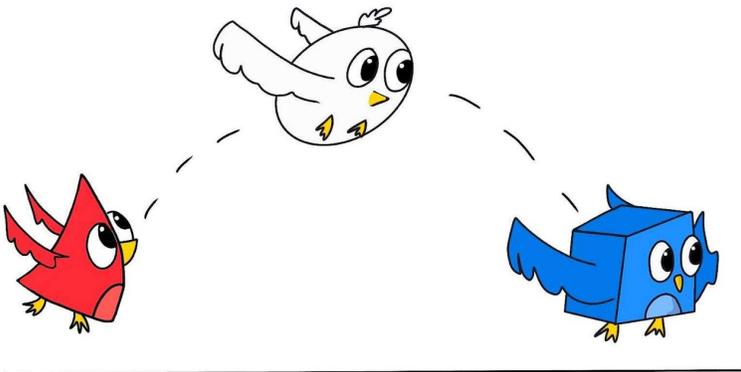


FLL FLIGHT MANUAL



Brought to you by the Buchanan Bird Brains
Team 1671

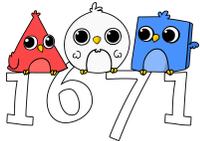


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Takeoff- Project Explained

In a project judging room, it is equipped with a table for the judges and occasionally a desk for the FLL team's presentation, it's best to plan for an empty presentation room.

When you enter the room, a panel of judges will be sitting awaiting your performance and response to their in depth questions regarding your team's selected project. Your team will have 5 minutes to present your project to the judges. Be sure to include why you chose that problem and the details on your innovative solution such as how you came up with it, how it is different from current solutions. Following your presentation the judges will get 5 minutes to ask members of your team about aspects of your project that you may have forgotten to cover or that the judges are curious about.

Make sure each team member is involved in the development of your project. The judges may ask questions directly to team mates that they suspect aren't very knowledgeable about the team's project.



Where to start?

Each year FIRST announces a theme for the year. Each FLL team researches modern problems that relate to the FIRST theme. The team brainstorms a solution to their problem and presents their innovative solution in front of a panel of judges at competition.

The first step in coming up with a great project is to research FIRST's theme for the current school year. Look at different problems regarding different problems and try to select ones that haven't been looked into much. The last thing you want to do is go into the judging room with an invention that has already been invented.

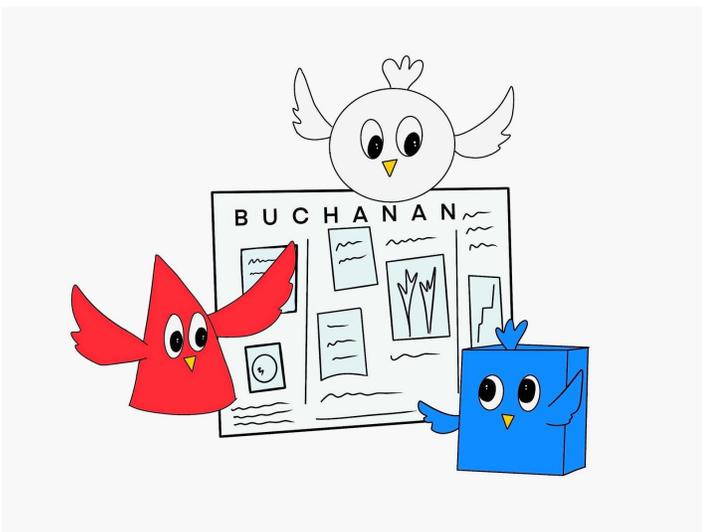
After deciding on a problem, your team will brainstorm ideas on ways to fix or improve the problem at hand. Have every student share ideas no matter how silly they may sound. Build off a combination of all member's ideas and come up with a basic plan for the invention or solution.

Consider reaching out to friends or family members that may have expertise in the field of study your team is interested in. Reach out to local organizations and build connections to make your project stronger.



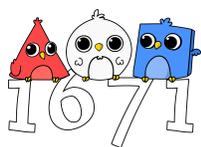
Once you have decided on a project, you need to decide how to present it. Your team has a lot of freedom with how to present. Choose what would suit your team best. You want to highlight your team's dynamic to the judges. You could present several ways: a playful skit, powerpoint, video, poster board, or anything else the members of your team would have the most fun with.

Practice your skit several times and make sure all members are knowledgeable about the project and ready to answer any questions the judges may throw.



Tips and Advice for Takeoff

- Be prepared for questions
- Make sure everyone is involved and passionate about your topic
- Reach out to local professionals that are knowledgeable in the chosen topic
- Be bold, be proud, if you don't believe that your solution/ invention is awesome, the judges won't either
- Be creative, don't be afraid to think out of the box
- Don't read off your project board (if available)
- Show improvement if you move on to the next round
- Don't feel rushed! Just relax
- Visit local businesses involved in your project
- Use props in your skit
- Dress up and act the part!
- Let everyone have a turn speaking
- Don't speak over each other
- Become a team that is easily remembered
- SHARE your ideas with friends, family, and local organizations
- Show how you have taken action and made progress
- Don't clutter your project board
- Remember that the time starts the minute you enter the room
- Listen to the person speaking (your team or judges)
- Introduce yourselves
- Take advice the judges make in the room and on the rubric
- PRACTICE MAKE PERFECT



Flight- Robot Design Explained

What is Robot Design?

In robot design, you will enter a room with a competition table and all of the missions set up. There will be one or two judges inside the room, awaiting your performance. They will question you about your robot, coding, and attachments.

They will have you run some missions that your robot can perform. It is up to you which ones you choose and who you choose on your team to run them.

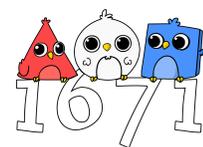
The judges will ask you why you designed the robot the way you did and what are the benefits and disadvantages you have to work with or around because of the way you designed it.

Try to be prepared for any questions they might throw at you, that has to do with the current gameplay strategy and the order in which you run your missions.

Make sure that all your teammates have equal knowledge on all your robot topics so that everyone can answer any question thrown at them.

For the topics, they will be scoring you and for practice for scoring yourself, open the link below the Robot Design rubric:

<https://firstinspiresst01.blob.core.windows.net/fll/2020/first-lego-league-rubrics.pdf>



Coding in a Nutshell

Basic Motion Blocks

- Base driving
- Motor turning
- Motor twisting
- Tank driving

Sensor Blocks

- Infrared sensor
- Touch sensors
- Timer
- Color Sensor

Flow Control Blocks

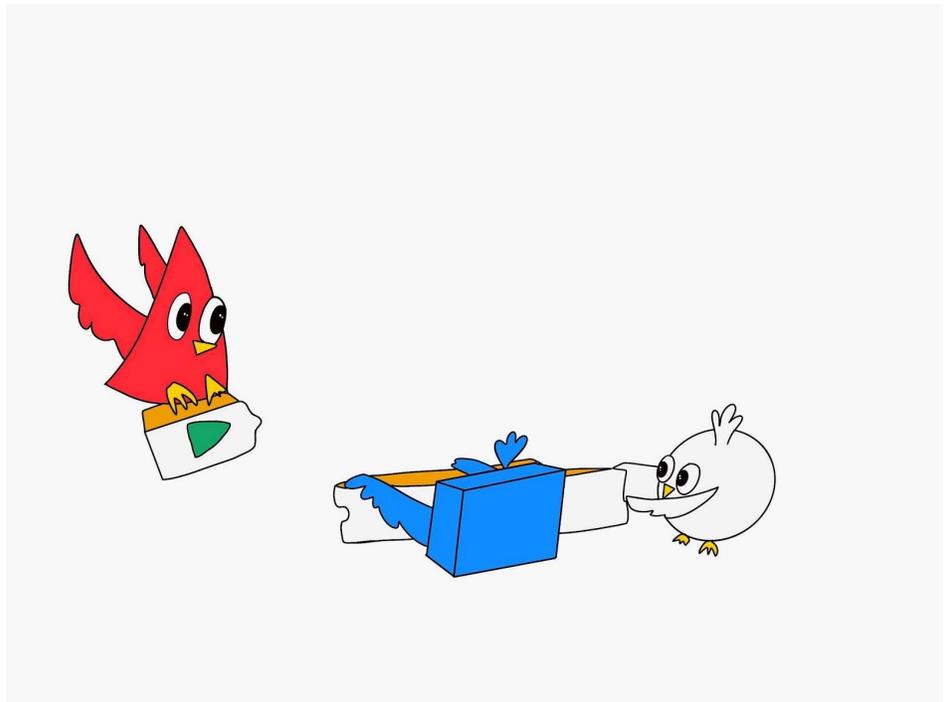
- Loop
- Loop interrupt
- Wait
- Start
- Switch

Data/Advanced Blocks

- Math equation solver
- Randomizer
- Text
- Bluetooth
- Email/Text
- Motor reverse
- Recycle

Coding Help

- By typing a negative integer into any of the motor control blocks the motor will reverse and go in the opposite direction.
- There is a function in the brick that will count as a ruler as you rotate the wheels.
- Use the swivel because you are only allowed 4 motors (2 for wheels, 2 for other function)
- Turn on the bricks Bluetooth for easy program updates
- Only touch the robot out of the home square when absolutely necessary because just because it doesn't hit the mission doesn't mean it won't make it back to base.
- Make sure that the battery is charged to the best it can be based on the situation. If the battery power is low the missions won't be as consistent and could mess up the run.
- Make sure your robot has a center of gravity in the middle, so it won't tip over as easily.



Flight Tips and Advice

- Switch off people running the robot in front of the judges
- Print out programming and set it up in a nice binder to show the judges
- Run most successful programs and most successful (judges don't mind if the program doesn't work)
- If the program doesn't work don't be disappointed, try again
- Show off your attachments
- Name your robot and programs (be creative)
- Create a base of legos for easier robot line up
- Be energetic when the robot completes a mission successfully
- Sensors aren't mandatory, but try to use them to your best of your ability
- You don't need an extremely fancy robot to be successful
- If having issues with the robot line up, try to switch up person running
- **DON'T LEAN ON THE TABLE!!!**
- Make sure everyone knows how to line up and run every mission on the robot
- It is okay to mention the project in this room, especially if it correlates to a certain mission on the table
- During the actual game feel free to argue for points (nicely, like a debate)
- Use loops for repetitive motion
- Check the field before you run in the room or in the actual game because they might not always reset correctly
- Learn the names of the mission on the board
- Know your total point count (GET THE FLL APP TO THE CORRESPONDING YEAR)
- Explain why you picked these certain missions



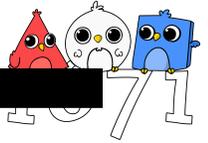
Landing- Core Values Explained

A Core Value is a display of cooperation and gracious professionalism, but what does that really mean? Coopertition and gracious professionalism is the whole idea of having a good time and succeeding while also being able to be friendly with your other competitors. In FIRST it is expected that you use your Core Values and reflect Gracious Professionalism and coopertition in them.

Now that's what a Core value is, but did you know that there are 6 different Core Values?

- Discovery: *We explore new skills and ideas.*
- Innovation: *We use creativity and persistence to solve problems.*
- Impact: *We apply what we learn to improve our world.*
- Inclusion: *We respect each other and embrace our differences.*
- Teamwork: *We are stronger when we work together*
- Fun: *We enjoy and celebrate what we do!*



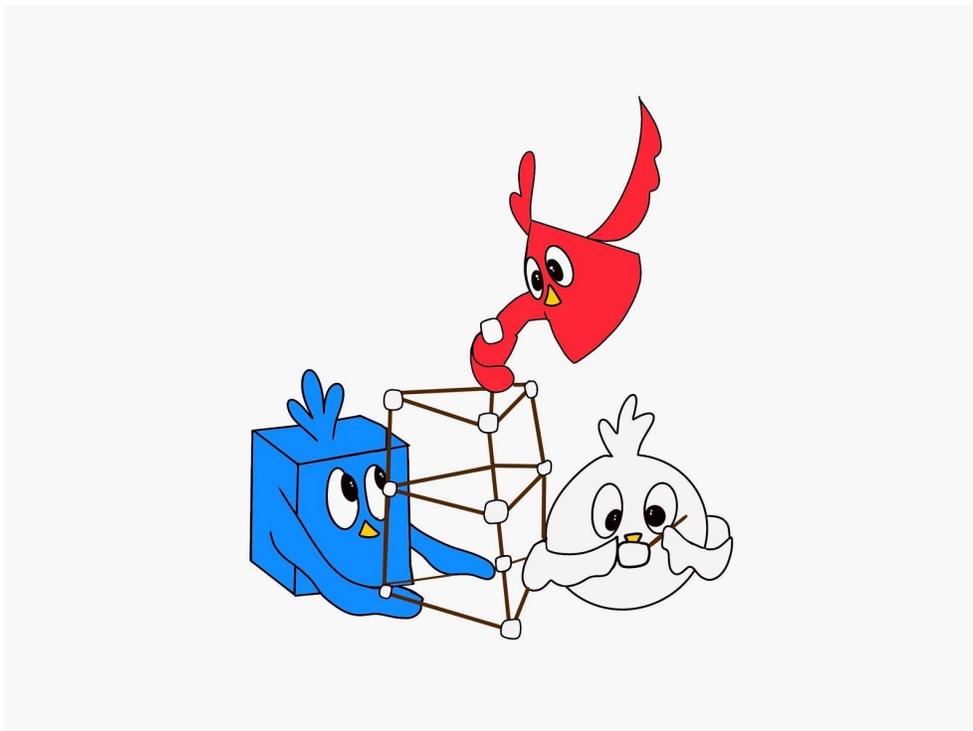


Why should we use our Core Values?

Our Core Values show signs of character and are a way to show that you are ready to work and have a good time, but Core Values aren't only for FIRST! You can use them in daily life

Core Values in daily life.

- ❑ By using your Core Values you can be seen as a person with good character, a hard worker, and can be seen as fun too!
- ❑ By using your Core Values it will not only improve others' view of you, but even your own view of you. It can boost your self confidence and allow you to live a more healthy life emotionally.
- ❑ With these Core Values you always have an extra tool to solve problems!



Core Values Games

Now at first the idea of judging Core Values seems a little silly, but ends up playing a crucial role in the competition.

You and your team will go into a room where you will be presented with a challenge. These challenges are to show that you and your team can properly work together without fighting or ignoring your other team members. Now you won't know what the challenge is, but here are some examples of games you can try!

- ❑ Human knot: It's easy, All you need is a group of people! Everyone just stand in a circle and interlock hands and try to untangle yourselves while holding hands.

- ❑ Marshmallow bridge: All you need is a pack of marshmallows, toothpicks, and a slightly heavy object. You and your team have to build a bridge that can support the weight of the object



Tips and Advice

- **Have a plan before going into the room.**
 - ❑ **Create a Facilitator: A person who delegates everyone's ideas and feelings**
 - ❑ **Prepare! Prepare! Prepare! Make sure you are ready for any questions about your team they may ask.**
 - ❑ **This should be an easy one, but KNOW YOUR TEAMMATES. It sounds silly, but some teams barely even interact with each other!**
 - ❑ **Plan events with your team to better get to know them**
 - ❑ **Make sure while doing these all you HAVE FUN**
 - ❑ **Listen to everyone's ideas**
 - ❑ **Don't be afraid to explain your project if you have extra time**
 - ❑ **Create a team chant**
 - ❑ **Have everyone on the team memorize their own core values, that way the work is more spread out and everyone is included**
 - ❑ **Remember that the judges are observing you even when you are not in the room**