GEORGIA | PEACH STATE PATHWAYS

Career, Technical, & Agricultural Education

ENGINEERING & TECHNOLOGY

COURSE: Engineering Applications (ET-EA)

UNIT: 4. Technology Student Association

INTRODUCTION

Annotation:

In this unit students will have an opportunity to apply engineering design as they develop a solution for a technological problem. Students will select the project, the proper tools, machines and materials, and processes to develop a solution of a design problem.

Grade(s):

X	9th
X	10th
X	11th
X	12th

Time:

5 hours

Author:

Gillespie

Notes to the Teacher:

This is a great opportunity to have your TSA students work towards the state conference.

Students with Disabilities:

For students with disabilities, the instructor should refer to the student's IEP to be sure that the accommodations specified are being provided. Instructors should also familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation.

FOCUS STANDARDS

GPS Focus Standards: Please list the standard and elements covered.

- ENGR-EA-1 – Students will use selected discipline specific engineering tools, machines, materials, and processes.
- ENGR-EA-2 – Students will develop and follow a detailed plan for the solution of a design problem.
- ENGR-STEM-4 – Students will apply principles of science, technology, engineering, mathematics, interpersonal communication, and teamwork to the solution of a technological problem.
- ENGR-STEM-7 – Students will develop leadership and interpersonal problem-solving skills through participation in co-curricular activities associated with the Technology Student Association.
- CTAE-FS-8 – Leadership and Teamwork: Learners will apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

GPS Academic Standards:

- SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.
- SCSh3. Students will identify and investigate problems scientifically.
- SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.
- SCSh6. Students will communicate scientific investigations and information clearly.
- MM3P1. Students will solve problems (using appropriate technology).

National / Local Standards / Industry / ISTE:

UNDERSTANDINGS & GOALS

Enduring Understandings: Enduring understandings are statements summarizing important ideas and have lasting value beyond the classroom. They synthesize what students should understand – not just know.

Students will safely and effectively manipulate materials, tools, and processes to solve a technological problem.

Essential Questions: Essential questions probe for deeper meaning and understanding while fostering the development of critical thinking and problem-solving skills. Example: Why is life-long learning important in the modern workplace?

- How are effective communication skills and teamwork used to accomplish a specific goal?
- How can materials, tools, and processes be manipulated to solve a problem?
- How is the effectiveness of a design plan assessed?

Knowledge from this Unit: Factual information.

Skills from this Unit: Performance.

ASSESSMENT(S)

Assessment Method Type: Select one or more of the following. Please consider the type(s) of differentiated instruction you will be using in the classroom.

____ Pre-test
____ Objective assessment - multiple-choice, true- false, etc.
__ Quizzes/Tests
__ Unit test
____ Group project
_X_ Individual project
X Self-assessment - May include practice quizzes, games, simulations,
____ checklists, etc.
__ Self-check rubrics
__ Self-check during writing/planning process
__ Journal reflections on concepts, personal experiences and impact on one's life
__ Reflect on evaluations of work from teachers, business partners, and competition judges
__ Academic prompts
__ Practice quizzes/tests
____ Subjective assessment/Informal observations
__ Essay tests

____
__ Observe students working with partners
__ Observe students role playing

____ Peer-assessment
__ Peer editing & commentary of products/projects/presentations using rubrics
__ Peer editing and/or critiquing

____ Dialogue and Discussion
__ Student/teacher conferences
__ Partner and small group discussions
__ Whole group discussions
__ Interaction with/feedback from community members/speakers and business partners

____ Constructed Responses
__ Chart good reading/writing/listening/speaking habits
__ Application of skills to real-life situations/scenarios

____ Post-test

Assessment(s) Title:

TSA Activity

Assessment(s) Description/Directions:

See description under Sequence of Instruction & Learning

Attachments for Assessment(s): Please list.

TSA Internet Scavenger Hunt

LEARNING EXPERIENCES

Instructional planning: Include lessons, activities and other learning experiences in this section with a brief description of the activities to ensure student acquisition of the knowledge and skills addressed in the standards. Complete the sequence of instruction for each lesson/task in the unit.

Sequence of Instruction

1. Identify the Standards. Standards should be posted in the classroom for each lesson.

- ENGR-EA-1 – Students will use selected discipline specific engineering tools, machines, materials, and processes.
- ENGR-EA-2 – Students will develop and follow a detailed plan for the solution of a design problem.

- ENGR-STEM-4 – Students will apply principles of science, technology, engineering, mathematics, interpersonal communication, and teamwork to the solution of a technological problem.
- ENGR-STEM-7 – Students will develop leadership and interpersonal problem-solving skills through participation in co-curricular activities associated with the Technology Student Association.
- CTAE-FS-8 – Leadership and Teamwork: Learners will apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.
- SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.
- SCSh3. Students will identify and investigate problems scientifically.
- SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.
- SCSh6. Students will communicate scientific investigations and information clearly.
- MM3P1. Students will solve problems (using appropriate technology).

2. Review Essential Questions.

- How are effective communication skills and teamwork used to accomplish a specific goal?
- How can materials, tools, and processes be manipulated to solve a problem?
- How is the effectiveness of a design plan assessed?

3. Identify and review the unit vocabulary.

4. Assessment Activity.

This 5 day unit pulls activities specifically from the Technology Student Association. You may group students or have them choose cooperative groups themselves. If you have students attending the State Conference you may choose to have them work on their project during this time. I would have students choose an activity they are interested in, but you may assign them according to materials & resource availability. At the end of the 5 days they should have a completed project along with any required documentation. If they are not done in this time period, students should have a project proposal showing final completion dates & work done up to this point. Any work they have left to do would be completed outside of normal class time.

Attachments for Learning Experiences: Please list.

TSA Internet Scavenger Hunt

Notes & Reflections: May include notes to the teacher, pre-requisite knowledge & skills, suggestions, etc.

CULMINATING PERFORMANCE TASK (Optional)

Culminating Unit Performance Task Title:

TSA Internet Scavenger Hunt

Culminating Unit Performance Task Description/Directions/Differentiated

See TSA Internet Scavenger Hunt

Attachments for Culminating Performance Task

TSA Internet Scavenger Hunt

UNIT RESOURCES

Web Resources:

Attachment(s): Supplemental files not listed in assessment, learning experiences, and performance task.

Materials & Equipment:

What 21st Century Technology was used in this unit:

	Slide Show Software		Graphing Software		Audio File(s)
	Interactive Whiteboard		Calculator		Graphic Organizer
	Student Response System	X	Desktop Publishing		Image File(s)
	Web Design Software		Blog		Video
	Animation Software		Wiki		Electronic Game or Puzzle Maker
	Email		Website		