**IB Biology SL Unit Plan**

**Instructor:** Joshua Amiel

**Subject / Grade**: IB Biology SL (Reproduction)

**IB Biology SL PLO’s:**

6.6.1: Draw and label diagrams of the adult male and female reproductive systems.

6.6.2: Outline the role of hormones in the menstrual cycle, including FSH, LH, estrogen and progesterone.

6.6.3: Annotate a graph showing hormone levels in the menstrual cycle, illustrating the relationship between changes in hormone levels and ovulation, menstruation and thickening of the endometrium.

6.6.4:List three roles of testosterone in males.

6.6.5: Outline the process of *in vitro* fertilization (IVF).

6.6.6: Discuss the ethical issues associated with IVF.

11.4.1: Annotate a light micrograph of testis tissue to show the location and function of interstitial cells, germinal epithelium cells, developing spermatozoa and Sertoli cells.

11.4.2: Outline the processes involve in spermatogenesis within the testis, including mitosis, cell growth, meiosis and cell differentiation.

11.4.3: State the role of FSH, LH and testosterone in spermatogenesis.

11.4.4: Annotate a diagram of the ovary and show the function of germinal epithelium, primary follicles, mature follicle and secondary oocyte.

11.4.5: Outline the processes involved in oogensis within the ovary, including mitosis, cell growth, meiosis, and polar bodies.

11.4.6: Draw and label a diagram of a mature egg and sperm.

11.4.7: Outline the role of the epididymis, seminal vesicle and prostate gland in the production of semen.

11.4.8: Compare the processes of spermatogenesis and oogenesis, including the number of gametes and timing of the formation and release of gametes.

11.4.9: Describe the process of fertilization, including the acrosome reaction, penetration of the egg membrane by a sperm and the cortical reaction.

11.4.10: Outline the role of HCG in early pregnancy.

11.4.11: Outline early embryo development up to the implantation of the blastocyst.

11.4.12: Explain how the structure and functions of the placenta, including its hormonal role in secretion of estrogen and progesterone, maintain pregnancy.

11.4.13: State that the fetus is supported and protected by the amniotic sac and amniotic fluid.

11.4.14: State that materials are exchanges between the maternal and fetal blood in the placenta.

11.4.15: Outline the process of birth and its hormonal control, including the changes in progesterone and oxytocin levels and positive feedback.

**Summative Assessment**

Three quizzes; Unit Test.

**Resources:**

IB Biology text (Damon *et al.*).

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| **Date** | **Lesson Topic** | **Subject PLO’s** | **Student Activities** | **Teacher Activities** |
| Mar. 23 | Ch. 6 Reproduction (Damon *et al.* 186, 310-311). | 6.6.1 Draw and label diagrams of the adult female reproductive system.  11.4.4: Annotate a diagram of the ovary and show the function of germinal epithelium, primary follicles, mature follicle and secondary oocyte.  11.4.5: Outline the processes involved in oogensis within the ovary, including mitosis, cell growth, meiosis, and polar bodies.  11.4.6: Draw and label a diagram of a mature egg and sperm. | * Make name cards. * Demonstrate knowledge of reproduction. * Jigsaw to complete pp. 1, 3-4 of handout. * Step through female reproductive tract as a class (including ovaries and oogenesis). | * Introduce myself. * Probe for students knowledge about reproduction (e.g. ploidy, mitosis, meiosis). * Provide reproduction hand-out. * Step through female reproductive tract. |
| Mar. 25 | Ch. 6 Reproduction (Damon *et al.* 185, 307-309, 311). | 6.6.1 Draw and label diagrams of the adult male reproductive system.  11.4.1: Annotate a light micrograph of testis tissue to show the location and function of interstitial cells, germinal epithelium cells, developing spermatozoa and Sertoli cells.  11.4.2: Outline the processes involved in spermatogenesis within the testis, including mitosis, cell growth, meiosis and cell differentiation.  11.4.6: Draw and label a diagram of a mature egg and sperm.  11.4.7: Outline the role of the epididymis, seminal vesicle and prostate gland in the production of semen.  11.4.8: Compare the processes of spermatogenesis and oogenesis, including the number of gametes and timing of the formation and release of gametes. | * Draw and label the female reproductive tract warm-up activity (peer assessed). * Work on pages 1, 6-7 of reproduction handout. * Create a class flowchart for spermatogenesis to ejaculation. * TPS to compare and contrast oogenesis and spermatogenesis. | * Provide quiz answers for peer assessment. * Facilitate student-led flow chart for spermtaogenesis to ejaculation. * Review the locations and functions of the different parts of the male reproductive tract. * Compare and contrast oogenesis and spermatogenesis. |
| Mar. 27 | Ch. 6 Reproduction (Damon *et al.* 186-188). | 6.6.2: Outline the role of hormones in the menstrual cycle, including FSH, LH, estrogen and progesterone.  6.6.3: Annotate a graph showing hormone levels in the menstrual cycle, illustrating the relationship between changes in hormone levels and ovulation, menstruation and thickening of the endometrium.  6.6.4:List three roles of testosterone in males.  11.4.3: State the role of FSH, LH and testosterone in spermatogenesis. | * **Quiz:** Male and female reproductive tracts, oogenesis and spermatogenesis. * Work on handout p. 2, 5. * In groups, create a flowchart to show the effect of hormones in uterine and ovarian cycles (include oogenesis mitosis, meiosis I and II, fertilization). | * Proctor quiz. * Facilitate the construction of a class flowchart on hormones in female reproduction. * Review the roles of FSH, LH, estrogen and progesterone in the uterine and ovarian cycles. * Birth control extension and negative feedback control. |
| Mar. 31 | Ch. 6 Reproduction (Damon *et al.* 312-314). | 11.4.9: Describe the process of fertilization, including the acrosome reaction, penetration of the egg membrane by a sperm and the cortical reaction.  11.4.10: Outline the role of HCG in early pregnancy.  11.4.11: Outline early embryo development up to the implantation of the blastocyst. | * Kahoot quiz on female reproductive hormones. * Work on handout top of page 8, male reproductive hormones. * Work on pages 10-12 of handout. | * Facilitate the Kahoot quiz. * Review any questions that are unclear. * Review male reproductive hormones. * Introduce fertilization and early pregnancy. |
| Apr. 2 | Ch. 6 Reproduction (Damon *et al.* 314-317). | 11.4.12: Explain how the structure and functions of the placenta, including its hormonal role in secretion of estrogen and progesterone, maintain pregnancy.  11.4.13: State that the fetus is supported and protected by the amniotic sac and amniotic fluid.  11.4.14: State that materials are exchanges between the maternal and fetal blood in the placenta. | * **Quiz:** Reproductive hormones, fertilization and early pregnancy. * Work on pp. 13-14 of handout. * Review exercise for maternal-fetal exchange. | * Proctor quiz. * Introduce maternal-fetal exchange. * Review maternal-fetal exchange. |
| Apr. 8 | Ch. 6 Reproduction (Damon *et al.* 316-317). | 11.4.15: Outline the process of birth and its hormonal control, including the changes in progesterone and oxytocin levels and positive feedback. | * Review maternal-fetal exchange. * Translational activity for process of birth. * Presentations | * Review maternal-fetal exchange. * Introduce translational activity for process of birth. * Assess translational activity. |
| Apr. 10 | Ch. 6 Reproduction (Damon *et al.* 316-317). | 11.4.15: Outline the process of birth and its hormonal control, including the changes in progesterone and oxytocin levels and positive feedback.  6.6.5: Outline the process of *in vitro* fertilization (IVF).  6.6.6: Discuss the ethical issues associated with IVF. | * Complete translational activity presentations. * **Quiz:** Fertilization to birth. * Complete p. 8 of handout. | * Assess translational activity. * Review fertilization to birth. * Proctor quiz. * Introduce IVF and debate. |
| Apr. 14 | Ch. 6 Reproduction (Damon *et al.* 316-317). | Debate and review. | * IVF debate * Reproduction review. | * Mediate IVF debate. * Facilitate reproduction review. |
| Apr. 16 | **Reproduction test.** | **Reproduction test.** | **Reproduction test.** | **Reproduction test.** |