

Team Problem Solving

Middle School and High School

TEAM CONTEST - Maximum of three individuals per team

(from Wisconsin Skills Championships Technical Standards, 2009 and SkillsUSA at UW-Stout, 2007) This is a state-only contest. There is no corresponding national contest. Winning this contest does not qualify the participant to attend the National Leadership and Skills Contest.

Designing for Manufacturing

The theme of this year's problem solving competition will focus on designing a product for manufacturing. The contest asks students to create a prototype for a product that fulfills a given function and identify the secondary processes that will go into creating the real item.

Students participate in teams of up to 3 students. The competition is divided into three parts. The first part requires students to demonstrate their knowledge of manufacturing and manufacturing processes on a written objective test. The second part will ask students to design and build a model that reflects their solution to a given problem. Lastly, student will be required to present their solution to the problem.

Each segment of the contest will be evaluated. One third of the total score will be the performance on the test. Another third of the score will come from the work they do in a design portfolio that describes their thought processes (e.g. thumbnail sketch, anecdotal notes, final sketch, reflections) and the extent to which their model addressed the problem that was to be solved. The final third of the score will be based on the extent to which the individuals work and present as a team.

The Written Objective Test

After a short orientation, students will be asked to put their group number on the upper right hand corner of an envelope. Students will then be asked to retrieve a test and an answer sheet for each member of their team. Every member of the team will take the test and they will need to record their answer on the answer sheet. Given the fact that this is a team competition, students will be allowed to discuss the items and record their answers as they see fit. When students have completed the tests, they will return the tests and answer sheets to the team envelope and will sit quietly until everyone has finished the test. Only one test from the group's envelope will be randomly selected and subsequently scored.

The concepts addressed on the tests can be found in most middle school and introductory textbooks for the study of technology. Participants may want to visit the following websites as well:

<http://www.iteaconnect.org/Publications/HITSKITS/PH31D.PDF>

http://www.g-wlearning.com/technologyeducation/1590707184/student/PDF/Ch16_Glossary.pdf

Laboratory Portion

Each team will be given a manufacturing problem that has more than one viable solution. Their challenge will be to develop the optimum solution to the problem within a given set of constraints. These constraints will include specific design specifications, material restrictions, and a time limitation. To solve the problem, each team will need to analyze the problem, generate alternative solutions to the problem, select and refine the optimum solution, construct a prototype of their solution, and test their solution to the problem.

The problem solving process will start with an examination of a problematic situation. The problem will be presented to students in the form of a design brief. A design brief is a short narrative that describes a situation, which is usually hypothetical, that features a problem that needs to be solved. In addition to describing a problem, each design brief will provide students important contextual information that will add meaning to the learning experience. It will also define the important design considerations or specifications that need to be accounted for during the problem solving

process. Lastly, the design brief will encourage students to think creatively, allow for a variety of alternative solutions, and initiate the problem solving process.

Each team will also be required to develop a design portfolio that will be included in the judging process. The term design portfolio is a generic name for a number of formats that can be used to encourage students to document their problem-solving process. The primary purposes of the design portfolio are to:

- Record the students' ideas which can assist them in planning and executing the problem-solving process, recalling important information and problem specifications, and developing the best solution to the problem.
- Show a lineage of the students' progress from the inception of the problem to its solution.
- Document the students' thought processes and provide concrete evidence of what the student has learned
- Enable the judges to assess how well the student understands the important concepts associated with the problem as well as the problem-solving process itself.

Presentation Portion

Students conclude the competition by making a three to five minute presentation regarding their product solution. Judges will be identifying the teamwork process team roles relative to the solution presented. Judges will be looking for evidence of teamwork in the presentation portion of the competition.

Purpose

To evaluate a team of students' ability to work together, using creative and critical thinking and the decision making process to solve a problem. The contest is intended to foster creativity, innovation, team work, and problem solving skills.

General Regulations

People entering this contest must follow all rules listed below as well as the "General Regulations" of the Wisconsin Skills Championships. The "General Regulations" can be found in a separate file under that name. You will be held accountable for knowing and following all rules and guidelines of the Wisconsin Skills Championships.

Clothing Requirement

A Skills USA blazer, sweater, or windbreaker and accompanying official dress or professional business attire is acceptable. For information about "accompanying official dress" or purchasing official clothes, refer to the separate file called "Clothing Requirements." Penalty: Two points will be deducted for each team member not wearing official Skills USA dress or professional business attire.

Eligibility

This contest is open to active SkillsUSA members. A team consists of 3 students for the same local chapter. There is no national contest in this event.

Contest Procedures

1. Contestants will be identified by number only. The number will be assigned during the pre-contest briefing.
2. Each team's solution will be constructed on site.
3. Contest judges will interview each member as a part of the contest.
4. The technical committee will provide each team with the problem and the contest supplies at the time of the pre-contest briefing.

Scope of the Contest

Virtually all occupations require some level of problem solving skills. Often, the better the pay and benefits of a job, the more problem solving skills are required. In addition, just owning items such as cars, homes, electronics, etc. often require people to solve a variety of problems. In most cases, several people working together can find a better solution to a problem than can one person working alone.

The Team Problem Solving Contest will allow SkillsUSA members to demonstrate their ability to work together to solve a problem. This year's problem is selected from the Manufacturing area.

Equipment and Materials

1. Materials supplied by the technical committee:
 - a. All tools, materials, and supplies necessary to solve the contest problem except those items listed under number two below.
 - b. All necessary information and furnishings for judges and technical committee.
2. Supplied by the students:
 - a. Drawing equipment (team's choice – for example straightedge, t-square, triangle, scale, pens/pencils).
 - b. Safety glasses
 - c. Calculator
 - d. Scissors
 - e. Exacto-knife or equivalent
 - f. Note pad

Skills USA at UW-Stout
Team Problem Solving Rating Sheet

Evaluated Items	Points Possible	Points Earned	Remarks
Written Test General Understanding of problem-solving processes and processes of manufacturing.	20		
Team Work & Problem Solving Process Did everyone contribute?	5		
Did the team work together?	5		
Did the team identify different elements of the problem before seeking a solution	5		
Did the team explore more than one solution	5		
Did the team discuss the +/- of various solutions?	5		
Solution Creativity/Originality	10		
Quality of work Thoughtfulness of design, care and quality of construction	10		
Application – practicality, function (does it do what it's supposed to do?)	10		
Presentation Eye contact	5		
Grammar	5		
Volume	5		
Poise of team	5		
Whole team participated	5		

Subtotal	100		
Clothing Penalty (minus 2 points per student not in appropriate dress)			
Total			