

- **How to Run a Virtual FTC Team**
- **Question and Answers from FTC Coaches**

Virtual Tools: What virtual learning tools/resources exist?

- Virtual Platforms
- Zoom – <https://zoom.us/> - free but limited
- Slack – <https://slack.com/> - to track sub-teams, calendar reminders (free version is limited)
- Discord – <https://discord.com/> - free, can create own private server, can create text channels to leave messages and multiple chat channels
- Google Meets - <https://meet.google.com/> - free but limited, no breakout rooms
- Teleconference.com – <https://www.freeconferencecall.com/> - free, best free platform
- Team project managing resources
- Trello – <https://trello.com/> -
- Monday.com – <https://monday.com/> - not free
- Google Drive - not project management but great for sharing documents
- Asana.com - <https://asana.com/> - not free
- Microsoft Planner - <https://tasks.office.com/> - comes with Microsoft

Engaging Team Members: How do you make sure students are engaged, motivated and attending?
How do you still create a sense of team?

- Fun Fridays - Connect with teams by playing online games –
- Jackbox.tv – <https://shop.jackboxgames.com/> - inexpensive
- Codenames – <https://codenames.cards/> - great for teamwork and tons of fun
- Scattegories – free - <https://swellgarfo.com/scattergories/>
- Kahoot (makeup trivia questions) - free - <https://kahoot.com/>
- Family Feud - free - <https://zone.msn.com/en/familyfeud/default.htm>
- Show and Tell with the team (share pets, what they are working on, cool stuff)
- Watch Parties – Watch last year’s season matches with team, not just your matches but others and critique matches.
- Orange Alliance - <https://theorangealliance.org/home> - watch FTC matches from all over
- Have team Leaders run meetings with coach supervision – give them more responsibility and to get quiet team members involved.
- Fun FTC Simulator Game -
- Gluten Free FTC team 11115 made XRCSimulator - <https://xrcsimulator.org/downloads/>

Robot Game - Building: How can the students build the robot while social distancing or with virtual-only meetings?

- Getting started in FTC website - <https://gm0.copperforge.cc/en/stable/docs/getting-started-in-ftc/index.html>
- Rotate equipment between team members
- Divide up the robot into subsystems
- Design subsystems in CAD
- FreeCAD - <https://www.freecadweb.org/>
- OnShape – <https://www.onshape.com/education-plan> - free CAD program and multiple kids can work on at the same time – Great Tutorials that are free - <https://www.onshape.com/videos/topic/tutorials>

- Fusion 360 – free for FIRST Teams and multiple kids can work on at the same time - <https://www.autodesk.com/education/competitions-and-events/first/recommended-software>
- Solidworks - https://files.solidworks.com/pdf/EDU_FIRST_Flyer.pdf - possible sponsor
- Share files with GrabCAD - <https://grabcad.com/>
- Rotate robot between team members but take copious notes in Engineering Notebook
- Before rotating subsystems or robot, make sure you have rules in place on what to tear apart or rebuild. Make sure you ask before major changes.
- After Kickoff, watch the video again together and brainstorm ideas together use:
 - Google Jam Board
- Invite a few team members to work together on robot while wearing masks and being safe.

Robot Game – Programming: How can the students learn to program this year? How do we get everyone involved in programming if you have only 1 robot and virtual-only team meetings? How do you share code? How do you do iterative testing?

- Robot at one person's house (or other meeting spots/school classroom if allowed and available) with a field, programmers send program and they test
- Use GitHub to share programs - <https://github.com/>
- Reach out to other FTC teams and FRC teams to ask for help
- FTC Team Beta 8397 has a simulator that runs your code on a virtual field - Team Beta simulator - https://github.com/Beta8397/virtual_robot
- Learning to Program Java and/or Blocks
- Java Tutorial Part 1 Video - <https://www.youtube.com/watch?v=TKPscPqsZ8s>
- Stem Robotics - <https://stemrobotics.cs.pdx.edu/node/4196>
- SoloLearn – a great place to learn how to code - <https://www.sololearn.com/>
- Online Blocks Programming Help
 - <https://ortop.org/ftc/ftc-team-resources/blocksprogramming/>
 - <https://codelabs.developers.google.com/codelabs/blockly-web/index.html#0>
- Debugging/developing FTC code <https://github.com/acmerobotics/ftc-dashboard>

Practice Driving: How can the drive team practice driving if they can't meet together?

- Have a virtual strategy session. Talk about the strategy and mental part of driving.
- Don't forget the defense of driving or shortcuts/tips (if in-person meets are happening)
- Gluten Free FTC team made XRCSimulator - <https://xrksimulator.org/downloads/>
- Rotate robot to different team members to practice driving - wait at least 24 hours in-between
- Practice with an RC car might help with teams using tank drive. Can also help with how joystick works
- Play Rocket League – ~\$20 for Xbox, PC - <https://www.rocketleague.com/>
- Any racing or motorsport game
- Build a simple drive train and rotate to team members to practice
- Play loud music and use timers during the drive sessions
- Don't forget Driver Checklists for prepping for match
- Maybe have 1 driver only this year if possible? Have driver-coach work with driver virtually
- Write more auto parts for TeleOp code
- Have the 2 drivers stand as far apart as possible from each other for distancing, wear masks. Use USB extension wires for more distancing.
- Driver coach could be virtual – use laptop next to the driver with the coach on laptop talking to the driver

Game Play: How will gameplay look this year if it is virtual or partially virtual and what about internet issues, some teams may not have internet? **NOTE: This is subject to change**

- Remote FTC Events – Real events on at least a partial field at each team’s location
- Teams would do the entire game without an alliance partner and no defense from opposing alliance.
- Scoring – Teams will run their matches and score them – once you start a match you must finish, no redo’s
- Tie-Breaker Points – #1 Autonomous Points, #2 End Game Points
- Each team has to have an equal opportunity at each level of competition
- Virtual meets will last 1 week – teams will log in to schedule their 6 matches
- Bad internet/no internet – For a full remote event you would just have to access the scoring software online to run the match and post the score. You can use a phone or tablet. You don’t have to have great internet for that, but you will need at least a partial field (borrow one?)

Outreach: How can teams do community outreach or connect with STEM professionals while social distancing?

- Connect with professionals and businesses remotely, do a virtual presentation- also a good way to ask for sponsors.
- Invite FIRST Alumni and/or Professionals to talk virtually to your teams
- Do presentations virtually to:
 - Senior Centers
 - Elks Lodge
 - Society of Women Engineers
 - Rotary Club
 - Boy/Girl Scouts
- Take this as an opportunity for your team to connect virtually with other teams around the world
- Mentor other teams
- Teach webinars
- Connect with teams around the world
- Mentor younger teams: FLL Challenge, Explore, Discover all virtually
 - Watch their presentations – give feedback
 - Help with programming/design/game strategy
 - Become a virtual volunteer for their events
 - Play games to get to know each other – younger kids love interacting with older kids
- Contact Hospitals, VA Hospitals, Senior Centers, Libraries, Food Banks – how can you help them virtually?
- Food Drives
- Make masks
- Make Face Shields
- Donate hand sanitizer
- Play games through the window with patients, senior citizens, veterans
- Make pen pals - contact facility to ask for a pen pal

Fundraising

- When you approach a business make sure they are thriving and not hurting because of COVID
- Make sure large corporations that you contact are not already donating to your region’s program (they don’t like being approached after they are already donating millions of dollars)

- Develop new resources this season, don't just rely on 1 type of fundraising
- Talk to:
 - Lions Club
 - Rotary Club
 - Elks Club
 - Kiwanis Club
 - Dentist
 - Doctors
 - CVS Pharmacy
 - Walmart
- Partner with a local restaurant with takeout food
- Create a GoFundme page - <https://www.gofundme.com/>
- Contact small businesses that might need help with setting up websites possibly for donation or free for outreach
- Make sure to support your sponsors this year so they will come back
- Send thank-you note
- Make masks and/or face shields for a company and then ask for sponsorship
- Large Sponsor – have a cover letter explaining who you are and what they will get from being a sponsor.
- Talk to Casinos for grants
 - Check gaming protocols for your area to see if they have to donate a percentage

Recruiting: What kind of expectations should we set up before people join the team this season since it is going to be different? Also, how is your team fundraising?

- Recruiting
- Schedule a video conference for possible recruits to talk with your team
- Make sure recruits know things are not set and tell them to be flexible