

Oregon LEGO Robotics Best Practices for Coaches

Summary of recommendations from coaches of four award-winning teams at the Oregon State Tournament on January 18, 2003.

4/10/03

Team Logistics & Administration:

Team member recruitment:

- 5 to 7 students is the ideal team size.
- Register early so that you receive your materials from FIRST in a timely manner.
- An all-girl team can help female students flourish.
- Difficult to coach a team which an age range that spans more than 3 grades.
- Make sure the kids understand they aren't just "playing with LEGOs", that they will have to solve some specific problems.
- Recruitment:
 - Start early. Recruit team members in the spring.
 - Seeing the robots in action or video of the robots really hooks kids.
 - Contact parents: talk, email, school newsletters, flyers going home with kids
 - Presentations to kids: school assembly, after school session
 - Team members talking to their friends.
 - Caution: You will soon have more interested kids than you can support. Set your limit and then encourage others to form teams.

Fundraising:

- Plan on spending \$800 - \$1,000 per team if you are starting from scratch.
- Potential sources for funds:
 - Corporate sponsors
 - TAG money from school
 - Charge a fee per student on the team

Approach for dealing with parents and schools:

- Have at least two adults involved as leaders (coach or mentor)
- Have a parents' meeting at the beginning to be clear on expectations
- It is important to have 2 adults at all sessions. A- It provides multiple adult perspectives on incidents that may occur; important in case of charges of improper conduct. B- If a medical emergency occurs, one adult can drive to the hospital while the other stays with the rest of the kids.

Team meeting schedule:

- Twice a week for 2 hours worked well.
- Right after school can be best time for kids, but tough on working adults.
- Set the schedule in the beginning and work out conflicts with sports, music & other commitments. Allow kids to be kids with other (non-LEGO Robotics) lives without pressuring them to attend when they have conflicts.
- Snack was important part of each session.
- Plan on extra meetings as the competition approaches.
- Everyone doesn't have to do everything; it is OK to specialize. Sometimes it may be best to have a subset of the team meet.

LEGO Robotics:

LEGO kits:

- Each team needs 2 LEGO kits for critical spare parts (motors, sensors) and for trial designs.
- For larger teams, best to have one LEGO kit for every three team members, allowing all kids to be productive during robot development.
- Ordering standard kits directly from PITSCO rather than FLL kits as part of registration may mean that they will arrive sooner. (Number of motors, sensors, etc. may be different.) (PITSCO's web site is www.pitsco-legodacta.com)
- Order early.

Teaching:

- Worked well to break the season into phases:
 - Teach Robolab (or RIS) and LEGO construction basics for a month.
 - Do experimental designs & mini-challenges for a month.
 - Focus on the challenge for the rest of the time.
- Kids need to be building something at every session. Small groups of 2 or 3 kids working on simplified challenges or problems.
- The Minnesota materials are excellent for teaching.
http://www.hightechkids.org/fll/coaching/Training%20Material/training_matl.htm
 - These materials have a lecture portion and hands on labs.
- The Robolab multimedia tutorial was very good for teaching Robolab. (A CD-ROM is available from ORTOP.)
- Establish "coding conventions" so Robolab code is easy for others to understand and help debug.

Building the robot:

- Let the kids try out lots of different ideas.
- Work in small subgroups on specific tasks.
- Kids tend to be pretty self-managing once focused on the challenge.
- Coaches most effective by adding structure, not technical help: (Technical help is in the teaching about Robolab / RIS or LEGO construction principles before they start building and programming their robot.)
 - Have kids retest all missions during each session. (A change to help one mission invariably breaks another mission that was already working.)
 - Keep track of time used for each mission because the 2:30 time limit is an important constraint that is easy to forget.
 - Pace your team. Help the kids set up an overall plan and periodically talk about number of work sessions left until the tournament and get the kids to talk through their plan for completing all the work.
- Have one or two of the kids regularly check the FLL web site (www.firstLEGOleague.org) and review the “FLL Forum”.
 - This is a great source for coaches also!

Robot scores:

- One team got a perfect score of 360 points. Only a couple teams scored more than 300 points.
- Scoring 150 or more points means your robot has done very well.
- If your team is young or uncertain, don't try to do everything. Set your sights on getting a couple of the easier missions done first, and expand from there.

Research Presentation:

Time & Participation to develop:

- Presentation can be done in last few weeks before the tournament.
- Helps to have everyone participate in brainstorming possibilities before a smaller sub team does most of the preparation work.

Content & Form:

- Presentations addressed a wide variety of problems: traffic fatalities, cleaning sidewalks, washing windows, etc.
- Successful presentations had:
 - Some visuals (poster board, photos, model, mock up) that described the problem and the team's proposed solution.
 - Active participation by all team members with some passion for the problem and proposed solution.
- Have the kids get creative – funny and crazy works.