Unit 8: Reproductive System

Content Area: **Science**
Course(s): **Anatomy and Physiology**
Time Period: **Fourth Marking Period**
Length: **3 Weeks**
Status: **Published**

Unit Overview

This unit deals with the role of the reproductive system as it pertains to the growth and development of humans. In this chapter, the male anatomy and reproductive functions are presented first. The testes and their accessory ducts are each described in order of sperm travel, followed by an explanation of the accessory glands and their secretions. The next section of this chapter covers the female anatomy and reproductive functions. The ovaries and their accessory ducts are each described, followed by an explanation of the roles of the uterus and vagina, as well as a description of the external female genitalia and female perineum.

STAGE 1- DESIRED RESULTS

Standards- 2020 New Jersey Student Learning Standards- Science

SCI.9-12.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.9-12.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

Science and Engineering Practices

- Analyzing and Interpreting Data
- Asking Questions and Defining Problems
- Constructing Explanations and Designing Solutions
- Developing and Using Models
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information
- Planning and Carrying Out Information
- Using Mathematics and Computational Thinking

Cross Cutting Concepts

- Cause and Effect
- Energy and Matter
- Influence of Engineering, Technology, and Science on Society and the Natural World
- Interdependence of Science, Engineering, and Technology
- Patterns
- Scale, Proportion, and Quantity
- Stability and Change
- Structure and Functions
- Systems and System Models

Disciplinary Core Ideas

Physical Sciences

- PS1A: Structure and Properties of Matter
- PS1B: Chemical Reactions
- PS1C: Nuclear Processes
- PS2A: Forces and Motion
- PS2B: Types of Interaction
- PS3A: Definitions of Energy
- PS3B: Conservation of Energy and Energy Transfer
- PS3C: Relationship Between Energy and Forces
- PS3D: Energy in Chemical Processes and Everyday Life
- PS4A: Wave Properties
- PS4B: Electromagnetic Radiation
- PS4C: Information Technologies and Instrumentation

Life Sciences

- LS1A: Structure and Functions
- LS1B: Growth and Development of Organisms
- LS1C: Organization for Matter and Energy Flow in Organisms
- LS1D: Information Processing
- LS2A: Interdependent Relationships in Ecosystems
- LS2B: Cycles of Matter and Energy Transfer in Ecosystems

- LS2C: Ecosystems Dynamics, Functioning, and Resilience
- LS2D: Social Interactions and Group Behavior
- LS3A: Inheritance of Traits
- LS3B: Variation of traits
- LS4A: Evidence of Common Ancestry and Diversity
- LS4B: Natural Selection
- LS4C: Adaptation
- LS4D: Biodiversity and Humans

Earth and Space Sciences

- ESS1A: The Universe and its Stars
- ESS1B: Earth and the Solar System
- ESS1C: The History of Planet Earth
- ESS2A: Earth Materials and Systems
- ESS2B: Plate Tectonics and Large-Scale Systems
- ESS2C: The Role of Water in Earth's Surface Processes
- ESS2D: Weather and Climate
- ESS2E: Biogeology
- ESS3A: Natural Resources
- ESS3B: Natural Hazards
- ESS3C: Human Impacts on Earth Systems
- ESS3D: Global Climate Change

Engineering. Technology. and Applications of Science

- ETS1A: Defining and Delimiting an Engineering Problem
- ETS1B: Developing Possible Solutioins
- ETS1C: Optimizing the Design Solution

Essential Questions

- What are the components of the reproductive system that supports human growth and development ?
- How are the structures of the reproductive system important in growth and development ?
- What are the stages of growth and development from fertilization to maturity ?

Enduring Understanding

- Reproduction is the mechanism by which the body repairs itself and passes on traits to the next generation.
- The goal of all living things is to continue the species and improve the next generation.
- Sexual reproduction increases variability and thus helps to insure resistance from disease.
- The male body is designed to manufacture and deliver sperm and the female body is designed to manufacture ova and nourish the developing fetus.
- Sperm and ova are carriers of the DNA message and must be united for the next generation to occur.
- The female body is specifically designed and hormonally driven to nourish the developing fetus for at least nine months.

Students will know...

Vocabulary definitions:

Students will know the following vocabulary definitions: Meiosis, Oogenesis, Spermatogenesis, Menstruation, Progestrone, Lutenizing hormone, Follicle stimulating hormone, Corpus Luteum, Blastocycst, Gestation.

Misconceptions:

Students may think that reproductive system functions only because of the reproductive organs.

Students may not realize that hormones and enzymes play an important role in the functioning of the reproductive system.

Students may believe that reproductive health is totally different from the general health of an individual.

Students sometimes think that babies have developed all their organs as soon as they are fertiized.

Students may not realize the gradual progress of development in fetuses.

Students will be able to...

- Connect the structures to the functions of the male and female reproductive system.
- Synthesize the role of hormones in the reproductive system.
- Investigate the process of fertilization, implantation, and development for a human fetus.
- Recognize that the reproductive system ensures continuity of the species by producing offspring.
- Outline the events of the three trimesters of pregnancy.
- Distinguish common diseases/disorders based on homeostatic imbalances within the reproductive system.

STAGE 2- EVIDENCE OF LEARNING

Formative Assessment

- 3- Minute Pause
- A-B-C Summaries
- Analogy Prompt
- Choral Response
- Debriefing
- Exit Card / Ticket
- Hand Signals
- Idea Spinner
- Index Card Summaries
- Inside-Outside Circle Discussion (Fishbowl)
- Journal Entry
- Misconception Check
- Observation
- One Minute Essay
- One Word Summary
- Portfolio Check
- Questions & Answers
- Quiz
- Self-Assessment
- Student Conference
- Think-Pair-Share
- Web or Concept Map

Authentic Assessments

Homework

Classwork

Labs/Assignments

Research

Reproductive System: Work-Alikes and Look-Alikes

Students will draw structural and functional analogies to the working organs of the reproductive systems of both males and females. The organs identified will focus on fertilization, implantation and development of a fetus

Benchmark Assessments

Chapter test on structure of Male/Female Reproductive System.

Chapter test on Reproductive system.

STAGE 3- LEARNING PLAN

Instructional Map

- PowerPoint presentations and notes
- Cooperative grouping
- Audio Visual presentations
- Research
- Have students find and bring in articles that deal with the effects of maternal drug use or alcoholism on the fetus. Use this information as a starting point for class discussion, including a discussion of fetal alcohol syndrome.
- Human development timeline project

- Human cloning debate
- Use a “pregnant” torso model to illustrate the most desirable positioning of the placenta and the vertex presentation of a fetus, along with the placement of fetuses during a multiple pregnancy. Also, demonstrate a breech delivery placement and other nonvertex placements
- Use models and/or animations showing the process of meiosis in spermatogenesis and oogenesis. Emphasize the concept that the haploid cells unite to form diploid cells, which then undergo mitosis. Also, discuss the implications of heredity with meiosis
- Use a “stages of fertilization” model to discuss the process of ovulation, fertilization, and implantation in the female reproductive tract
- Show pictures, models, or preserved specimens of human embryos or fetuses in various stages of development to illustrate the later changes that occur during gestation
- Provide diagrams of the reproductive system for students to label

Modification/Differentiation of Instruction

Modification Strategies

- Cooperative Grouping
- Extended Time
- Frequent Breaks
- Highlighted Text
- Interactive Notebook
- Modified Test
- Oral Directions
- Peer Tutoring
- Preferential Seating
- Re-direct
- Repeated Drill and Practice
- Shortened Assisgnment
- Teacher Notes
- Tutorials
- Use of Additional Reference Materials
- Use of Audio Resources

Differentiation Strategies

High Preparation

- Alternative Assessments
- Choice Boards
- Games and Tournaments
- Group Investigations
- Guided Reading
- Independent Research / Project
- Interest Groups
- Learning Contracts
- Leveled Rubrics
- Literature Circles
- Multiple Intelligence Options
- Multiple Texts
- Personal Agendas
- Project Based Learning (PBL)
- Stations / Centers
- Think-Tac-Toe
- Tiered Activities / Assignments
- Varying Graphic Organizers

Low Preparation

- Choice of Book / Activity
- Cubing Activities
- Exploration by Interest (using interest inventories)
- Flexible Grouping
- Goal Setting With Student
- Homework Options
- Jigsaw
- Mini Workshops to Re-teach or Extend Skills
- Open-ended Activities
- Think-Pair-Share by Readiness, Interest, or Learning Style
- Use of Collaboration
- Use of Reading Buddies
- Varied Journal Prompts

- Varied Product Choice
- Varied Supplemental Materials
- Work Alone / Together

Horizontal Intergration- Interdisciplinary Connections

See Appendix

Vertical Integration- Discipline Mapping

Science classes are designed around the Performance Expectations, Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts in the NGSS. In grade 6, students complete a unit on "Diversity of Life". This leads into "Populations and Ecosystems" in grade 7. In grade 8, students study "Human Systems Interactions" and "Heredity and Adaptations." Following Biology in 9th grade, students take Chemistry in 10th grade. Then, students have taken this full year course of Human Anatomy and Physiology. Anatomy and Physiology being a full year course will focus on having students gain a deeper understanding of the Performance Expectations outlined in the NGSS, particularly in Life Sciences and Engineering Design. Following this course, students will have the option to choose from Physics, Human Impact on the Environment, Forensics and Zoology.

Additional Materials

- Video : The Incredible Human Machine
- Video: Life's Greatest Miracle

Learning Activity #1 : Analyzing Data: Hormonal Changes
Students will use a multi-line graph to analyze the hormonal changes throughout the menstrual cycle. From this information, students will then be able to assess the most fertile period of the female hormone cycle. Students will also be able to conclude the correlations between hormones and the activities of the reproductive organs.

Learning Activity # 2: Hormones: Cause and Effect
Students will identify the cause or effect of given hormones on the reproductive system. Using the cause and effects, they will answer one question analyzing the effect of a specific hormone on the reproductive organs of the body.

Learning Activity # 3 : Timeline Project
Phases of Embryological and Fetal Development. Students will research and create a time line depicting the processes of fertilization, implantation and development of a human fetus. Students will follow a scoring guide to locate photos, images and information of the processes that include how a new human embryo is created and how it develops from conception to birth. The time line will summarize the major events that lead to a completely developed human.