



# TEAM ENGINEERING CHALLENGE

State & National Guidelines - *online*

## PURPOSE

This contest is designed to evaluate and to recognize outstanding students for excellence and professionalism in the areas of creative and critical thinking skills 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

### CLOTHING REQUIREMENT

These regulations refer to clothing items that are pictured and described at: [www.skillsusastore.org](http://www.skillsusastore.org). If you have questions about clothing or other logo items, call 800-401-1560 or 703-956-3723.

For men: Official blazer, jacket or sweater; black dress slacks; white dress shirt; plain black tie with no pattern or SkillsUSA black tie; black socks and black shoes.

For women: Official blazer or jacket; black dress skirt (knee-length) or slacks with business like white, collarless blouse or white blouse with small, plain collar that may not extend onto the lapels of the blazer; black sheer or skin-tone seamless hose and black dress shoes.

Note: Contestants must wear their official contest clothing to the contest orientation meeting.

## ELIGIBILITY

This contest is open to active SkillsUSA members. There are two divisions for competition/awards. Middle School TEC consists of members in grades 6-8 and High School TEC consists of members in grades 9-12. IF a team consists of a mix between Middle School and High School members, they will be considered a High School Competitive Team. A team consists of 3 students from the same local chapter.

## OBSERVER RULE

Observers will be allowed to watch the match providing space is available. No talking or gesturing will be permitted. The event chair or moderator may remove observers and/or close the event to observers for cause.

## EQUIPMENT AND MATERIALS

1. 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
    - i. Such items may include: hack saw, glue guns, cordless drill.
  - b. All necessary information and furnishings for judges and technical committee
2. Supplied by the students:
  - a. Drawing equipment (team's choice - for example: ruler, straightedge, t-square, triangle, scale, pencils, pens, compass, etc...)
  - b. Safety glasses
  - c. Calculator
  - d. Scissors
  - e. Exacto-knife or equivalent
  - f. Coloring / Writing utensils ( Markers, Crayons, Colored Pencils, etc)
  - i. Paint is not allowed.
  - g. Students are not allowed materials that will "add" to their prototype. (i.e. tape, glue, paper, staples, paper clips, etc)
  - h. Other tools as listed on the contest update page of the national website

Be at the contest area  
10 minutes early  
for your testing timeslot.

Do NOT enter the contest area  
during testing/judging  
unless you are let in by a  
TEC Official

TIMES	Testing	Judges 1	Judges 2	Judges 3	Judges 4	Judge 5	Judge 6
2:42 PM	7839						
2:44 PM	7626						
2:46 PM	7405		7626				
2:48 PM	7005			7405	7005		
2:50 PM	7538					7538	
2:52 PM	8111-MS						8111-MS
2:54 PM	7305		7478				
2:56 PM	7478			7821			
2:58 PM	7821				7602		
3:00 PM	7602					7455	
3:02 PM	7455						
3:04 PM	8135-MS						8135-MS
3:06 PM	7020		7384				
3:08 PM	7384			7210			
3:10 PM	7210				7218		
3:12 PM	7218					7037	
3:14 PM	7037						
3:16 PM	8020-MS						8020-MS
3:18 PM	7031						
3:20 PM	7543		7543				
3:22 PM	7999			7999			
3:24 PM	7029				7029		
3:26 PM	7824					7824	
3:28 PM	8051-MS						8051-MS
3:30 PM	7787						
3:32 PM	7816						
3:34 PM	7741						
3:36 PM	7997						
3:38 PM	7010						
3:40 PM	8121-MS						8121-MS
3:42 PM	7030						
3:44 PM	7925						
3:46 PM	7783						
3:48 PM	7299						
3:50 PM	7896						
3:52 PM	8023-MS						8023-MS
3:54 PM	7025						
3:56 PM	7388						
3:58 PM	7270						
4:00 PM	7605						
4:02 PM	7003						
4:04 PM	8009-MS						8009-MS
4:06 PM	7138						
4:08 PM	7084						
4:10 PM	7337						
4:12 PM	7612						
4:14 PM	7182						
4:16 PM	8029-MS						8029-MS
4:18 PM	7115						
4:20 PM	7040						
4:22 PM	7032						
4:24 PM	7367						
4:26 PM	7002						
4:28 PM	8090-MS						8090-MS
4:30 PM	0						
4:32 PM	0						
4:34 PM	0						
4:36 PM	0						
4:38 PM	0						
4:40 PM	8098-MS						8098-MS

TIMES	ROUND 1 - Judging						Testing	ROUND 2 - Call Backs							
	Judges 1	Judges 2	Judges 3	Judges 4	Judges 5	Judge 6		Times	Judging	Times	Judging				
12:30 PM	7296						7296								
12:32 PM	7990	7990					7990								
12:34 PM	7452		7452				7452								
12:36 PM	7135		7135				7135								
12:38 PM	7266		7266				7266								
12:40 PM	8005-MS		8005-MS				8005-MS								
12:42 PM	7342		7342				7342								
12:44 PM	7479		7479				7479								
12:46 PM	7600		7600				7600								
12:48 PM	7289		7289				7289								
12:50 PM	7831		7831				7831								
12:52 PM	8126-MS		8126-MS				8126-MS								
12:54 PM	7207		7207				7207								
12:56 PM	7348		7348				7348								
12:58 PM	7360		7360				7360								
1:00 PM	7034		7034				7034								
1:02 PM	7109		7109				7109								
1:04 PM	8100-MS		8100-MS				8100-MS								
1:06 PM	7429		7429				7429								
1:08 PM	7105		7105				7105								
1:10 PM	7872		7872				7872								
1:12 PM	7150		7150				7150								
1:14 PM	7011		7011				7011								
1:16 PM	8133-MS		8133-MS				8133-MS								
1:18 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
1:20 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
1:22 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
1:24 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
1:26 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
1:28 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
1:30 PM	7016		7016				7016								
1:32 PM	7060		7060				7060								
1:34 PM	7027		7027				7027								
1:36 PM	7603		7603				7603								
1:38 PM	7859		7859				7859								
1:40 PM	8054-MS		8054-MS				8054-MS								
1:42 PM	7104		7104				7104								
1:44 PM	7998		7998				7998								
1:46 PM	7009		7009				7009								
1:48 PM	7445		7445				7445								
1:50 PM	7874		7874				7874								
1:52 PM	8102-MS		8102-MS				8102-MS								
1:54 PM	7833		7833				7833								
1:56 PM	7225		7225				7225								
1:58 PM	7015		7015				7015								
2:00 PM	7232		7232				7232								
2:02 PM	7736		7736				7736								
2:04 PM	8091-MS		8091-MS				8091-MS								
2:06 PM	7778		7778				7778								
2:08 PM	7573		7573				7573								
2:10 PM	7006		7006				7006								
2:12 PM	7461		7461				7461								
2:14 PM	7898		7898				7898								
2:16 PM	8113-MS		8113-MS				8113-MS								
2:18 PM	7533		7533				7533								
2:20 PM	7591		7591				7591								
2:22 PM	7519		7519				7519								
2:24 PM	7923		7923				7923								
2:26 PM	7667		7667				7667								
2:28 PM	8057-MS		8057-MS				8057-MS								
2:30 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
2:32 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
2:34 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
2:36 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
2:38 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break
2:40 PM	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break	Break

## Round 2 High School CALL BACKS

will be posted in the contest area  
AND  
online  
around 5pm, Wednesday



[www.GoslingElectric.com/tec2015wi](http://www.GoslingElectric.com/tec2015wi)

# TEAM ENGINEERING CHALLENGE

State & National Guidelines - *continued...*

### CONTEST PROCEDURES

1. Contestants will be identified by number only.
2. The Team Written Test will be taken during the pre-contest briefing.
3. The technical committee will provide each team with the problem and the contest supplies at the time of the pre-contest briefing.
4. Each team's "solution" will be constructed on site.
  - a. Construction is ONLY allowed in the contest area and during the contest times as presented in the pre-contest briefing.
5. Contest judges will interview each team as a part of the contest.
  - a. Team interview timeslots will be available during the pre-contest briefing.

### SCOPE OF THE CONTEST

#### Knowledge Performance

- The contest includes a written test to be taken by all members of the team at the same time.

#### Skill Performance

- The demonstration is a presentation of an occupational skill accompanied by a clear explanation of the topic through the use of examples, experiments, displays and practical testing operations.

#### Contest Guidelines

The Team Engineering Challenge contest will allow SkillsUSA members to demonstrate their ability to work together to solve a problem.

1. The challenge will be selected from an area such as, but not limited to:
  - a. Transportation
  - b. Communications
  - c. Construction
  - d. Manufacturing
  - e. Biotechnology
  - f. Engineering
2. The contestant's advisor/instructor must attend the mandatory orientation meeting with the contestant.
3. Contestants will not take the skills-related written or Professional Development Test as outlined in the general regulations.
4. Tie Breaker — Tie will be broken by reviewing the Highest score from the team rubrics. If tie is not broken from option a, then option b and c will be looked at in order.
  - a. "Solution: Performance"
  - b. "Interview: Problem Solving / Team Work"
  - c. "Written Test score"



## Contest Description

Your team works for “H2O Upward Bound, Inc.” in Riverton, WI. This new company is trying to make it’s mark on the world by creating an “above city - river system” with a target audience of recreational users in larger cities. H2O Upward Bound, Inc. has multiple teams working on the project - your task is to create a test device for the prototype stream. This device must travel against a current, a distance of more than 16feet, under self contained power and floating on the water in under 60 seconds. You have 6 hours for creating your prototype and presentation. If awarded this job, your team could be receiving some hardware.

**Objective:** Your team is to;

- Develop a plan for your prototype.
  - o Think about materials, effectiveness and your presentation.
  - o Include a Budget for your presentation.
- Develop your prototype. Construct, test, improve.
- Develop props, posters, models, etc for use in your presentation...
  - o No digital media is to be used in creating or presenting your product line.
- Test your prototype in accordance with the TEC Rubric with the judges.
- Present your prototype in accordance with the TEC Rubric to the judges.

**Materials:** Your team is ONLY allowed the building/design materials supplied by the 2015 TEC Contest Committee. (you may use your team supplied scissors, exacto knife, rulers, protractors, calculators, writing and/or coloring utensils and scratch paper. Scratch paper is only for personal team notes).

- Your team received \$60 in Plastic Coins to begin today.
  - o Teams will NOT get additional coins, lost or stolen - no excuses
  - o IF a team is caught trading or stealing coins (or supplies) from another team, they will be disqualified from the 2015 TEC Contest.
- Supplies for everyone are in the TEC Store area and on your “Purchase Sheets”
  - o Each supply item has a cost associated with it (per item)
  - o Some items have limits on “how many per team allowed.”
- Your team is allowed 3 timeslots to purchase materials at no penalty.
  - o Time Slot 1: You have until 5pm today to place your first order!
    - Any items that have “max/team” listed – you cannot buy more than that.
  - o Time Slots 2 & 3: after all 1st orders are received, you may order anytime
    - “Max/Team” items no longer matter. If we have extras of anything and you want to purchase them, you can. (First come – First Serve)
  - o Time Slots 4 - 8: A 10 point penalty will be applied to your TEC Score for each trip after 3 to the TEC Store.
- Placing Orders for supplies
  - o 1 team member from each team should be designated for ordering.
  - o Step 1: Complete your order form
    - (White for TimeSlot 1 / Yellow for TimeSlots 2-3 / Green for TimeSlots 4-8)
  - o Step 2: Bring your order form to the TEC Store and wait in line.
  - o Step 3: Follow the TEC Store Clerk in fulfilling your order.
  - o Step 4: Verify your order is correct as it is being fulfilled & Sign order sheet.
    - Have Patience for TimeSlot1: We have 100+ orders to fill in 1 hour
  - o Step 5: Pay for your order using the TEC Plastic Money
  - o Step 6: Take your supplies to your table - they are yours to construct with.

## SAFETY!!!

- Teams will be using hand tools (Exacto knives, Scissors, Hot Glue Guns, Hand Saws).
  - o BE CAREFUL and TAKE YOUR TIME
- Be careful when around other contestants not to distract them or injure yourself.
- Horseplay will not be tolerated - act professionally.

## 2015 TEC Timeline

### Tuesday:

3:00pm	.	.	.	Contest Welcome
3:10pm	.	.	.	Team Written Test - Problem Solving
3:30pm	.	.	.	Collect Written Tests Contest Briefing
3:40pm	.	.	.	Teams begin worktime
4:00pm	.	.	.	TEC Store Opens
5:00pm	.	.	.	Round 1 Purchases done (Limited supply) Following completion of Round 1 - Round 2, 3, 4... begins First-come, First-serve on Rounds 2, 3, 4...
6:00pm	.	.	.	Team worktime ends for Day 1. ( <i>Projects STAY in contest area</i> )

### Wednesday:

8:00am	.	.	.	Contestant Worktime in contest area
11:30am	.	.	.	Lunch delivered to TEC area for contestants
11:50am	.	.	.	Contestant Worktime ENDS Clean up area & leave TEC Room until Testing timeslot
12:10pm	.	.	.	Clear contest area - no competitors
12:30pm	.	.	.	Judging Begins - Round 1
5:15pm	.	.	.	HS Callbacks Posted outside TEC Door & Online
6:00pm	.	.	.	Judging Begins - Round 2
7:15pm	.	.	.	Judging Ends
7:30pm	.	.	.	Teams may pick up their supplies, materials, prototypes, etc TEC Contest time done - waiting for awards ceremony Thursday :)

### Thursday:

AWARDS CEREMONY :)

- Buy Backs. Did you mess up and order more than you needed??? We will purchase back your "in new condition" supplies at 50% original cost. (If you paid \$5 Plastic Coins – we will give you back \$2.50)
- Trading supplies with other teams is not allowed in TEC

### Size:

- Your prototype Size Requirements are;

Maximum Length = 10 inches long		Minimum Length = none
Maximum Width = 5 inches wide		Minimum Width = none
Maximum Height = none		Minimum Height = none

### Practice / Testing of your prototype during worktime...

- There are 4 test stations for teams to use during worktime.
  - o Station 4 is open to any teams at all times. This is an area with 5 gallon buckets specifically available for testing the buoyancy of your prototypes.
  - o Stations 2 & 3 are open to any teams at all times. Just wait in line to use...
    - 1 team at a time, be curious
    - Try and keep to 60 seconds at the trough if there is a line.
  - o Station 1 is the "Official Test Station" for TEC 2015.
    - Teams are limited to 2 times on the "Official Test Station"
    - Teams must use their provided Plastic Pink Round coins as passes.
    - Teams may purchase additional "Official Test Station" passes for \$10 coins
- CAUTION: All test stations are full of Water - DO NOT SPILL THE STATIONS!!!!!!

### Evaluation / Judging Criteria:

- Points will be awarded in accordance with the TEC Rubric in the Contest Guidelines.
- Testing of Devices "*SOLUTION: Performance*" (200 points on rubric - breakdown below)
  - o 1 point for every 1 inch traveled past the start line, measured from the front of the prototype.
  - o Prototypes will be started with their front most point at the start line in the trough.
- Round 1 Presentations will be graded by individual groups of judges.
  - o Teams will be randomly selected for what group of judges they will present to.
  - o Each group of judges shall submit their top 3 teams to be "Called Back" for Round 2.
- High School Round 2 Presentations will be judged from each of Round 1 judges.
  - o Final Grading of Round 2 Contestants will qualify for 1st, 2nd, 3rd, 4th & 5th place awards & prizes for SkillsUSA State TEC Contest.
  - o Teams MUST be present at awards ceremony to receive their prizes.
- Middle School Round 1 contestants will qualify for 1st, 2nd and 3rd place awards for SkillsUSA State TEC Contest.
  - o There is no Round 2 for Middle School contestants.
  - o Teams MUST be present at awards to receive their prizes.
  - o 1st Place Team qualifies to move onto Nationals in June!!!!!!

## Testing

- Your team will have 2 minutes to perform your test.
  - o When brought into the contest area, gather your supplies from your table and return to the entry awaiting your turn to test.
  - o When brought to test area – place your prototype on test pad.
    - Your prototype must fit within the test area.
  - o When ready to test, and judges give the go, place your device in the trough at/ behind the starting line and turn it on or engage the forward propulsion.
    - Your 1 minute time starts when you let go of your device.
  - o Upon starting your device, no team member may touch it or affect it anymore.
    - Your team may NOT provide any forward motion at the start.
  - o The judges will observe your device and record the furthest distance reached.
    - If your device turns around, no negative points will be assigned.
    - Your test ends when the device reaches the finish line OR time runs out.
  - o Each team gets ONLY ONE test run.
  - o Your time limit will be held to 2 minutes – keep on task.
- Upon completion of your test, your team will be directed to a Round 1 Judging Table.

## Presentation: Round 1 (4 minutes)

- Your team will have the first TWO MINUTES for;
  - o Sales Pitch of your solution to the judges
  - o In this time period YOU will be talking to the judges about why your solution should be the best...
  - o You may use props, posters, models, etc
  - o Your team WILL BE CUT OFF at 120 seconds.
- Your team will have an additional TWO MINUTES to;
  - o Explain how your team came to the conclusion of the final product line.
  - o This is in accordance with the “Interview” section of the TEC Rubric.
  - o You may use props, posters, models, etc.
  - o Your team WILL BE CUT OFF at 120 seconds.
- Your team will have a final THREE MINUTES for Q&A from the judges.
  - o Your team will be asked to answer random questions from the judges.
  - o Questions will be about your team work process.
  - o You may use props, posters, models, etc.
  - o Your team WILL BE CUT OFF at 180 seconds.

## CALL-BACK Presentations: Round 2 - High School Only (6 minutes)

- Each group of judges will select the TOP 2-3 groups to come back for a second round of presentations.
  - o There will be more than one group of judges in Round 1.
  - o Round 2 will be in front of various judges from Round 1 (1 from each group)
  - o Round 2 will be identical to the previous presentations in Round 1.
    - You will be presenting in front of more judges.

# TEC Rubric

	EVALUATED ITEMS	Points Possible	Points earned	REMARKS
Pre-Contest Briefing	<b>WRITTEN TEST</b> General understanding of the; Problem-Solving Process, Engineering-Design Process and Technical Skills related to the Team Engineering Challenge contest guidelines.	50		This is a “team test”
	Pre-Planning; sketches, brainstorming, plan Materials Order Form(s)	100 50		1st - 3rd Order Form -0pts 4th Order Form -10pts 5th Order Form -20pts
Contest Time	<b>Use of Worktime</b> • ex: Did team work together? • ex: Did team utilize testing opportunities?	100		
	<b>INTERVIEW: Presentation / Sales Pitch</b> • ex: Does the solution meet the Client's goals? • ex: Does the team explain their solution? • ex: Did the team use visual aids?	150		Interview process is generally 5-7 minutes in length
<b>INTERVIEW: Problem Solving / Team Work</b> • ex: How did the team overcome a challenge? • ex: Did everyone contribute? • ex: Did team improve their solution through testing? • ex: Did team explore more than one solution? • ex: Did team discuss +/- of various solutions?	150			
INTERVIEW / TESTING	<b>SOLUTION: Prototype / Construction</b> • ex: Creativity/Originality • ex: Workmanship - thoughtfulness of design, care and quality of construction	150		Testing of prototypes will be done in front of judging panel. 2-3 minute time frame for test.
	<b>SOLUTION: Performance</b> • Application - practicality, function (does it do what it's supposed to do?)	200		
	Clean-Up	50		11:50 - Noon (Wednesday)
	<b>SUBTOTAL</b>	<b>1,000</b>		
PENALTY POINTS	<b>Material Penalty</b>	0 to -50		
	<b>Clothing Penalty</b>	0 to -50		
	<b>Resume Penalty</b>	0 to -10		
	<b>Team Member Penalty</b>	0 to -50		(Team of 3)
	<b>TOTAL – ROUND 1</b>	<b>1,000</b>		
INTERVIEW PROCESS	<b>INTERVIEW: Presentation / Sales Pitch</b> • ex: Does the solution meet the Client's goals? • ex: Does the team explain their solution? • ex: Did the team use visual aids?	150		Round 2 “Call Backs” only needed if over 20 teams competing.
	<b>INTERVIEW: Problem Solving / Team Work</b> • ex: How did the team overcome a challenge? • ex: Did everyone contribute? • ex: Did team improve their solution through testing? • ex: Did team explore more than one solution? • ex: Did team discuss +/- of various solutions?	150		TOP 3 FROM EACH JUDGE'S GROUP IS CALLED BACK FOR ROUND 2  Interview process is generally 5-7 minutes in length
	<b>Sub-Total – Round 2 Interview</b>	<b>300</b>		Round 2 includes points from Round 1 to total 1,000 pts using Round 2's Interview include penalties from round 1
	<b>Sub-Total - Round 1 (-interview)</b>	<b>700</b>		
	<b>TOTAL FINAL ROUND 2</b>	<b>1,000</b>		