Spermatogenesis

Production of _____

Begins at _____ and continues throughout life

Occurs in the _____

_____ (stem cells) undergo rapid mitosis to produce more stem cells before puberty

_____ (FSH) stimulates sperm to divide

Primary spermatocytes undergo _____

One primary spermatocyte produces _____ spermatids with _____ chromosomes

Human Life Cycle

Union of a _____ (___ chromosomes) with an _____ (____ chromosomes) creates a _____ (____ chromosomes)

_____- Growth of a Sperm

Late spermatids are produced with distinct regions - _____, _____, _____

Spermatogenesis takes _____ days

Structure of a Sperm

Head

Contains _____

_____—"helmet" on the nucleus, similar to a large lysosome

Breaks down and releases _____ to help the sperm penetrate an egg

Midpiece - Wrapped by _____ for ATP generation (energy)

Testosterone Production

Produced in _____

During puberty, _____ (LH) activate the interstitial cells

Functions of testosterone: Stimulates reproductive organ development, Underlies sex drive, Causes secondary sex characteristics like _____

_____

Ovarian Follicle Stages

Primary follicle —contains an _____ oocyte

Graafian follicle — _____ follicle with a maturing oocyte

Ovulation —when the egg is _____, the follicle ruptures; occurs about every _____

The ruptured follicle is **transformed into a _____** (degenerated follicle)

Oogenesis and the Ovarian Cycle

The **total supply of eggs are _____**

Ability to **release eggs begins a_____**

Reproductive ability **ends at _____**

Oocytes are **matured in** developing ovarian **follicles**

_____— female **stem cells** found in a developing fetus

Oogonia undergo mitosis to **produce primary oocytes**

Primary oocytes are surrounded by cells that form _____ in the ovary

Oogonia _____ by the time of birth

Primary oocytes are _____

_____ (FSH) causes some primary follicles to mature each month

Follicle development to the **stage of a vesicular follicle takes about _____ days**

_____ signals the release of the secondary oocyte

Ovulation

Once ovum is formed, the 23 chromosomes can be combined with those of the sperm to form the fertilized egg

If the secondary oocyte is *not* penetrated by a sperm, it _____ and does not complete meiosis to form an ovum

Male and Female Differences

Males —

Females —

Uterine (Menstrual) Cycle

Cyclic changes of the _____

Regulated by cyclic production of _____

_____ regulate the production of estrogens and progesterone

Both female cycles are about _____days in length

Ovulation typically occurs about midway through cycle on day 14

Menstrual phase - Days _____

Functional layer of the endometrium is _____

Bleeding occurs for 3–5 days

Proliferative stage - Days _____

_____ of functional layer of the endometrium

Ovulation occurs in the ovary at the end of this stage

Secretory stage - Days 15–28

Progesterone levels rise due to increase the blood supply to the endometrium

Endometrium _____ in size and _____for _____

If fertilization does occur: Embryo produces a hormone that causes the corpus luteum to continue producing its hormones

If fertilization does NOT occur: Corpus luteum degenerates as LH blood levels decline

_____ – 1st period

_____ — a whole year has passed without menstruation, Ovaries stop functioning, Childbearing ability ends

Hormone Production by the Ovaries

Estrogens: Produced by _____cells, Cause secondary sex characteristics

Progesterone: Produced by the _____, Does not contribute to the appearance of secondary sex characteristics, Helps maintain _____, Prepare the breasts for _____ production

Stages of Pregnancy and Development

Fertilization

The oocyte is viable for _____hours after ovulation, Sperm are viable for _____ hours after ejaculation

Mechanisms of Fertilization

- When sperm reach the oocyte, enzymes break down the _____ layer of the oocyte
- Once a path is cleared, sperm undergo an acrosomal reaction (acrosomal membranes break down and _____ holes in the oocyte membrane)

- Membrane receptors on an oocyte _____of the first _____cell to make contact
- The membrane of the oocyte does _____ a second sperm head to enter
- Fertilization occurs when the **genetic material of a sperm combines with that of an oocyte to form a zygote**

Developmental Stages

Embryo —

Morula —

Blastocyst —

Fetus —

Development After Implantation

_____ develops

_____ — fluid-filled sac that surrounds the embryo

_____ - Blood-vessel containing stalk of tissue, Attaches the embryo to the placenta

Functions of the Placenta

- Forms a _____ between mother and embryo (blood is not exchanged)
- Delivers _____ and _____
- Removes _____ from embryonic blood
- Produces hormones and takes over for the corpus luteum by producing: Estrogen, Progesterone, Other hormones that maintain pregnancy

The Fetus (Beginning of the Ninth Week)

- All organ systems are formed by the _____
- Activities of the fetus are growth and organ specialization
- This is a stage of tremendous growth and change in appearance

Childbirth (Parturition)

- _____ —the series of events that expel the infant from the uterus
- False labor —_____ contractions are weak, irregular uterine contractions

Initiation of labor

- *Estrogen levels* _____
- Uterine _____begin
- The *placenta releases* _____
- _____ is released by the pituitary
- Combination of these hormones oxytocin and prostaglandins produces contractions

Dilation

- _____ becomes dilated
- Full dilation is _____ cm
- Uterine contractions begin and _____
- Cervix _____ and _____ (thins)
- The amnion _____ (“breaking the water”)
- Longest stage at 6–12 hours

Expulsion

- Infant passes through the _____
- Can last as long as 2 hours, but typically is 50 minutes in the first birth and 20 minutes in subsequent births
- Normal delivery is _____
- _____ presentation is buttocks-first

Placental stage

- Delivery of the placenta "_____"
- Usually accomplished within 15 minutes after birth of infant

Developmental Aspects of the Reproductive System

Gender is _____

Males have____ sex chromosomes

Females have _____ sex chromosomes

Gonads do not begin to form until the _____

_____ determines whether male or female structures will form