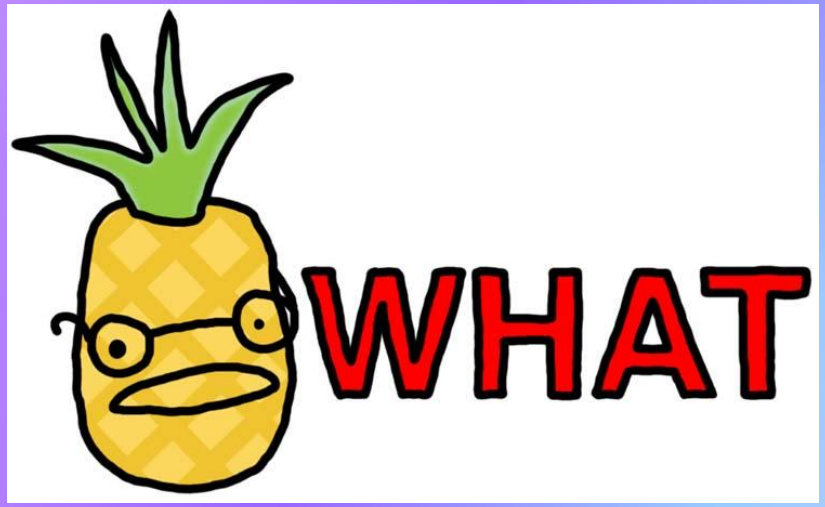
Female Reproductive System

Female Reproduction System

- The female sex cell is the **egg**
- Purpose of the female reproductive system is the **nurture** the egg from **fertilization** to **birth**

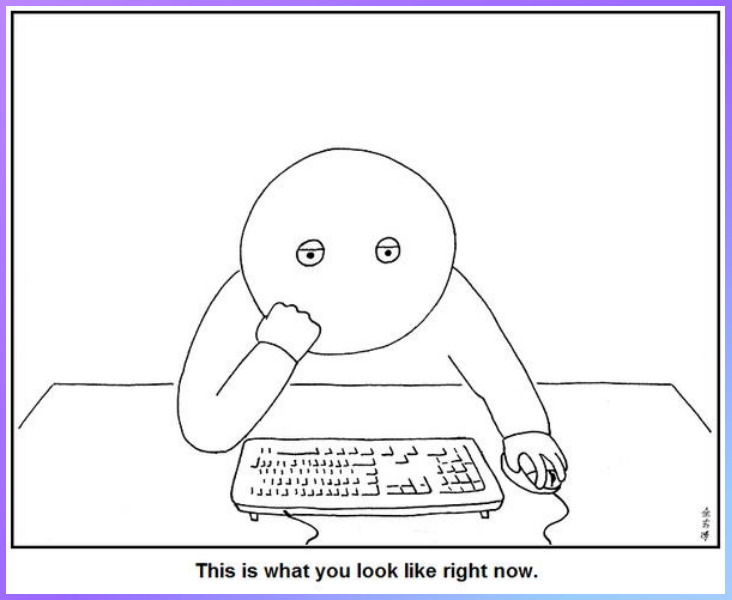
Sex Characteristics

- Females have both **primary** and **secondary** sex characteristics
- Primary = **reproductive** organs

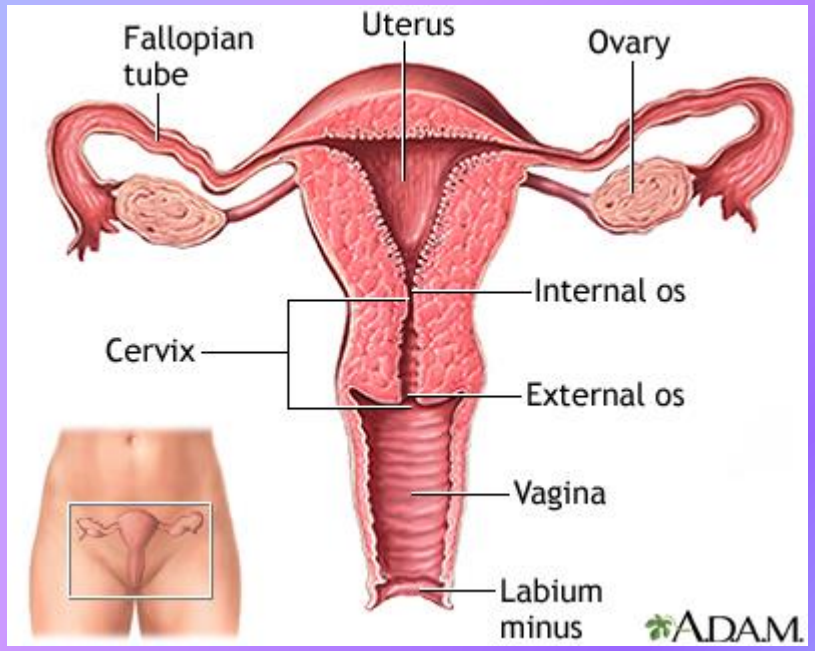


Secondary Characteristics

- Develops during **puberty**
- Puberty: between 10 and 12
  - occurs when **estrogen** is produced
- Includes:
  - Breast development
  - Wider hips
  - Underarm and pubic hair



Reproductive Organs

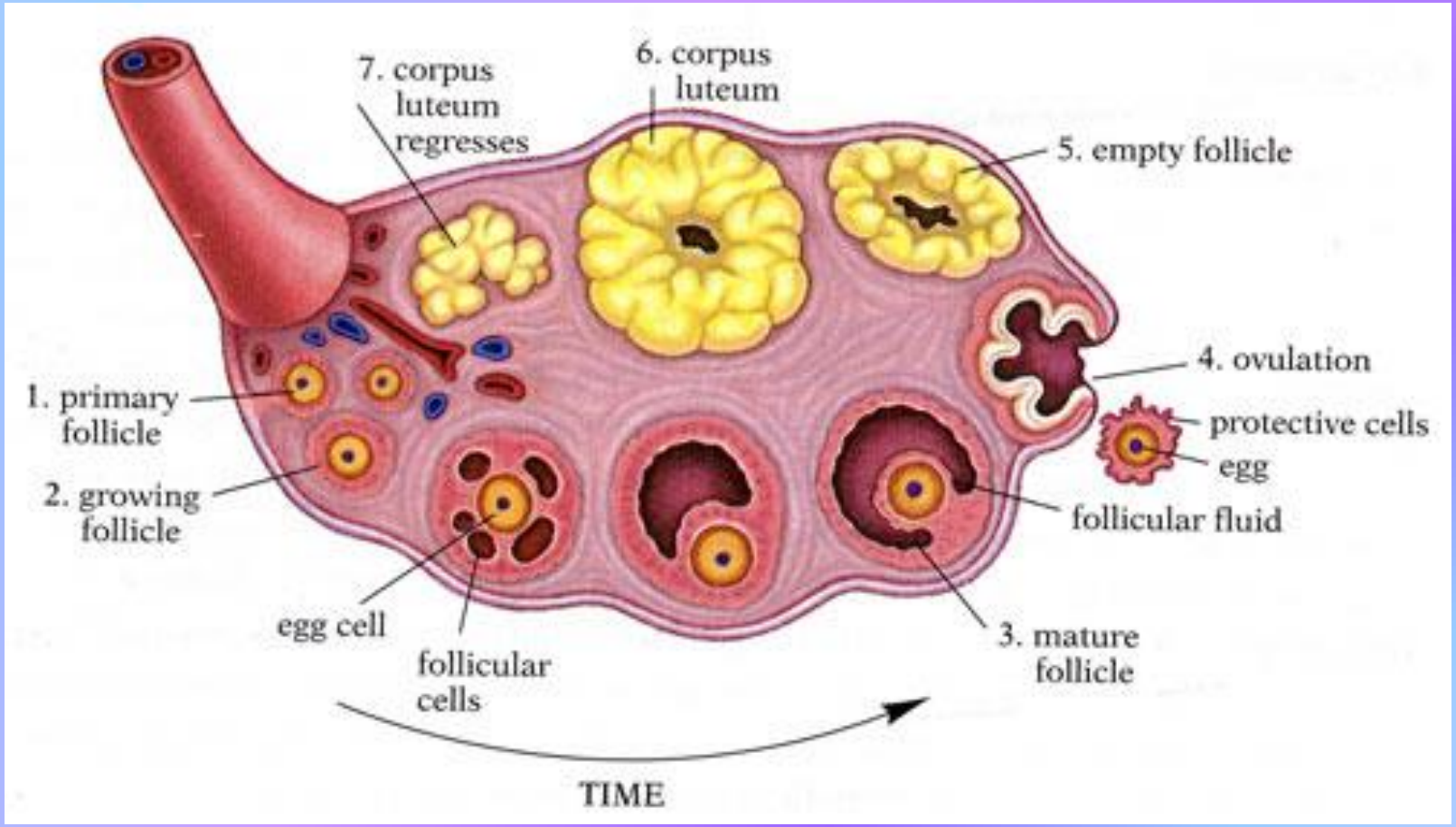


Egg Production and Development

- Egg (ovum) is much larger than sperm
  - Has an outer barrier that prevents more than one sperm from entering

- Females have all sex cells at birth
  - Over two million but break down over time leaving around 400,000 at puberty
  - Once puberty begins a single egg matures and is released each month

Egg Development



Menstrual Cycle

- Female reproductive cycle
- Begins at the onset of puberty
- Approx 28 days but can vary
- Also can change throughout a woman's life
- Each cycle an egg matures and is released
  - It is possible to have more than one released
- This repeats until menopause where the cycle stops (40-50 years old)

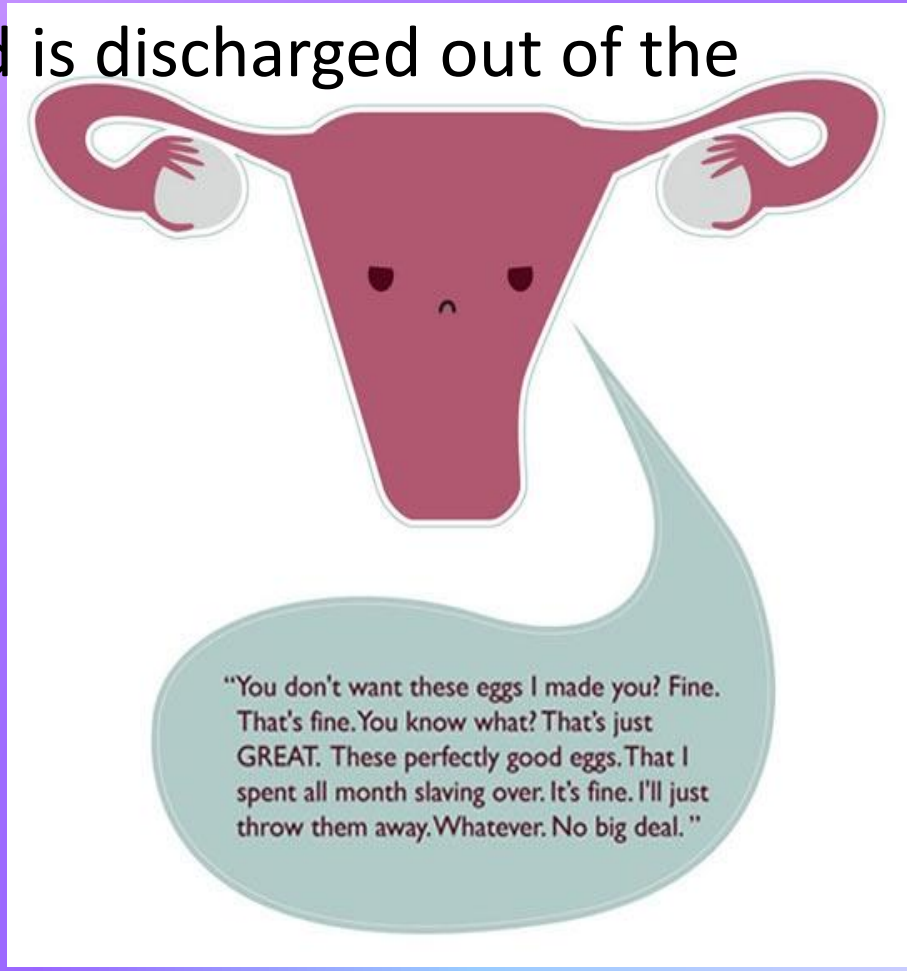

Olfactory bulb
Olfactory tract
Forebrain
Midbrain
Cerebellum
Hindbrain
SHARK BRAIN
Supportive muscle of Ovary
Uterus (upright)
Cervix
Vaginal Fornix
Vagina
Labia Minora
Labia Majora
VAGINA
FROM NOW ON MY PERIOD WILL BE KNOWN AS "SHARK WEEK"
Consider yourself warned.

Ovulation

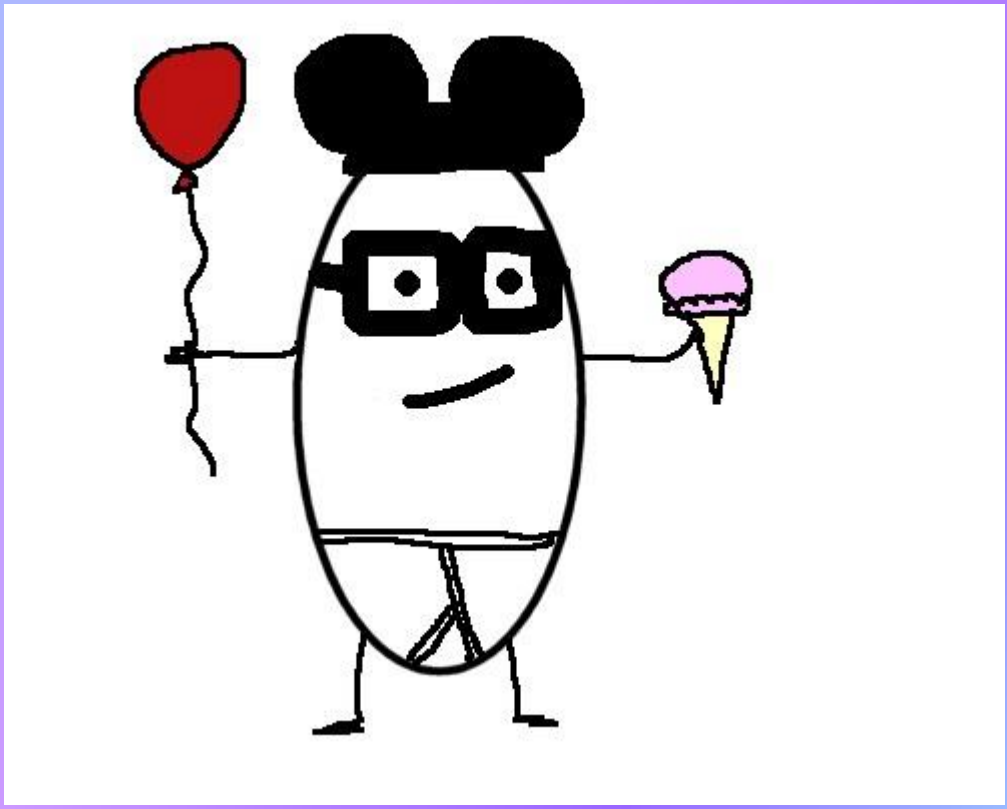
- As follicle matures nutrient producing cells develop around the egg cell
- The cells will divide and form a nutrient rich cavity
- Once egg is mature it will burst through the wall of the ovary (ovulation)
- Empty follicle is called the corpus luteum which matures and produces estrogen and progesterone

Menstruation vs Pregnancy

- If no sperm is present in the oviduct the egg continues to the uterus and is discharged out of the vagina.
- Menstruation is the shedding of the endometrium
- If the egg and sperm are present in the oviduct then fertilization can occur



Questions for the GIRLS!

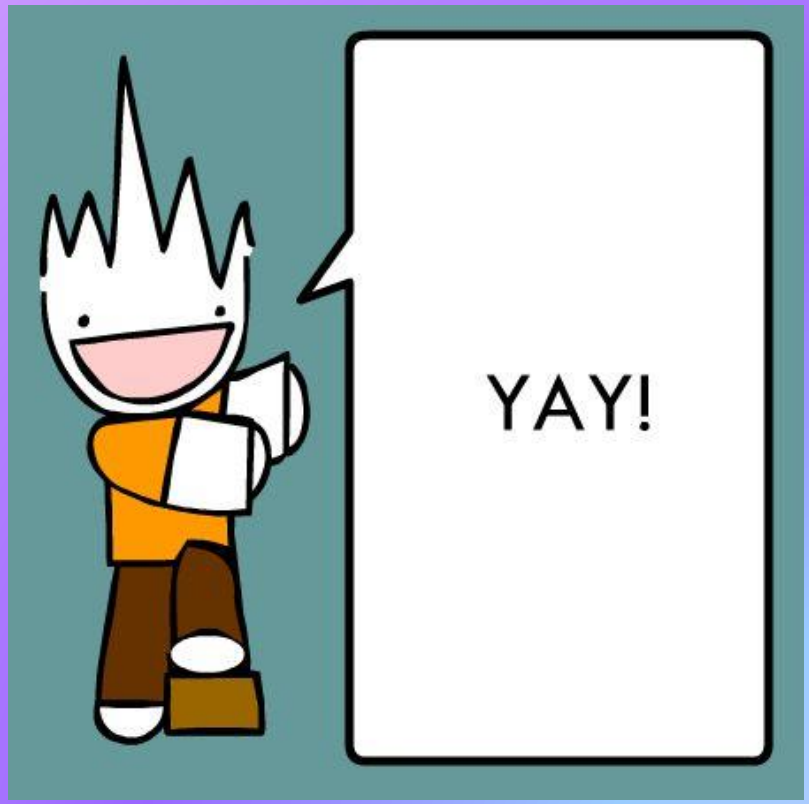


What is the menstrual cycle and how long does it last?

- It is the reproductive cycle
- The shedding of the endometrium (the uterine lining)
- Lasts 28 days

Define Menopause

- Halting of menstrual cycle: no more eggs are being produced



When does ovulation occur?

- Day 14
- HALF WAY through the 28 day cycle

What is the corpus luteum?

- Results from empty follicle?