Oogenesis

- Girls become mature at time of puberty, the main sign of puberty is menstrual cycle

1) Intra-uterine (before birth):-

- Gametes (sex cells / reproductive cells) originate from the Epiblast as primordial germ cells (PGCs) → ("during second week") They move to the wall of the yolk sac → They settle down in the ovaries (gonad) (4th-5th week)

mitotic divisions → Oogonia (diploid (2n), single structured)

- They become surrounded by flat epithelial cells (Follicular cells) → (3rd month)
- Continue to divide by Mitosis but some of them enter meiosis and arrest in their cell division in (prophase meiosis 1) form → Primary oocyte (2n) (Double structured).
- remain arrested in prophase of meiosis I diplotene stage and not finish their first meiotic division before puberty is reached.
  - by oocyte maturation inhibitor (OMI) a small peptide secreted by follicular cells.
- Total number of germs cells in ovary reaches maximum (5th month) → Estimated 7 millions.
- At this time, many oogonia and primary oocyte become atretic.
- By (7th month) majority of oogonia have degenerated exept for few near surface.

All surviving primary oocytes will
- Individually surrounded by a layer of flat cells (Follicular cells) → primordial Follicle.
- Enter prophase of meiosis 1

- Near the time of birth: all primary oocytes have started prophase of meiosis I but instead of proceeding into metaphase, they enter the diplotene stage.

2) At birth:-

600,000 to 800,000 primary oocytes.

- It's still "primary oocyte" rested in (diplotene stage in meiosis 1).

3) During childhood:-

- Most oocyte become atretic
- 40,000 are present by the begining of puberty.
- Fewer than 500 will be ovulated during life time.

4) At puberty:-

The female begins to undergo regular monthly cycles called sexual cycles (→ under the control of the Hypothalamus.)

Neuroendocrine access→ the brain send massages at certain time at certain age at puberty to the Hypothalamus send massages in form Gonadotropin releasing hormone (GnRH) which goes to Anterior lobe (adenohypophysis) of the pituitary gland secretes 2 hormones "Follicle stimulating hormone (FSH) and Luteinizing hormone" which drive the ovarian cycle. So the ovary secrets (Estrogen & Progesterone) affect the Uterus Endometrium and they drive what we called Menstrual cycle.

* ovarian cycle *

ovarian follicles → ovulation → formation the corpus luteum

↳ Follicular development → FSH → Stimulates 15 to 20 follicles selected to be matured and pass through 3 stages each month, and only 1 of these follicle reaches full maturity.