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| **TEXAS CTE LESSON PLAN**  [www.txcte.org](http://www.txcte.org) | |
| **Lesson Identification and TEKS Addressed** | |
| **Career Cluster** | Transportation, Distribution & Logistics |
| **Course Name** | Principles of Transportation Systems |
| **Lesson/Unit Title** | GIS and GPS in Transportation, Distribution, and Logistics |
| **TEKS Student Expectations** | **130.442. (c) Knowledge and Skills**  (9) The student applies problem-solving, mathematical, and  organizational skills to maintain financial and logistical records  related to transportation. The student is expected to:  (D) discuss Geographic Information Systems, Global  Positioning Systems, and other computer-based equipment  in transportation systems |
| **Basic Direct Teach Lesson**  (Includes Special Education Modifications/Accommodations and  one English Language Proficiency Standards (ELPS) Strategy) | |
| **Instructional Objectives** | After completing this lesson, the student will be able to:  Discuss GIS and GPS and describe how they are currently being applied with regards to transportation, distribution, and logistics. |
| **Rationale** | In Principles of Transportation Systems, students gain knowledge and skills in the application, design, production, and assessment of products, services, and systems. This knowledge includes common practices used in the transportation industry as well as the application of technology, such as GIS and GPS. |
| **Duration of Lesson** | 3-4 45-minute periods |
| **Word Wall/Key Vocabulary**  *(ELPS c1a, c, f; c2b; c3a, b, d; c4c; c5b) PDAS II (5)* | * **Global Positioning System (GPS)** – a satellite network used to determine a geographic location on the earth’s surface * **Geographic Information Systems (GIS)** – a system used to store, analyze, and graphically display tabular data that has a spatial component * **Layer** – digital representation of a geographic feature (ex. soil type, drainage, etc…) * **Altitude** – height above sea level * **Latitude** – measurement of a location’s distance north or south of the equator * **Longitude** – measurement of a location’s distance east or west of the Prime Meridian |
| **Materials/Specialized Equipment Needed** | * Computer * Poster paper * Markers or colored-pencils * Using GIS and GPS PowerPoint (PPT) * Using GIS and GPS student notes (WS) |
| **Anticipatory Set**  (May include pre-assessment for prior knowledge) | Nissan has announced that it will have a self-driving car by 2020, Google has said it will do so by 2018. Students will discuss with their neighbor the technologies that have made this a future possibility. The teacher will facilitate a class discussion over this topic being sure to address (GPS receivers, internal navigation, laser rangefinders, radar, video, etc.…) |
| **Direct Instruction \*** | 1. The teacher will provide the student with background knowledge of GPS and GIS. (See PowerPoint) 2. The student will fill in notes as information is presented. (See student notes WS)   *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 \*** | Students will be divided up into groups of three. Each student will be assigned one aspect of TDL (i.e., transportation, distribution, or logistics) to research and investigate how that component utilizes GPS and GIS technologies. At the end of their investigation, students will come together with their group and discuss how each component of TDL utilizes GIS and GPS technologies.  *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 \*** | Students will be divided up into groups of three. Each student will be assigned one aspect of TDL (i.e., transportation, distribution, or logistics) to research and investigate how that component utilizes GPS and GIS technologies.  *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** | At the end of their investigation, students will come together with their group and discuss how each component of TDL utilizes GIS and GPS technologies.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*  *NONE* |
| **Summative/End of Lesson Assessment \*** | During each group’s discussion, each group will be responsible for compiling the information they gathered into an informational poster. The poster will be graded using the rubric below.  Poster Rubric   |  |  |  |  | | --- | --- | --- | --- | |  | **POOR** | **GOOD** | **EXCEPTIONAL** | | **Required Elements** | Incomplete, Minimal effort shown | Complete, some effort shown | Complete, obvious effort shown | | **Writing Presentation** | Sloppy or illegible, poor use of space | Legible, adequate use of space | Very legible, great use of space | | **Quality of Language** | Little or no original language | Some original language | All language is original | | **Examples** | Incomplete or no examples shown | Some concepts without examples | Every concept has an example | |
| **References/Resources/**  **Teacher Preparation** | Have students research how TDL is utilized during emergency management (i.e., mandatory evacuations, FEMA relief, etc…)  See “Introduction to GPS – GIS”  <http://transportationcareers.org/lesson-plan-listing/> |
| **Additional Required Components** | |
| **English Language Proficiency Standards (ELPS) Strategies** |  |
| **College and Career Readiness Connection[[1]](#footnote-1)** | I Writing A2  II Reading A2, A3, B1  III Speaking A2, B2, B3  IV Listening B1, B3  V Research A2, B1, B2, B3, C1, C2  **I Nature of Science C1, D1**  **III Foundation Skills B1, B3, B4, C1, D1, D2**  **I Social Studies A1**  **I Cross-Disciplinary A1, D1, D4, E1, E2, F1, F2**  **II Cross-Disciplinary A2, A4, A5, A6, C4, C5, C6, 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) | **References/Additional Materials / Extended Learning Opportunities/ Enrichment**  Have students research how TDL is utilized during emergency management (i.e., mandatory evacuations, FEMA relief, etc.…) |
| **Family/Community Connection** |  |
| **CTSO connection(s)** | DECA, SkillsUSATexas |
| **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)