GEORGIA | PEACH STATE PATHWAYS

Career, Technical, & Agricultural Education

ENGINEERING & TECHNOLOGY

COURSE: Engineering Concepts (ET-EC)

UNIT: 1. Safety in Engineering

INTRODUCTION

Annotation:

As students progress through the pathway, more equipment will be needed to complete more complex projects. Therefore students will be required to understand more machines and understand them more in-depth. This unit of safety focuses on the students' ability to use the lab equipment.

Grade(s):

	9th
X	10th
X	11th
X	12th

Time:

4 days

Author:

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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-EC-3b – Demonstrate applications of precision measuring instruments to describe parts and inspect artifacts.
- ENGR-STEM-1b – Identify the relationships among technologies along with connections to contemporary issues.
- ENGR-STEM-2b – Demonstrate ethical and professional behavior in the development and use of technology.
- ENGR-STEM-5 – Students will select and demonstrate techniques, skills, tools, and understanding related to energy and power, bio-related, communication, transportation, manufacturing, and construction technologies.
- CTAE-FS-1 – Technical Skills: Learners achieve technical content skills necessary to pursue the full range of careers for all pathways in the program concentration.
- CTAE-FS-7 – Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.
- CTAE-FS-9 – Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

GPS Academic Standards:

- SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.
- ELA10C1. The student demonstrates understanding and control of the rules of the English language, realizing that usage involves the appropriate application of conventions and grammar in both written and spoken formats.
- ELAALRC3. The student acquires new vocabulary in each content area and uses it correctly.

National / Local Standards / Industry / ISTE:

UNDERSTANDINGS & GOALS

Enduring Understandings:

Students will understand the importance of lab safety for themselves and their peers. In this unit, students will:

- Be able to select and use lab equipment properly and safely.
- Be able to properly recognize each safety color and what they mean.

Essential Questions:

- What is the proper way to use the lab equipment?
- What do different colors mean in the lab?

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
X Objective assessment - multiple-choice, true- false, etc.
__ Quizzes/Tests
_X_ Unit test
____ Group project
____ Individual project
____ 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
X Subjective assessment/Informal observations
__ Essay tests
_X_ 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
X Dialogue and Discussion
__ Student/teacher conferences
_X_ Partner and small group discussions
_X_ 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:

General Safety Test

ANSI Safety Colors PowerPoint

Assessment(s) Description/Directions:

Attachments for Assessment(s): Please list.

- EC_1_General Safety Test
- EC_1_ANSI Safety Colors

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-EC-3b – Demonstrate applications of precision measuring instruments to describe parts and inspect artifacts.
- ENGR-STEM-1b – Identify the relationships among technologies along with connections to contemporary issues.
- ENGR-STEM-2b – Demonstrate ethical and professional behavior in the development and use of technology.
- ENGR-STEM-5 – Students will select and demonstrate techniques, skills, tools, and understanding related to energy and power, bio-related, communication, transportation, manufacturing, and construction technologies.
- CTAE-FS-1 – Technical Skills: Learners achieve technical content skills necessary to pursue the full range of careers for all pathways in the program concentration.
- CTAE-FS-7 – Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.
- CTAE-FS-9 – Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

- SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.
- ELA10C1. The student demonstrates understanding and control of the rules of the English language, realizing that usage involves the appropriate application of conventions and grammar in both written and spoken formats.
- ELAALRC3. The student acquires new vocabulary in each content area and uses it correctly.

2. Review Essential Questions.

- What is the proper way to use the lab equipment?
- What do different colors mean in the lab?

3. Identify and review the unit vocabulary.

4. Assessment Activity.

- Day 1
  - Review Safety materials from Foundations class.
  - In groups students will read the owners manual and prepare a presentation on the important safety information of each machine, the proper procedure for operating the machinery, and any care or maintenance required.
- Day 2
  - Students should work and finish their presentation.
  - Students will make their presentations to the class.
- Day 3
  - Finish the group presentations.
  - The teacher should demonstrate how to use each piece of equipment.
- Day 4
  - ANSI Safety Colors PowerPoint
  - Students should be given a floor plan of your lab and correctly mark where each color is needed.
- Day 5
  - Test

  (*Note: Teacher should add specific questions about the equipment in their own lab.)*

Attachments for Learning Experiences: Please list.

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

CULMINATING PERFORMANCE TASK (Optional)

Culminating Unit Performance Task Title:

Equipment Presentation

Culminating Unit Performance Task Description/Directions/Differentiated

Students will be divided up into groups and assigned a machine or piece of equipment in the room. The group will read the owner's manual and gather other information to present to the class on how to properly operate it.

Grade should be based on accuracy and how well the information was presented.

Attachments for Culminating Performance Task

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:

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