Unit Topic: Reproduction

Essential Question: How is the body designed in order to create cells that allow for sexual reproduction to create offspring?

Concept 1: The Reproductive System

Objectives:

1. Summarize the overall function of the reproductive system and the steps utilized to accomplish this function. Make sure to highlight the additional responsibility of the female reproductive system that the male system doesn't have.
2. List the primary sex organs and describe the role they play in accomplishing the overall function of the reproductive system.
3. Describe where sperm are made and summarize the path they take as they mature and leave the male body.
4. Explain the significance of the different accessory gland secretions to the sperm in the semen.
5. Sketch a cross-section of the penis and label the various erectile tissues that compose it. Explain how each component makes it possible for the penis to serve as the male copulatory organ.
6. Summarize the path an oocyte will take from ovulation to implantation. Include the mechanisms utilized to move it along this path.
7. List the three layers of the uterine wall and describe the specific roles of the two deepest layers in the overall function of the female reproductive system.
8. Summarize where milk is made in lactating females and the path it takes to be secreted from the body for a nursing baby.
9. Explain the role of the HPG axis specifically in puberty, but also its impact on reproduction as a whole.
10. Make a chart to show the differences and similarities between the changes associated with puberty in males vs. females.
11. Summarize the main events and timing of the phases of the ovarian cycle.
12. Summarize the main events and timing of the phases of the uterine cycle.
13. Explain the relationship between gonadotropins, female sex hormones, and the ovarian and uterine cycles.
14. *Be able to interpret and analyze diagrams related to the ovarian and uterine cycles.*
15. *Be able to identify the name and summarize the function of a structure of the male reproductive system when given a description, picture, or physical specimen to reference.*
16. *Be able to identify the name and summarize the function of a structure of the female reproductive system when given a description, picture, or physical specimen to reference.*

Vocabulary:

Gametes
Copulation
Gestation
Parturition
Sperm
Egg
Oocyte
Semen
Erection
Ejaculation
Ovulation
Mammary glands
Puberty
Ovarian cycle
Uterine cycle
Menarche
Dominant follicle
Corpus luteum
Menopause

Concept 2: Fertilization

Objectives:

1. Briefly summarize the overall sequence of events from stem cells in the gonads to the fertilization of an egg to make a zygote.

Vocabulary:

Somatic cells
Haploid
Diploid

2. Differentiate between meiosis and mitosis. 3. Compare and contrast the overall processes of oogenesis and spermatogenesis. 4. Explain the process of spermatogenesis. 5. Sketch a sperm cell and label its key parts. 6. Explain how the structure of each part of the sperm dictates its overall regional function. 7. Explain the process of oogenesis, specifically noting when each phase occurs in a female's lifetime. 8. Describe the path a sperm must travel, and the obstacles it must overcome, in order to fertilize an egg. 9. Explain how the male and female reproductive systems can fail and thus result in infertility. Include a description of at least one form of reproductive technology that can be used to hopefully treat infertility in couples. 10. *Be able to interpret a model of cell division or fertilization and explain what is happening.*	Spermatogonia Primary spermatocytes Spermatids Spermiogenesis Oogonia Primary oocytes Secondary oocytes Ovum Polar bodies Ovarian follicle Primordial follicle Atresia Fertilization Zygote Capacitation
<u>Concept 3</u>: Pregnancy and Development	
<u>Objectives</u>: 1. Explain what is happening to the zygote as it travels from where it is fertilized to where it will implant. 2. Explain why the high surface area to volume ratio that results from early mitotic divisions in the zygote is important. 3. Describe the process of implantation, including where it occurs and how it affects the female cycle. 4. Explain the critical role the placenta plays throughout pregnancy. 5. Sketch a gastrula and summarize what each of the three germ layers will eventually develop into as the embryo grows. 6. Create a timeline of the nine months of pregnancy, summarizing the key events that occur throughout each stage in both the embryo/fetus and the mother. 7. Summarize the importance of hormones to the entire pregnancy process, specifically addressing the roles that key hormones play during childbirth. 8. Explain what must happen to the cervix for the fetus to be able to be delivered vaginally. 9. List the three stages of labor and summarize the key events in each. 10. *Be able to interpret and analyze diagrams related to embryonic and fetal development.*	**<u>Vocabulary</u>**: Gestation period Embryonic period Fetal period Cleavage Morula Blastocyst Gastrula Ectoderm Mesoderm Endoderm Organogenesis Amniotic sac Umbilical cord