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| **TEXAS CTE LESSON PLAN**  [www.txcte.org](http://www.txcte.org) | |
| **Lesson Identification and TEKS Addressed** | |
| **Career Cluster** | Hospitality and Tourism |
| **Course Name** | Food Science |
| **Lesson/Unit Title** | Knowledge Is Power: Why Study Food Science? |
| **TEKS Student Expectations** | **130.256. (c) Knowledge and Skills**  (3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:  (H) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports  (5) The student analyzes the role of acids and bases in the food sciences. The student is expected to:  (B) analyze the relationship of pH to the properties, safety, and freshness of food |
| **Basic Direct Teach Lesson**  (Includes Special Education Modifications/Accommodations and  one English Language Proficiency Standards (ELPS) Strategy) | |
| **Instructional Objectives** | **Students will:**   * Describe personal benefits of studying topics in food science * Describe contributions of food science to increasing food supplies * Explain the role of food science in the preserving environment * Explain contributions of food science to nutrition and food safety * Relate food science to social change and technological advances |
| **Rationale** | What are some common uses for brown paper bags like the one on your desk? Allow time for student responses.  “It may surprise to you to learn that brown paper bags can also be used to demonstrate principals of food science.  Currently, the fruit inside your bag is releasing ethylene gas and the bag traps these gasses inside. Once trapped, these gasses help ripen the fruit faster. A few fruits that continue to ripen are apricots, bananas, cantaloupe, kiwi, nectarines, peaches, pears, plantains, and plums. The opposite occurs when you place fruit in the refrigerator. Cool temperatures slow down the production of ethylene gas causing fruit to ripen slower.  Now you know that this is not just a brown paper bag you can use to pack your lunch, but it is a tool used in food science as well!” |
| **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)* | **Biodiversity:** Cultivating a variety of plants and animals  **Entrepreneurs:** Run businesses of their own  **Entry-Level-Jobs:** Those that do not require experience or training  **Integrated Pest Management (IPM):** Controls pests with nonchemical deterrents  **Sustainable Farming:** Producing food by natural methods that fit with local needs and conditions  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 and PowerPoint presentation * Projector with screen * Student computers with internet access   **Food supplies:**   * A variety of comparative food labels (example: two different types of granola bars) * Climacteric fruit (see anticipatory set)   **Supplies:**   * Brown paper bags (see anticipatory set) * Poster board * Copies of handouts   **PowerPoint:**   * Knowledge Is Power: Why Study Food Science?   **Graphic Organizer:**   * Where to Study Food Science? * Where to Study Food Science? Key   **Handouts:**   * Comparing Food Labels * Knowledge Is Power: Why Study Food Science? Notes * Knowledge is Power: Why Study Food Science? Notes – Key * Poster and Letter Rubric |
| **Anticipatory Set**  (May include pre-assessment for prior knowledge) | **Before Class Begins:**  At each desk/table, place a brown paper bag with a piece of fruit inside.  Set up the projector and have the brown paper bag slide displayed, slide 3 of the Knowledge Is Power PowerPoint.  See accompanying script on PowerPoint slide, or rationale section, to direct discussion. |
| **Direct Instruction \*** | Introduce lesson objectives, terms, and definitions.  Distribute fill-in-the-blank notes, Knowledge Is Power: Why Study Food Science? Notes. Continue showing the PowerPoint, Knowledge Is Power: Why Study Food Science? Students will use slide presentation to fill in the notes.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * providing a copy of PowerPoint * check for understanding |
| **Guided Practice \*** | Distribute lab handout Comparing Food Labels. Direct students to work with a partner and complete the experiment and analyze their results by answering the experiment follow-up questions.  When all groups are finished with the experiment, discuss the follow-up questions, and answer any questions that arise.  Direct students to work with a partner to complete the experiment and analyze their results by answering the experiment follow-up questions.  When all groups are finished with the experiment, discuss the follow-up questions, and answer any questions that arise.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * provide students with labels that have been color coded with highlighters, making it easier for students to locate needed information. * check for understanding |
| **Independent Practice/Laboratory Experience/Differentiated Activities \*** | Show Video: Food Science at WSU After showing video, distribute graphic organizer, Where to Study Food Science.  Direct students to use the Internet to research three higher education schools that offer a degree in food science and to gather necessary information from the school’s website. Students will create a poster board presentation over one of the school’s food science degree programs. Make sure that students are not researching the same schools.  Lastly, students will write a professional letter to the school’s food science department requesting brochures and additional information about the program. Distribute Poster and Letter Rubric for presentation grading.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * allow students to work with a partner to complete research, poster, and letter. |
| **Lesson Closure** | Review lesson objectives, terms, and definitions.  At the end of each class, have students respond to a journal topic, (see Writing Strategies section of the lesson plan). Student responses should be between 1 and 2 paragraphs in length.  Have students share their responses and check for understanding. Verify that students have responded with correct information and answer any questions that may arise during discussion. |
| **Summative/End of Lesson Assessment \*** | Students will present their food science degree findings to the class using their poster board presentation. Presentations will be graded using the rubric provided during independent practice.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*   * allow students to work with a partner * allow students to present their poster with note cards and a partner. |
| **References/Resources/**  **Teacher Preparation** | **Technology:**   * Microsoft Clip Art: Used with permission from Microsoft.   **Textbook:**   * Mehas, K. Y., & Rodgers, S. L. (2006) Food science: The biochemistry of food and nutrition. New York, N. Y: Glencoe, McGraw-Hill.   **YouTube:**   * What is Food Science? Everyone asks me, “What is your major?” And when I tell them it’s food science, they think I’m going to be a chef…<http://youtu.be/72eHuIakdLc> |
| **Additional Required Components** | |
| **English Language Proficiency Standards (ELPS) Strategies** | * Write word wall on the board. * Have students create notecards for unfamiliar words and terms with which they need additional help. * Use cooperative learning strategies. * Use peer tutoring. * Use multiple assessment strategies. |
| **College and Career Readiness Connection[[1]](#footnote-1)** |  |
| **Recommended Strategies** | |
| **Reading Strategies** | Students will practice reading food labels to compare nutrition facts.  Students will research food science degree programs by reading various school degree program catalogues online.  Suggestions:   * USA Today New degree programs produce chef-scientists.<http://usatoday30.usatoday.com/tech/news/techinnovations/2005-08-14-culinology_x.htm?csp=34> * GradSchools.com 295 Food Science Graduate Programs.<http://www.gradschools.com/search-programs/food-science>   Encourage students to connect reading to their life experiences or prior knowledge. |
| **Quotes** | Part of the secret of success in life is to eat what you   like and let the food fight it out inside. **-Mark Twain**  A house is no home unless it contains food and fire for   the mind as well as the body. **-Sarah Margaret Fuller**  I like neither new clothes nor new kinds of food. **-Albert Einstein**  Don’t dig your grave with a knife and fork. **-English Proverb** |
| **Writing Strategies**  **Journal Entries + 1 Additional Writing Strategy** | **Journal Entries:**   * Food science can help solve global issues by… * Food science promotes environmental protection through…. * I can better manage my health using food science principles by…. * One thing from this lesson that I can apply to my eating habits is….   **Writing Strategy:**   * Use Introduction-Body-Conclusion (I-B-C) writing methods * Use PLAN (Pay attention to the prompt, List the main idea, Add supporting ideas, Number your ideas) writing strategy * Have students prepare their 90 second speech topics using the PLAN method of writing |
| **Communication**  **90 Second Speech Topics** | * How does population growth affect our food supply? * How can the knowledge you gain in food science improve your health? * Discuss sustainable farming and how it has impacted agriculture around the world. * How has food science improved public safety? |
| **Other Essential Lesson Components** | |
| **Enrichment Activity**  (e.g., homework assignment) | Locate an article that focuses on a health or nutrition issue. Analyze the situation and develop a possible solution using food science principles.  Suggestions:   * The Impact of Food Science on World Hunger: World Food Day<http://www.ift.org/newsroom/world-food-day.aspx> * Develop a Service Learning Project to focus on the challenges and issues in nutrition education. |
| **Family/Community Connection** | Host community meetings that focus on reading/understanding food labels and the important role they play in our health.  Partner with a community organization to start a community garden.  American Community Garden There are many ways to start a community garden. Whether you’re working with friends, neighbors, or a local organization, there are many things you’ll want to consider before you ever dig the first hole. |
| **CTSO connection(s)** | **Family, Career, and Community Leaders of America (FCCLA)**<http://texasfccla.org>  **STAR Events**   * Applied Technology: Individuals or teams develop a project using technology that addresses a concern related to family and consumer sciences and/or related occupations. The project should integrate and apply content from academic subjects. There will be a junior, senior, and occupational category. * Environmental Ambassador: Individual or team event that recognizes participants who address environmental issues that adversely impact human health and well-being and who actively empower others to get involved. Participants will research one of five current topics, investigate, develop, and carry out stewardship projects and educate others. For competition, participants must prepare a portfolio and an oral presentation. There will be a junior, senior, and occupational category. * Food Innovations: Individuals or teams demonstrate knowledge of the basic concepts of food product development by creating an original prototype formula, testing the product through focus groups and developing a marketing strategy. Participants must prepare a display, suggested product packing and an oral presentation. There will be a junior, senior, and occupational category. |
| **Service Learning Projects** | Successful service learning project ideas originate from student concerns and needs. Allow students to brainstorm about service projects pertaining to lesson.<http://www.nylc.org/>  Service learning is a way for youth to gain knowledge and develop skills while meeting real community needs. After identifying and examining local issues, students agree on a plan, take action, and evaluate results.  Possible Idea: Students can create a local public service announcement (PSA) discussing food safety. The PSA should address common food sanitation mishaps. Examples could include, incorrect thawing methods of frozen meat or how long food can safely be left out of the refrigerator at room temperature. |

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)