ROBOT DRONE LEAGUE
2024 Challenge: MINESHAFT

Standards Alignment with the Texas Essential Knowledge and Skills for Technology Applications

RDL Introduction
Creativity and innovation are key elements to advancing the fields of science, technology, engineering, and mathematics (STEM) into the future. Robot Drone League (RDL) has been designed to provide students with open-ended challenges that allow for creation and innovation by engaging in hands-on design, engineering, and programming of interactive robots and drones. Students are presented with the opportunity to develop real-world connections to classroom learning. Working with robots in a collaborative game format can be a very powerful tool to engage students and enhance math and science skills through hands-on, student-centered learning. Through participation in RDL, students can develop the essential life skills of teamwork and collaboration, as well as critical thinking, project management, and communication required to become the next generation of innovators and problem-solvers in our global society.

Technology Applications Grade 6
Knowledge and skills.
(1) Computational thinking--foundations. The student explores the core concepts of computational thinking, a set of problem-solving processes that involve decomposition, pattern recognition, abstraction, and algorithms. The student is expected to:
(A) decompose real-world problems into structured parts by using visual representation;
(B) analyze the patterns and sequences found in visual representations such as learning maps, concept maps, or other representations of data;
(C) define abstraction and distinguish between generalized information and specific information in the context of solving a problem or completing a task;
(D) design a plan collaboratively using visual representation to document a problem, possible solutions, and an expected timeline for the development of a coded solution;
(E) analyze different techniques used in debugging and apply them to an algorithm; and
(F) analyze the benefits of using iteration (code and sequence repetition) in algorithms.

(2) Computational thinking--applications. The student applies the fundamentals of computer science. The student is expected to:
(A) define and label variables that relate to their programming or algorithm; and
(B) use a design process to create block-based and text-based programs that include sequences, loops, conditionals, and events to solve an everyday problem.

(3) Creativity and innovation--innovative design process. The student takes an active role in learning by using a design process and creative thinking to develop and evaluate

solutions, considering a variety of local and global perspectives. The student is expected to:
(A) resolve challenges in design processes independently using goal setting and personal character traits such as demonstrating courage and confidence;
(B) discuss and implement a design process using digital tools to compare, contrast, and evaluate student-generated outcomes; and
(C) identify how the design process is used in various industries.

(4) Creativity and innovation--emerging technologies. The student demonstrates a thorough understanding of the role of technology throughout history and its impact on societies. The student is expected to:
(A) discuss how changes in technology throughout history have impacted various areas of study;
(B) discuss how global trends impact the development of technology; and
(C) transfer current knowledge to the learning of newly encountered technologies.

Technology Applications Grade 7
Knowledge and skills.
(1) Computational thinking--foundations. The student explores the core concepts of computational thinking, a set of problem-solving processes that involve decomposition, pattern recognition, abstraction, and algorithms. The student is expected to:
(A) decompose real-world problems into structured parts using flowcharts;
(B) analyze the patterns and sequences found in flowcharts;
(C) identify abstraction and analyze how an algorithm the student created can be generalized to solve additional problems;
(D) design a plan collaboratively using flowcharts to document a problem, possible solutions, and an expected timeline for the development of a coded solution;
(E) analyze different techniques used in debugging and apply them to an algorithm; and
(F) analyze the benefits of using iteration (code and sequence repetition) in algorithms.

(2) Computational thinking--applications. The student applies the fundamentals of computer science.The student is expected to:
(A) manipulate and rename variables and describe different data types; and
(B) use a software design process to create text-based programs with nested loops that address different subproblems within a real-world context.

(3) Creativity and innovation--innovative design process. The student takes an active role in learning by using a design process and creative thinking to develop and evaluate solutions, considering a variety of local and global perspectives. The student is expected to:
(A) resolve challenges in design processes independently using goal setting and personal character traits such as demonstrating responsibility and advocating for self appropriately;
(B) discuss and implement a design process that includes planning and selecting digital tools to develop and refine a prototype or model through trial and error; and

(C) identify how the design process is used in various industries.

(4) Creativity and innovation--emerging technologies. The student demonstrates a thorough understanding of the role of technology throughout history and its impact on societies. The student is expected to:
(A) explain how changes in technology throughout history have impacted various areas of study;
(B) explain how global trends impact the development of technology; and
(C) transfer current knowledge to the learning of newly encountered technologies.

Technology Applications Grade 8
Knowledge and skills.
(1) Computational thinking--foundations. The student explores the core concepts of computational thinking, a set of problem-solving processes that involve decomposition, pattern recognition, abstraction, and algorithms. The student is expected to:
(A) decompose real-world problems into structured parts using pseudocode;
(B) analyze the patterns and sequences found in pseudocode and identify its variables;
(C) practice abstraction by developing a generalized algorithm that can solve different types of problems;
(D) design a plan collaboratively using pseudocode to document a problem, possible solutions, and an expected timeline for the development of a coded solution;
(E) develop, compare, and improve algorithms for a specific task to solve a problem; and
(F) analyze the benefits of using iteration (code and sequence repetition) in algorithms.

(2) Computational thinking--applications. The student applies the fundamentals of computer science. The student is expected to:
(A) construct named variables with multiple data types and perform operations on their values;
(B) use a software design process to create text-based programs with nested loops that address different subproblems within a real-world context; and
(C) modify and implement previously written code to develop improved programs.

(3) Creativity and innovation--innovative design process. The student takes an active role in learning by using a design process and creative thinking to develop and evaluate solutions, considering a variety of local and global perspectives. The student is expected to:
(A) demonstrate innovation in a design process using goal setting and personal character traits, including demonstrating calculated risk-taking and tolerance;
(B) discuss and implement a design process that includes planning, selecting digital tools to develop, test, and evaluate design limitations, and refining a prototype or model; and
(C) identify how the design process is used in various industries.

(4) Creativity and innovation--emerging technologies. The student demonstrates a thorough understanding of the role of technology throughout history and its impact on societies. The student is expected to:

(A) evaluate how changes in technology throughout history have impacted various areas of study;
(B) evaluate and predict how global trends impact the development of technology; and
(C) transfer current knowledge to the learning of newly encountered technologies.