FLL Coaches Clinic
Game, Project, Core Values, Tournament, Q&A

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University of Texas at Dallas
October 8, 2016
September:
  Getting started, team activities, project selection, game analysis, project research

October:
  Skill building, project development, robot chassis and experiments, solve a mission or two

November:
  Project finalization, sharing, scrimmages, solve more missions

December:
  Final tournament preparation, Qualifier events
Sections:

Core Values
The Project

The Robot Game
  Robot Game Rules
  Robot Game Missions
  Robot Game Executive Summary
Central component of FIRST LEGO League:

- We are a team.
- We do the work to find solutions with guidance from our coaches and mentors.
- We know our coaches and mentors don't have all the answers; we learn together.
- We honor the spirit of friendly competition.
- What we discover is more important than what we win.
- We share our experiences with others.
- We display Gracious Professionalism® and Coopertition® in everything we do.
- We have FUN!
## Core Values

Directions: For each skill area, clearly mark the box that best describes the team’s accomplishments. If the team does not demonstrate skill in a particular area, then put an ‘X’ in the first box for Not Demonstrated (ND). Please provide as many written comments as you can to acknowledge each team’s hard work and to help teams improve. When you have completed the evaluation, please circle the team’s areas of strength.

### Teamwork

<table>
<thead>
<tr>
<th>Core Values</th>
<th>Beginning</th>
<th>Developing</th>
<th>Accomplished</th>
<th>Exemplary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Effectiveness</strong></td>
<td>Problem solving and decision making processes help team achieve their goals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>team goals AND team processes unclear</td>
<td>team goals OR team processes unclear</td>
<td>clear team goals and processes</td>
<td>clear processes enable team to accomplish well defined goals</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td>Resources used relative to what the team accomplishes (time management, distribution of responsibilities)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>limited time management AND unclear roles</td>
<td>limited time management OR unclear roles</td>
<td>excellent time management and role definition allows team to accomplish most goals</td>
<td>excellent time management and role definition allows teams to accomplish all goals</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Kids Do the Work</strong></td>
<td>Appropriate balance between team responsibility and coach guidance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>limited team responsibility AND excessive coach guidance</td>
<td>limited team responsibility OR excessive coach guidance</td>
<td>Good balance between team responsibility and coach guidance</td>
<td>team independence with minimal coach guidance</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Inclusion**

Consideration and appreciation for the contributions (ideas and skills) of all team members, with balanced involvement

<table>
<thead>
<tr>
<th>Core Values</th>
<th>Beginning</th>
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<th>Accomplished</th>
<th>Exemplary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respect</strong></td>
<td>Team members act and speak with integrity so others feel valued—especially when solving problems or resolving conflicts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>not evident with majority of team members</td>
<td>evident with majority of team members</td>
<td>almost always evident with all team members</td>
<td>always evident, even in the most difficult situations</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cooperation</strong></td>
<td>Team competes in the spirit of friendly competition and cooperates with others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>not evident with majority of team members</td>
<td>evident with majority of team members</td>
<td>almost always evident with all team members</td>
<td>always evident, even in difficult situations—and team actively helps other teams</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Strengths:**

<table>
<thead>
<tr>
<th>Core Values</th>
<th>Inspiration</th>
<th>Teamwork</th>
<th>Gracious Professionalism®</th>
</tr>
</thead>
</table>

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The Core Values Poster

Optional in qualifiers; may be required at Championship

Diagram:
- Discovery
- Integration
- Inclusion
- Coopertition

Other Core Values judging categories:
(For example: Respect or Team Spirit)

Dimensions:
- No taller than 36 inches (91 cm)
- No wider than 48 inches (123 cm)
Model Scout Robotics, 2013 N. Amer Championship

Discovery
- Packaging tool for seniors
- Equipment testing
- Problems seniors encounter: Making beds, shopping for groceries, proper medication
- Light sensor calibration

Inclusion
- Lead roles
  - Katie: Captain
  - Veronica: Project
  - Anthony: Lawyer / Robot
  - Matthew: Programming
- Walter: Attachments
  (we work together in all areas)
- Meeting at championship
- Attachment improvements from all members

Core Values
- We are a team
- We have FUN!

Integration
- Presentation skills
- Perot Museum Discovery Days
- Rubik's cube solver robot
- BSA Troop 219 demo

Cooperetition
- We do the work to find solutions with guidance from our coaches
- What we discover is more important than what we win
- Cooperation on lever mission
- Team website with tips
- Helped other teams with software

We share our experiences with others
Article I: The Bill of Core Values

Section I – We are a team
Section IX – We have fun

Section VI – We share our experiences with others

Republic of Pi

We the People
# Project

Directions: For each skill area, clearly mark the box that best describes the team's accomplishments. If the team does not demonstrate skill in a particular area, then put an 'X' in the first box for Not Demonstrated (ND). Please provide as many written comments as you can to acknowledge each team's hard work and to help teams improve. When you have completed the table, please circle the team's areas of strength.

<table>
<thead>
<tr>
<th></th>
<th>Beginning</th>
<th>Developing</th>
<th>Accomplished</th>
<th>Exemplary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problem Identification</strong> *</td>
<td>Clear definition of the problem being studied</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>unclear; few details</td>
<td>partially clear; details missing</td>
<td>mostly clear; detailed</td>
<td>clear; very detailed</td>
</tr>
<tr>
<td><strong>Sources of Information</strong></td>
<td>Types (e.g. books, magazines, quality sources cited, including websites, reports and other resources) and number of professionals in the field</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>one type of information cited; minimal sources</td>
<td>two types of information cited; several sources</td>
<td>three types of information cited; many sources, including professionals</td>
<td>four or more types of information cited; extensive sources, incl. professionals</td>
</tr>
<tr>
<td><strong>Problem Analysis</strong></td>
<td>Depth to which the problem was studied and analyzed by the team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>minimal study; no team analysis</td>
<td>minimal study; some team analysis</td>
<td>sufficient study and analysis by team</td>
<td>extensive study and analysis by team</td>
</tr>
<tr>
<td><strong>Review Existing Solutions</strong></td>
<td>Extent to which existing solutions were analyzed by the team, including an effort to verify the originality of the team's solution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>minimal review; no team analysis</td>
<td>minimal review; some team analysis</td>
<td>sufficient review and analysis by team</td>
<td>extensive review and analysis by team</td>
</tr>
<tr>
<td><strong>Team Solution</strong> *</td>
<td>Clear explanation of the proposed solution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>difficult to understand</td>
<td>some parts confusing</td>
<td>understandable</td>
<td>easy to understand by all</td>
</tr>
<tr>
<td><strong>Innovation</strong></td>
<td>Degree to which the team's solution makes life better by improving existing options, developing a new application of existing ideas, or solving the problem in a completely new way</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>existing solution/application contains some original element(s)</td>
<td>solution/application contains original solution/application</td>
<td>original solution/application contains the potential to add significant value</td>
<td>original solution/application contains the potential to add significant value</td>
</tr>
<tr>
<td><strong>Implementation</strong></td>
<td>Consideration of factors for implementation (cost, ease of manufacturing, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>minimal factors considered</td>
<td>some factors considered</td>
<td>factors well considered; some question about proposed solution</td>
<td>factors well considered and feasible solution proposed</td>
</tr>
<tr>
<td><strong>Sharing</strong> *</td>
<td>Degree to which the team shared their Project before the tournament with others who might benefit from the team's efforts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>shared with one individual</td>
<td>shared with one group</td>
<td>shared with one individual or group who may benefit</td>
<td>shared with multiple individual or groups who may benefit</td>
</tr>
<tr>
<td><strong>Creativity</strong></td>
<td>Imagination used to develop and deliver the presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>minimally engaging OR unimaginative</td>
<td>engaging OR imaginative</td>
<td>engaging AND imaginative</td>
<td>very engaging AND exceptionally imaginative</td>
</tr>
<tr>
<td><strong>Presentation Effectiveness</strong></td>
<td>Message delivery and organization of the presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>unclear OR disorganized</td>
<td>partially clear; minimal organization</td>
<td>mostly clear; mostly organized</td>
<td>clear AND well organized</td>
</tr>
</tbody>
</table>

### Strengths:

*Required for Award Consideration

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Project: Keys to success

Clearly state problem being addressed

Interview experts

Document research and sharing with others
  Bibliography
  Interviews
  Presentations

Perform some critical analysis of solution
  Cost, benefit, feasibility
Project: Some presentation options

Posters

Powerpoint

  Be careful of AV setup time and equipment failure

Skit or performance

Presentation

Demonstration

  Practice – Practice – Practice!
Robot Design

Judging of mechanical and programming design of team's robot

Panel of judges will interview the team and want to see demonstrations of robot capabilities
# Robot Design

Directions: For each skill area, clearly mark the box that best describes the team’s accomplishments. If the team does not demonstrate skill in a particular area, then put an ‘X’ in the first box for Not Demonstrated (ND). Please provide as many written comments as you can to acknowledge each team’s hard work and to help teams improve. When you have completed the evaluation, please circle the team’s areas of strength.

<table>
<thead>
<tr>
<th>Skill Area</th>
<th>Beginning</th>
<th>Developing</th>
<th>Accommplished</th>
<th>Exemplary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Durability</strong></td>
<td>Quite fragile; breaks a lot</td>
<td>Frequent or significant faults/repairs</td>
<td>Rare faults/repairs</td>
<td>Sound construction; no repairs</td>
</tr>
<tr>
<td><strong>Mechanical Efficiency</strong></td>
<td>Excessive parts or time to repair/modify</td>
<td>Inefficient parts or time to repair/modify</td>
<td>Appropriate use of parts and time to repair/modify</td>
<td>Streamlined use of parts and time to repair/modify</td>
</tr>
<tr>
<td><strong>Mechanization</strong></td>
<td>Imbalance of speed, strength and accuracy on most tasks</td>
<td>Imbalance of speed, strength and accuracy on some tasks</td>
<td>Appropriate balance of speed, strength and accuracy on most tasks</td>
<td>Appropriate balance of speed, strength and accuracy on every task</td>
</tr>
<tr>
<td><strong>Programming Quality</strong></td>
<td>Programs are appropriate for the intended purpose and would achieve consistent results, assuming no mechanical faults</td>
<td>Would not achieve purpose OR would be inconsistent</td>
<td>Should achieve purpose repeatedly</td>
<td>Should achieve purpose every time</td>
</tr>
<tr>
<td><strong>Programming Efficiency</strong></td>
<td>Excessive code and difficult to understand</td>
<td>Inefficient code and challenge to understand</td>
<td>Appropriate code and easy to understand</td>
<td>Streamlined code and easy for anyone to understand</td>
</tr>
<tr>
<td><strong>Automation/Navigation</strong></td>
<td>Frequent driver intervention to aim AND retrieve robot</td>
<td>Frequent driver intervention to aim OR retrieve robot</td>
<td>Robot moves/acts as intended repeatedly w/ occasional driver intervention</td>
<td>Robot moves/acts as intended every time with no driver intervention</td>
</tr>
</tbody>
</table>

**Design Process**
- Ability to develop and explain improvement cycles where alternatives are considered and narrowed, selections tested, designs improved (applies to programming as well as mechanical design)
- ND organization AND explanation of need improvement
- ND organization OR explanation of need improvement
- Systematic and well-explained
- Systematic, well-explained and well-documented

**Mission Strategy**
- Ability to clearly define and describe the team’s game strategy
- ND no clear goals AND no clear strategy
- ND no clear goals OR no clear strategy
- Clear strategy to accomplish the team’s well-defined goals
- Clear strategy to accomplish most/all game missions

**Innovation**
- Creation of new, unique, or unexpected feature(s) (e.g. designs, programs, strategies or applications) that are beneficial in performing the specified tasks
- ND original feature(s) with no added value or potential
- ND original feature(s) with some added value or potential
- Original feature(s) with the potential to add significant value
- Original feature(s) that add significant value

## Strengths:

- Mechanical Design
- Programming
- Strategy & Innovation

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Robot Design: judging tips

Focus on design process used to create robot

During judging, let the team members least involved in robot construction drive the robot

Make sure everyone has something to do in presentation

Have props or photos showing previous designs that were discarded
RoboDesign

LEGO Digital Designer is a good way to draw/print/document LEGO models

PiBot V2
“Swiss Army Knife” design

- Vertical arm
  - Robotics loop

- Lever (folds up)
  - Engagement section
  - Community Tree loop

- Rotating arm
  - Senses loop
  - Door
  - Robotics insert

- Fork (folds sideways)
  - Search Engine loop

- Hook (fixed)
  - Rev. Engineering
  - Project Directed Learning

- Catapult (elastic)
  - Sports

- Push arm
  - Search Engine spin

- Swing arms (spring loaded w/release pins)
  - Adapting to Changing Conditions
  - Remote Learning
  - Project Directed Learning
  - Engagement pinwheel
  - Cloud Storage
Carefully learn all rules and mission descriptions.

Game strategy: Determine which missions increase score and are easiest to complete.

Calculate highest possible score.

Focus on robot consistency and reliability.

Use scoring apps and scoring tools.
Be sure drive team members are familiar with FLL Score sheets
Game scoring

Drive team members are allowed to discuss scoring sheets with referees

- ONLY the drive team members (not coaches)

Rule GP3 – Benefit of the Doubt

Be courteous!

Consider whether points will actually improve ranking

Once score sheets are signed, they’re final!
Qualifier event day overview

Morning
  Load in and setup
  Judged sessions (Robot Design, Project, Core Values)
  One or two Robot Game rounds

Lunch

Afternoon
  Remaining Robot Game rounds
  Callbacks
  Awards and advancement
What to bring

What to Bring to an Event
Aug. 8 2016 | 0 KB

Content Type: FIRST LEGO League
Tags: Event Preparation, Events

- Robot and attachments
- Parts kit
- Print-out of programs and robot specification page
- Materials, props, and equipment needed for Project presentation
- Laptop computer with batteries and/or AC adaptor, extra batteries, extension cords
- Team scrapbook
- Team banner, posters, or other decorations for pit space
- Snacks and drinks
- Storage box for personal items USB cable or IR tower Team introduction page
- Fun, inexpensive gifts to share with other teams (pins, hats, personalized, team playing cards)

Some events require teams to bring a printed page of information about themselves, usually known as the Team Info Sheet, Team Information Sheet, or Team Profile. These pages typically include a picture of the team, a picture of the robot, and a description of the team’s Project, Robot design process, and how they follow the FIRST LEGO League Core Values. Please check with your tournament director to find out if you are required to bring one to your event.
Other suggestions – game cart

Office Depot Mobile Folding Cart - $15

32 liter Really Useful Box - $27

Can hold robot and parts between matches

Acts as a side table during Robot Game

Store judging handouts
Other suggestions – team banner

Available from Staples and Vistaprint

Often on sale (look for online coupons)
Other suggestions – Judge and Pit giveaways

Buttons

Art

Wooden nickels

Candy is popular but prohibited by some venues
The afternoon period of a competition day is often slow

Bring activities to share with other teams in the Pit Area

- Other interesting LEGO robots
- Team information
- Displays
- Videos
Other coaching tips

FLL events take place beyond the North Texas region; including Oklahoma, Central Texas, etc.

“Espionage”:
Visit events you aren't competing at
Visit veteran team meetings and events

“Peek behind the curtains”:
Volunteer at an event
Become a judge or referee