# Robot Design Sample Questions

## Mechanical Design: Durability

•How did you get your robot to stay together?
•How often does your robot fall apart? What happens and have you thought about ways to fixthis?

## Mechanical Design: Mechanical Efficiency

•Would it be possible touse fewer pieces or components for your robot and still accomplishthe same missions?
•If your robot has attachments, tell us about them.

## Mechanical Design: Mechanization

•Tell us about how your robot uses attachments or other mechanisms to complete missions.
•Describe how your robot moves from place to place, or overcomes obstacles, and balancesspeed and power.
• What other ideas did you try?

## Programming: Quality

•What program do you feel is your best? Why?
•Do your robot's programs achieve the same result every time? If not, why do you think thismight happen?

## Programming: Efficiency

•What did you do to make your programs more understandable and easier to use?
•What mission is your favorite? Explain the steps in the program for that mission.

## Automation/Navigation

•Would you explain how your robot turns (or travels a specific distance, or goes from base to aspecific destination)? How satisfied are you with this?
•As your robot moves around the field, was there one area that was more difficult to navigatethan another? If so, what did your team do to overcome this challenge?
•Would you explain which sensors you used, and how and why you used them?
•Would you explain how your robot knows where it is on the field? Note: Sensing includes not only touch and rotation sensors, but time (timers in the RCX)and passive sensing such asreferencing to walls or other objects, etc.

## Strategy: Design Process

•What was the greatest design or programming difficulty you encountered? How did you solvethat problem?
•How did you test your designs?
•Describe one way your robot got better over the course of the season.

# Strategy:
## Mission Strategy
•How did your team decide which missions to tackle?
•How many of the missions has this robot completed successfully in a single match (includes atournament match, a tournament practice, or home practice)?
•We want to consider the overall strategy behind your robot's design. Tell us about your robot,its attachments and sensors and the missions the robot attempts so that we will understandyour team's design strategy.
•Which attachments are most difficult to put on and/or take off?

## Innovation
•What part of your design, program or strategy do you think is unique to your team?•How did you come up with the idea?

For team to talk about while running missions for judges
Start mission 1.
While running the mission, discuss attachments used. Discuss strategy for this mission. Why is this mission run first? Mention other ideas tried for this mission. Mention when sensors are being used.

Start Mission 2.
While running the mission...

# Look For:
•Unusual strategy, programming or design.
•Propulsion or steering methods or functional aspects that no one else has or you aresurprised someone would try.
•Robot is able to effectively perform the same task over and over.
•Parts or functional aspects that make something difficult look very easy.
•Parts or mechanisms that perform several functions.
•Propulsion, steering methods or functional aspects that work, but children have nounderstanding how.
•Children can describe what the robot will do based on the program.
•Does the team look to the coach for answers or are they focused on the robot and judges?
•Noteworthy observations about FLL Core Values to share with the judging team.

# Core Values Sample Questions Inspiration:
## Discovery
•What's the most important thing you learned this season?
 •Would you still do FLL even if there were no awards? Why?
 •If an FLL team can't attend an event because there isn't one nearby, is FLL still worth doing? Why?
•Do any of your team members mentor others? If so explain.
 •What was the most surprising thing you learned this season?
•Which aspect of FLL did your team like best? Least?

•How did your team decide which aspect of FLL to do first?
•Describeany struggles your team had making sure they addressed all 3 aspects (Project, Robot, Core Values) of FLL.

## Inspiration: Team Spirit

•How would you describe your team?
•How did your team decide its name?
•What's the most important thing we should know about your team?
•What does your team do when it is having a bad day?
•How does your team share with others your excitement and enthusiasm?
•Do you participate on any other teams (i.e., sports, debating, chess club, drama club) and, if so, is there anything different about your FLL team experience?

## Inspiration: Integration

•Tell us what you have learned about FLL and how you think it will help you in the future.
•Name one of the FLL Core Values and explain how your team uses it (or could use it) outside of FLL.
•Who can give me an example of a way they used an FLL Core Value this year on their own away from the team?
•Does anyone have an example of someone they know (on the team or off) using FLL Core Values in a way that impressed you?

## Teamwork:  Effectiveness

•What were your team goals this season?
•How did you decide on your team goals?
•Tell me about a problem you had on your team and how it was resolved.
•Tell me about how your group makes decisions together.
•What do you do when your group doesn't agree?
•How does your team solve problems that come up?
•Does your team have a set of rules? If so, what are they, and how are they enforced?

## Teamwork: Efficiency

•How did your team decide what to do each time you met?
•Did your team get everything done this season that you set out to do?
•How does your team manage its time?
•If we gave your team one more week to work together, how would you use it?
•Tell us about the roles each of you had on the team and how this worked.
•How did you decide who would do each role?
•What happens if a team member is not getting his/her job done?
•Can someone else do your job? What happens when someone is sick?
•Do you have team leaders? If so, explain how that works.

## Teamwork: Kids Do The Work

•What's the most important thing you learned from your coach?
•What does your team do when it gets stuck?
•Describe a situation when your coach helped you. What did he/she do?
•What makes a good coach?
•What kinds of things does a coach need to know?
•What would your team do if it didn't have a coach?

•How did your coach help the team be successful?

# Gracious Professionalism:Inclusion

•How does your team get its ideas?
•How does your team decide which ideas they will pursue?
•Tell me about one thing each of you contributed to the team.
•What doyou do when you don't like someone else's idea?

# Gracious Professionalism:Respect

•What does Gracious Professionalism mean to you?
•How do you show Gracious Professionalism when you relate to your team? To your coach? To others?
•How do you make someone feel valued when you talk to them?

# Gracious Professionalism:Coopertition

•What example of Gracious Professionalism have you seen another team do today?
•If you saw something happening to another team and thought it wasn't fair, what would you do and why?
•Explain how Gracious Professionalism is like good sportsmanship. And how is it different?
•Can you give an example of Gracious Professionalism that your team displayed this season?
•Competitions can sometimes be stressful. How does your team prepare eachother or maybe other teams to get ready for a big event?

# Look for:

•Confidence and enthusiasm of team members.
•Concrete descriptions and examples.
•Are team members listening to each other and to the judges? Are they interrupting each other or waiting their turn?
•Are team members looking at the judges when they speak or at team members when they are talking?
•Is everyone answering questions or just a few?
•Do they encourage each other to participate?
•Does the team look to the coach for direction?


# Project Sample QuestionsResearch:
## Problem Identification

•How did your team decide which problem to study?
•Describe the problem your team selected in three sentences or less.
•What are the most important things to understand about the problem that you studied?

# Research: Sources of Information

•What resources did you use to research your problem and why did you choose these?•Did you use any unusual methods to research your topic? If so what and why?
•Did you speak to anyone whose work relates to the Challenge area? What did you learn fromthem?
•What was the most helpful resource that your team used? Why?
•If you had to start your research over, which resource would you use first? Why?

# Research: Problem Analysis

•How did your team organize and use its research?
•After working on this project, what is the most important thing that your team learned?
•Can you tell us about a problem you discovered or something that you learned that surprisedyou while completing this project?

# Research: Review Existing Solutions

•Are you awareof anyone else who has studied the problem you chose?
•How have other people tried to solve the problem you identified?
•Did the information you found offer different ideas than what you expected to find? If so,what and how did your team use this information?

# Innovative Solution: Team Solution

•Describe the solution your team identified in three sentences or less.
•What are the most important things to understand about the solution that you developed?
•How did you arrive at your solution and why?
•Were there other solutions that you thought of that you decided not to use? Why?

# Innovative Solution: Innovation

•What makes your solution different from what is being used to solve this problem now, andwhy do you think it is better?

# Innovative Soultion: Implementation

•If someone tried to use your solution today, would it be possible?
•What kinds of things would be important to think about if you tried to use your solution rightnow?
•What resources would you need to develop your solution?
•Do you think your solution wouldbe easier or less costly than other solutions you consideredor are used by others?

# Presentation: Effectiveness

•How many/what different presentation styles did your team consider?
•Why did you choose the presentation style that you chose? How does this style help youraudience understand what you are telling them?
•When you have given your presentation to others, what types of questions have they asked?
•Describe how you chose what information to include in your presentation.
•Why did you choose to organize your presentation the way you did?

# Presentation: Creativity

•How did you decide on this presentation style that you used?
•What do you think was the most creative aspect of your presentation or project and why?
•How is the way your team chose to present your Project special or unique?

# Presentation: Sharing

•One aspect of the project asked you to share your ideas with others. How did your team do this?
•With whom did you share your project? Why did you choose them?
•How did you share the information? Did you present it in the same manner as you presented to us,or did you choose a different approach? Why?
•What impact did your presentation have on them?

•What changes have you or others made as a result of your research and presentation?

# Look for:

•Documentation of resources used.
•Depth of the information provided.
•All students participated in the research process, or understand the process and results of the team'sresearch.
•Supporting printed materials provided to judges.
•Entire team participating in discussion.
•How the team interacts with each other.
•Do they all talk, or only a few? If so, why?
•Does the team look to the coach often or are they focused on the presentation and judges.
•Noteworthy observations about FLL Core Values to share with the judging team