Reproductive System

Male Reproductive System
- seminal vesicle
- prostate gland
- penis
- vas deferens
- testis
- scrotum
- urethra

Female Reproductive System
- fallopian tube
- ovary
- uterus
- cervix
- vagina

Inside View
HATERS GONNA HATE

AIN'TERS GONNA AINT
We still aren’t 100% sure why people yawn.

Many scientists today think that yawning is a way to keep our brains alert in times of stress, but exactly why that happens or what the yawn does to help our body isn’t 100% clear.

That could be why they are contagious; we are alerted to a potential stressor by another person. Others believe that yawns are a reaction to being tired, as a way to reengage. Yawning may help us get more oxygen to help our brains perform better, or it may cool down the brain, which gets hotter in times of stress. We still aren’t exactly sure what role yawning serves in human biology.
The female gonads are the **ovaries**. Much like the male gonad, these gonads are responsible for making haploid sex cells and sex hormones. The ovaries usually produce one **egg** (or **ovum**) per month during the process of **oogenesis**.

**Ovulation** is the release of the egg from the ovary as it enters an oviduct.
The Genital Tract

The oviducts that extend from the ovaries to the uterus have finger-like projections or fimbriae that sweep the egg into an oviduct with the help of cilia. Fertilization usually takes place in the oviduct; the zygote moves by ciliary movement and oviduct contractions to the uterus, where it implants in the uterine lining (endometrium).
The pear-shaped *uterus* is thick-walled and muscular. The lower end of the uterus is the *cervix* that opens into the *vagina*. The vagina facilitates sexual intercourse, serves as the birth canal, and acts as an exit for menstrual flow.
External Genitals

The external genital area of the female is the *vulva* and includes the vaginal opening, urethral opening, clitoris, labia minora, and labia majora. The vagina may be partially closed by a ring of tissue called the *hymen*. The reproductive and urinary systems in females are completely separate.
The female reproductive tract
https://www.youtube.com/watch?v=9rs2gNchQig
Female Hormone Levels

The Ovarian Cycle

An ovary has an outer cortex and an inner medulla; the cortex is where egg cells lie.

A female is born with up to 2 million ovarian follicles (with immature oocytes) that reduce to 300,000–400,000 by puberty, but only 400 follicles mature at the rate of one egg per monthly cycle.

The ovarian cycle is under the control of FSH and LH.
Anatomy of ovary and follicle
Egg follicles mature, from primary follicles to Graafian follicles. When the egg is released, the empty follicle becomes the hormone-secreting corpus luteum.

The ovaries produce the female sex hormones estrogen and progesterone. Estrogen and progesterone exert feedback control over the hypothalamus and the anterior pituitary causing the cycle to begin again.
Let’s talk about the Ovarian Cycle Specifics!

3 phases

1. Follicular Phase (day 1-13)
   • Menstruation occurs
   • Rebuilding uterine lining
   • Estrogen predominates

2. Ovulation (day 14)
   • LH Surge

3. Luteal phase (day 15-28)
   • Progesterone predominates; released by corpus luteum
   • Day 25, negative feedback by progesterone on LH causes corpus luteum to degenerate->decrease in progesterone -> endometrium lining degenerates
During a **follicular phase** (day 1-13), the Ant Pit Secretes LH and FSH, which promote the maturation of a follicle in the ovary. As the follicle matures, it secretes estrogen (neg. affects LH and FSH secretion) and progesterone (to build endometrium).
- As Follicle Develops it puts out increasing levels of Estrogen. This Estrogen helps prepare the Uterus for possible Implantation.
Ovulation occurs on day 14 of a 28-day cycle…. The Ovary releases an ovum (due to a spike/surge in LH and the corpus luteum begins to form
During a *luteal phase* (days 15–28), the corpus luteum develops under the influence of LH and secretes progesterone and estrogen to promote the development of the endometrium.

If there is no fertilization of the egg, therefore no implantation of the developing zygote, then the Corpus Luteum will degenerate. As it degenerates, the levels of Estrogen and Progesterone both drop. This drop in Estrogen and Progesterone is noticed by the Hypothalamus.
Ovarian Cycle.. In a nutshell...
Hormonal control of ovaries
The Uterine Cycle
The female sex hormones, estrogen and progesterone, affect the endometrium, causing the uterus to undergo a cyclical series of events called the uterine cycle.

3 main phases:
1. Menstrual phase (Menses) (day 1-5)
2. Proliferative phase (day 6-14)
3. Secretory phase (day 15-28)
During *menstruation* (days 1-5), menses occurs due to the low levels of estrogen and progesterone in the blood.

- The endometrium lining (uterine lining) breaks down and is discharged (when bleeding starts)
During a **proliferative phase** (days 6-13), the endometrium thickens.

*Ovulation* occurs about day 14.

During a **secretory phase** (days 15-28), the endometrium continues to thicken and becomes vascular. [the lining of the uterus is maintained]

If pregnancy does not occur the cycle begins again.
Female hormone levels

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Ovarian cycle

Hormone Levels

FSH
LH

Ovarian Events

Developing follicle
Mature follicle
Early corpus luteum
Regressing corpus luteum

Days

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 1

Follicular Phase
Ovulation
Luteal Phase

Uterine cycle

Hormone Levels

Estrogen
Progesterone

Endometrium

Menses

Menstruation
Proliferative Phase
Secretory Phase

Days

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 30
https://www.youtube.com/watch?v=rL3TGNbBQWM

https://www.youtube.com/watch?v=l_wX285vrrU
Fertilization and Pregnancy

If fertilization occurs, the embryo *implants* in the endometrium. The *placenta* begins to produce *human chorionic gonadotropin (HCG)*, which maintains the corpus luteum and the uterine lining is maintained. Eventually, the placenta will produce sufficient estrogen and progesterone. No new ovulations occur during this time.
• The muscular uterus continues to contract slightly throughout pregnancy. As contractions being more intense and more sustained, true labour begins to happen.
The birth process has 3 stages
1. Dilation of cervix
2. Birth
3. Expulsion of the afterbirth
Oxytocin is a hormone that is produced by the hypothalamus and secreted by the posterior pituitary.

- Its release is stimulated by pressure on the cervix (which is due to the contractions of the uterus) -> true labour!
- More contractions = more oxytocin released = positive feedback
Estrogen and Progesterone

At puberty, sex hormones (primarily estrogen) stimulate development of sex organs and maintain the secondary sex characteristics.

Estrogen is primarily responsible for female fat distribution.

Both estrogen and progesterone are needed for breast development.

Females have a wider pelvic girdle than males.