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| **TEXAS CTE LESSON PLAN**  [www.txcte.org](http://www.txcte.org) | |
| **Lesson Identification and TEKS Addressed** | |
| **Career Cluster** | Science, Technology, Engineering, and Mathematics |
| **Course Name** | Robotics I |
| **Lesson/Unit Title** | Robotics I - Automation and Patents |
| **TEKS Student Expectations** | **130.408. (c) Knowledge and Skills**  (9) The student uses engineering design methodologies.  (A) The student is expected to demonstrate an understanding of and discuss the design process |
| **Basic Direct Teach Lesson**  (Includes Special Education Modifications/Accommodations and  one English Language Proficiency Standards (ELPS) Strategy) | |
| **Instructional Objectives** | **Performance Objective**  At the end of the lesson, students will understand the robot design process and how to get a patent for a robot design. Students will demonstrate how to sketch, design, and build a robot to match the criteria in the *Rubric: Robotics and Patents*.  **Specific Objectives**   * Describe the robot design process. * Research the potential patents available for their robot design. * Explain how to patent a robot design. * Demonstrate how to sketch, design, and build a robot using the robot design process. * Describe how to get a patent for a robot design |
| **Rationale** | It is critical that students understand the robot design process and how to get a patent for a robot design. |
| **Duration of Lesson** | The lesson should take approximately 45 minutes to teach and 45 minutes for students to complete each of the three lab sessions. The amount of time to complete the assignment will vary for each team. |
| **Word Wall/Key Vocabulary**  *(ELPS c1a,c,f; c2b; c3a,b,d; c4c; c5b) PDAS II(5)* | * **Design -** to sketch an outline for; plan. * **Robot -** mechanical device operating automatically, in a seemingly human way. * **Sketch -** a rough drawing or design, done rapidly. * **Patent -** a document granting the exclusive right to produce or sell an invention, for a specified time. |
| **Materials/Specialized Equipment Needed** | **Instructional Aids**   * United States Patent and Trademark Office website * JPL Robotics website * Handouts for each student * Assignment: Robotics and Patents * Draw a Robot Model * Rubric: Robotics and Patents |
| **Anticipatory Set**  (May include pre-assessment for prior knowledge) | * **Show** Types of patented robot designs * **Ask** Have you ever wondered how robot designs are patented? * **Show** Types of robots used in hospitals, military, and industrial working environments * **Say** Robots are used in various industries and solve problems in society. * **Ask** What types of robots are used to solve problems in society? |
| **Direct Instruction \*** | 1. Defining a patent 2. Describing the Robot Design Process 3. Define the Problem 4. Research and Design 5. Create a prototype 6. Build the Robot 7. Program and test the robot 8. Evaluate the Robot 9. Reviewing Potential Robot Patents 10. Getting a Patent for a Robot Design 11. Write down your idea 12. Conduct a Patent Research 13. File provisional or non-provisional patent application 14. Wait for USPTO to evaluate application 15. *Assignment: Robotics and Patents* 16. Use the Robot Design Process 17. Complete the *Draw a Robot Model-Part I. Proportion Problems Exercise* 18. Complete the *Draw a Robot Model- Part II.* 19. Submit an USPTO patent application 20. *Rubric: Robots and Patents*   *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 \*** | The students will practice by sketching, designing, and building a robotics project.  *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 students will design and build a robot by selecting a robotics project of their choice.  *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** | The students will be able to discuss the patent design process for their robot. Students will share the sketch, design, and build of their robot. |
| **Summative/End of Lesson Assessment \*** | The students’ robots are graded using the *Rubric: Robotics and Patents*.  *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** | * United States Patent and Trademark Office <http://www.uspto.gov/> * JPL Robotics http://www-robotics.jpl.nasa.gov/patents/ * *Webster’s New World College Dictionary.* (2002). Cleveland, OH: Wiley, John & Sons, Inc.   **Preparation**   * Research the Internet for robotics patents. * Become familiar with the terminology on the website of the United States Patent and Trademark Office. * Have materials and websites ready prior to the start of the lesson. * Make each student a copy of the *Rubric: Robotics and Patents*. * Have robotics projects for students to choose. |
| **Additional Required Components** | |
| **English Language Proficiency Standards (ELPS) Strategies** |  |
| **College and Career Readiness Connection[[1]](#footnote-1)** |  |
| **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) | The students will visit the campus library to research robotics patents. |
| **Family/Community Connection** |  |
| **CTSO connection(s)** | SkillsUSA  Technology Student Association (TSA) |
| **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)