



## Anatomy and Physiology – Unit 15 - The Reproductive System (Chapter 19)

**Overview:** The reproductive system includes gonads (ovaries and testes), ducts, accessory glands and organs, and the external genitalia. The human reproductive system produces, stores, nourishes, and transports functional gametes (reproductive cells). Fertilization is the fusion of male and female gametes.

### Essential Questions:

- How are the anatomy and physiology of the human reproductive system related?
- What are the components of the male reproductive system and describe how sperm are formed?
- What is oogenesis and describe the ovarian and uterine cycles?
- Why is communication between the reproductive and nervous systems of humans crucial to homeostatic regulation?
- What happens during fertilization of the gametes?
- What are the functional relationships between the human muscular system and other human systems?

### NYSSLS Standards:

- **HS-LS1-1 Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.**
  - (DCI) **LS1.A: Structure and Function:** Systems of specialized cells within organisms help them perform the essential functions of life
  - (CCC) **Structure and Function:** Investigating or designing new systems or structures requires a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem.
  - (SEP) **Constructing Explanations and Designing Solutions:** Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
- **HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.**
  - (DCI) **LS1.A: Structure and Function:** Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.
  - (CCC) **Systems and System Models:** Models (e.g. physical, mathematical, computer models) can be used to simulate systems and interactions -- including energy, matter, and informational flows -- within and between systems at different scales.
  - (SEP) **Developing and Using Models:** Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system. Use a model based on evidence to illustrate the relationships between systems or between components of a system.
- **HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis**
  - (DCI) **LS1.A: Structure and Function:** Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.
  - (CCC) **Stability and Change:** Feedback (negative or positive) can stabilize or destabilize a system.
  - (SEP) **Planning and Carrying Out Investigations:** Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.



### BPS Science Department Anatomy and Physiology

<b>3D Learning Overview:</b> <b>KNOW</b> → <u>Disciplinary Core Ideas</u> (DCI): what students need to know  <b>UNDERSTAND</b> → <u>Crosscutting Concepts</u> (CCC): what students look for/ applies across all science domains and <u>Science &amp; Engineering Practices</u> (SEP): how students explore and apply		<b>Crosscutting Concepts (CCC):</b> <ul style="list-style-type: none"> <li>● Patterns</li> <li>● Cause and Effect</li> <li>● Scale, Proportion, and Quantity</li> <li>● Systems and System Models</li> <li>● Energy and Matter</li> <li>● Structure and Function</li> <li>● Stability and Change</li> </ul>		<b>Science and Engineering Practices (SEP):</b> <ul style="list-style-type: none"> <li>● Asking questions (for science) and defining problems (for engineering)</li> <li>● Developing and using models</li> <li>● Planning and carrying out investigations</li> <li>● Analyzing and interpreting data</li> <li>● Using mathematics and computational thinking</li> <li>● Constructing explanations (for science) and designing solutions (for engineering)</li> <li>● Engaging in argument from evidence</li> <li>● Obtaining, evaluating, and communicating information</li> </ul>	
Time Frame	Skills, Practices or Expectations	Textbook Resources	Online Resources	Vocabulary	Higher Order Questions
<b>5.22.23 - 6.2.23</b>  <b>NOTE:</b> <b>5.29.23 – Memorial Day</b>	<b>Anatomy and Physiology:</b> The students will be able to: <ul style="list-style-type: none"> <li>● Describe the anatomy and physiology of the human male and female reproductive systems.</li> <li>● Compare/contrast the male and female reproductive systems.</li> <li>● Compare/contrast the male and female reproductive hormones.</li> <li>● Identify and locate male and female reproductive anatomy.</li> <li>● Evaluate birth control strategies.</li> <li>● Explain the female menstrual cycle and associated hormones.</li> <li>● Describe the effects of aging on the human reproductive system.</li> <li>● Describe the relationships between the reproductive system and other body systems.</li> </ul> <b>Diseases/Disorders:</b> The students will be able to: <ul style="list-style-type: none"> <li>● Explain the effects of lack of exercise on the human reproductive system.</li> </ul>	<b>Chapter 19</b> 19-1 Basic Reproductive Structures (p.639)  19-2 Spermatogenesis and Male Reproductive System (p.640-649) <ul style="list-style-type: none"> <li>● Figure 19-1 Male Reproductive System (p.640)</li> <li>● Figure 19-2 Scrotum, Testes and Seminiferous Tubules (p.641)</li> <li>● Figure 19-5 Ductus Deferens (p.645)</li> <li>● Figure 19-6 The Penis (p.647)</li> </ul> 19-3 Oogenesis and Female Reproductive System (p.649-660) <ul style="list-style-type: none"> <li>● Figure 19-8 Female Reproductive System (p.650)</li> <li>● Figure 19-10 Follicle Development and Ovarian Cycle (p.652)</li> <li>● Figure 19-11 Uterus (p.654)</li> <li>● Figure 19-12 Female External Genitalia (p.655)</li> <li>● Figure 19-13 Mammary Gland (p.656)</li> </ul> 19-5 Effects of Aging (p.661-662)	Michigan State Histology Slides: <ul style="list-style-type: none"> <li>● <a href="#">Male Reproductive System</a></li> <li>● <a href="#">Female Reproductive System</a></li> </ul> HASPI: <ul style="list-style-type: none"> <li>● <a href="#">Fetal Development</a> - creating graphs to interpret fetal growth compared to average</li> </ul> <a href="#">Menstrual Cycle Lab</a> (PDF of student lab activity covering hormone and uterine changes during cycles with and without fertilization)  <a href="#">What if women didn't have to pay for giving birth?*</a> <ul style="list-style-type: none"> <li>● <a href="#">Article: Giving birth may be one of the most dangerous moments in a person's life. This article investigates the barriers that are made due to lack of access and fees to give birth safely.</a></li> </ul>	Meiosis Oogenesis Spermatogenesis/ Spermatozoa Lactation Menses Ovarian Follicles Ovulation Perineum Prepuce STIs (Sexually Transmitted Infections) <u>Hormones:</u> Estrogen, Progesterone, Testosterone <u>Male:</u> Epididymis, Ductus Deferens, Seminal Vesicles, Prostate, Semen, Penis, Testes, Seminiferous Tubules <u>Female:</u> Ovary, Fallopian Tubes, Uterus, Vulva, Vagina, Endometrium	<ul style="list-style-type: none"> <li>● How does the reproductive system differ functionally from all other organ systems in the body?</li> <li>● A 36 year old mother of four is considering tubal ligation as a means of ensuring that her family gets no larger. She is worried she will enter menopause after the surgery. How would you ease her concerns?</li> <li>● Describe meiosis and identify the products of this process in both males and females.</li> <li>● How does aging affect the reproductive systems of men and women?</li> <li>● Diane has peritonitis (inflammation of the peritoneum), which her physician says resulted from a urinary tract infection. Why could this situation occur in females but not in males?</li> </ul>



## BPS Science Department Anatomy and Physiology

	<ul style="list-style-type: none"><li>Describe a disease or disorder of the reproductive system including symptoms, diagnosis, medications, prevention, and treatment.</li><li>Diagnose a human reproductive system disease/disorder given a data set of symptoms.</li><li>Explain homeostasis in the reproductive system through negative and positive feedback.</li><li>Predict prevention and treatment of a human reproductive system disorder based on a given data set.</li></ul>	<p>Figure 19-1 Hormones of the Reproductive System (p.663)</p> <p>Birth Control Strategies (p.664-665)</p> <p>Chapter 19 Review Questions p.668-669</p> <p>Reproductive System and Other Body Systems (p.670)</p>	<p><b><u>Ernest Everett Just Article (Gale Database)*</u></b></p> <ul style="list-style-type: none"><li>Article: Ernest Everett Just conducted research on fertilization, as well as the development of unfertilized eggs in a process known as parthenogenesis. His most important achievement was the discovery of the role protoplasm plays in the development of a cell. Just conducted his research despite widespread discrimination as a Black researcher.</li></ul> <p><b><u>Ugly History: The US Syphilis Experiment*</u></b></p> <ul style="list-style-type: none"><li>Video: Afflicting nearly 1 in 10 Americans, Syphilis was raging in the US in the 1930's. This video digs into the unethical Tuskegee Syphilis Study, which spanned 40 years and lied to its participants about receiving treatment for syphilis.</li></ul> <p><b><u>The Puerto Rico Pill Trials*</u></b></p> <ul style="list-style-type: none"><li>Article: Unethical human trials were performed to poor, uneducated women in Puerto Rico to bring contraceptives to the market. The women had only been told that they were taking a drug that prevented pregnancy, not that this was a clinical trial, that the Pill was experimental or that there was a chance of potentially dangerous side effects.</li></ul>	<p>Homeostasis/ Homeostatic Regulation</p> <p>Disease/ Disorder Symptoms</p> <p>Negative Feedback Loop</p> <p>Positive Feedback Loop</p>	<ul style="list-style-type: none"><li>Female bodybuilders and women with eating disorders such as anorexia nervosa often stop having menstrual cycles, a condition known as amenorrhea. What does this relationship suggest about the role of body fat in menstruation? How might the body benefit from ceasing to menstruate under such circumstances?</li></ul>
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<b>Resources</b>	<p><a href="http://ngss.nsta.org/Classroom-Resources.aspx">http://ngss.nsta.org/Classroom-Resources.aspx</a> - Searchable NYSSL/NGSS aligned resources curated by NSTA</p> <p><b>Dissection Videos</b> (these videos -- dissection of heart, liver, uterus and eye -- were created in collaboration with the Jacobs School of Medicine and Biomedical Sciences. All dissection videos have two separate segments - an introduction segment and a dissection segment. All segments have an accompanied student activity resource)</p> <p>Access via Schoology BPS Science K-12 Group Resources 9-12 Resources Anatomy &amp; Physiology Dissection Videos</p> <p><a href="#">Virtual Frog Dissection</a> (step by step virtual dissection)</p> <p>PBS Learning Media Dissection Videos and Resources (<a href="#">Sheep Heart</a>, <a href="#">Cow Eye</a>, <a href="#">Frog</a>)</p> <p><a href="#">Virtual Fetal Pig Dissection</a> (from Whitman College)</p> <p><a href="#">Cow Eye Dissection</a> (video, step-by-step virtual dissection, PDF of student lab guide )</p> <p><a href="#">NYSED Bilingual Glossaries</a> – NYS Statewide Language Regional Bilingual Education Resource for NYSED approved bilingual glossaries.</p>				
<b>English Language Learners (ELL) Enhancements</b>  To access <a href="#">hyperlinked</a> material, you must be logged into your BPS Google Drive	<p><b>Listening</b></p> <ul style="list-style-type: none"> <li>● <b>Cross- Linguistic Practices:</b> Gives students opportunities to make connections between what they hear and their home language (ex: allow students to listen to a passage and identify cognates.)</li> <li>● <b>Build background knowledge</b></li> <li>● <b>Activating Prior Knowledge</b> means both eliciting from students what they already know and building initial knowledge that they need in order to access upcoming content</li> <li>● <b>Visuals</b> - GIFs, pictures- assist students in understanding. Use <a href="#">visual thinking strategies</a> to set learning lens</li> <li>● Video to review/ introduce topics– use <a href="#">closed captioning</a> to help students see the words and pronunciations while they listen</li> <li>● <b>Word stretching / Vowel stretching</b> when instructing allows student to listen closely to the pronunciation of the word</li> <li>● <b>Performance Level Descriptors</b> - description of expected output from</li> </ul>	<p><b>Speaking</b></p> <ul style="list-style-type: none"> <li>● <b>Sentence Frames</b> - to begin a sentence - such as <i>Evolution is...</i> or <i>I think that evolution is...</i></li> <li>● <b>Academic Conversation Starters:</b> Have a visual of a list of academic sentence starters that students can refer to in a discussion (helps students have a more science focused dialogue). Examples include- I expect ____ to happen. My data shows that...</li> <li>● <b>Choral Reading</b> - To build fluency, self-confidence and motivation with <a href="#">reading/speaking</a></li> <li>● Create <b>movement</b> to go with the word. Movement can be a motivating factor, as well as a kinesthetic tool for conceptualizing the rhythm and flow of fluent reading while triggering brain function for optimal learning</li> <li>● <b>Performance Level Descriptors</b> - description of expected output from students based on earned NYSESLAT levels in the modality of speaking(Scroll for grades 9-12)</li> </ul>	<p><b>Reading</b></p> <ul style="list-style-type: none"> <li>● <b>Supplementary Text</b> to help reinforce concepts. If necessarily, use lower Lexile levels to ensure comprehension.</li> <li>● <b>Visual Aids</b> - Pictures or models to support vocabulary words and concepts</li> <li>● Video to review or introduce a topic - use <a href="#">closed captioning</a> to help students read along while they listen to the content</li> <li>● <b>4 Square / Frayer models</b> to help students gain a deeper understanding of vocabulary.</li> <li>● <b>Highlighting</b> important text to assist students in answering questions after the reading.</li> <li>● <b>Chunking</b>-Break reading of text into chunks or paragraphs</li> <li>● <b>Performance Level Descriptors</b> - description of expected output from students based on earned NYSESLAT levels in the modality of reading(Scroll for grades 9-12)</li> <li>● <b>Vocabulary Morphology-</b> Morphology relates to the segmenting of words into affixes (prefixes and suffixes) and roots or base words, and the origins of words. Understanding that words connected by meaning can</li> </ul>	<p><b>Writing</b></p> <ul style="list-style-type: none"> <li>● <b>Sentence Frames</b> - to begin a sentence- such as <i>Biodiversity is...</i> or <i>An example of competition is....</i></li> <li>● <b>Cloze passages</b> with word banks</li> <li>● <b>Word banks</b></li> <li>● <b>Graphic Organizers</b> to help break down the writing process and organize thoughts</li> <li>● <b>Standards-based sentence stems</b></li> <li>● <b>Performance Level Descriptors</b> - description of expected output from students based on earned NYSESLAT levels in the modality of writing(Scroll for grades 9-12)</li> </ul>	<p><b>Instructional Accommodations (depending on the student's needs)</b></p> <ul style="list-style-type: none"> <li>● <b>Extended time</b> for tests in class, projects and assignments</li> <li>● <b>Directions read.</b> Broken down as necessary</li> <li>● <b>Model</b> how to complete the activity in the lesson</li> <li>● <b>Oral simplification</b> of directions or questions</li> <li>● <b>Translated version</b> of test when available. Student may have both version English and native language version</li> <li>● Use of <a href="#">approved bilingual glossaries</a> from NYS in each subject</li> </ul>



### BPS Science Department Anatomy and Physiology

	students based on earned NYSESLAT levels in the modality of listening (Scroll for grades 9-12)		be connected by spelling can be critical to expanding a student's vocabulary.		
<p><b>Special Education Modifications</b></p> <p>Special Education students must have accommodations as per Individual Educational Plan (IEP)</p>	<p><b>Instructional</b></p> <ul style="list-style-type: none"> <li>● <b>Pre-teach</b> vocabulary</li> <li>● Use <b>picture vocabulary</b></li> <li>● Scaffold <b>Depth of Knowledge</b> questions</li> <li>● Provide copy of notes/<b>notes in “cloze”</b> form</li> <li>● Use of <b>Think, Pair, and Share</b> strategy to help process information</li> <li>● <b>Scaffold</b> written assignments with the use of <b>graphic organizers</b></li> <li>● Allow for <b>multiple ways to respond</b> (verbal, written, response board)</li> <li>● Provide <b>model of performance task</b></li> <li>● <b>Modify informational text</b> to fit the needs of the students</li> <li>● Provide a digital or paper <b>interactive notebook</b></li> <li>● Present complex <b>tasks in multiple ways</b></li> <li>● Provide <b>mnemonic strategies</b> for Chemistry concepts</li> </ul>		<p><b>Technology:</b></p> <ul style="list-style-type: none"> <li>● <b>Audio</b> reading of text</li> <li>● <b>Text to type</b> functions</li> <li>● <b>Videos</b> to clarify/visualize Chemistry concepts</li> <li>● <b>Record class lecture/discussions</b> and make accessible to student</li> <li>● <b>Nearpod-</b> interactive presentations of notes</li> <li>● <b>Playposit</b> - show a video clip about the topic and add your own questions for them to answer as they watch</li> <li>● Allow students to type answers in chat on <b>Teams</b></li> </ul> <p><b>Other:</b></p> <ul style="list-style-type: none"> <li>● Arrange seating for maximum engagement and minimum distraction</li> <li>● Accessible lab space (counter level)</li> </ul>		<p><b>In Class Assessments</b></p> <ul style="list-style-type: none"> <li>● Provide <b>review packet or review sheet</b> of concepts covered on the test</li> <li>● Practice similar questions prior to the test</li> <li>● Provide <b>multiple options</b> for projects</li> <li>● Give a <b>timeline</b> of when things are due and remind them of the process often.</li> <li>● <b>Use of timer</b> in class</li> <li>● Break all complex tasks into chunks</li> </ul>
<p><b>Step Up to Writing</b></p> <p>Step Up to Writing materials can be found in BPS Science K-12 Schoology Folder 9-12 Resources Chemistry Resources Curriculum Materials</p>	<p><b>SUTW Strategy</b></p> <ul style="list-style-type: none"> <li>● Informal Outline</li> <li>● Color-Coding – Informative/Explanatory Text</li> <li>● Two-column notes</li> <li>● I-V-F Topic Sentence progressing to Four Step Summary Paragraph</li> <li>● CUPS – Capitalization, Usage, Punctuation, Spelling</li> <li>● Transitions</li> </ul>				
<p><b>Culturally and Linguistically Responsive Teaching (CLRT) in the Science Classroom</b></p>	<p>Materials, resources, and/or discussions address diverse cultural backgrounds and real-world applications</p> <ul style="list-style-type: none"> <li>● Artifacts (posters, charts, etc.) in the science classroom are representative of the cultures of the student population</li> <li>● All students are given an opportunity to engage in science discourse</li> <li>● Teacher demonstrates high expectations for all students</li> </ul> <p>CLRT resources which align to Science content are denoted with a *</p>				