Designing a FRC Robot, a Team Approach

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FRC mentor since 1998, team 45  
2003 Championship Woodie Flowers Award Winner
Ten tips from Andy
1. Pre-season tasks

- Build team
- Set team goals
- Determine leaders
- Set up resources
- Develop Skills
2. Kickoff

- Divide into equal sub-groups
- Watch Kickoff together
- No stragglers
- Know the game
- Brainstorm
- Start building the field
- Buy stuff

Day 0
3. Sub-Group Decision Process

- BRAINSTORM
- Organize & categorize ideas
- Focus on **OVERALL GAME PLAY**
- Critique, analyze, & eliminate ideas
- Pick best ideas
- Agree on overall design

Days 1-3
4. Design Presentations

- Audience – everyone!
- Sub-teams present design concepts
- Students lead, adults help as needed

Day 4
5. Disown, sleep and decide

- All sub-team concepts are team property
- Sleep on it
- Decide the following day
6. Make a decision

- Review and critique, using GP
- Discuss common ideas
- Make a Decision Matrix
  - Determine qualities and assign values
  - Rate each team’s idea per each quality
  - Total each sub-team’s points
  - Highest point total wins
- Focus on concept with highest point total
- Add common features from other concepts
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Sub-Teams:
- **Blue**: Simple robot, known designs, can score well and defend OK.
- **Red**: Complex robot, stretch designs, does all functions well if they work.
- **Black**: Simple robot, no risks, using easiest designs.
- **White**: Complex robot, very risky designs, can do it all if it works.
Democracy should ensue… but a monarchy may come about during an impasse
7. Putaside

- Mr. Bill Beatty, team 71
8. Design Assignments

- Drivebase
- Arm, grabber, etc.
- Lift, structure, etc.
- Software team (already in place)
- Finish the field
- Don’t let slackers bring you down
- Reviews daily and weekly
- Weight and motor management
- To air or not to air
- Build 2?
9. Build a Robot

- Drive it early, by week 3
- Break it early, fix it early
- Weigh it down
- Meet build goals
- Give drivers 1 week to practice
- Give software team 2 weeks to debug
- Celebrate mistakes
- Make spares
10. Celebrate Success

- Have an open house
- Plan for fun, right before shipping
- Ship
- Practice, fix-it, and tweak
Thank you

Any questions?