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| **TEXAS CTE LESSON PLAN**  [www.txcte.org](http://www.txcte.org) | |
| **Lesson Identification and TEKS Addressed** | |
| **Career Cluster** | Agriculture, Food, and Natural Resources |
| **Course Name** | Mathematical Applications in Agriculture, Food, and Natural Resources |
| **Lesson/Unit Title** | Statistical and Data Analysis of Rare, Threatened, and Endangered Wildlife |
| **TEKS Student Expectations** | **130.5 (c) Knowledge and skills**  (10) The student demonstrates mathematical knowledge and skills required to solve problems related to natural resource systems and related career opportunities. The student is expected to:  (C) use statistical and data analysis to evaluate natural resource systems data reported numerically or graphically such as Geographic Information Systems and Global Positioning Systems data, weather-related data, and data related to wildlife and habitat |
| **Basic Direct Teach Lesson**  **With Special Education Modifications/Accommodations and**  **one English Language Proficiency Standards (ELPS) Strategy** | |
| **Instructional Objectives** | **The student will be able to:**   * The student will demonstrate the use of statistical and data analysis with regards to rare/endangered/threatened wildlife in the state of Texas. * The student will report analyses and statistics graphically and numerically by using a paper map and a pie chart. |
| **Rationale** | Provides students the opportunities to reinforce, apply, and transfer their knowledge and skills related to mathematics in a variety of contexts. |
| **Duration of Lesson** | Teacher’s Discretion |
| **Word Wall/Key Vocabulary**  *(ELPS c1a, c, f; c2b; c3a, b, d; c4c; c5b) PDAS II (5)* | **Geographic Information Systems (GIS):** a system used to store, analyze, and geographically display spatial and tabular data  **Spatial data:** information that can be represented on a map  **Tabular data:** information found in a data table  **Taxa:** (taxon) a group of one or more populations of an organism that forms a distinct unit  **Endangered species:** a species that has been identified as likely to become extinct  **Rare species:** a species that is very uncommon, scarce, or infrequently encountered, usually fewer than 10,000  **Threatened species:** a species that is likely to become endangered in the foreseeable future |
| **Materials/Specialized Equipment Needed** | **Equipment:**   * Computer   **Material:**   * Notecard (3 per group) |
| **Anticipatory Set**  (May include pre-assessment for prior knowledge) | Rare? Threatened? Endangered?  With your group, come up with a definition that fits each one. Write each definition on a different notecard.  As a class, discuss the differences and similarities of each term. Discuss what those terms mean when used to label plant or animal wildlife. The teacher will facilitate the class discussion. Ultimately the student should arrive at or be led to the following definition differences.   * **Endangered species:** a species that has been identified as likely to become extinct * **Rare species:** a species that is very uncommon, scarce, or infrequently encountered, usually fewer than 10,000 * **Threatened species:** a species that is likely to become endangered in the foreseeable future |
| **Direct Instruction \*** | * The teacher will facilitate the discussion about the differences between rare, threatened, and endangered species. * The teacher will model how to use the Rare, Threatened, and Endangered Species of Texas website. <http://tpwd.texas.gov/gis/rtest/>   *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*  NONE |
| **Guided Practice \*** | *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*  NONE |
| **Independent Practice/Laboratory Experience/Differentiated Activities \*** | The teacher will divide the 254 counties of Texas up amongst their class. You may choose to have the students work individually or in groups.  The student is responsible for identifying which Taxa of species is at greatest risk in each county. For example, in Anderson County there are 14 different types of birds on the list which is significantly more than any other Taxa in that county.  Students will color-code their county to match the legend requirements given.   * Red-Birds * Orange-Mammals * Purple-Amphibians * Yellow-Fishes * Dark green-Reptiles * Light green-Plants * Blue-Insects * Pink-Other * Gray-Two or more (Tie)   Once all the most at-risk Taxa are identified in all counties, students will calculate the state at-risk percentages for each Taxa and graph in a pie chart.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*  NONE |
| **Lesson Closure** |  |
| **Summative/End of Lesson Assessment \*** | The student will analyze and evaluate the map for trends or data patterns. The students will identify and summarize patterns and provide justification as to why those patterns might exist. (i.e., Are their regional patterns? Are their patterns that occur around urbanized areas? Are their patterns that occur along waterways? etc.)  Grading Summary Rubric (Attached)  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*  NONE |
| **References/Resources/Teacher Preparation** |  |
| **Additional Required Components** | |
| **English Language Proficiency Standards (ELPS) Strategies** |  |
| **College and Career Readiness Connection[[1]](#footnote-1)** | III Speaking B2  IV Listening B3  I Numeric Reasoning B1  VI Statistical Reasoning B2, B4, C2  IX Communication and Representation C1, C2  I Nature of Science C1, D1, D2, D3  I Social Studies A1  I Key Cognitive Skills D1, D4, E2  II Foundational Skills B1, C5 D1, D2, E1, E4 |
| **Recommended Strategies** | |
| **Reading Strategies** |  |
| **Quotes** |  |
| **Multimedia/Visual Strategy**  **Presentation Slides + One Additional Technology Connection** |  |
| **Graphic Organizers/Handout** |  |
| **Writing Strategies**  **Journal Entries + 1 Additional Writing Strategy** |  |
| **Communication**  **90 Second Speech Topics** |  |
| **Other Essential Lesson Components** | |
| **Enrichment Activity**  (e.g., homework assignment) | Extended learning:  Investigate the different types of thematic maps. Which maps would be best to use during statistical analyses? Explain.  <http://www.earthonlinemedia.com/ebooks/tpe_3e/essentials/map_types.html> |
| **Family/Community Connection** |  |
| **CTSO connection(s)** |  |
| **Service Learning Projects** |  |
| **Lesson Notes** |  |

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)