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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** | More Power To You! The Energy in Food |
| **TEKS Student Expectations** | **130.274. (c) Knowledge and Skills**  (2) The student understands the role of nutrients in the body. The student is expected to:  (A) classify nutrients and their functions and food sources and compare the nutritive value of various foods;  (B) assess the effects of nutritional intake on health, appearance, effective job performance, and personal life.  (3) The student understands the principles of digestion and metabolism. The student is expected to:  (B) calculate and explain basal and activity metabolisms and factors that affect each;  (E) explain the relationship of activity levels and caloric intake to health and wellness, including weight management. |
| **Basic Direct Teach Lesson**  (Includes Special Education Modifications/Accommodations and  one English Language Proficiency Standards (ELPS) Strategy) | |
| **Instructional Objectives** | **Students will:**   * Determine how many calories are burned during various activities * Identify the food chain and how it provides energy to food * Calculate their BMI * Investigate facts connected to weight-related disorders and diseases |
| **Rationale** | How do we get the energy we need to dance, jog, run or walk? Where does it come from? If you answered FOOD! You are right, but how much food and how much energy we need is different for everyone. We will calculate our BMI and investigate the relationship between weight-related disorders and diseases and the energy imbalances as we learn more about nutrition. |
| **Duration of Lesson** | Five 45-minute class periods |
| **Word Wall/Key Vocabulary**  *(ELPS c1a,c,f; c2b; c3a,b,d; c4c; c5b) PDAS II(5)* | **Body Mass Index (BMI):** A ratio that allows you to assess your body size in relation to your height and weight  **Calorie:** A unit of energy supplied by food  **Food chain:** The series of processes by which food is grown or produced, sold and eventually consumed  **Nutrients:** Substances in food that your body needs to grow, to repair itself, and to supply you with energy  **Obesity:** Having an excess amount of body fat  **Overweight:** A condition in which a person is heavier than the standard weight range for his or her height  **Physical activity:** Any form of movement that causes your body to use energy  **Sedentary lifestyle:** A way of life that involves little physical activity  **Underweight:** A condition in which a person is less than the standard weight range for his or her height  Note: Many other terms on the slide presentation can be identified. Encourage students to include the definition in the assignment. |
| **Materials/Specialized Equipment Needed** | **Equipment**   * Computer with projector for multi-media presentations * Computers with Internet access (be sure to follow school district guidelines) * Weight scale with height indicator   **Materials**   * Images of (magazine or clip art):   + Food (various)   + Physical activity (dancing, jogging, running, swimming, walking) * Scotch tape   **Supplies:**   * Balance scale   Copies of handouts  **PowerPoint:**   * More Power to You! The Energy in Food * Presentation Notes – More Power to You! The Energy in Food   **Technology:**   * Free iPad App:   + BMI Calculator  A simple app that lets you calculate your BMI.<https://itunes.apple.com/us/app/bmi-calculator/id550932668?mt=8> * TED Talks:   Food and Fuel in the 21st Century: Stephen Mayfield at TEDxUCSD  Stephen Mayfield is director of the San Diego Center for Algae Biotechnology, and a Co-director of the Food and Fuel for the 21st Century organized research unit at UC San Diego. He is also the John Doves Isaacs Chair of Natural Philosophy in the department of Biology. His research focuses on the molecular genetics of green algae, and on the production of high value recombinant proteins and biofuel molecules using algae as a production platform.  [https://www.youtube.com/watch?v=eWMQysrBGDk](http://tedxtalks.ted.com/video/Food-and-Fuel-in-the-21st-Centu)  **Handouts:**   * Activity vs. Calories Burned (Key) * Activity vs. Calories Burned (moderate) * Activity vs. Calories Burned (vigorous) * BMI for-Age Weight Status Categories Chart * Boy 2 to 20 years BMI index-for-age percentiles * Fizzy Yeast * Girls 2 to 20 years BMI index-for-age percentiles * Rubric for Weight-Related Disorders and Diseases * Weight-Related Disorders and Diseases   **Graphic Organizers:**   * The Food Chain and Nutrition * The Food Chain and Nutrition (Key) |
| **Anticipatory Set**  (May include pre-assessment for prior knowledge) | **Before class begins: All Handouts are**  Print and cut apart the handout **Activities vs. Calories Burned (moderate)** and **Activities vs. Calories Burned (vigorous)** (see All Lesson Attachments tab). The moderate activity cards will be used in the Anticipatory Set and the vigorous activity cards will be used in the Lesson Closure. Each student will receive either an activity card or a “calories burned card.”   Display as many items from the Materials or Specialized Equipment Needed tab as you have available on a table in front of the room so that students may view as they enter.  As students enter the classroom, distribute one card from the **Activities vs. Calories Burned (moderate)** to each.  Explain to the students that the activities and calories burned are based on a 154- pound male who is 5’ 10” tall.  Allow students to move around the classroom to try to match the activity to the calories burned. They may tape the cards together to a board or wall and explain their findings.  Ask the students if they agree or disagree on the calories burned for each activity. Discuss any changes they would make or why they would leave them the way they are.  Demonstrate how the food intake and physical activity should balance using the balance scale.  If too much food is eaten and not enough activity is done, an imbalance occurs. The opposite occurs if there is too much activity and not enough food is eaten. |
| **Direct Instruction \*** | Introduce lesson objectives, terms, and definitions.  Select and distribute a handout or graphic organizer from the Instructional Strategies drop down menu in Classroom Essentials or instruct students to take notes in their journal books or on their own paper.  Distribute the graphic organizer The Food Chain and Nutrition so that students may complete during slide presentation.  Introduce the PowerPoint More Power to You! The Energy in Food. Students will be expected to take notes while viewing the slide presentation. Allow time for classroom discussion.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * check for understanding * provide a copy of slide presentation |
| **Guided Practice \*** | If students have access to computers, they can calculate their Body Mass Index (BMI). Allow them to read the results and find out more about their Body Mass Index (BMI).  Formula: weight (lb.) / [height (in)]2 x 703  Calculate BMI by dividing weight in pounds (lbs.) by height in inches (in) squared and multiplying by a conversion factor of 703.  Example: Weight = 150 lbs., Height = 5’5” (65”) Calculation: [150 Ã· (65)2] x 703 = 24.96  Distribute the handouts Girls – 2 to 20 years BMI index for age percentiles and Boys – 2 to 20 years BMI index for age percentiles.  Simple instructions for calculating the Body Mass Index (BMI) are at the bottom of the small chart. Students should then plot their number on the growth chart with their age.  Students should then refer to the BMI-for-age Weight Status Categories Chart to see their percentile range. This will tell them their weight status category.  Note: Be discreet with the weight of students and the percentile range.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * strategically place students in groups * assist with converting feet to inches in BMI activity |
| **Independent Practice/Laboratory Experience/Differentiated Activities \*** | Distribute the handout, Weight-Related Disorders, and Diseases. Inform students that project assignment may be prepared individually or with a partner.  Allow students to select one topic from the handout list so that all topics are covered.  Explain that information will be expected to be retrieved only from reliable sources.  Reliable sources may include online databases (if your school subscribes):   * Encyclopedia Britannica * World Book Encyclopedia * Merck Manual of Medical Information * Medline Plus * U.S. National Library of Medicine   Students may present summative information with a visual display that can include a:   * Brochure * Graphic foldable * Infographic * Three- panel presentation board (science board)   Distribute the handout Rubric for Weight-Related Disorders and Diseases Visual Display (see All Lesson Attachments tab) so that students understand what is expected.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * assisting student in gathering information * providing praise and encouragement |
| **Lesson Closure** | Review the Activities vs. Calories Burned (moderate) activity from the Anticipatory Set.  Distribute the cards Activities vs. Calories Burned (vigorous) (see All Lesson Attachments tab) to each student and instruct them to find the matching activity for the calories burned. They may tape the cards together to a board and explain their findings.  Ask the students if they agree or disagree on the calories burned for each activity. Discuss any changes they would make or why they would leave them the way they are. |
| **Summative/End of Lesson Assessment \*** | Students will be assessed with the appropriate rubric.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * encourage participation in discussion * check for understanding |
| **References/Resources/**  **Teacher Preparation** | **Textbooks:**   * Duyff, R. L. (2010). *Food, nutrition & wellness.* Columbus, OH: Glencoe/McGraw-Hill. * *Food for today.* (2010). Woodland Hills, CA: McGrawHill/Glencoe. * Mehas, K. Y., & Rodgers, S. L. (2002). *Food science: The biochemistry of food and nutrition.* New York, NY: Glencoe/McGraw-Hill.   **Website:**   * ChooseMyPlate.gov  Physical activity is important for everyone, but how much you need depends on your age.<http://www.choosemyplate.gov/physical-activity/amount.html> * Healthy Weight – it’s not a diet, it’s a lifestyle!   When it comes to weight loss, there’s no lack of fad diets promising fast results. But such diets limit your nutritional intake, can be unhealthy, and tend to fail in the long run.<http://www.cdc.gov/healthyweight/index.html> |
| **Additional Required Components** | |
| **English Language Proficiency Standards (ELPS) Strategies** | * Word wall * Give students time to explain their notes to a partner * Accomplish research in native language |
| **College and Career Readiness Connection[[1]](#footnote-1)** |  |
| **Recommended Strategies** | |
| **Reading Strategies** | Have students research childhood obesity and develop an opinion on vending machine contents at school.  Other articles pertaining to this lesson that students may read include:   * How to Calculate Physical Activity Level  A person’s physical activity level is a numeric method of expressing one’s daily energy expenditure.<http://www.ehow.com/how_7264020_calculate-physical-activity-level.html> * How to Interpret BMI  Understanding your Body Mass Index (BMI) can help you determine whether body fatness is an indicator of potential health issues.<http://www.ehow.com/how_2190743_interpret-bmi.html> * The Average Daily Calorie Requirements  Although the “rule of thumb” is that the average person needs 2000 calories a day, realistically, the needs of every individual varies rather greatly.<http://www.ehow.com/about_5077103_average-daily-calorie-requirements.html>   **Reading Strategy** Encourage students to “visualize” as they read. Many students are visual learners and will benefit from making sketches or diagrams on scrap paper as they read. Providing students with graphic organizers to help them organize their thoughts is also helpful. |
| **Quotes** | Those who think they have not time for bodily exercise will sooner or later have to find time for illness. **-Edward Stanley**  A man’s health can be judged by which he takes two at a time – pills or stairs. **-Joan Welsh**  Lack of activity destroys the good condition of every human being, while movement and methodical physical exercise save it and preserve it. **-Plato**  Physical fitness can neither be achieved by wishful thinking nor outright purchased. **-Joseph Pilates**  Physical fitness is not only one of the most important keys to a healthy body, it is the basis of dynamic and creative intellectual activity. **-John F. Kennedy** |
| **Writing Strategies**  **Journal Entries + 1 Additional Writing Strategy** | **Journal Entries:**   * I feel \_\_\_\_ when I exercise because … * My physical activity goal is \_\_\_\_\_\_\_\_\_\_\_\_ because I am concerned about … * My BMI is \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and that means that I have to … * The physical activity that I prefer is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because … * To be able to maintain a certain weight, you should …   **Writing Strategy:**   * RAFT (Role/Audience/Format/Topic) writing strategy:   + Role – physical activity trainer   + Audience – teenagers   + Format – flyer   + Topic – announcement of a new classes at the local gym   Design a flyer that can be distributed in the community announcing the new classes for teenagers at the local gym. |
| **Communication**  **90 Second Speech Topics** | * Three things about BMI are … * The energy requirements for an activity level of ‘vigorous’ are … |
| **Other Essential Lesson Components** | |
| **Enrichment Activity**  (e.g., homework assignment) | Allow students to demonstrate the lab experiment **Fizzy Yeast** (see All Lesson Attachments tab) if time permits.  Students will be able to view how food generates energy.  **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 video 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.  Food and Fuel in the 21st Century: Stephen Mayfield at TEDxUCSD  Stephen Mayfield is director of the San Diego Center for Algae Biotechnology, and a Co-director of the Food and Fuel for the 21st Century organized research unit at UC San Diego. He is also the John Doves Isaacs Chair of Natural Philosophy in the department of Biology. His research focuses on the molecular genetics of green algae, and on the production of high value recombinant proteins and biofuel molecules using algae as a production platform.  https://www.youtube.com/watch?v=eWMQysrBGDk |
| **Family/Community Connection** | Encourage students to try one or more of the suggestions below:   * organize a family exercise time * prepare a well-balanced meal for the family * participate in a walk-a-thon or race as a family to benefit the prevention of weight-related eating diseases and disorders |
| **CTSO connection(s)** | **Family, Career and Community Leaders of America (FCCLA)**  <http://www.texasfccla.org>   * National Programs in Action  An individual or team event that recognizes participants who explain how the planning process was used to implement a national program project. Participants must prepare a file folder containing specified summary documents, an oral presentation describing the use of the planning process and visuals. * Nutrition and Wellness  An individual event, 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.   Student Body The FCCLA Student Body national peer education program helps young people learn to eat right, be fit, and make healthy choices. Its goals are to: help young people make informed, responsible decisions about their health, provide youth opportunities to teach others and develop healthy lifestyles, as well as communication and leadership skills. |
| **Service Learning Projects** | Successful service learning project ideas originate from student concerns and needs. Allow students to brainstorm about service projects pertaining to this lesson. [www.ysa.org](http://www.ysa.org)  Possible Idea:  Students may organize an after-school exercise program that would target young sedentary teenagers. |

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)