WISELearn Resources

Career Academy Teacher Externship Program

Title: 5S Lean Manufacturing

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Externship Business: Nercon

Overview / Description:

This will be a year-long lesson that is graded quarterly. Students will follow the 5S Lean workforce model daily when working in the shop areas. 5S stands for Sort, Set in Order, Shine, Standardize, Sustain, and sometimes a 6th S stands for Safety. This model will help students with daily reminders on how we should maintain the shop and perform in the shop.

Subject(s):

Technology Education

Grade Level(s):

Grades 9-12

Learning goals/objectives:

After completing this activity, students should be able to:

- Model proper workforce habits in a manufacturing setting.
- Use proper tools for the job in hand.
- Keep a clean and organized work environment.
- Follow written and oral instructions when given.
- Maintain a safe working area and follow all safety rules.

Type of Activity:

X Individual
X Small Group
X Whole Class

Teaching Strategies:

X Discussion
X Simulation
X Performance Assessment

Content Standards

WIsconsin Standards for Technology and Engineering

Content Area: Technology and Engineering

BB/Broad Based

- **BB1.b:** Analyze and use tools and materials.

MNF/Manufacturing:

- **MNF1**: Students will be able to select and use manufacturing technologies.
- **MNF1.a:** Identify, select and safely use tools, machines, products and systems for specific tasks.
- **MNF1.a.5.m:** Use tools, materials and machines safely, adjust and repair systems.

Model Academic Standards for School Counseling

Career Development Domain

Content Standard H: Students will understand the relationship between educational achievement and career development.

- Core Performance Standard 2: Participate in ongoing, lifelong learning experiences to adapt to and excel in a diverse and changing environment.

Length of Time and length of class periods:

9 week marking periods. Class periods are 45 minutes in length.

Materials List :

- Working shop
- Technology Education Basic Safety Rules
- 6S Workshop Working Guidelines
- Grading Rubric

Directions (Step-by-Step): (See workshop working guidelines below)

This lesson is an employability skills assessment. It models the 5S workforce environment which I learned about while working at Nercon.

- Teacher will introduce the 5S concept with students. A video resource for this introduction can be found here: https://youtu.be/umUvWLeMZMY
- Next, the teacher will use the 6S Workshop Working Guidelines to review with students how the 5S + Safety process will be used in the workshop. Teacher will also review the safety rules with the Technology Education Basic Safety Rules worksheet, since safety is a sixth “S” which will be added to the process.
- The Grading Rubric will be shared with the class. Each step in the rubric will be outlined and expectations will be reviewed in each area. Students will give themselves a score at the end

of each quarter. They will then sit down with the teacher and compare scores. A final score will be agreed upon, based upon dialog between the teacher and student.

Wrap-Up:

Students will follow the 5S procedures during each quarter and then follow the protocol above to grade themselves and dialogue with the teacher to reach a final grade.

Formative/Summative Assessment:

- Formative assessment is done by observation of the instructor.
- Summative assessment includes the quarterly grading rubric, along with grading for individual projects and safety exams which are included in the overall assessment.

Extension Activity for differentiation:

- Manufacturing field trips can be taken to visually see how workers are expected to maintain their work areas under the 5S process.

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Grading Rubric for 5S Maintenance of Shops		
Low Scores 1-3	**Average Score 4-7**	**High Scores 8-10**
	1. Sort **(Organize Equipment /materials)**	
Fails to establish proper organization skills.	Is usually organized, and has a neat working environment.	Establishes a strong sense of organization. Always works in a neat, organized manner. Maintains all equipment in a proper manner.
	2. Set in Order **(Using proper items for job)**	
Often uses incorrect tools/instructions to complete the task.	Usually uses the proper items to complete tasks. Sometimes needs adjustments, or directions repeated.	Always follows directions on the first instruction. Completes tasks using the proper tools. Is a leader to others in the room.
	3. Shine **(Shop Cleanliness/Organization)**	
Student rarely puts things in the proper place. Student does not complete end of period cleaning.	Student usually puts things away. Cleaning is usually done.	Student always puts things back where they belong If something is not in the proper place student will organize it properly. If a shop area in not clean student will take it upon themselves to make sure it is.

	4. Standardize **(Following Directions)**	
Does not follow directions Wastes material continuously	Wastes little to no extra material Usually follows given instructions.	Always follows instructions that are given. No material is ever wasted. Encourages and leads others to follow instructions, and not to waste materials.
	5. Sustain **(Maintain good working habits)**	
Student was hard to work with. Student consistently had to be reminded to behave, and follow instructions.	Student usually was well mannered. Collaborated with other students in a proper manner.	Student always worked well with others. Student took on a leadership role. Student excelled whenever projects had to be completed.
	6. Safety **(Follow all shop safety rules)**	
Student had to be reminded constantly about safety glasses Student had to be reprimanded about safety issues. Student did not complete all safety exams with 100% accuracy in a proper timeline	Student was always safe. Rarely had to be told about safety glasses. All safety exams were completed in a timely manner.	Student completed all safety exams in a timely manner. Student was a leader in maintaining a safe environment. Student never needed to be reminded of wearing safety glasses.

OHS Technology Education Basic Safety Rules

1. Operate only with the instructor's permission and after you have received instruction and passed necessary safety and demonstration tests.
2. Remove jewelry, eliminate loose clothing, and confine long hair.
3. No open toed footwear, leather steel toed work boots are best.
4. Make sure all guards are in place and operating properly.
5. Always use proper eye protection.
6. Obey operator safety zones. Only 1 person in the safety zone of a machine. If safety zones are not painted on the floor, use the 2 foot rule.
7. Think Safety at all times.
8. Stay completely focused on what you are doing.
9. Tell the Teacher immediately if you notice anything that you think is unsafe, or anyone that you think is not working safely.
10. All accidents, no matter how minor, must be reported immediately.
11. Horseplay is not allowed, and can result in immediate removal from the class.
12. Disconnect all electrical outlets by the plug, not the cord.
13. If you find a dull or damaged tool/equipment, tell the instructor immediately.
14. Always keep your hands away from the cutting edge, when using tools. (A minimum of 3”from any saw blade.)
15. Always ask questions when you are unsure on how to use/operate a machine, equipment, or tools.
16. Clean up after yourself. You are responsible for returning any tools used.
17. Always shut off and wait for the machine to stop before walking away.
18. Know where the fire extinguishers are, and how to use them.
19. Safety guards must be installed and working properly before using any piece of equipment.
20. Know what to do in case of a fire, tornado, intruder, or hold lock alarm.

OHS 6S Workshop Working Guidelines

1. Sort
   a. All unnecessary tools and parts should be put away.
   b. The project should be fully planned.
   c. Inventory of all parts and tools should be marked properly.
   d. Maintenance of tools should be inspected before use.

2. Set in Order
   a. The correct tool should be used for the job.
   b. Project plans should be followed according to instructions.
   c. Be a leader, and helpful shop mate.
   d. Extra parts and tools should not be needed.

3. Shine
   a. When you are finished with a tool put it back.
   b. Keep your work area organized and neat.
   c. Keep the shop organized.
   d. Clean up time is for everyone.
   e. Equipment should be clean and free of clutter before, during, and after every use.

4. Standardize
   a. Instructions should be followed the first time given.
   b. Materials should never be wasted.
   c. Encourage others not to waste time or resources.
   d. Are you certain the first 3 S's are being followed.

5. Sustain
   a. Work well with others and offer words of encouragement. (no negativity, or berating)
   b. Be a leader whenever possible.
   c. Complete projects in a timely and professional manner. (Do it right the first time)
   d. Ensure you are following all protocols and be a reminder for classmates.

6. Safety
   a. Safety glasses must be worn at all times. (No exceptions)
   b. Tool and equipment safety and demonstration exams must be passed before usage.
   c. Be a leader in maintaining a safe working environment.
   d. All safety protocols on the safety sheet must be followed.