Ten80 Student Racing Challenge: NASCAR STEM League™

2013 National Finals Event Guide

zMAX Dragway at Charlotte Motor Speedway

6570 Bruton Smith Boulevard ● Concord, NC 28027 (near Charlotte, NC)
Banquet on Friday, 17 May 2013 ● 6:00 PM – 8:00 PM (time subject to change)
Competition Saturday, 18 May 2013 ● 8:15 AM – 4:30 PM

Finals Event Guide Contents

2013 Competition Events

Location & Dates

2013 Dates & Times

Friday, 10 May: P.I.T. Now! Project Submission Deadline to earn head start in Endurance Race
Friday, 17 May: Opening Banquet, 6 – 8 PM (time subject to change)
Saturday, 18 May: Finals Competition, 8:00 AM – 5:00 PM

Friday Banquet & Check-In: Sprint Hospitality Tent at Charlotte Motor Speedway

5555 Concord Parkway South ● Concord, NC 28027 ● Access instructions coming soon

Saturday Competition: zMAX Dragway

6570 Bruton Smith Boulevard ● Concord, NC 28027

Registration & Special Needs

Participation Waiver - Required for Every Individual

Please disseminate the participation waiver to all teachers, students, chaperones and volunteers. Every individual must submit a signed document to enter the event by mail or at entry. The wavier is the last page of this document.

Special Needs – Food and/or Access

If anyone in your group has food allergies, you must let us know in advance and buy or bring food for those individuals. If anyone in your group requires handicap access, let us know in advance.

Opening Banquet: What to Expect & Bring

Friday, 17 May from 6 – 8 PM
Sprint Hospitality Tent at Charlotte Motor Speedway

Agenda items include:

1. Dinner!
2. Tech session to prepare your car for competition***
3. Check-in

Bring to the banquet:

1. Signed Waivers
2. Competition Car, charged battery and controller
3. All of your RF chips if your car uses them

*** Tech session includes installing transponders, inspection and upgrading cars that still use RF chips to the 2.4 GHz radio. Changing the radio means you will have a new controller/transmitter. ***

Competition Schedule Summary - SUBJECT TO CHANGE

Saturday, 18 May from 8:30 – 5 PM
zMAX Dragway

Subject to Change, final version given at check-in. Find the detailed schedule later in the document.

Begin	End	Activity
8:30 AM	9:10 AM	Check-in, practice
9:10 AM	9:40 AM	Team Meeting and Stations!
9:40 AM	10:00 AM	Race: Single lap, best time
10:00 AM	11:00 AM	Race: 10 minutes (2 qualifiers, 1 final)
11:00 AM	11:30 AM	Pit Stop Challenge
11:30 AM	11:55 AM	Lunch
12:00 PM	3:00 PM	Team Presentations, Robo RaCeCar and tech workshops
3:00 PM	3:10 PM	Setup for Racing
3:10 PM	3:55 PM	Endurance Race
3:55 PM	4:15 PM	Scoring & Clean up
4:15 PM	4:35 PM	Awards

Team Responsibility

Waiver / Agreement: All participants, adult and youth, must return the signed agreement to the mailing address by May 1, 2012 or hand deliver for every individual at the opening banquet.

Arrival & Departure (EXACT TIMES SUBJECT TO CHANGE): Teams can arrive anytime between 8:00 and 9:00 AM. Check in formally begins at 8:30 AM. The team meeting begins at 9:30 and competition at 10:00. Teams depart approx. 5:00 PM.

Tools & Equipment: Each team must bring its own sanctioned Ten80 SRC car and everything required to race including controls, batteries, chargers, tools and spare parts. One plug-in will be provided to you. Should you want additional charging stations, you must bring an extension cord and power strip. Should you require battery or charger or other parts from the Sanctioning Body, you will be penalized by adding 5 seconds in each racing event.

Schedule: A detailed event schedule will be provided to you upon arrival and sign-up. Your team is responsible for understanding when and where to be at all times. Nobody will remind you. If you miss a planned event, a score of zero will be entered for that event.

The event organizers will do the following to help teams stay on schedule, even if the schedule shifts:

- An event schedule will be projected and updated as necessary
- An official clock will be projected
- Announcements will be made in between each event and if the schedule changes

Car Specifications: You are responsible for ensuring your team car and equipment is within specifications as outlined in the Race Events section of this guide.

New specifications for 2013 include:

- No RF Chips - all cars must upgrade to 2.4 GHz radios
- The car body you use during races (not the one you submit for decal design) must have clear windows. You will have to use one provided by Sanctioning Body if yours is not completely clear.

Special Notes

Clean & Organized: Visuals are very important.

- Cleanliness & Organization is a points category.
- Organize in bins and stay aware of how your pit area looks to outsiders.
- Bring banners and Wear team tees

Bring Snacks & Drinks or $ to buy them: Lunch is not served until around Noon. Some snacks and water will be provided but perhaps not as much as you want. If you'll get hungry, make sure to plan ahead by bringing snacks and drinks.

Competition Events & Scores

Middle School teams are scored on their top 6 events. High Schools are scored on top 7 events. All teams are required to compete in the Road Course Races (#1) and (#8) Team Presentations.

Race Events

Scoring for race events is based on placement. 1st place earns 100 points, 2nd place 80 points, etc.

1. Road Course Races
   Winner A = lowest single lap time, 5 minutes on track
   Winner B = most laps over 10 minutes on track
2. Superspeedway Endurance Race
   Winner = most laps over 40 minutes on oval track
3. Robo RaCeCar
   Winner = highest score, score = laps - wall hits over 5 minutes
   Bonus points for full automation vs. steering or speed only
4. Pit Stop Challenge
   Winner = first to finish
   Earn bonus points from analysis activity

Engineering Projects

Score based on rubric that includes evaluation of written documentation, visual materials at your pit area, a 10 minute presentation (including Q&A) that covers all of your projects and your final product, also known as the deliverable.

5. PIT Now
6. Aerodynamics
7. Creative Engineering

Enterprise & Innovation

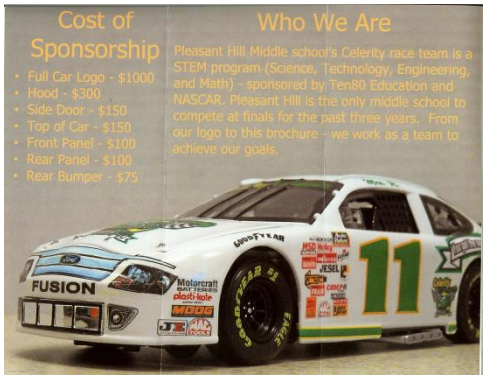
8. Team Presentation

Score based on rubric that judges evaluate only during the 10 minutes you are in the separate (private) presentation area.

9. Graphic Design - Car Decal & Team Identity

Score based on rubric. No presentation is allowed; your graphics must speak for themselves.

Bonus. Elevator Speech



Competition Score

There are 9 Student Racing Challenge events.

Middle school team scores are the sum of the top 6 events
Team Score = Sum of Points from Six Events

High school team scores are the sum of the top 7 events
Team Score = Sum of Points from Seven Events

Teams are required to compete in the Road Course Races (#1) and give a team presentation (#8). If you do not compete in the minimum number of events, a score of zero is assigned to those missing.

#	Event	Possible Points
1	Road Course Races Race Event A: Single lap time, 5 min on track Race Event B: 10 minute race	(200 total) 100 100
2	Superspeedway Endurance Race: 40 minutes	200
3	Pit Crew Challenge	200
4	Robo RaCeCar	200
5	P.I.T. NOW! Alternative Energy Project	200
6	Aerodynamic Design Project	200
7	Creative Engineering Project	200
8	Team Presentation, 8-min	200
9	Graphic Design • Car Body Decal Design • Team Identity / Logo	(100 total) 50 50
-	Bonus: Elevator speech via video	+50 bonus
-	Teamwork	+50 bonus
	Total Points Possible	**1700 + bonus**

Scoring in Race Events

Race Events include events 1 - 4. Teams are awarded points based on their final ranking in each event as shown in this table. The 1st place team is awarded 100 points, 2nd place 80 points, etc.

Race Ranking	Event Points
1st	100
2nd	80
3rd	70
4th	50
5th	40
6th+Participate	30

Scoring in Engineering Projects and Enterprise & Innovation Categories

Projects and presentations are scored by judges that assign points based on rubrics or informal evaluation criteria. Those rubrics and criteria are listed in this document. In some events, you can earn bonus points so read carefully.

2013 Team Awards & Grants

The following trophy and ribbon awards will be given:

- 2012-13 Student Racing Challenge Points Race Winners: 1st Place, 2nd Place (Do not have to be present)
- 2012-13 Student Racing Challenge National Finals Overall Winners: 1st Place, 2nd Place, 3rd Place
- Race Event Winners: 1st Place, 2nd Place
- Aerodynamic Design Winner: 1st Place, 2nd Place
- P.I.T. Now! Alternative Energy Project Winner: 1st Place, 2nd Place
- Creative Engineering Project Winner: 1st Place, 2nd Place
- Graphic Design; Points are added together for Team Logo & Car Body Decal: 1st Place, Runner-up
- Team Presentation: 1st Place, 2nd Place

A total of ~$3000 Grant Funds awarded to event winners and outstanding teams.
Grant funds can be used for materials and resources or registration from Ten80 Education.
All-Star Race tickets are provided to all participants.

Points Race Champions, $500

Point Race 2nd Place, $250

2013 National Finals Champion, $1000

2013 National Finals Runner-Up, $500

Race Events Winner, $250

Aerodynamic Design Winner, $100

P.I.T. Now! Alternative Energy Project Winner, $100

Creative Engineering Project Winner, $100

Team Presentation, $100

Graphic Design, $50

2013 Ten80 Student Racing Challenge Finals Participation Agreement

To participate in the 2013 Ten80 Student Racing Challenge Finals and opening events, complete and mail this signed agreement by April 20, 2013 to the following address or bring the signed waivers to the event: Ten80 Education; 26F Congress St. #338; Saratoga Springs, NY 12866. No one can enter the event without turning in the signed agreement.

Please Print Very Neatly			
Participating School/Org:			
Participant Name:		**On-Site Chaperone**	
Participant Age:		**Relation to Participant**	☐ Self ☐ Parent-Guardian
Parent or Guardian Name:			
Home Address:			
Emergency Phone		**Home Phone**	
Email:			

WAIVER AND RELEASE OF LIABILITY. In consideration of being permitted to participate in the Ten80 Student Racing Challenge: NASCAR STEM Initiative 2013 National Finals on Saturday May 18, 2013 and opening banquet on Friday May 17, 2013 at the zMAX Dragway and Charlotte Motor Speedway (the "Events"), I, _____("Participant") agree to the following on behalf of myself and my heirs, successors and assigns.

I confirm that I have legal authority over myself as a Participant or as a parent or guardian for the Participant. I request that my child be permitted to participate in the Events. I, the Participant or Parent/Guardian of Participant agree that the Participant will follow all instructions of Event organizers and to assume all risks associated with a failure to follow instructions. The Participant will inspect the Event site, all related facilities, and all equipment and advise Event personnel of any unsafe conditions.

I, the Participant or Parent/Guardian of Participant, agree to release and discharge 1080 Education Inc. ("Sponsors"), Ten80 Foundation ("Sponsors"), NASCAR®, the U.S. Army ("Sponsors"), Speedway Motorsports International ("Sponsors"), Belmont Abbey College ("Sponsors"), vendors and exhibitors and their respective affiliates, employees, representatives and agents ("Released Parties") from any and all injuries (fatal or non-fatal), losses, causes of action, liabilities, damages, expenses or claims (collectively, "Claims"), whether foreseeable or not, that might arise from the negligence of the Released Parties in connection with the Event or the condition of the property, facilities or equipment used for the Event, regardless of when such Claim may arise. I agree to indemnify, defend and hold harmless the Releases Parties from and against any and all Claims arising from my acts or omissions in connection with the Event.

I, the Participant or Parent/Guardian of the Participant, understand the Event may include hazardous activities including but not limited to riding in a car at highway speeds and that this type of activity can be dangerous and can, and sometimes does, result in serious, permanent bodily injury (fatal or non-fatal). I also understand that my participation in the Event may involve risks that may or may not be foreseeable and may expose me to the possibility of injury as well as damage to personal property. I acknowledge that such hazards may result from my own acts or omissions or those of others, the rules of play or the condition of the premises or equipment. I knowingly assume all risks associated with participation in the Event regardless of how such property damage, injury or death might arise. I understand that it is my responsibility to obtain any insurance needed to cover personal injury, death, property damage or any Claims arising from my participation in the Event.

VIDEO/PHOTO RELEASE I, the Participant or Parent/Guardian of the Participant, hereby grant Sponsors the right to use the Participant's name, likeness, voice, biographical information and any other indicia of his/her identity in connection with the Event, and publicity, advertising and promotion for the Event and future editions of the Event in all forms of media throughout the world in perpetuity without compensation. I waive any right that the Participant may have to inspect or approve any materials that may use such rights in connection with the Event. I acknowledge that Sponsor shall own all rights to photos, video imagery, sounds or other recordings made in connection with the Event.

MEDICAL AUTHORIZATION: To the best of my knowledge, I, the Participant or Parent/Guardian of the Participant, have no physical condition which would interfere with the Participant's ability to participate in or attend the Event or would endanger the Participant's health or any other participant's health. Should the Participant need to have medical treatment while participating in this event, I hereby give the Event Sponsors personnel permission to use their judgment in obtaining medical service for the Participant and I give permission to the physician selected by Sponsor personnel to render medical treatment deemed necessary and appropriate by the physician. I understand that the Sponsor has no insurance covering such medical or hospital costs incurred for the Participant and, therefore, any costs incurred for such treatment shall be my sole responsibility.

This waiver and release will be construed broadly to provide a release and waiver to the maximum extent permissible under applicable law. Any provisions found to be void or unenforceable shall be modified or deleted to the minimum extent necessary to make them enforceable, and shall not affect the enforceability of any other provisions.

I have read this Waiver and Release of Liability, I fully understand its terms, and I recognize that I have given up rights by signing it in consideration of being permitted to participate in the event. I sign it voluntarily and without any inducement OR DURESS.

Parent or Guardian Signature:		**Date:**	

Track Schedule - Detailed

Team Data Sheet

Team Data Sheet – Event & Score Instructions

Directions to zMAX Dragway at Charlotte Motor Speedway

Directions to zMAX Dragway and Charlotte Motor Speedway from Belmont Abbey College and I-85 heading North from Charlotte. Some teams are staying at Belmont Abbey College dorms.

Belmont Abbey College; 100 Belmont Mt Holly Rd; Belmont, NC 28012

1. Head **south** on **Wimmer Cir**
144 ft

2. Turn right toward **Belmont Mt Holly Rd**
325 ft

3. Turn left onto **Belmont Mt Holly Rd**
0.4 mi

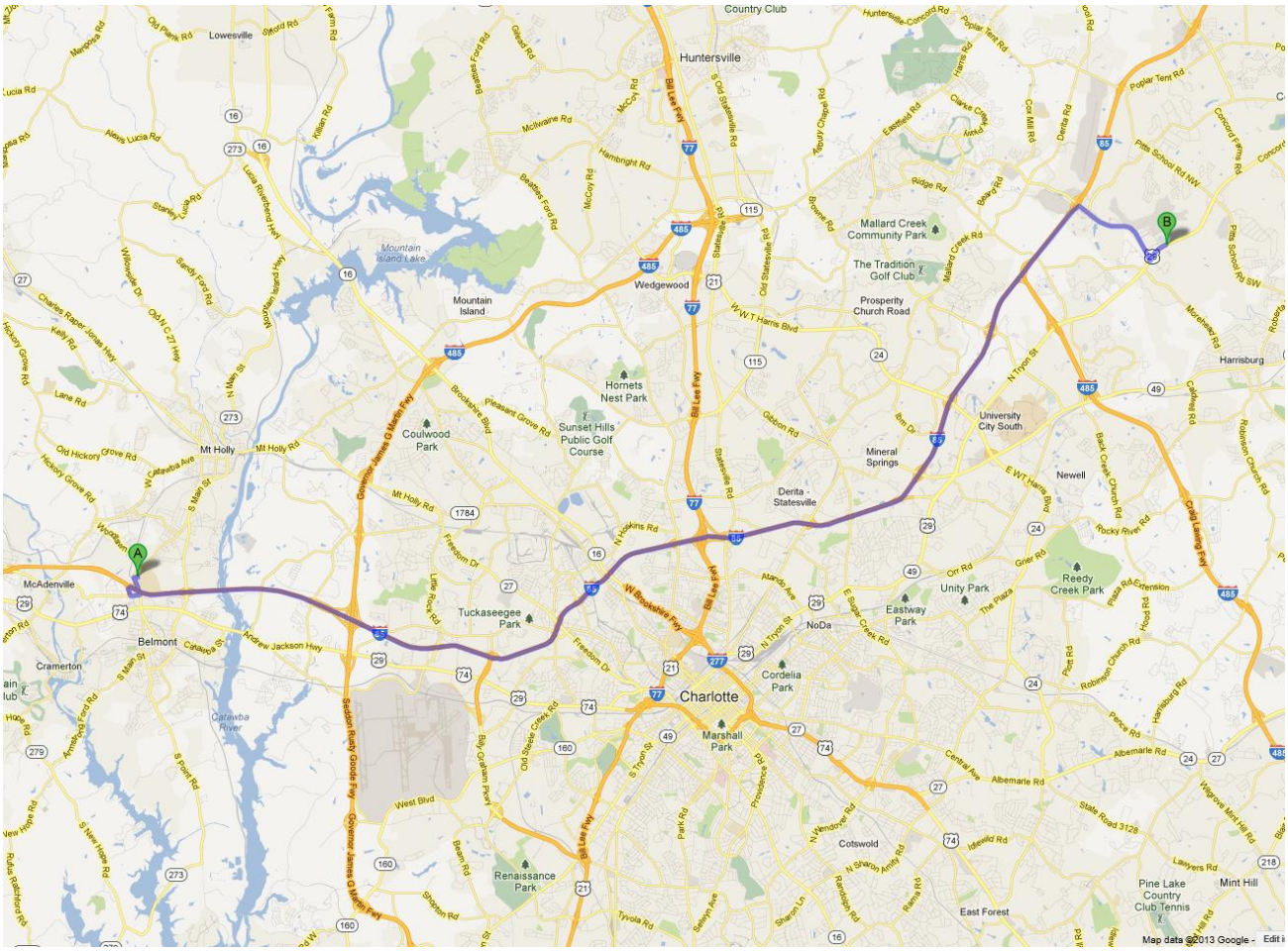
4. Turn right onto **McAdenville Rd**
0.2 mi

5. Take the ramp onto **I-85 N**
23.4 mi

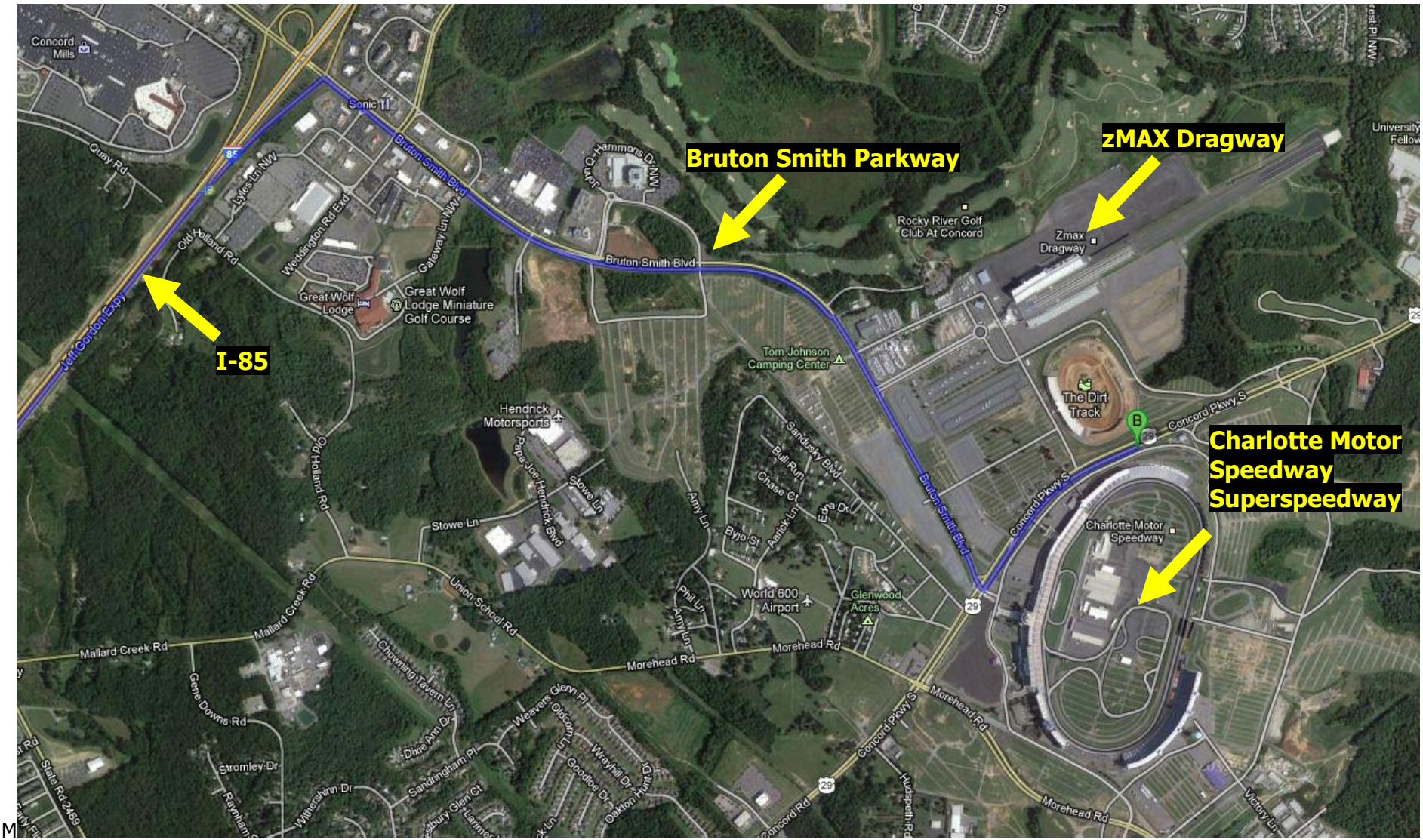
6. Take exit **49** for **Bruton Smith Blvd** toward **Concord Mills Blvd**
0.3 mi

7. Turn right onto **Bruton Smith Blvd**
1.9 mi

8. zMAX Dragway is on the left, just before you 'run into the Superspeedway'



Satellite Image zMAX Dragway and Charlotte Motor Speedway



Event Footprint

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2013 Competition Events

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Race Events

Scoring for race events is based on placement. 1st place earns 100 points, 2nd place 80 points, etc.

5. Road Course Races **Required
   Winner A = lowest single lap time, 5 minutes on track
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   Winner = first to finish
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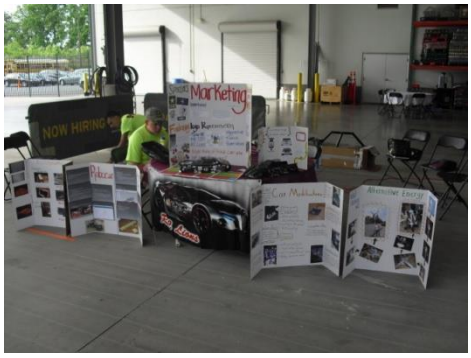

Engineering Projects & Presentation

Score based on rubric that includes evaluation of written documentation, visual materials at your pit area, a 10 minute presentation (including Q&A) that covers all of your projects and your final product, also known as the deliverable.

5. PIT Now
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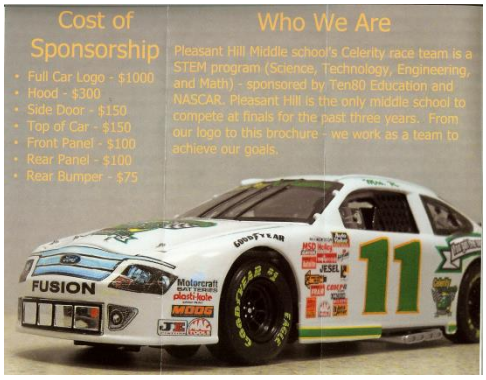
7. Creative Engineering

Enterprise & Innovation

8. Team Presentation **Required

Score based on rubric that judges evaluate only during the 10 minutes you are in the separate (private) presentation area.



9. Graphic Design - Car Decal & Team Identity

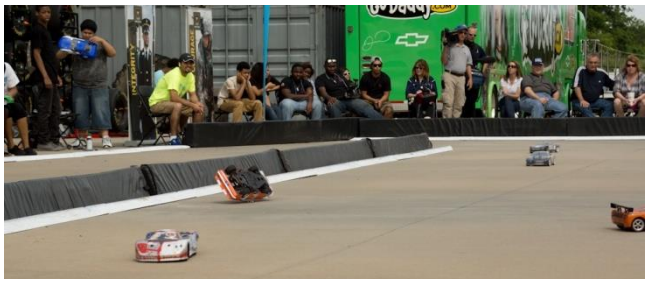
Score based on rubric. No presentation is allowed; your graphics must speak for themselves.

Bonus. Elevator Speech

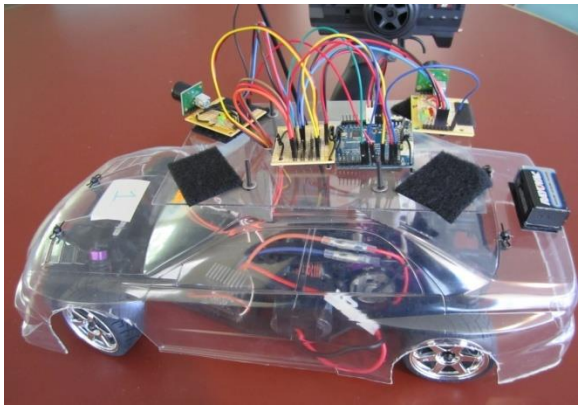
Race Event Details

In Race Events, points are awarded based on placement. For example, the 1st place team earns 100 points, 2nd place earns 80 points, etc. Teams can earn an additional 100 bonus points in the Robo RaCeCar and Pit Stop Challenge events. Details are outlined in this section.

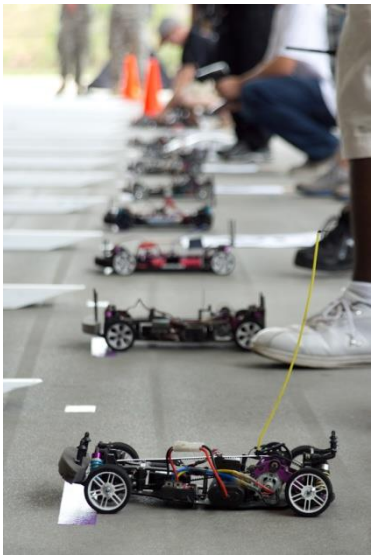
1. Road Course Races



2. Superspeedway Endurance Race



3. Robo RaCeCar



4. Pit Stop Challenge

Race Events: Car Specifications & Inspections

Inspections

Pre-Inspection
A pre-race inspection will be held between 8:45 and 9:30 AM. If your car is in violation, if possible, a spec' part will be provided to you and you are required to install and use that part. If this is required, you will be penalized by adding 5 seconds to your drive times in each race event and must pay retail value for the part before leaving the finals venue.

Random Inspections
Teams can change bodies, wings, tires, gears and set-ups between events so the league sanctioning body may inspect team cars at any time.

Post-Inspection
The sanctioning body may inspect team cars at any time, including after all events are completed and winners announced.

Car Specs, What you can race

- Clear Windshield: The car body you use during races (not the one you submit for decal design) must have clear windows for the transponder to work properly. You will have to use one provided by Sanctioning Body if yours is not completely clear.
- *Required Radio Exchange for Cars Still Using RF Chips:* If your car runs on RF chips, the Sanctioning Body will upgrade your radio and receiver to a 2.4GHz radios at the opening banquet tech session. You will have to use a new receiver in this case. You can request that the new radio be sent to you in advance in order to practice.
- Car: HPI Sprint 2 or Redcat spec car purchased through Ten80 Education. For HPI drivers, the serial number must be registered and match those provided to you by Ten80. You can change anything on the car if it is not prohibited below but must be able to show proof (pictures, etc.) that the base car you're using is the car with the serial number provided to you by Ten80.
- Motor: motor with 15 or more turns only; ONLY ONE MOTOR PER CAR
- (Does not apply to Robo RaCeCar event) Controller: Stock programmable controllers are not allowed. You can modify a non-programmable controller but you must prove, on site through documentation, that you did the work yourself. If there is a question about the type of controller, you must prove it cost no more than $80 to purchase.
- Battery: NiCd or NiMH; No Li-ion
  - Voltage: 8.4 V or less for pre-packaged battery packs you can build your own from individual cells
  - Capacity: 4200 mAh for pre-packaged battery packs; you can build your own from individual cells
- Tires: Any commercially available tires and traction compound are allowed
- Gears: Any commercially available gears are allowed
- Car Body: Any commercially or team made body including wings is allowed; front window must be clear
- Springs / Shocks: Any commercially available springs and shocks are allowed
- Chassis: Chassis can be modified but wheel base, and track width, must remain stock

Race Event #1: Road Course Races ** Required Category**

Purpose: These two road course events showcase team's race engineering skills, tests team's strategies and pits drivers against one another in head-to-head races and time trials. Teams with an optimal car set up, well thought out strategies and top driving will win these events.

Road Course Race A is based purely on your fastest single lap time.

Road Course Race B will also showcase your driver's consistency over time and energy management. You may not see degradation in performance over a 10 minute race, but you might. Investigate to see.

Possible Points: For each race, A and B, 100 total points is possible based on ranking as defined in the following table. 200 points is the maximum possible for both races.

Race Ranking	Event Points
1st	100
2nd	80
3rd	70
4th	50
5th	40
6th+Participate	30

Penalties: For every penalty, a car is 'sidelined' before proceeding. Assigning penalties and measuring time is up to track referees alone. A penalty is applied…

- If your car has fewer than 2 wheels on the drive lane (keep 2 wheels in the lane at all times)
- If your team interferes with other cars.

Road Course Race A: Go Fast! Best Single Lap Time

- Score = Best Lap Time Winner = Lowest Lap Time Penalty = 5 seconds
- Description: (Using the transponder system) Drive for 5 minutes and log your best lap time. You can stop and make adjustments, using the 5 minutes on track however you choose. Up to 5 cars will be on track at a time.

Road Course Race B: 10 minute race

Winner = Most laps after 10 minutes Penalty = 5 seconds

Description: Two heat races narrow the field to the top 5 teams which race head-to-head for places #1 - #5.

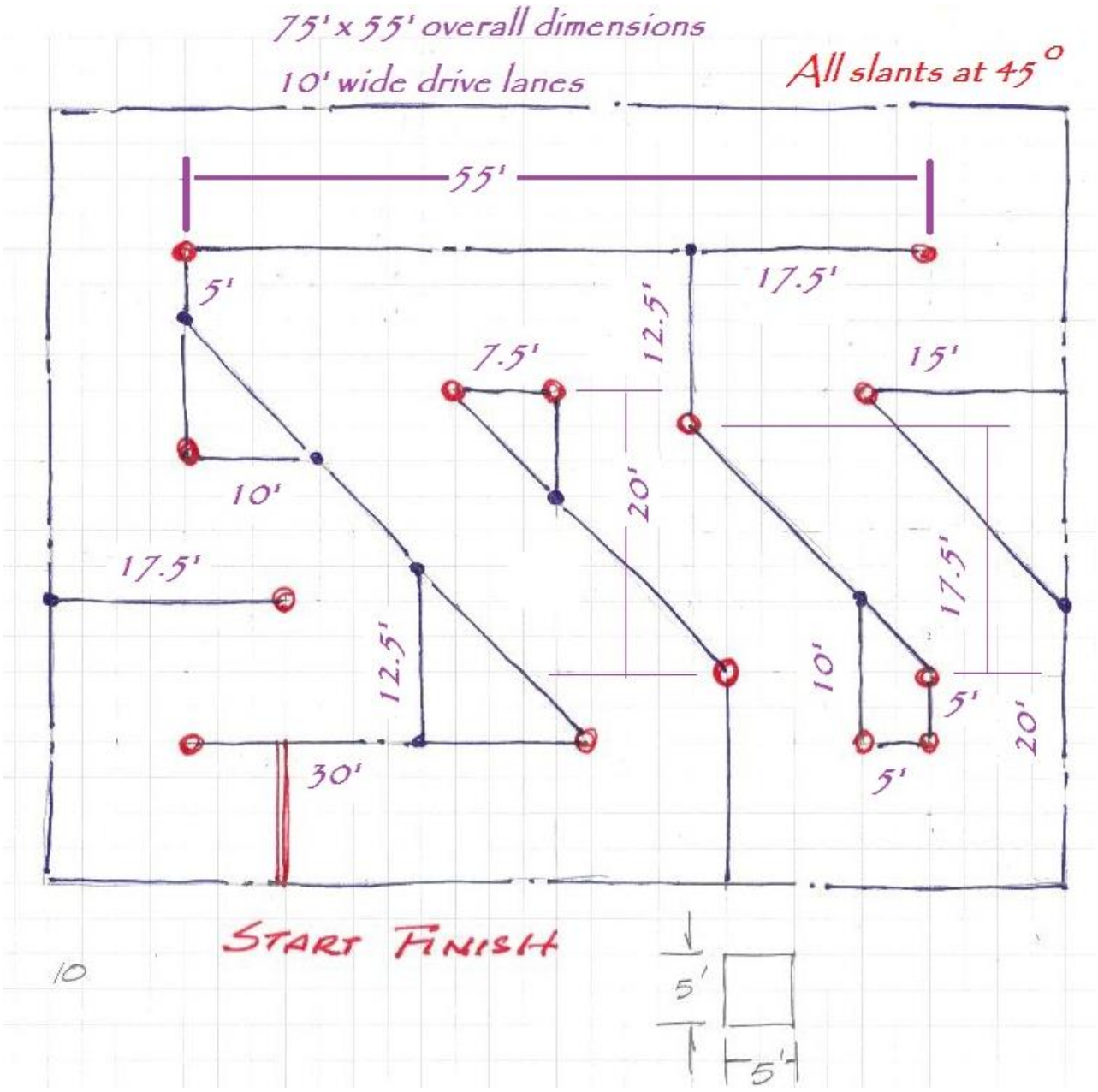
The following rules also apply to this event:

- If a car flips over, moves lanes or otherwise interrupts racing, a team-mate is required to repair the track and get the team car going again WITHOUT interfering with other cars on track. If a team interferes, purposefully or not, the team car is assigned an extended penalty of 30 seconds.
- Multiple drivers are allowed but hand-offs of the receiver can only occur in the designated space.
- Pit stops are allowed
- Batteries: Multiple allowed; must be 8.4V and 4200 mAh or less; CANNOT be Li-PO

Strategy/Hint: For more info, see the Jan and Feb, 2011 Monthly Challenges (archived web site).

Road Course Layout & Surface

Surface TBD soon.



Race Event #2: Superspeedway Endurance Race

Purpose: This endurance race showcases your team's race engineering skills, strategies, and driving & concentration skills. It pushes limits of concentration and mechanical, electrical components. It is very possible that you overheat and ruin electronics if not careful. Teams with an optimal car set up, well thought out strategies and top driving will win these events.

Possible Points: 100 total points is possible based on ranking as defined in the table to the right. 100 bonus points are awarded to teams that finish the full 40 minutes.

Race Ranking	Event Points
1st	100
2nd	80
3rd	70
4th	50
5th	40
6th+Participate	30

Bonus via Head-Start: Teams can earn a head-start by submitting a credible P.I.T. Now! project by the early deadline a week prior to competition (Fri, May 10). The top ranked P.I.T. Now! project (based on preliminary review of written materials only...) earns a 30 second head-start, 2nd place begins 30 seconds later and so on.

Teams that did not submit a project by the early deadline start 60 seconds after the last ranked team that submitted by the early deadline.

Penalties: For every penalty, a car is 'sidelined' before proceeding. Assigning penalties and measuring time is up to track referees alone. A penalty is applied…

- If your car has fewer than 2 wheels on the drive lane (keep 2 wheels in the lane at all times)
- If your team interferes with other cars.

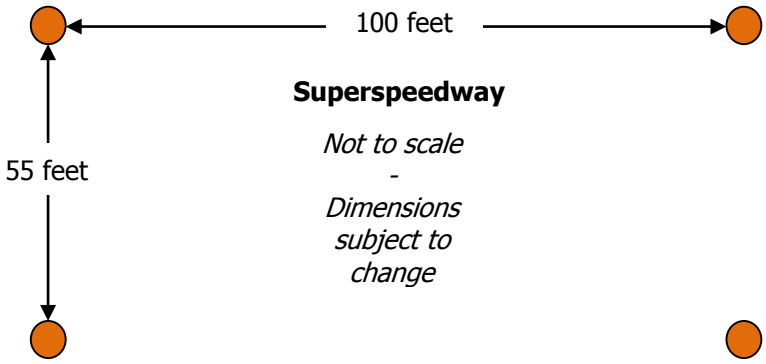
Preparation & Strategy: You can crash and burn literally and figuratively without a plan for this long race. You may need to sacrifice some laps in order to cool your car engine and cycle your batteries. Will you drive hard and take breaks, drive slower than top speeds or just max out and hope for the best (not recommended)? Some teams will install hydrogen fuel cells to earn a high starting position and to extend time between battery changes.

Rules: The following rules also apply to this event:

- If a car flips over, moves lanes or otherwise interrupts racing, a team-mate is required to repair the track and get the team car going again WITHOUT interfering with other cars on track. If a team interferes, purposefully or not, the team car is assigned an extended penalty of 30 seconds.
- Multiple car drivers are allowed but hand-offs of the receiver can only occur in the designated space.
- Pit stops are allowed
- Batteries: Multiple allowed; must be 8.4V and 4400 mAh or less; CANNOT be Li-PO

Superspeedway Layout & Surface
Oval "Superspeedway" 100 feet at its longest point, 55 feet at its widest point (Subject to change)

Surface in good weather is TBA soon. Surface in poor weather is TBA soon.



Race Event #3: PIT Crew Challenge

Goal:

- Part 1 – Pit stops are sometimes the most flashy part of a race for NASCAR teams and now for Student Racing Challenge teams. Good pit stops are expected…bad ones can ruin the day. Your goal is to work well together and design a car that facilitates fast tire and battery changes.
- Part 2 - To ensure teams understand the inner workings of the electric car and are prepared to keep their team cars in good working order.

Possible Points: 200 points
(Up to 100 points for part 1 based on ranking + 100 bonus points for part 2)

Race Ranking	Event Points
1st	100
2nd	80
3rd	70
4th	50
5th	40
6th+Participate	30

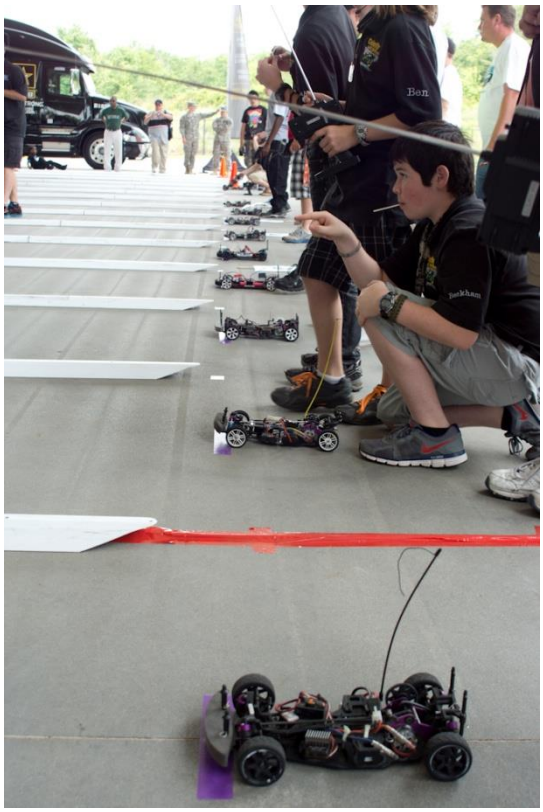
How to Compete (Procedure):

In part one, your team will showcase your teamwork, going head-to-head against all teams at the same time, in performing a pit stop. Teams drive the car along a short 10 - 15 foot pit road into a pit box. Once inside the pit box, team members can grab the car then exchange all 4 tires and the battery.

The fastest time, after penalties applied, wins. A car with loose or backwards lug nuts are disqualified.

In part two, your team or individual team members you choose will go to the assigned, private space where you'll be asked to examine an RC car that needs a repair, identify that repair and make it.

Preparation: See the *Mechanical Systems Certification Guide* and project folder, *Pit Crew & Tires (download only).*



Pit Road Layout & Surface

Track is a straight track that is 20 - 30 feet long as shown in the pictures here.

Surface in good weather is TBA soon.
Surface in poor weather is TBA soon.

Race Event #4: Robo RaCeCar

Goal: Turn your radio controlled (RC) car into a robot that is programmed to automatically drive a circular, walled track of diameter = 30 to 40 feet as fast as possible with as few crashes as possible. This goal is expressed in the following score.

Maximize this Race Score: (# of Laps) - (# of Bumps into the Wall) over 5 minutes on track

You can earn 100 bonus points for automating both the steering and speed. Once the timer is begun, you do not touch the controls. You can enter the event by automating only the steering OR speed but do not earn the bonus.

Possible Points: 200 points

Race Points: Up to 100 points based on ranking as shown in the table. Ranking is based on the following score. You want a high score.

Score: (# of Laps) - (# of Bumps into the Wall) over 5 minutes on track

Race Ranking	Event Points
1st	100
2nd	80
3rd	70
4th	50
5th	40
6th+Participate	30

Bonus points: There are three levels of automation.
Only the fully automated version earns the bonus points.

1. Automate BOTH the steering and speed. Once the timer is begun, you do not touch the controls. Bonus points = 100.
2. Automate ONLY the steering. You control the speed via throttle trigger but do not touch the steering control. Bonus points = 0.
3. Automate ONLY the speed. You control the steering via controller but do not touch the throttle trigger. Bonus points = 0.

How to Compete (Procedure):

At your assigned testing time, your car will be placed in the track and the timer begun. A judge will count the number of laps and the number of wall bumps over 5 minutes.

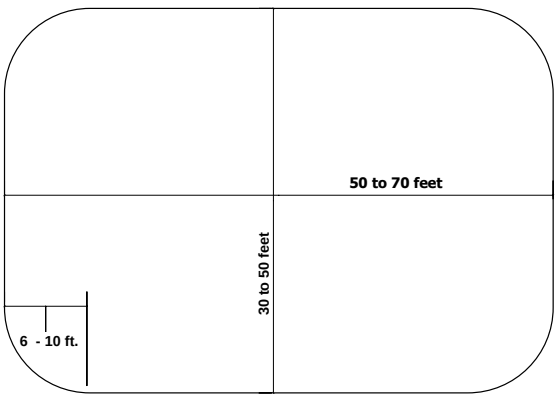
Preparation: How you automate the car is totally up to you. Two projects are provided as optional guidance only.

1. Automation through Arduino - Ten80's kit for this project is called Robo RaCeCar 1.0
2. Automation using 'found' mindstorm parts - You have to source the parts for this

Track Layout & Surface

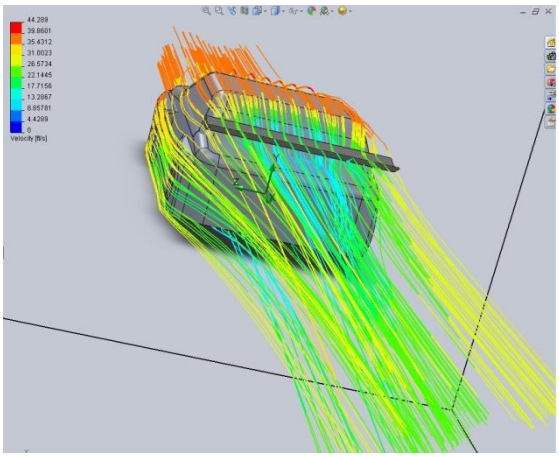
Track surface TBA soon. It will have solid walls of wood, corrugated cardboard or similar opaque materials. It will be a rounded rectangle with the following possible dimensions. The final shape will be revealed at the opening banquet, Fri 18 May.

- Longest diameter: 50 – 70 feet
- Shortest diameter: 30 – 50 feet
- Corner diameter: 6 – 10 feet



Engineering Project Details

5. P.I.T. Now!
Renewable Energy Projects



6. Aerodynamics Design

7. Creative Engineering

In Engineering Projects, points are awarded based on a rubric that is custom to each project.

Judging is based on four things: (1) Written documentation such as a report and/or logbook, (2) Visual presentation at your pit areas, (3) Verbal presentation to judges covering all projects that is 8 - 10 minutes including Q&A and (4) the project deliverable (the product).

Project Format & Deadlines: Think of a 'STEM Fair' project with visual and verbal presentations.

1. Written Documentation: Your written documentation can be a report or logbook or both. It will be judged by STEM professionals based on the rubric criteria for data and documentation.

- The deadline to submit is at the Opening Banquet on Friday May 17, 2013.
- P.I.T. Now! projects only - Deadline to earn a head start in the Superspeedway Endurance Race is Friday, May 10th
- If you cannot attend the banquet on Friday, submit via email or other web application.
- You can submit updates during check-in on Saturday, May 18th as long as you also submit a complete list of changes and additions.
- The rubric rewards you for submitting a package on Friday and for minimizing any changes between the initial submission and final submission (Sat at check-in).

2. Visual: In your pit area on Saturday, display a visual 'table-top' or 'floor-stand' presentation (like science fairs) so that viewers can learn the project purpose, procedures, data, analysis, conclusions and suggestions for future work.

3. Verbal: A professional judge will come to your pit area on Saturday where your team will verbally present all of your projects, including this one. Consider keeping your presentation under 5 minutes to allow Q&A.

4. Deliverable: During your pit area presentation, show the product of your project whether it is a car that runs on hydrogen, an aerodynamic car body, etc.

Event #5: PIT NOW! Renewable Energy

Summary

Project Goal: P.I.T. Now! stands for Practical Innovations in Transportation. Your goal in this project is to minimize the amount of energy used and CO_2 footprint created by the Student Racing Challenge. It does not have to be used in any performance tests like the race events.

Example Topics: This category allows you to be creative because the requirements are broad as long as its topic is directly related to your team's energy use. For example, the following are example Alternative Energy projects:

- Charging batteries without using a wall plug; i.e. solar, wind, bio, natural gas, fuel cells, etc.
- Optimizing energy efficiency of the car through aerodynamics, reducing waste heat loss, etc.
- Optimizing energy efficiency of the team (ex. quantifying energy use for a typical competition and organizing a competition that cuts the use dramatically)

How to Compete (Procedure): Submit written reports according to the project deadlines. Display visual materials at your pit area during the competition. Judges will review written reports and displays prior to your verbal presentation. Judges will come to your pit area for your 10 minute verbal presentation and Q&A on all of your projects including this one.

Possible Points: 200 points

Earn a Head Start in the Endurance Race

Submit your written report to the sanctioning body by mail or electronically by Friday May 10, 2013 to earn a head-start in the Superspeedway Endurance Race. Submit in advance via email to tech@ten80education.com or send a request for DropBox or YouSendIt link to that address.

As with all engineering projects, the final deadline to submit is at the Opening Banquet on Friday May 17, 2013. You can turn in changes or additions on competition day (Sat. 18 May) for a penalty in points.

Expected Content

- Clearly stated purpose including hypothesized benefits if implemented throughout the league
- Analysis of the sources of electricity for your electric grid (ex. 70% coal + 5% nuclear + 5% wind +……)
- Explanation (visual and/or narrative) of how the energy source transforms to electricity
- Viability for scale-up to all student teams or to full-scale human systems (cars, meetings, etc.)
- Economic pro's and con's of this project if implemented throughout the league
- Environmental pro's and con's of this project if implemented throughout the league including energy use, CO_2 footprint and other pollution (like particulate matter) created by the energy sources.
- Logbook including procedure, data and analysis (graphs)
- Conclusion and recommendations clearly based on data
- Information source citations

Technical Content & Values

Because your numbers can vary depending on the source (ex. getting them from a coal company vs. anti-coal activist groups), use the following values in your analysis.

Scope of Analysis: This project DOES NOT require a full life-cycle analysis, meaning you DO NOT have to evaluate the energy required and environmental impact of manufacturing the solar panels, wind turbines, generators, etc. used in your system. Your system only has to evaluate output of its operation.

To expand the scope, you can use SolidWorks SustainabilityXpress. This tool helps you evaluate the complete life-cycle impact on manufactured parts including water use, air pollution and CO_2 footprint. It evaluates the impact from the raw materials used to manufacture it all the way to scrapping or recycling it. There are however limitations on the options you have in setting up the analysis and you must have a 3-D CAD

Note on Energy & Units

The watt-hour (Wh) is a unit of energy equivalent to one watt (1 W) of power expended for one hour (1 h) of time. The watt-hour is commonly used in electrical applications but rarely in others.

Gasoline, oil, or coal contains potential energy that is liberated when the fuel is burned. The heat energy from such combustion is usually expressed in in British thermal units (BTU) or in joules according to the International System of Units (SI).

One BTU represents the amount of thermal energy necessary to raise the temperature of one pound of pure liquid water by one degree Fahrenheit at the temperature at which water has its greatest density (39 degrees Fahrenheit).

Energy to Charge a Battery:
P = EI is a common equation for calculating power (P) from electrical current in amps (I) and potential energy in volts (E). As the *Note on Energy & Units* explains, energy used is the power sustained over time and the following calculation for your system can be derived.

Theoretical Energy from Full Drain to Full Charge = Battery Capacity × Voltage

Ex. Battery Capacity = 3300 mAh ÷ 1000 mAh/Ah = 3.300 Ah

Ex. Theoretical Energy Use = 3.300 Ah × 7.2 V = 23.76 Wh

In reality, batteries DO NOT go to full drain. Empirical testing shows that about 30% of the battery capacity is used in any given cycle.

Ex. Real Energy Use = 3300 mAh ×7.2 V × 0.30 = 7.1 Wh

Coal Power: More than 75% of the U.S. grid electricity is produced by coal or natural gas fired plants. You must find out the sources for energy delivered to your school and most likely it will be a combination of types. Below are the values to use for that portion that's provided by coal plants.

- A typical coal fired power plant uses 10,000 BTU to put 1 kWhr on the grid; that is a 34% conversion of chemical energy in the coal to electrical energy in the grid.
- Combustion of 1 pound of commercial coal provides 12,000 BTU and produces 3.4 lbs of CO_2.

Relationship between CO_2 & Energy Use: If your energy source is 'off-the-grid' like wind or solar, the CO_2 footprint is reduced linearly with the reduction in energy saved. If your source generates CO_2 in its operation, you must consider that in your analysis of savings.

CO_2 per Ton-Mile: To compare transportation systems, the amount of CO2 per ton-mile of movement is a standard measure. It is a more accurate measurement for impact than just miles driven because a bus carries more payload than a car does over one mile and that should be considered.

Example Spreadsheet Calculation

	A	B	C	D	E	F	G	H	I
1	milli-Amp-hr (mAh) per Amp-hr(Ah)			1000		CO_2 produced by 1 lb coal:		3.4	
2	Actual Battery Capacity Used:			30%		FastTrack RC Car Weighs (lb):		4	
3	BTU Produced per KWh Grid Energy:			10,000		FastTrack RC Car mileage (miles/charge):		0.8	
4	Coal Produces, BTU per pound:			12,000		pounds (lb) per ton		2,000	
5									
6		**Battery Capacity**	**Battery Voltage**	**Theoretical Energy Used**	**Actual Energy Used**	**Energy Production Required**	**Coal Required**	**CO_2 Produced**	**CO_2 per ton-mile for FTRC car**
7	**Units**	*mAh*	*V*	*Wh*	*Wh*	*BTU*	*lb*	*lb*	*lb per ton-mile*
8	**Formula**	-	-	*=B9/D1*C9*	*=D9*D2*	*=E9/1000*D3*	=F9/D4	=G9*H1	=H9/(H2/H4*H3)
9	**Example**	3300	7.2	23.76	7.1	71.28	0.006	0.02	12.6

P.I.T. Now Evaluation Rubric: Judges will use ONLY this rubric to score

Criteria	Novice 0 points	Apprentice 10 points	Practitioner 15 points	Expert 20 points
1. Deadlines	Final moment on Sat, May 18	Partial on Fri, May 17	Complete on Fri, May 17	Early deadline, May 10
2. Goals, Purpose and Innovation	The explanation isn't clear at all and/or doesn't relate to minimizing or reducing energy use and environmental impact of the Ten80 league.	A short explanation is given but the mission isn't clearly conveyed and questions of its relevance remain or the proposal is already common place.	A thorough description is given and is innovative; however, it only marginally relates to minimizing or reducing energy use and environmental impact of the Ten80 league.	A thorough description is given, the project is innovative and directly relates to minimizing or reducing energy use and environmental impact of the Ten80 league.
3. Implementation (Viability) for teams, league and/or society	Ideas only are given with no detail on how it would actually be implemented for a team or the league.	A simple description of how the project would be implemented is given but there are unanswered questions; did not consider relevant obstacles.	A description of how the project would be implemented is given with some data to back it up; however, the audience isn't convinced it is viable.	A thorough description of how the project would be implemented is given with real, accurate data to back it up. The audience is convinced it is viable.
4. Economic Impact	There is no discussion of the economic impact of the implementation.	Impact is reported, but references to data are infrequent, inaccurate or inappropriate	Impact is clearly reported and supported by data that was collected, evaluated and presented clearly.	…And the impact is significant.
5. Impact – Energy Use and CO2 generation	There is no discussion of the actual impact on energy and CO2 from of the implementation	Impact is reported, but references to data are infrequent, inaccurate or inappropriate	Impact is clearly reported and supported by data that was collected, evaluated and presented clearly.	…And the impact is significant.
6. Data Organization	• Data are inaccurate • Data are haphazardly • recorded • Data tables missing	• Most data are collected but checks are not placed on measurement to insure accuracy • Data recorded in a manner that threatens reliability • Data tables incomplete or contain inconsistencies	• All significant data measured with some checks placed on measurement for accuracy • Data recorded effectively • The data tables are relevant to the project requirements	• All significant data measured, checks are placed on measurements for accuracy • Data recorded effectively and efficiently • Tables well designed to the project requirements
7. Procedure & Documentation	Purpose, materials and procedures are not documented for all or most investigations. Reader cannot follow what was done.	Purpose, materials and procedures are documented before most but not all investigations. Reader has to infer what was done.	Purpose, materials and procedures are documented before each investigation but not completely clear. Reader has to infer some of what was done	Purpose, materials and procedures are neatly documented before each investigation or analysis. Reader does not have to infer what was done.
8. Visual Presentation	Project has limited eye appeal or is not easily readable at 2 feet distance. The project has limited organization, or contains confusing visuals, or contains major language or spelling errors.	Project is appealing and readable at 2 feet distance. It is organized and clear, uses understandable visuals and/or models, and contains few language and spelling errors.	Project is appealing and neat, and is readable at 2 feet distance. It is well organized and clear, makes striking use of inventive or amusing visuals and/or models, and uses language and spelling flawlessly.	... Also presents a compelling argument with data to support the process, conclusions and recommendations.
9. Verbal Presentation	Presentation is disorganized and does not discuss procedure or data. Articulation is unclear. Presenters do not speak directly to the audience.	Presentation is organized but doesn't discuss procedures or data accurately. Articulation is pretty clear and eye contact pretty good.	Presentation is organized and creative and addresses procedures and data accurately. Articulation is clear and eye contact good.	...Also presents a compelling argument with data to support the process, conclusions and recommendations.
10. Deliverable, Finished Product	• Features seem to have no relevance to performance goals • Messy appearance • Little intricacy in fabrication • Model and designs do not align with final product • Does not function well	Some of the expert criteria are present, but not many	Many of the expert criteria are present, but not all	• Design features reflect professional body of knowledge • Visually appealing • Intricacy is relevant to its use • Matches the model and design • Performance is competitive

Event #6: Aerodynamics Design

Project Goal: To design a car body with high downforce and low drag then to make that car body as close to design as possible. An aerodynamic design also helps performance in the Superspeedway Endurance Race.

How to Compete (Procedure): Only bodies that have been purposefully modified, with documentation to show intent will be entered into this event. Turn in your car body for testing during check-in on Sat, May 18. The top designs will be tested in one of two ways. If AeroDYN Wind Tunnel is available on the morning of May 18th, your car bodies will be taken to the tunnel off-site and tested. If the tunnel is booked at the last minute, bodies will be tested in a 1:10 scale wind tunnel.

Possible Points & Scoring: 200 points total

- 100 points from judges evaluation of documents, visual display and verbal presentation defined in the rubric.
- 100 points come from wind tunnel testing (AeroDYN or scale model). Score = Downforce ÷ Drag

What if I want to race with my Aero body? If testing at the AeroDYN wind tunnel, you will be provided a clear car body because your submission has to be taken off-site.

Strategy & Background: See the booklet, *Aerodynamic Design Projects*. It is available at the Team Web Site. The rubric is ultimately the only resource Ten80's guest judges will use to evaluate your submissions.

Aerodynamic Design Evaluation Rubric: Judges will use ONLY this rubric to score

Criteria	Novice 0 points	Apprentice 10 points	Practitioner 15 points	Expert 20 points
1. Data Organization	• Data are inaccurate • Data are haphazardly recorded • Data tables missing	• Most data are collected but checks are not placed on measurement to insure accuracy • Data recorded in a way that threatens reliability • Data tables incomplete or contain inconsistencies	• All significant data measured with some checks placed on measurement for accuracy • Data recorded effectively • The data tables are relevant to the project requirements	• All significant data measured, checks are placed on measurements for accuracy • Data recorded effectively and efficiently • The data tables well designed to the project
2. Procedure & Documentation	Purpose, materials and procedures are not documented for all or most investigations. Reader cannot follow what was done.	Purpose, materials and procedures are documented before most but not all investigations. Reader has to infer what was done.	Purpose, materials and procedures are documented before each investigation but not completely clear. Reader has to infer some of what was done	Purpose, materials and procedures are neatly documented before each investigation or analysis. Reader does not have to infer what was done.
3. Visual Presentation	Project has limited eye appeal or is not easily readable at 2 feet distance. The project has limited organization, or contains confusing visuals, or contains major language or spelling errors.	Project is appealing and readable at 2 feet distance. It is organized and clear, uses understandable visuals and/or models, and contains few language and spelling errors.	Project is appealing and neat, and is readable at 2 feet distance. It is well organized and clear, makes striking use of inventive or amusing visuals and/or models, and uses language and spelling flawlessly.	... Also presents a compelling argument with data to support the process, conclusions and recommendations.
4. Verbal Presentation	Presentation is disorganized and does not discuss procedure or data. Articulation is unclear. Presenters do not speak directly to the audience.	Presentation is organized but doesn't discuss procedures or data accurately. Articulation is pretty clear and eye contact pretty good.	Presentation is organized and creative and addresses procedures and data accurately. Articulation is clear and eye contact good.	...Also presents a compelling argument with data to support the process, conclusions and recommendations.
5. Deliverable, Finished Product	• Features seem to have no relevance to performance goals • Messy appearance • Little intricacy in fabrication • Model and designs do not align with final product • Does not function well	• Some of the expert criteria are present, but not many	• Many of the expert criteria are present, but not all	• Design features reflect professional body of knowledge • Visually appealing • Intricacy is relevant to its use • Matches the model and design • Performance is competitive

Event #7: Creative Engineering Project

Goal & Purpose: Follow sound development practices and get creative. The rubric outlines how judges evaluate your projects and is ultimately the only resource that Ten80's guest judges will use to evaluate your submissions. The product or process does not have to be included in any performance tests or race events.

This project was implemented for 2010 because teams were doing very innovative things through which the team was learning a lot; however there is not always a direct positive impact on performance. This competition category is the venue to show off your ideas and project skills including good investigation planning, documentation, implementation, analysis and communication.

How to Compete (Procedure): Submit written reports according to the project deadlines. Display visual materials at your pit area during the competition. Judges will review written reports and displays prior to your verbal presentation. Judges will come to your pit area for your 10 minute verbal presentation and Q&A on all of your projects including this one.

Possible Points: 200 points

Example Topics: Any project outlined in the projects listed under the Creative Engineering Projects booklet (download from your resource course). Strictly following these guidelines will qualify your team for full scores in every criterion except creativity (see the evaluation rubric). Ongoing conversations at the StudentRacingChallenge.com forum is a source for ideas as well.

Expected Content

- Clearly stated purpose
- Viability for scale-up to all TEN80 teams or to full-scale human systems (cars, meetings, etc.)
- Economic pro's and con's of this project
- Impact on performance of the car in various types of races; use data to back up your conclusions
- Logbook including procedure, data and analysis (graphs)
- Conclusion and recommendations clearly based on data
- Information source citations

Creative Engineering Evaluation Rubric: Judges will use ONLY this rubric to score

Criteria	Novice 0 points	Apprentice 10 points	Practitioner 15 points	Expert 20 points
1. Goals, Purpose	The purpose of this project and what teams stand to gain from it isn't clear at all.	A short explanation is given but the potential gain from isn't clearly conveyed.	A thorough description is given about why the team is implementing this project.	…and its purpose is clearly beneficial to the team and potentially the league.
2. Patentable, Creative	Project is obvious to most observers and is not patentable.	Project is obvious to those skilled in the art and is likely not patentable.	Project idea is not obvious to those skilled in the art and could be submitted for patent with confidence.	…. and support data is of high quality that the project seems highly patentable.
3. Actual Implementation (Viability) for TEN80 teams	Ideas only are given with no detail on how it would actually be implemented for a team or the league.	A simple description of how the project would be implemented is given but there are unanswered questions; did not consider relevant obstacles.	A description of how the project would be implemented is given with some data to back it up; however, the audience isn't convinced it is viable.	A thorough description of how the project would be implemented is given with real, accurate data to back it up. The audience is convinced it is viable.
4. Economic Impact	There is no discussion of the economic impact of the implementation.	Impact is reported, but references to data are infrequent, inaccurate or inappropriate	Impact is clearly reported and supported by data that was collected, evaluated and presented clearly.	…And the impact is significant.
5. Performance Impact	There is no discussion of the actual impact on race performance.	Impact is reported but data references are infrequent, inaccurate or inappropriate	Impact is clearly reported and supported by data that was collected, evaluated and presented clearly.	…And the impact is significant.
6. Data Organization	• Data are inaccurate • Data are haphazardly • recorded • Data tables missing	• Most data are collected but checks are not placed on measurement to insure accuracy • Data recorded in a way that threatens reliability • Data tables incomplete or contain inconsistencies	• All significant data measured with some checks placed on measurement for accuracy • Data recorded effectively • The data tables are relevant to the project requirements	• All significant data measured, checks are placed on measurements for accuracy • Data recorded effectively and efficiently • The data tables well designed to the project
7. Procedure & Documentation	Purpose, materials and procedures are not documented for all or most investigations. Reader cannot follow what was done.	Purpose, materials and procedures are documented before most but not all investigations. Reader has to infer what was done.	Purpose, materials and procedures are documented before each investigation but not completely clear. Reader has to infer some of what was done	Purpose, materials and procedures are neatly documented before each investigation or analysis. Reader does not have to infer what was done.
8. Visual Presentation	Project has limited eye appeal or is not easily readable at 2 feet. It has limited organization or contains confusing visuals, or contains major language or spelling errors.	Project is appealing and readable at 2 feet distance. It is organized and clear, uses understandable visuals and/or models, and contains few language and spelling errors.	Project is appealing and neat, and is readable at 2 feet. It is well organized and clear, makes striking use of inventive or amusing visuals and/or models. Language use & spelling are flawless.	…. Also presents a compelling argument with data to support the process, conclusions and recommendations.
9. Verbal Presentation	Presentation is disorganized and does not discuss content requirements. Articulation is unclear. Presenters do not speak directly to audience.	Presentation is organized but doesn't discuss all content accurately. Eye contact pretty good; articulation is pretty clear	Presentation is organized and creative and addresses procedures and data accurately. Articulation is clear and eye contact good.	…. Also presents a compelling argument with data to support the process, conclusions and recommendations.
10. Deliverable, Finished Product	• Features seem to have no relevance to performance goals • Messy appearance • Little intricacy in fabrication • Model and designs do not align with final product • Does not function well	• Some of the expert criteria are present, but not many	• Many of the expert criteria are present, but not all	• Design features reflect professional body of knowledge • Visually appealing • Intricacy is relevant to its use • Matches the model and design • Performance is competitive

Enterprise & Innovation Category Details

For 2013, this category includes the all-important (and required) team presentation, graphic design and bonus elevator speech categories.

8. Team Presentation

9. Graphic Design

Bonus. Elevator Speech

Event #8: Team Presentations

**** Required Category****

Goal: Through the team presentation you'll showcase your communication skills by conveying to the judges panel what your team has been doing and how you did it. You can provide support materials like handouts, cards, etc. You're expected to support your presentation with visual media like slides, video clips, etc.

Possible Points: 200 points

How to Compete (Procedure): Submit any electronic files during check-in before competition begins. Store ALL required files on a thumb/jump drive formatted for a WINDOWS computer. See the on Presentation Format below for more details.

At the scheduled time, your team will go to the designated area and give an 8 minute presentation. Judges will have your electronic files queued up on the computer (see presentation format below for details on what is and is not allowed). You can navigate the computer or be prepared to tell judges how to navigate. Just remember, you have only 10 minutes in the room total (1 min to get in. 8 minute presentation. 1 min for Q&A. 1 min to get out).

Presentation Format

- Duration: 10 minutes in the presentation room to give an 8 minute presentation; do not go over time and target to finish as close to 8 minutes as possible.
- Electronic Files: Files must be in one of the following common formats:
    - PowerPoint
    - Adobe Acrobat Reader (PDF)
    - Adobe Flash or Java Applets
    - Common image files (JPG, BMP, TIF, etc.)
    - Common movie files (mp4, wmv, mp3, mov, etc.)
- Internet Access: Assume you DO NOT have any. Bring all files you need on the thumb drive you submit to the Sanctioning Body upon check-in on Sat, May 18.
- Presentation Equipment: There will be a WINDOWS computer, projector and speakers for your use.
- Mac vs. Windows: The presentation computer is a WINDOWS computer so ensure that all files you provide will work for that format. If you want to use your own MAC computer, iPad or similar you'll have to take up some of your 10 minutes to switch over. Bring ALL required connectors to the projector that accepts VGA or HDMI.
- Paper Handouts: If you choose to handout materials to the judges, provide 3 copies.

Required Presentation Content

The main story you tell is up to you. You can present it as a marketing presentation to potential sponsors or as a summary report to current sponsors showing them the return on investment (ROI) in your team was high.

Within your chosen format, the following topics should be addressed.

- Main team goals
- Team management and structure
  (How often you met and how you decided what to do at those meetings)
- 'Round estimate' of the budget for your team and how you acquired the funding
- Marketing activities including logo development, public relations and sponsorship seeking
- Race engineering strategies & activities
- Outline of projects your team implemented
- Other types of learning; what did students gain from the Ten80 Student Racing Challenge this year?
- What are the plans to improve in the future?

Team Presentation Evaluation Rubric: Judges will use ONLY this rubric to score

Criteria	Novice 0 points	Apprentice 10 points	Practitioner 15 points	Expert 20 points
1. Audience Response & Eye-Contact	• Incoherent; audience lost interest. • Reads all or most of report with no eye contact.	• Some related facts but went off topic and lost the audience. • Some eye contact but not • Maintained and at least half the time; reads most of report.	• Presented facts with some interesting "twists"; held the audience attention most of the time. • Mostly maintains eye contact but frequently returns to notes.	• Involved the audience in the presentation; held the audience's attention throughout. • Maintains eye contact; seldom returning to notes; like a planned conversation.
2. Organization & Logic	• Poor organization. • Does not clearly introduce • the purpose • Choppy and disjointed • because there is no apparent logical order of presentation • Ends without a summary or conclusion	• Somewhat organized. • Introduces the purpose • Jumps around topics. Several points are confusing • Ends with a summary or conclusion that seems disconnected to content •	• Generally well organized • Introduces the purpose clearly. • Most information is in logical sequence; A few minor points may be confusing • Ends with a summary of main points	• Extremely well organized • Introduces the purpose • clearly and creatively • Presents information in • logical, interesting sequence which audience can follow • Ends with a strong conclusion
3. Creativity	Bland, predictable, and lacked "zip. Repetitive with little or no variety; little creative energy used	Little or no variation; a few original touches but for mainly presented with little originality or interpretation	Some originality apparent; clever at times; good variety and blending of materials/media	Uses the unexpected to full advantage; very original, clever, and creative approach that captures audience's attention
4. Use of Communication Aides	Uses superfluous graphics, no graphics, or graphics that are so poorly prepared that they detract from the presentation Font is too small to be easily seen	Occasional use of graphics that rarely support presentation content; visual aids were not colorful or clear, choppy, time wasting use of multimedia Font is too small to be easily seen	Graphics aid thesis but media should be more varied and connected to presentation content. Font size is appropriate for reading	Graphics reinforce content and aid maximize audience understanding; use of media is varied and not added simply for the sake of use Visuals were colorful and large enough to be seen by all
5. Content: Team Organization, Funding	Little of these topics were covered. Audience had little feel for the team's organization and funding.	Not all content was covered or was covered so that audience had a grasp of team's organization and funding	For the most part, the content was covered.	Speakers give a good picture of the team's organization and funding.
6. Content: Race Engineering & Projects	Little of these topics were covered. Audience had little feel for the team's technical investigations and projects.	Not all content was covered or was covered so that audience had a grasp of team's technical investigations and projects.	For the most part, the content was covered.	Speakers give a good picture of the team's technical investigations and projects..
7. Content: Motivation, Goals, Future Plans	Little of these topics were covered. Audience had little feel for the team's motivation, goals and future plans.	Not all content was covered or was covered so that audience had a grasp of team's motivation, goals and future plans..	For the most part, the content was covered.	Speakers give a good picture of the team's motivation, goals and future plans.
8. Duration	• Less than 6 minutes OR • More than 9 minutes	• Between 6 and 7 minutes OR • Between 8 and 9 minutes	• Between 7 and 7.5 minutes OR • Between 8 and 8.5 minutes	Between 7.5 and 8 minutes
9. Compelling	You aren't compelled to invest your time or resources in this team.	You would like to invest your time or resources in this team....but don't really think it would happen.	You would invest your time or resources in this team.	You would invest your time or resources in this team and ask that others do the same.
10. Technology	Team did not prepare electronic materials as required and therefore could not use them	Team did not prepare electronic materials as required but were able to get them ready to use in time	Team had some difficulty preparing electronic materials or helping judges navigate them	Team submitted materials that were easily loaded and navigated

Finals Event #9: Graphic Design

Half of the points come from car body decals and half from team identity. The team identity is more than just a logo ideally. To earn full points, evaluate the criterion completely.

Car Body Decal

Goal: To design a car body for visual appeal and to showcase team and league sponsors.

How to Compete (Procedure): During registration on Sat. 18 May, submit either your car body or pictures from every angle (all angles shown below) to the Sanctioning Body. Teams that want to race with their car body entry should bring the pictures.

Possible Points: 50 points

REQUIRED LOGOS:
Full points can only be awarded if the following logos of your national sponsors are missing. As Matt Dorton of Hendrick Motorsports says, "The key is showing your sponsors as prominently as possible, as cleanly as possible". Download logos under the marketing section at the TEN80 team web site (Car_Decal_Logos.zip).

- Ten80 Education
- Student Racing Challenge Program Logo
- U.S. Army
- Your local & team sponsors

Preparation: See the *Car Decal Design* project in the *Business, Project Planning & Public Relations* guide.

Evaluation Criterion:

1. SPONSOR MARKETING (0 - 15 points): How well are the team and league sponsor logos displayed? Can you see them from afar? How many are included?
2. CONCEPT (0 - 15 points): Technical or artistic skills are not considered, but creativity and 'vision' are.
3. TECHNICAL, FINAL PRODUCT (0 - 20 points): How compelling is the actual final product?

Team Identity (Logo)

Goal: To create a team identity that symbolizes your team in viewer's minds. A team identity that is more than just a logo; it describes how to use your logo and gives example products. If you have a great logo but hide it on the wrong color T-shirt, its impact is totally wasted and your message is lost. A potential supporter or customer might walk right by without seeing you at all. The entire design is what matters in getting people's attention.

Possible Points: 50 points

How to Compete (Procedure): During registration on Sat. 18 May, submit your documentation, pictures and/or samples.

Preparation: See the *Public Relations Project, Team Identity* in the new *Business Planning, Project Management & Public Relations* book. This project describes the many aspects of an identity - it goes further than just a logo.

Evaluation Criterion:

1. CONTENT (0-15 points): Is the submission a team logo only or is it a full team identity including logo, color scheme, merchandise examples and potentially guidelines on how to use the logo?

2. CONCEPT (0-10 points): Technical or artistic skills are not considered, but creativity and 'cleverness' are.

3. TECHNICAL (0-10 points): How well is the concept implemented by hand or design software?

4. MERCHANDISING/BRANDING VALUE (0-15 points): Does the identity work well on T-shirts, signs, as a car decal? Does it grab your attention from afar? Is it memorable and does it bring to mind your project?

No Verbal Presentations

A graphic identity must stand on its own, without presentation about the concept behind it. Any information you would like to convey about the concept behind your designs must be submitted in writing at the time of check-in.

Bonus: Elevator Pitch

Goal: To make a very quick, concise and COMPELLING statement about your team and vision. It is intended to make people you just meet interested enough to learn more with the hopes that they'll ultimately get involved in some way.

Picture this. You're in an elevator that stops at floor 30 on its way down. In walks a company executive who is top on your target list. You desperately want to partner with this company and only have 30 seconds on your elevator ride. What do you say to get him or her on board with your team?

If you've practiced this scenario, you're set. If not...well, try summarizing what your team does and why it is important right now! You only get one chance. Go

Possible Points: 50 points

Evaluation Criteria: Points are doled out based solely on the business professional's response to submissions. The basic question she or he will ask is, "Would I be compelled to take my own time and setup a second meeting with this team?". Your goal is to have the answer be a resounding YES.

How to Compete (Procedure): This is a bonus category so you will compete for these points BEFORE the actual finals. Create a video of your 30 second (± 10 seconds) pitch and send the link or file to the Sanctioning Body by Friday, May 10th. Email links or files to tech@ten80education.com. Put the following in the subject line: "Finals Elevator Speech - School or Club Name".

Preparation: See the project, "*Prepare an Elevator Speech*" in the *Business Planning, Project Management & Public Relations* book or just search for "Elevator Speech" in your favorite search engine.