## Summarizing to Comprehend Learning Experience Plan

Subject: Biology Grade level: 8

Unit: Endocrine System Theme: Fear

Topic: Hormonal Response to Fear

Content Standards:

Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development in ideas in science.

Literacy Standards (Grade Level 6-8):

**R2.** Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

**R4.** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6– 8 texts and topics*.

**R7.** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

**R10.** By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

**W4.** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

**W9.** Draw evidence from informational texts to support analysis, reflection, and research.

**Theme Description/Relevance to 8th Graders:**

Everyone experiences fear. Fear of whatever or whoever it may be is expressed in many ways. This theme explores the different effects fear has on the body, both physically and psychologically. On a day-to-day basis we experience anxiety due to exposure to stressors.  Fear tends to lead to irrational thinking, or not being able to think or act at all as well as anxiety. At the end of this theme students will be expected to answer: How can we gain control over our fear(s)? This particular lesson is designed to introduce the physical components of fear on the anatomical level. It is also intended specifically for Eighth graders because they are much more mature (both psychologically and physically) than their 6th and 7th grade counterparts. Most will go into high school after 8th grade, and they could be nervous or scared. Some also have already experienced or witnessed bullying, or are currently doing so. By discussing fear and its expression in the brain, students will have a better understanding on why they feel scared at certain times or from certain things, people, or places. This will hopefully give them confidence and knowledge to tackle their fears and develop into stronger minded people and become fear*less* (yet cautious and inquisitive) of the world around them.

**This Lesson’s Connection with *Some* of the 21st Century Skills Middle Schoolers are Learning:**

* *Collaborate with others; use teamwork* 🡪 Students can bounce ideas off of each other during a possible class discussion. Disrespect towards others during class will not be tolerated. Students may work together in answering the *Do-Now*. They are also allowed to work in pairs while working on the summary frame for the hormones.
* *Think critically* 🡪 Students will be developing critical thinking skills by completing a summary frame. This will not be collected, but should be used as a study guide for the students.
* *Be autonomous* 🡪 Students will work independently on their summaries. All work and notes taken in class must be recorded in their notebooks.
* *Ask questions (be inquisitive)* 🡪 Students will be encouraged to ask questions relevant to the material by participating in or initiating class discussions before, during, and after the direct instruction part of the lesson.

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| **Learning Experience Outcomes**  Students will:   * Define key vocabulary words. * Relate those vocabulary words to every day life. * Summarize the information that they have learned on specific hormones by first focusing on the vocabulary words, then using those words to summarize the mentioned hormones in the endocrine system. | | | **Learning Experience Assessments:**   * Exit slip to be submitted at the end of class answering the aim. * Completion of summary frame. * Assessment of summary frames done in class will be done by observation. Completed homework of those summary frames will be observed the next class. * Students will be assessed on how often they engage in class discussions, ask questions, participate, etc. | |
| **Differentiation:** | | | | |
| **Approaching**  Students approaching the level may find this lesson very helpful because of the graphic organizer used to summarize. Also, all students will be required to summarize and define each hormone mentioned during the direct instruction. They will also find comfort in working in pairs of their choice. | | **On-level**  Students that meet the standards will use the summary frames as a supplement to their learning and a potentially useful study guide. | | **Beyond**  Students beyond the level are expected to complete summary frames for all hormones mentioned during class time. They have the option of helping their peers or working alone. |
| **Curriculum Integration**  ELA, Psychology | | | | |
| **Materials/Resources:** | **Procedures/Strategies** | | | |
| * Pictures used as sponge activity * Chalk/White Board | **Sponge Activity:**  As students are walking in the classroom, the following images will be posted on the board/projector screen:    (From left to right, a shadow of the vampire character Nosferatu, from the movie, *Nosferatu*, the famous painting of *The Scream*, by Edvard Munch, and a poster of the antagonist Voldemort from the final *Harry Potter* movie from the Harry Potter Series.)  Students will be asked to write down a reaction for each picture. After everyone is done writing in about 5 – 10 minutes, the class will discuss their observations and thoughts.  **Anticipatory Set:**  Q: What did you feel while looking at these pictures?  A: Scared. Not scared. Reminded me of \_\_\_\_\_\_\_\_\_\_\_\_. Laughed.  Q: If a person were scared of any of these pictures, what would he or she feel?  A: In danger. Threatened.  Q: How would their body react?  A: It would react with the flight-or-fight response that causes an increased heart rate, increased sweating and a release of adrenaline, among other effects.  Q: What is adrenaline?  A: A hormone.  Student Elicited Aim; possible aims:  *How do hormones play a role in fear?*  *How are hormones necessary for normal function in life?*  *How can we understand the role of hormones in a person’s response to fear?*  *How does fear stimulate hormones?*  **Activating Prior Knowledge:**  *“Do-Now: What is the difference between fear and stress?”*  Students will take 5-7 minutes to answer this, and spend only 5-7 more minutes reviewing.  **Direct Instruction:**  Definition of hormone: A regulatory substance produced in an organism and transported in tissue fluids such as blood or sap to stimulate specific cells or tissues into action. Hormones can influence mood and/or behavior.  **Epinephrine** or **adrenaline** is a hormone that plays a central role in the short-term stress reaction—the physiological response to threatening or exciting conditions. It is secreted by a GLAND that is located on top of the kidneys. When released into the bloodstream, epinephrine binds to other cells that are specially shaped to receive its signal and has many effects throughout the body, some of which are:   * Increase in heart rate * Dilates the pupils * Constricts (shrinks) blood vessels * Dilates (widens) airway passages * It elevates the blood sugar level * Begins the breakdown of fats.   Many times, this is called an “adrenaline rush.”  Adrenaline, or epinephrine is produced in some neurons of the central nervous system or near the kidneys. Its signals are received in the pancreas, liver, and muscles.  Q: Describe a real-life situation where a person may be experiencing these symptoms.  A: Threatened; burglary, fight  Q: What if the person is not feeling scared?  A: On a roller coaster, jumping out of an airplane, etc.  **Cortisol** is a hormone that is released in response to stress. Its primary functions are to increase blood sugar, and help in fat, protein and carbohydrate metabolism   * Increasing blood sugar and reduction of sugar uptake into cells. * Suppressing the immune system * Aiding in fat, protein, and carbohydrate metabolism   This hormone is released near the kidneys in the same area that adrenaline is secreted. (“Secreted” = released) However, this release is controlled by the hypothalamus.  Q: Based on the effects cortisol has on the body, where do you think its signals are reached?  A: Blood cells, immune system; immune cells, fat cells, muscle cells, etc.  Q: Infer on what physically happens when people who are stressed do not take a break, or are continually stressed?  A: They feel tired, get sick easily, etc.  Q: What are some ways we can help control stress?  A: Exercise, eating healthy, talking about what bothers us, etc.  These are the two main hormones that aid in controlling stress and fear. But there is one more hormone that can help combat feelings of stress and fear. This hormone is called oxytocin.  **Oxytocin** stimulates feelings of contentment; reductions in anxiety, and feelings of calmness and security around loved ones. Many studies have shown that oxytocin is connected with human bonding, increases in trust, and decreases in fear. This is also known as the hormone that is released when someone is in love. Oxytocin is still present there are feelings of happiness when with friends, family and loved ones.  This hormone is released from the hypothalamus. Its signals are received in the brain and throughout the body as well.  (Discussion follows on where, since this is a hormone that can affect many areas of the body, including sexually but that will not be discussed in this lesson.)  Q: How can a release of oxytocin combat stress or anxiety?  A: It reduces anxiety by focusing on the positive.  Q: How can we produce oxytocin on purpose?  A: Surround yourself with friends and family and positive people. Talk to your trusted friends and adults about anything that is bothering you.  **Guided Practice:**  Students will complete the definition summary frame for at least two hormones. They are allowed to work together in pairs. The definition frame will consist of the traditional definition frame, but the term in the middle is the specific hormone being focused on, and the four surrounding boxes will be the definition, physical effects, initial location of where the hormone is being secreted, and the location of where the hormone’s effects are taking place.  **Closure:**  Students will answer the aim on an index card to be handed in at the end of class.  **Independent Practice:**  Students will complete definition summary frames for whatever is left for homework. This will not be collected, but checked for completion the next class. | | | |