

Robotics and Manufacturing

5S + Safety

Audience

High School Students Grades 9 – 12

Purpose

We have an unorganized workspace with precision metal classes returning this school year. Our shop has the following dangerous equipment: CNC and Manual Lathes, Mills and Routers, saws, drills, break, rollers, welders, shears, sanders, grinders, chemicals, tumblers, presses, lasers and raw material. We want to teach students how to develop a safe and efficient workplace. We want to install a safety focus culture that prevent injuries to our students. We want to implement 5S + Safety which stands for Sort, Shine, Straighten Standardize, Sustain and Safety.

Standards

- Understand each of the five S's and how each "S" builds upon the previous "S."
- TEKS §130.352(c)(1-5), §130.359(c)(1-6), 130.408(c)(5), 130.409(c)(5)

Objectives

- At the end of this lesson, students will be able to develop a plan to turn our workplace 5S+Safety
- Implement the first S by sorting all the tools and materials in the workplace
- Determine what is needed in each area: 2 FRC Bench/Cart, 3D print area, Laser , Welders, 5 VEX build stations , 3 FRC build stations, CNC Lathe, CNC Mills, CNC Router, Manual Mills and Mutual Lathes
- Implement the next two S's by designing the work areas for placement of tools, building materials, waste to implement shine and straighten
- Build the 5S workstations. Include places to hang incident reports and Lock Out Tag Out equipment
- Perform a mock ran of each workstations practicing 5S + Safety
- Determine if the process is sustainable and safe. If something is not sustainable or safe, circle back to top objective
- Display safety data and success via our building displays
- Post 5S+Safety reminders in the work areas via signs and labels

Opener:

- Video of a workplace safety incident
- Discuss the root cause of that incident

- Show a 5S+Safety Workplace
- Walk thru our workplace
- Compare our workplace to a 5S+Safety Workplace

ACADEMIC KNOWLEDGE & SKILLS:

Students will be able to use CAD skills, the experience in building robots, project management, and engineering design process learned.

PROJECT-BASED LEARNING OPPORTUNITIES:

This lesson is a multiple days project where students are divided into various groups to implement the 5S + Safety workplace

RESOURCES/MATERIALS NEEDED:

- Pegboards
- Foam
- Tools
- Work Benches
- Work Tables
- Box cutter for the foam cutouts
- Tool Holders for pegboard
- Tape for marking workplace area (including yellow safety)
- Tape for item markings
- Can with lids for various waste management
- TBD (items identified in brainstorming session of objective 1)

What is 5S all About?

1. Sort

Keep what is needed

2. Shine

Make it inspection ready

3. Straighten

Assign a location

4. Standardize

Repeat the process

5. Sustain

Establish discipline

