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| **TEXAS CTE LESSON PLAN**  [www.txcte.org](http://www.txcte.org) | |
| **Lesson Identification and TEKS Addressed** | |
| **Career Cluster** | Human Services |
| **Course Name** | Lifetime Nutrition and Wellness |
| **Lesson/Unit Title** | Maintaining a Healthy Digestive System |
| **TEKS Student Expectations** | **130.274. (c) Knowledge and Skills**  (3) The student understands the principles of digestion and metabolism. The student is expected to:  (A) describe the processes of digestion and metabolism  (B) calculate and explain basal and activity metabolisms and factors that affect each  (C) apply knowledge of digestion and metabolism when making decisions related to food intake and physical fitness |
| **Basic Direct Teach Lesson**  (Includes Special Education Modifications/Accommodations and  one English Language Proficiency Standards (ELPS) Strategy) | |
| **Instructional Objectives** | **Students will:**   * Analyze the process of digestion * Investigate digestive disorders * Calculate basal metabolic rate/view the total calories burned a day depending on the activity levels * Evaluate tips on eating nutritious food |
| **Rationale** | In order to stay healthy, it is important to eat the right balance of food to aid in the digestive process. In this lesson, you will have the opportunity to analyze the process of digestion and learn to calculate basal metabolic rate. |
| **Duration of Lesson** | Four 45-minute class periods |
| **Word Wall/Key Vocabulary**  *(ELPS c1a, c, f; c2b; c3a, b, d; c4c; c5b) PDAS II (5)* | **BMR (Basal Metabolic Rate):** rate at which the body used energy while at rest to keep vital functions going such as breathing and keeping warm  **Constipation:** Abnormally difficult or infrequent bowel movements  **Diarrhea:** Abnormally frequent, loose, watery bowel movement  **Digestion:** Process used by the body to break down food into simple substances for energy, growth, and cell repair  **Esophagus:** A long tube connecting the mouth to the stomach  **Gall bladder:** The small sac-shaped organ beneath the liver, in which bile is stored after secretion by the liver and before release into the intestine  **Gastroesophageal reflux disease (GERD):** Backflow of stomach acid into the esophagus  **Large intestine:** Absorbs water from the remaining indigestible food matter, and then passes useless waste material from the body  **Liver:** A large organ in the body that stores and metabolizes nutrients destroys toxins and produces bile  **Mouth:** The opening in the lower part of the human face, surrounded by the lips, through which food is taken in  **Pancreas:** A large gland behind the stomach that secretes digestive enzymes into the duodenum  **Saliva:** Watery liquid secreted into the mouth by glands, providing lubrication for chewing and swallowing, and aiding digestion  **Small intestine:** That section of the gastrointestinal tract which digests food and absorbs nutrients after they have passed through the stomach  **Stomach:** The internal organ in which the first part of digestion occurs, being (in humans and many mammals) a pear-shaped enlargement of the alimentary canal linking the esophagus to the small intestine |
| **Materials/Specialized Equipment Needed** | **Equipment:**   * Calculators * Computer with projector for PowerPoint presentation   **Materials:**   * Card stock for index cards with individual digestive system organs listed * Model of digestive system (borrow from science teacher) * Pictures of nutritious foods or plastic food models * Poster of Heimlich Maneuver<http://www.nlm.nih.gov/medlineplus/ency/article/000047.htm> * Copies of handouts   **PowerPoint:**   * Maintaining a Healthy Digestive System * Presentation Notes – Maintaining a Healthy Digestive System   **Technology:**   * Tedx Talk:   + Graham Hill: Why I’m a weekday vegetarian We all know the arguments that being vegetarian is better for the environment and for the animals â but in a carnivorous culture, it can be hard to make the change. Graham Hill has a powerful, pragmatic suggestion: Be a weekday vegetarian.<http://www.ted.com/talks/graham_hill_weekday_vegetarian>   **Websites:**   * United States Department of Agriculture MyPlate The Center for Nutrition Policy and Promotion, an organization of the U.S. Department of Agriculture, was established in 1994 to improve the nutrition and well-being of Americans. Toward this goal, the Center focuses its efforts on two primary objectives: advance and promote dietary guidance for all Americans, and conduct applied research and analyses in nutrition and consumer economics.<http://www.ChooseMyPlate.gov> * BMI Calculator: BMR formula Calculate basal metabolic rate. The BMR formula uses the variables of height, weight, age, and gender to calculate the Basal Metabolic Rate (BMR).<http://www.bmi-calculator.net/bmr-calculator/bmr-formula.php>   **Graphic Organizer:**   * Healthy Eating Tips   **Handouts:**   * Calculating BMR * Factors in Calculating BMR * The Digestive System * The Digestive System Index Cards * The Digestive System Quiz |
| **Anticipatory Set**  (May include pre-assessment for prior knowledge) | **Before class begins, set out the following:**   * Disassembled model of digestive system * Pictures of nutritious foods or plastic food models * Poster of Heimlich Maneuver   Have students brainstorm answers to the following questions:   * What do you think these items are for? * What do you think we will be studying?   Allow students to assemble the digestive system model.  Students will revisit their list of questions during Lesson Closure. |
| **Direct Instruction \*** | Introduce the lesson objectives, terms, and definitions.  Review student knowledge of digestive system. Distribute handout, Digestive System. Instruct students to label the digestive system during the slide presentation.  Introduce PowerPoint Maintaining a Healthy Digestive System. Allow for questions and discussion.  Explain the difference between BMI and BMR. BMI is the Body Mass Index that uses a ratio of weight to height and can determine whether you are at risk for health problems related to weight. Students will calculate BMI, which is more common, in another lesson. Model how to calculate BMR. Distribute handout, Factors in Calculating BMR.  Continue with slide presentation to complete direct instruction.  Explain to the students that if we do not maintain a healthy digestive system, digestive disorders can occur. Specific digestive disorders will be covered later in a lesson on food related illnesses.  Review the Heimlich Maneuver poster with the students and ask if any of them have ever choked on a piece of food or if they have seen anyone choke on a piece of food. What happened? How did they dislodge the food? Would they be able to assist someone who was choking? Demonstrate the steps of the Heimlich Maneuver to the students.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * encouraging students to participate in class discussion * continuously checking for understanding |
| **Guided Practice \*** | Distribute handout, Healthy Eating Tips. Students will fill in the blank circles with the tips and foods that they should eat to maintain a healthy digestive system. Discuss answers.  Model how to calculate BMR. Guide students as they calculate their own. Assign handout, Calculating BMR as homework. The key is included. Instruct students to show their work. They may check their answers on the following website:<http://www.bmi-calculator.net/bmr-calculator/bmr-formula.php>  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * assigning a peer tutor to assist with calculating BMR * allowing more time to complete assignment |
| **Independent Practice/Laboratory Experience/Differentiated Activities \*** | Divide class into subgroups of 8 with two or three students in each group depending on your class size. Distribute the Digestive System Index Cards with one organ listed on each card. Assign students to research the organ and outline 10 facts about each organ on the back using reliable internet sources such as Medline Plus.<http://www.nlm.nih.gov/medlineplus/>  Students will present their findings to the class.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * reducing the number of problems * answering questions orally |
| **Lesson Closure** | Review lesson objectives, terms, definitions, and questions developed during anticipatory set. Remind students of quiz at the end of lesson.  Sample review discussion questions:   * What happens to food after you eat it? * Explain the steps in the digestive process. * Why do we need to know our BMR? * Explain the steps in the digestive process.   Students will present their outline for each digestive organ to the class.  Check for understanding. |
| **Summative/End of Lesson Assessment \*** | The students will be assessed with a quiz, The Digestive System Quiz.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * encouraging students to highlight terms and definitions * provide specific questions to assist in the writing of the reflection |
| **References/Resources/**  **Teacher Preparation** | **Textbook:**   * Kowtaluk, Helen. *Food for Today. Eighth.* New York, New York: Glenco, McGraw-Hill, 2004. 81-83. Print.   **Websites:**   * National Digestive Diseases Information Clearinghouse –  Your Digestive System and How It Works<http://digestive.niddk.nih.gov/ddiseases/pubs/yrdd/?debugMode=false> * BMI Calculator: BMR formula Calculates the basal metabolic rate. The BMR formula uses the variables of height, weight, age, and gender to calculate the Basal Metabolic Rate (BMR).<http://www.bmi-calculator.net/bmr-calculator/bmr-formula.php> * Nutrition and Well-Being A to Z Frequently asked questions on nutrition A to Z<http://www.faqs.org/nutrition/Met-Obe/Nutrients.html> |
| **Additional Required Components** | |
| **English Language Proficiency Standards (ELPS) Strategies** | * Clear explanation of academic tasks * Graphic organizers * Word wall |
| **College and Career Readiness Connection[[1]](#footnote-1)** |  |
| **Recommended Strategies** | |
| **Reading Strategies** | Have several current event articles from newspapers, magazines, and/or internet, available to students to read about nutrition, nutrition myths, digestive diseases and keeping active,  Have students use the pre-reading strategy of prediction. Have students read the title, scan the document, and predict the content of the document prior to reading.  Post-reading strategy may include summarizing the contents of the document. |
| **Quotes** | Today, more than 95% of all chronic disease is caused by food choice, toxic food ingredients, nutritional deficiencies, and lack of physical exercise. **- Mike Adams**  Processed foods not only extend the shelf life, but they extend the waistline as well.  **-Karen Sessions**  Happiness: a good bank account, a good cook, and a good digestion. **-Jean-Jacques Rousseau**  I don’t know a better preparation for life than a love of poetry and a good digestion. **-Zona Gale** |
| **Writing Strategies**  **Journal Entries + 1 Additional Writing Strategy** | **Journal Entries:**   * Write down all the foods you have eaten in the past 24 hours. * Write down all the physical activity you have done in the past 24 hours.   **Writing Strategy:**  RAFT   * + Role: Principal   + Audience: Teachers   + Format: Memo   + Topic: Upcoming Health Fair |
| **Communication**  **90 Second Speech Topics** | * My Favorite Nutritious Meal is ……. * My Fitness Plan is …. |
| **Other Essential Lesson Components** | |
| **Enrichment Activity**  (e.g., homework assignment) | Invite a qualified professional to provide training on properly performing the Heimlich Maneuver.  Additional research topics:   * Why does our stomach growl? * Why do we burp?   Share findings with class.  **TED Talks:**  TEDx is a program of local, self-organized events that bring people together to share a TED-like experience. At a TEDx event, TEDTalks videos and live speakers combine to spark deep discussion and connection in a small group. These local, self-organized events are branded TEDx, where x = independently organized TED event.  The video below is related to this lesson. Allow students to view the video, and lead a discussion concerning the TED Talk.  Graham Hill: Why I’m a weekday vegetarian We all know the arguments that being vegetarian is better for the environment and for the animals â but in a carnivorous culture, it can be hard to make the change. Graham Hill has a powerful, pragmatic suggestion: Be a weekday vegetarian.<http://www.ted.com/talks/graham_hill_weekday_vegetarian> |
| **Family/Community Connection** | * Suggested guest speakers: Gastroenterologist, Red Cross representative, or school nurse * Encourage students to share the new USDA website <http://www.ChooseMyPlate.gov> with parents and family. |
| **CTSO connection(s)** | **Family, Career, and Community Leaders of America (FCCLA)**  <http://www.texasfccla.org>  **Star Events:**  Nutrition and Wellness – an individual event that recognizes participants who track food intake and physical activity for themselves, their family, or a community group and determine goals and strategies for improving their overall health. Participants must prepare a portfolio and an oral presentation. |
| **Service Learning Projects** | Successful service learning project ideas originate from student concerns and needs. Allow students to brainstorm about service projects pertaining to lesson. For additional information on service learning see <http://www.servicelearning.org>  Example:  Students can volunteer at a local health fair and teach the community about tips and resources they may use to avoid digestive diseases. |

1. Visit the Texas College and Career Readiness Standards at <http://www.thecb.state.tx.us/collegereadiness/CRS.pdf>, Texas Higher Education Coordinating Board (THECB), 2009. [↑](#footnote-ref-1)