# Science & Technology 5: The Vulva, Vagina, Uterus, and Surrounding Systems

## Aim/Rationale

Students will understand the reproductive anatomy of bodies with vulvas.


### Materials

- Computer with projector

## Development/Teaching Methods

1. **Presentation of Anatomical Diagrams:** (15 minutes)
   - Using the PowerPoint presentation, introduce basic reproductive anatomy of bodies with vulvas. (All images courtesy of Wikimedia Commons)
   - Use the script below to explain the functions of the various organs and body parts.

REPRODUCTIVE ANATOMY:
From outside to inside:
**Vulva**: The outside of the vagina, consists of: major and minor labia, clitoris, vaginal opening

- Functions as protection for internal sex organs
- The size and colour of the inner and outer lips (labia) vary in different individuals.
- The **clitoris** is not a reproductive organ, but plays a large role in sexual pleasure. It has many nerve endings (like the tip of the penis) and is very sensitive. The clitoris becomes erect during arousal. Function is sexual pleasure.
- *Hygiene tip #1*: Do not use vaginal douches or perfumed soaps as they can change the pH balance of the vagina and allow bacteria to flourish.
- *Hygiene tip #2*: Wipe from *front to back* to prevent spread of bacteria from the anus to the vagina or urethra (potential cause for urinary tract infections).

**Vagina**: ~8cm long from the vaginal opening to the cervix, the walls are elastic and rest against each other when at rest, but a space opens when aroused or upon insertion of a tampon, for example

- Functions notably during menstruation, intercourse/sexual play, childbirth
- Not used for urination (the urethra is the opening just above the vagina from which urine is excreted from the bladder)
- The **hymen** (a thin membrane) surrounds the vaginal opening, and may not be noticeable in some bodies. Remember, size and shape of all body parts vary from person to person; there is no “right” or “wrong” way for these body parts to appear.

**Cervix**: entry point into the uterus

**Uterus**: The fist-sized organ that has the potential to hold a developing foetus. The uterus is lined with the endometrium (the layer of tissue and blood that supports implantation of a fertilized egg). The endometrium is shed during menstruation.

**Fallopian Tubes**: Two tubes that connect each ovary with the uterus. Eggs are released into the tubes and may be fertilized near the ovary. The fertilized eggs continue down the fallopian tubes to implant in the uterine lining (endometrium).

**Ovaries**: the sites of egg production and hormone production and release. There are two of these almond-shaped structures that lie on either side of the uterus. Each month, one or more eggs mature in follicles (small capsules) and then are released (ovulation) into the fallopian tubes. Ovaries hold about 250 000 ova (eggs) until puberty when they start being released, one per month.

Four functions:

1. Oogenesis: gamete production during fetal development
2. Maturation of the oocyte

3. Ovulation: Release of the mature oocyte
4. Secretion of steroid sex hormones (estrogen, progesterone, and testosterone)

2. **Reproductive Hormones and the Menstrual Cycle** (20 minutes)

Background knowledge (may or may not be necessary to review):

- **Hormone**: Chemical messengers carried through the bloodstream
- **Endocrine glands** secrete hormones.
- The **endocrine system** consists of all of the endocrine glands, and is one of the body's main communication systems (the other is the nervous system).
- The **hypothalamus** is part of the brain and is an important component of the endocrine system.
- The **pituitary gland** is connected to the hypothalamus.
- The pituitary gland is comprised of two adjacent lobes: the **anterior pituitary** and the **posterior pituitary**, both of which serve different endocrine functions.
- Ova (multiple ovum) exist inside **follicles** within the ovary.
- Ova are released from the follicles at ovulation and the ruptured follicle becomes the **corpus luteum**, which secretes estrogen and progesterone.

Reproductive hormones:
Note: Refer to the diagram of the menstrual cycle while presenting these hormones to orient students with the layout of the diagram.

- **GnRH** (Gonadotropin Releasing Hormone):
  - Beginning of the reproductive hormone chain
  - Secreted from hypothalamus, acts on anterior pituitary
  - Signals release of LH and FSH from anterior pituitary
- **LH** (Leutenizing Hormone):
  - Secreted from anterior pituitary
  - Stimulates production of estrogen in ovary
  - Involved in ovulation
- **FSH** (Follicle Stimulating Hormone):
  - Secreted from anterior pituitary
  - Stimulates ovarian follicle growth
- **Estrogen**:
  - Development of secondary sex characteristics
  - Involved in ovarian follicle development
- **Progesterone**:
  - Involved in endometrial growth and pregnancy
- **Androgens:**
  - Important role in development of secondary sex characteristics
  - Secreted by adrenal glands (above kidneys) and ovaries
  - Probably contributes to sex drive
- **Oxytocin**: (OPTIONAL)
  - Stimulates contraction of uterus during childbirth
  - Secreted from posterior pituitary in response to suckling of nipples
  - Stimulates milk ejection during lactation

- Unsure of function (if any) in people with penises

➢ **Prolactin**: (OPTIONAL)
- Secreted from anterior pituitary
- Stimulates milk production in breast

Present the menstrual cycle diagram slowly, explaining different steps and demonstrating the connection between certain hormone levels and their effect on the ovarian follicles and uterine lining.
Encourage students to write down important points on their handout.

| DAYS | PHASES AND EVENTS |
|---|---|
| 1-5 | **MENSES**<br>• Corpus luteum is degenerating so estrogen and progesterone levels are low<br>• Endometrial lining is shed<br>• Because of low estrogen and progesterone levels, FSH and LH levels increase<br>• Because of FSH and LH increase, several follicles begin to mature |
| 7-12 | **PROLIFERATIVE**<br>• One (usually) follicle becomes dominant<br>• The dominant follicle secretes estrogen so estrogen levels increase<br>• This stimulates proliferation of the endoemtrium<br>• LH and FSH decrease due to increase in estrogen (negative feedback)<br>• This leads to degeneration of non-dominant follicle |
| 12-13 | **LH SURGE**<br>• Increasing estrogen from dominant follicle stimulates LH surge<br>• Ocyte completes first meiotic division<br>• Involved in stimulation of ovulation |
| 14 | **OVULATION**<br>• Follicle ruptures releasing ova |
| 15-25 | **SECRETORY (LUTEAL)**<br>• Corpus luteum forms and secretes estrogen and progesterone<br>• Secretion of LH and FSH inhibited so new follicles develop |
| 25-28 | **CORPUS LUTEUM DEGENERATION** (if no fertilization and implantation occurs)<br>• Estrogen and progesterone levels decrease<br>• Endometrial lining begins to shed<br>• The cycle begins again |

## Culmination

- In groups, have students research one of the following health issues: Breast cancer, ovarian cancer, HPV, cervical cancer, pelvic inflammatory disease, clitoris, female ejaculation/orgasm, PMS, hormonal birth control, hormone replacement therapy, yeast infections, pap smears etc.
- Students should touch on the following in their presentations:
    - What age range does this topic affect most?
    - Discussion of the anatomy relating to the topic
    - Diagnosis/Treatment
    - How it works
    - New or recent areas of research on the topic
    - Population trends with respect to the topic

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