

**Science Remote L earning**

**LESSON PLAN FOR**

**Teacher Office Hours: Monday-Thursday 2:30-3:30 PM**

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**Teacher: Dr. Amar K. Pani**

**Week: 03/24-03/28-2025**

**Subject: Human A&P, Endocrine System**

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| # | Planning Question | Teacher/Teacher Team Response |
| 1 | Which state standard is your lesson progression addressing? | TN: Standard(s)  **HAP.LS1.30** Using a model, name and locate the major endocrine glands and identify additional organ tissues in the human body that produce hormones. Describe the hormones produced and their physiological effects on other body targets.  **HAP.LS1.31** Describe the relationship between receptors and ligands and differentiate between steroid and nonsteroidal hormones as ligands.  **HAP.LS1.32** Explain, using examples, the mechanism of negative feedback in hormonal production and control. |
| 2 | What scientific concepts or phenomena are embedded in the state standard? | Phenomenon  Though osteoporosis is often thought of as strictly a bone disorder, it often falls under the treatment of endocrinologists because of its underlying causes. Particularly, postmenopausal women sometimes develop the disease because of their low levels of the hormone estrogen, which helps to maintain bone mass. In such cases, osteoporosis may be treated with hormone replacement therapy.  The eight hormone-secreting glands of the endocrine system are the adrenal gland, hypothalamus, pancreas, parathyroid gland, pineal gland, pituitary gland, reproductive glands (ovaries and testes) and thyroid gland. But some other organs and tissues that are not generally considered part of the endocrine system also produce and secrete hormones. For instance, the placenta of a pregnant woman secretes a few hormones, including estrogen and progesterone. And the stomach releases the hunger-inducing hormone ghrelin and the hormone gastrin, which stimulates the secretion of gastric acid.  Plants do not possess an endocrine system like humans and other animals do. But they still produce hormones, which are responsible for processes such as plant growth, metabolism, and cell division.  Oxytocin and Childbirth: Years before oxytocin was discovered, it was common practice in midwifery to let a first-born twin nurse at the mother’s breast to speed the birth of the second child. Now we know why this practice is helpful-it stimulates the release of oxytocin. Even after a single birth, nursing promotes expulsion of the placenta (afterbirth) and helps the uterus regain its smaller size. Synthetic oxytocin (Pitocin) often is given to induce labor or to increase uterine tone and control hemorrhage just after giving birth. |
| 3 | What teacher knowledge, reminders, and misconceptions are assumed in the standard? | The faculty must be highly knowledgeable in Human A&P contents to explain the Organ systems of the human body. In addition, the teacher must be an expert to describe & demonstrate the roles & types of the various systems across the human whole body.   * Describe the chemical classes of hormones and explain how hormones control their targets. * Describe the relationships between the anterior and posterior pituitary and the hypothalamus. * Locate and discuss functions of major endocrine glands. * Discuss the impacts of some endocrine diseased on the normal function of this system. * Identify the impacts of the aging process on the endocrine system. * Analyze symptoms of endocrine diseases to hypothesize the target gland.   **Misconceptions?**   * + - * Some students think of endocrine and nervous regulation as entirely separate control mechanisms, failing to realize the extent of their cooperation in the regulation of physiological processes.       * Some students do not think that some molecules function both as hormones in the endocrine system and as chemical messengers in the nervous system, and that the hypothalamus and pituitary gland serve to integrate the endocrine and nervous systems of vertebrates. |
| 4 | What objective(s) must be taught? In what order? Why? | **SWBAT Identify the Endocrine Glands IOT Analyze the Hormonal Release in Human.** |
| 5 | What is your resource plan for each of the 5 Es of inquiry-based science instruction?   1. Engage 2. Explore 3. Explain 4. Elaborate 5. Evaluate | **Curricular Resources**  **Engage**  Adventures of Endo-Man! (comic strip): <https://classroom.kidshealth.org/classroom/9to12/body/systems/endocrine.pdf>  Endocrine System Concept Map: <https://www.biologycorner.com/anatomy/endocrine/endocrine_system_concept_map.html>  **Videos:**  [Endocrine System, Part 1: Gland & Hormones: Crash Course](https://www.youtube.com/watch?v=eWHH9je2zG4)  [Endocrine System, Part 2: Hormone Cascades: Crash Course](https://www.youtube.com/watch?v=SCV_m91mN-Q)  **Explore**  **EMC AA&P Workbook & Laboratory Manual**:   * Ch. 7 The Endocrine Glands and Hormones, pgs. 107-129 * Laboratory Activity 1: Microscopic Identification of Normal Endocrine Glands; pgs.123-124 * Laboratory Activity 2: Effects of Adrenaline and Caffeine on Daphnia; pgs. 125-126   [Laboratory Exercise Using Virtual Rats](https://www.physiology.org/doi/abs/10.1152/advances.1997.273.6.S24)  **Explain**   * + - * Case Study Investigation #7, pg. 242-243   **Elaborate**   * + - * Case Study: Environmental Hormones, pg. 270-271   Article: [Corticosteroids](https://www.biologycorner.com/worksheets/articles/corticosteroids.html)  **Evaluate**  Ch. 8 Function of the Nervous System-Concept Check pgs. 275, 278, 280, 284, 288, 289, 294, 296  Ch. 8 Function of the Nervous System-Study Guide pgs. 300-301  **Textbook:**  *Applied Anatomy & Physiology 2nd Ed.: A Case Study Approach; Brian R, Shmaefsky*  Ch. 8 Function of the Nervous System; pgs. 272 – 303 |
| 6 | What academic language must be taught before and after the explain phase? How will the academic language be taught and assessed? | Ductless glands, endocrine glands, endocrine secretions, environmental signals, exocrine glands, exocrine secretions, hormones, receptors, target cells, effector, internal receptor, ligand, surface receptor, negative feedback, paracrine secretions, thyroxine, antagonist, lipid hormones, peptide hormones, anterior pituitary gland, hypophysis, hypothalamus, pituitary gland, posterior pituitary gland, releasers, releasing hormones, melatonin, pineal gland, serotonin, adrenal glands, adrenal medulla, adrenaline, aldosterone, cortisol, epinephrine, noradrenaline, norepinephrine, calcitonin, parathyroid gland, parathyroid hormone, thyroid gland, glucagon, insulin, islets, islets of Langerhans, pancreas, T cells. |
| 7 | What is your plan to ensure that assessment of instruction on this standard is not solely characterized by remembering or regurgitating information? | Following teacher’s demonstration, students will apply their knowledge by thinking critically and within higher order according to Bloom’s Taxonomy. Real life occurrences & scenarios and project-based products as tasks will allow students to use their academic terms through in-depth understanding and relevance.  (I do, you do, & We all do)   * **Learning Outcomes** * Distinguish between the types of nervous system cells. * Explain the process of nervous system development. * Describe the structure and components of a nerve cell. * Explain the function of nerve cells. * Describe the sequence of events involved in nerve cell excitation.   Understand the biological basis of aging and the pathology of nerve cell function.  . |
| 8 | What literacy concept can be intertwined with instruction on this scientific concept or phenomenon? | * What are the two main functions of the endocrine system? * How does the body maintain control over all of its internal systems?   How does the endocrine system act as a feedback mechanism for maintaining homeostasis? |
| 9 | How will instruction be impacted by the Cross- Cutting Concepts and the Science & Engineering Practices? | Developing and using models  *Students can develop and use a model based on evidence to illustrate the relationships between systems and components of a system.*  **Curricular Resources**  **Engage**  Adventures of Endo-Man! (comic strip): <https://classroom.kidshealth.org/classroom/9to12/body/systems/endocrine.pdf>  Endocrine System Concept Map: <https://www.biologycorner.com/anatomy/endocrine/endocrine_system_concept_map.html>  **Videos:**  [Endocrine System, Part 1: Gland & Hormones: Crash Course](https://www.youtube.com/watch?v=eWHH9je2zG4)  [Endocrine System, Part 2: Hormone Cascades: Crash Course](https://www.youtube.com/watch?v=SCV_m91mN-Q) |