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2021-2022 *FIRST*<sup>®</sup> Tech Challenge

# Coach's Playbook

## Sponsor Thank You

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## Volunteer Thank You

Thank you for taking the time to volunteer for a *FIRST*® Tech Challenge event. *FIRST*® and *FIRST*® Tech Challenge rely heavily on volunteers to ensure events run smoothly and are a fun experience for teams and their families, which could not happen without people like you. With over 6,500 teams competing yearly, your dedication and commitment are essential to the success of each event and the *FIRST* Tech Challenge program. Thank you for your time and effort in supporting the mission of *FIRST*!

Revision History		
Revision	Date	Description
1	07/15/2021	Initial Release

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## Introduction

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### ***What is FIRST® Tech Challenge?***

*FIRST® Tech Challenge* is a student-centered program that focuses on giving students a unique and stimulating experience. Each year, teams engage in a new game where they design, build, test, and program autonomous and driver operated robots that must perform a series of tasks. To learn more about *FIRST® Tech Challenge* and other *FIRST® Programs*, visit [www.firstinspires.org](http://www.firstinspires.org).

### ***Gracious Professionalism®***

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*FIRST®* uses this term to describe our programs' intent.

*Gracious Professionalism®* is a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.

Watch Dr. Woodie Flowers explain *Gracious Professionalism* in this [short video](#).

Learn more about the roles of volunteers on our [Volunteer Resources page](#), "Volunteer Role Descriptions".

## Coach's Playbook Introduction

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### Welcome!

The *Coach's Playbook* has been designed to help you manage your *FIRST* Tech Challenge team throughout an entire season:

- The Playbook is divided into semiweekly game plans.
- It assumes that you will meet 90 minutes, twice a week, for a total of 12 weeks. The average team meets for more hours than this so please use this as an outline of your weekly meeting and add to this, as needed.
- You can adapt these game plans to fit your team's preferred schedule and skill-level, but assumes Kickoff is week one. For League teams, adjust the weeks of robot building to be completed by the first meet of the season
- The Playbook is targeted towards new mentors coaching rookie or second-season teams.
- Please review these documents for remote events:
  - [Game Manual, Part 1](#)
  - [Remote Scoring](#)

## Tasks and Team Roles

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The tasks in the Playbook can be done in parallel by sub-teams or can be done sequentially by the whole team. Here is a list of sub-team options:

### Team Roles

There are many roles that are needed during the season and at a competition. Team members should learn about the different roles and decide who will fill those roles. **A team member can be a part of multiple sub-teams.** These roles are group into sub-teams:

- Strategy Team – studies the game rules to help the team develop a strategy to be more successful during the season. Keeps track of changes to the game rules and make sure that the team's robot and strategy complies with current rules.
- Build Team – helps design, document and implement the mechanisms needed to complete the desired tasks during a match. This may consist of a Drivetrain and a Mechanism sub-team.
- Programming Team – helps write, document and test the computer programs or “op modes” needed to complete the desired tasks during a match. Manage source code to keep track of versions and backup copies.
- Logistics Team – Helps plan the season schedule (when is the first competition, where will it be located, what do we need to bring?). Helps organize and keep track of kit components and tools. Helps order/procure items needed for the season.
- Communication & Marketing Team – Helps document team activity as part of engineering notebook. Keep track of intermediate and long-term goals. Develops material to publicize team to parents, the community and sponsors. Creates team promotional material.
- Fundraising & Business Team – Helps track budgetary goals. Helps identify and approach potential sponsors. Helps develop a plan to raise money and resources for the season. Helps identify and recruit new mentors and team members.

## Pre- and Post-Season Activities

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Here is a list of pre- and post- season activities:

- [Pre-Event Checklist](#)
- [Registration](#)
- Order robot kit – school-based teams should have this budgeted and ready for ordering by May/June.
- [Youth team member registration](#)
- Order team apparel.
- [Fundraising and sponsorship](#) can be a pre- and post- season activity.
- [Outreach](#) to the non-technical community.
- [Outreach](#) to the technical community.
- Find mentors see [Mentor Manual](#) and the [FIRST Mentor Network](#) platform.
- [Connect with other teams for mentors or mentoring.](#)
- Explore CAD software for robot design and prototyping with our [video tutorial series](#), see [OnShape](#), [Solidworks](#), [Fusion 360](#).

## Timeline of the Season

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### Week 1

- Participation rules and safety see [Mentor Manual](#), [Building Robots](#) and [CDC Guidelines](#).
- Team roles, responsibilities and game strategy see [Game Manual](#) and [Game Animation Video](#).
- [Print and complete the Team Roles and Responsibilities chart.](#)
- Schedule [Dean's List](#) nominations for the 15<sup>th</sup> of the month prior to an event.
- [Scholarships](#) open.

### Week 2

- Team robot brainstorming.
- Begin chassis build or prototyping the robot. see [Build Guides](#) and [REV Robotics Guides](#).
- Begin electrical and pairing and configuration of robot see [Robot Wiring Guide](#), [Blocks Tutorial](#).
- Developing team [business plan](#) (if needed) and [marketing materials](#).

### Week 3

- Continue to build robot (chassis).
- Begin developing manipulator prototypes, see [Basic Bot Guide, Part 2](#)
- Follow-up with potential sponsors.
- Develop presentation for [judged awards](#) at events.
- [Youth team member registration completed.](#)

#### **Week 4**

- Try to have a robot moving in teleoperated mode and driving.
- Development of manipulators
  - Programmers should meet with build team to determine capabilities/limitations for programming.
- Determine algorithms needed for game strategy.
- Programming [basic autonomous](#). (Move robot and park)
- Develop event materials for display at events.
- Create team schedule for event participation.

#### **Week 5**

- Integrate manipulators on robot.
- Programming to add code to enable the manipulators.
- Complete [Control Award](#) paperwork (if applicable).
- Experiment and learn about [sensors](#).
- Rehearse presentation for [judged awards](#) at events.
- Review the [Preparing for a Competition](#).

#### **Week 6**

- Improve manipulators.
- Determine how sensors can be used on the robot to help improve performance.
- Review the [Pre-Match Checklist](#).

#### **Week 7**

- Practice using manipulators with game elements.
- Adjust manipulators.
- Continue to improve robot (may require more parts).

#### **Week 8**

- Improve programming.
- Prep and practice for competition.
- Develop a competition checklist.

#### **Week 9**

- Tune-up robot for next competition.
- Schedule outreach activity.

#### **Week 10**

- Competition Season

#### **Week 11**

- Competition Season

#### **Week 12**

- Prep for State/Region Championships (if applicable)
- Develop videos for [Compass and Promote](#) award
- Start fundraising for World Championship (if applicable)



## Appendix A – Resources

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### Game Forum Q&A

<https://ftc-qa.firstinspires.org/>

Anyone may view questions and answers within the *FIRST*® Tech Challenge game Q&A forum without a password. To submit a new question, you must have a unique Q&A system user name and password for your team.

### Volunteer Forum

Volunteers can request access to role specific volunteer forums by emailing [FTCTrainingSupport@firstinspires.org](mailto:FTCTrainingSupport@firstinspires.org). You will receive access to the forum thread specific to your role.

### FIRST Tech Challenge Game Manuals

Part 1 and 2 - <https://www.firstinspires.org/resource-library/ftc/game-and-season-info>

### FIRST Headquarters Pre-Event Support

Phone: 603-666-3906

Mon – Fri

8:30am – 5:00pm

Email: [Firsttechchallenge@firstinspires.org](mailto:Firsttechchallenge@firstinspires.org)

### FIRST Tech Challenge Event On-Call Support

The on call event support number is available for event personnel only. Please **do not** call these numbers if you are a team looking for a ruling, a decision, or assistance. We trust that you will not misuse this resource.

Event On-Call Support: 603-206-2412

### FIRST Websites

FIRST homepage – [www.firstinspires.org](http://www.firstinspires.org)

[FIRST Tech Challenge Page](#) – For everything *FIRST* Tech Challenge.

[FIRST Tech Challenge Volunteer Resources](#) – To access public volunteer manuals.

[FIRST Tech Challenge Event Schedule](#) – Find *FIRST* Tech Challenge events in your area.

### FIRST Tech Challenge Social Media

[FIRST Tech Challenge Twitter Feed](#) - If you are on Twitter, follow the *FIRST* Tech Challenge Twitter feed for news updates.

[FIRST Tech Challenge Facebook page](#) - If you are on Facebook, follow the *FIRST* Tech Challenge page for news updates.

[FIRST Tech Challenge YouTube Channel](#) – Contains training videos, game animations, news clips, and more.

[FIRST Tech Challenge Blog](#) – Weekly articles for the *FIRST* Tech Challenge community, including outstanding volunteer recognition!

[FIRST Tech Challenge Team Email Blasts](#) – contain the most recent *FIRST* Tech Challenge news for teams.

### Feedback

We strive to create support materials that are the best they can be. If you have feedback about this manual, please email [firsttechchallenge@firstinspires.org](mailto:firsttechchallenge@firstinspires.org). Thank you!