|  |  |
| --- | --- |
| **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** | The Irrigation Circle |
| **TEKS Student Expectations** | **130.10. (c) Knowledge and Skills**  (7) The student demonstrates mathematics knowledge and skills to solve problems related to plant systems and career opportunities. The student is expected to:  (C) Use geometric principles for the analysis of problems inherent to plant systems such as plan grain storage structures, volume of grain storage vessels, grain handling volume, greenhouse capacity, and regular and irregular shaped planting bed size |
| **Basic Direct Teach Lesson**  **With Special Education Modifications/Accommodations and**  **one English Language Proficiency Standards (ELPS) Strategy** | |
| **Instructional Objectives** | **The students will be able to:**   * Use symbols to represent unknowns * Relate geometric and algebraic representations in a circle use a drawing to solve a problem * Use the Pythagorean Theorem * Apply properties of geometric figures to solve a problem solve a quadratic equation |
| **Rationale** | This lesson deals with properties of geometric figures to solve a problem related to plant systems. It also encourages the students to apply mathematics knowledge and skills to solve problems related to plant systems. |
| **Duration of Lesson** | Teacher’s Discretion |
| **Word Wall/Key Vocabulary**  *(ELPS c1a, c, f; c2b; c3a, b, d; c4c; c5b) PDAS II (5)* | Tangent  Right Triangle  Pythagorean Theorem  Quadratic equations  Quadratic formula Circle  Radius Parallel  Perpendicular  Adjacent |
| **Materials/Specialized Equipment Needed** | **Materials:**   * Graphing calculator * Straightedge * The Irrigation Circle - Teacher key (TK) 07c |
| **Anticipatory Set**  (May include pre-assessment for prior knowledge) | How do I determine the radius of a circle? |
| **Direct Instruction \*** | * Present the problem * What is the question? * What do you know? * What facts are missing? * Identify needed parts on the drawing. * Set up the problem using Pythagorean Theorem * Solve and verify the answer. * Discuss the reasonableness of answers.   *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 \*** | *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 \*** | * Which crops benefit from this type of irrigation system? * Does this type of practice show good stewardship of the land?   *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** | * Algebra to Go, Geometry to Go, Math at Hand * Texas A&M AgriLife Extension Service materials * IMS Materials, Texas A&M University * Texas Education Agency curriculum resources * *Mathematics for Agriculture*, Betty Rogers, Interstate Publishers * When Do We Ever Gonna Have to Use This, Hal Saunders TI Agrimath Curriculum, Texas Instruments |
| **Additional Required Components** | |
| **English Language Proficiency Standards (ELPS) Strategies** |  |
| **College and Career Readiness Connection[[1]](#footnote-1)** | **Mathematics**  I. C.1.c II.C.1. a  III.A.1.a III.A.2. f  III.A.3.a  III.B.2.b  III.C.1.c  IV.C.3.c  VIII  IX  X |
| **Recommended Strategies** | |
| **Reading Strategies** |  |
| **Quotes** |  |
| **Multimedia/Visual Strategy**  **Presentation Slides + One Additional Technology Connection** |  |
| **Graphic Organizers/Handout** | Handout - The Irrigation Circle - Teacher key (TK) 07c (Attached) |
| **Writing Strategies**  **Journal Entries + 1 Additional Writing Strategy** |  |
| **Communication**  **90 Second Speech Topics** |  |
| **Other Essential Lesson Components** | |
| **Enrichment Activity**  (e.g., homework assignment) | How can this problem be applied in an agricultural setting?  How can you achieve optimum irrigation practices for this field? |
| **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)