

Royal Robotics

Lesson Plan – FRC Design practice

Review of Design Process (specific for FRC):

1. **Define the problem:** This step begins at Kick-off where the challenge is announced. The manual gives us details about limitations and requirements. The strategy meeting will select which elements of the challenge we intend to focus on for this season.
2. **Research:** General research can happen prior to the season. It is very helpful to look at designs for past games. Often challenges may have similar elements and prior successful designs can be modified and re-used. More refined research will happen after Kick-off. Having a broader knowledge base of what's been done, can help in developing ideas in step 3.
3. **Generate Multiple solutions-brainstorming:** Design teams should begin by coming up with many ideas for the different game elements. There are no 'wrong' ideas. Design groups should NOT spend a lot of time on details at this point, just concepts. Try not to get hung-up or side-tracked on a favorite idea. This step is more about quantity than quality.
4. **Analyze and select solution:** This is the step where you look at the concepts from step 3 and rate them as to how successful they could be and how well the team can do them. Then the group would select one (two at the most if want a 'back-up' idea) to develop.
5. **Implement and Evaluate:** Design groups will use the provided forms and checklists to create a detailed description of their concepts for presentation to the evaluation team. After evaluation, the team will vote on final design, which will be put into CAD, then into production.

Step 2 – Research:

Design groups will do a better job when they have seen more concepts and how they work. This is where some general research can be a benefit. Looking at prior robot designs by FIRST teams can help build a 'database' from which to pull ideas. This can minimize the "I have NO idea" reaction of those new to this program. We do NOT have to worry about plagiarism in the program. It is NOT stealing. FIRST is about learning and sharing, teams are strongly encouraged to share good ideas for designs. Teams post videos and drawings and pictures on websites and YouTube where other teams can be inspired to emulate their successful designs.

Research Activity:

Get a partner. You are going to try and find design ideas online for the past ten years worth of FRC games (listed below). make a links list (in Word) of the websites you find so we can return to them and show them to everyone at the next meeting. Be prepared to say what you like about the designs you chose (maybe make notes on your links page). Try to avoid duplicating other groups' work, the goal is a variety of ideas for presentation.

2011 Logomotion
2010 Breakaway
2009 Lunacy
2008 Overdrive
2007 Rack-n-Roll

2006 Aim High
2005 Triple Play
2004 FIRST Frenzy
2003 Stack Attack
2002 Zone Zeal

Research Presentation (day 2): Use the projector to go over ideas from each group. Have each group get their links ready ahead of time, then switch between computers.