

Team Coordinator Guide

Sphero Robotics Competition

Welcome to the **TEAM Alliance Team Coordinator Guide for Sphero Robotics Competition**! This guide is designed to help you confidently lead your team through the competition season.

IN THIS GUIDE:

- Register and Manage Your Team
- Introduce the Sphero Robotics Competition
- Guide Productive Working Sessions
- Register and Prepare for Competitions



Team Coordinator Guide

Sphero Robotics Competition for Blueprint Robotics

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Welcome to Sphero Robotics Competitions

Dear Team Coordinator,
Thanks for leading a team with this year's Sphero Robotics Competition (SRC).

At [TEAM Alliance](#), we believe in a global community (you!) where students have a lifelong sense of confidence and excitement in technology. The SRC game is carefully designed to encourage your students to become better coders, designers, problem solvers, and teammates.

SRC events provide an opportunity for student teams to compete against other students at Prequalifying and Qualifying Events in their region, with the top teams qualifying to participate in a Championship Event.

[SRC is a U19 program](#) so students must be under the age of 19 as of August 31 of the year the season starts.

SRC Event Formats

- **In-Person Events:** Teams, volunteers, and officials are present at the same physical venue to participate in Team vs Team Matches and Tech Trials.
- **Live Remote Events:** Teams participate from separate locations and perform Tech Trials live under the supervision of event volunteers using video conferencing. This format is included in the **In-Person** team registration for teams that cannot attend a physical venue.

SRC Event Types

There are three types of Events that are included in your season registration:

1. **Prequalifying Events:** An early season In-Person Event that does not qualify for a Championship Event (or any other event). Tech Trial scores are posted to the Global Leaderboard, and these scores can be used to fill Championship Events.
2. **Qualifying Events:** An SRC event that qualifies teams for Championship Events by earning performance awards. Tech Trial scores are posted to the Global Ranking.
3. **Championship Events:** An SRC state, regional, or national event that serves as the culminating competition for teams that qualify through designated Qualifying Events. In the U.S., Championship Events are typically state-level, but may include multiple Championship Events within a single state or combining multiple states into a regional Championship Event. Internationally, regional or national Championship Events are used where geographic considerations apply.

Review the *Championship Advancement Criteria* in the [SRC Manual](#) for more information on how to qualify for a SRC Championship Event.

As a Team Coordinator, you do not need to be a programmer or a teacher to support students through the event. Instead, you'll act as a facilitator as the [Student-Powered™](#) teams work to explore, solve problems, and tap into their creativity. This Team Coordinator Guide gives you the tools and structure to support your students in preparing for SRC.

How to use this Guide

This Team Coordinator Guide is designed to help you lead your SRC team from your first meeting through competition day. You don't need to use every session in order—use the *Season Checklist* to stay on track, reference the *Team and Competition Tips* as questions come up, and choose the meeting resources that best match your team's experience and needs. Whether your students are new to robotics or returning competitors, this Guide provides practical tips, activities, and resources to help you keep students engaged, organized, and ready to compete.

1. [Season Checklist](#) - Print out the Season Checklist and it becomes a great resource so nothing is dropped.
2. [Team and Competition Tips](#) - The Team Roles and Competition Resources sections give you best practices on how to coordinate the student roles, get the equipment you need, lay out the field, and what to expect while competing this season.
3. [Your First Robot Meetings](#) - Remove the guesswork and follow the plans laid out in this Guide.
 - a. *Intro Sessions* - Fun ways to introduce the season's game and get introduced to the BPR robot.
 - b. *Learning Sessions* - Based on the Intro Sessions, pick the Learning Sessions that your team needs. This is an opportunity to skip around if you have experienced students!
 - c. *Competition Sessions* - Tips on how to coordinate your team work sessions to prepare for competitions.
4. [Competition](#) - The team made it this far, time to compete!



SRC In-Person Season Checklist

Use the following checklists to stay on top of the competition requirements and timeline for In-Person and Live Remote Events.

Registering for the Sphero Robotics Competitions

- ☐ Log into your account on myTEAMevents.org. If this is your first time as a Team Coordinator, you may need to [create an account](#) and add your organization.
- ☐ [Register](#) and [pay](#) for your team(s).
- ☐ [Register](#) for an In-Person or Live Remote SRC Prequalifying and Qualifying Event.

Preparing for the Sphero Robotic Competitions

- ☐ Review the [SRC Manual](#) and [SRC Game Video](#) with the students.
- ☐ Identify and recruit students to form a team. The recommended team size is five to ten students. Once students for each team are selected, add them to the [Student Roster](#) and send the required digital TEAM Alliance Participation Waivers to their parent/guardian.
- ☐ Gather your robots. The team needs two Sphero BPR robots to compete.
- ☐ Review the TEAM Alliance [SRC Grants page](#) to see if there are any grants that may assist with providing competition equipment. **For the 26-27 SRC season, there is a SRC Matching Team Grant.**
- ☐ Teams that would like to practice using the official field and game elements should acquire a SRC Competition field - [SRC Field Tiles & Perimeter \(reused each year\) and current Field and Game Elements](#). The Event Host will provide this equipment at events, so this is optional, but many teams prefer to practice using the official field.
- ☐ Designate 1 - 2 coding devices. Blueprint Studio is run in a web browser, so it is not required to download an application.
- ☐ Bookmark [Blueprint Studio](#) on the coding devices. If you need to run Blueprint studio offline, click the install icon (often a small monitor with a down arrow or plus sign on the right side of the URL address bar).
- ☐ Identify a room that students can use for team meetings and to set up the SRC Competition Field.
- ☐ Keep an eye out for an email about our Team Coordinator webinar that will take place in the fall.

Competing in an In-Person Event

- ☐ Review an [overview of a typical competition day](#) to become familiar with the SRC event activities.
- ☐ Assign [team roles](#) or make a plan for switching roles periodically during the Event.
- ☐ Determine who will be part of the [Match Crew](#) for Team vs Team Matches and Tech Trials.

- ☐ Identify one or more team members to ensure your team arrives at Matches and Tech Trials on time. These students take the role of [Competition Managers](#) on the team. Event Hosts will provide a schedule the morning of the event.
- ☐ Use the meeting agendas in this Team Coordinator Guide to develop student coding and engineering skills.
- ☐ Develop and refine solutions for the Team vs Team Matches and Tech Trials.
- ☐ Prepare materials to bring to the event (robots, coding device(s), spare parts, chargers, etc.).
- ☐ Review the SRC Inspection Sheet to ensure your robots are compliant with the SRC Manual.
- ☐ Create a team chant, cheer, and/or t-shirt for your team.

Competing in a SRC Championship Event

- ☐ Review the *Championship Advancement Criteria* in the [SRC Manual](#) for more information on how to qualify for a SRC Championship Event.
- ☐ [Register](#) for the SRC Championship Event for your region **once you receive notification that your team has qualified.**
- ☐ Continue to iterate with the robot design and code in preparation for the Championship Event.
- ☐ Book travel arrangements and get school approval for travel, if required.
- ☐ Plan a team event to celebrate your results and success!

Tips for In-Person Competitions

SRC competitions are all about bringing teams together for an exciting, collaborative in-person experience. At events, your team will put their engineering, coding, strategy, and teamwork to the test through Team vs Team Matches and Tech Trials. In-person events also give students the opportunity to meet other teams, see different approaches to the game, and learn from the competition experience. To find SRC competitions, visit myTEAMevents.org. Interested in bringing an SRC event to your community? You can also inquire about becoming an Event Host.

Before your competition, the Event Host will communicate directly with registered teams and provide the information you need to prepare for event day. Be sure to review the event page on myTEAMevents.org and watch for Event Host communications with important details such as the schedule, arrival and check-in information, venue instructions, and other event-specific updates.

Consider the following when supporting your team with preparing for an In-Person Competition

1. **Practice the Competition Conditions** — Give students opportunities to practice both Team vs Team Matches and Tech Trials under realistic event conditions. Students should be familiar with the timing, procedures, team roles, and transitions they'll encounter during competition.
2. **Prioritize Reliability** — A solution that works consistently can be more valuable than an ambitious one that only works occasionally. Encourage students to test, iterate, and identify strategies they can execute reliably when it counts.
3. **Let Students Take the Lead** — Encourage students to troubleshoot, make decisions, and understand their programs and strategies so they can confidently work together at the event. Students should understand their robots, code, and overall strategy—not just the piece they worked on most. Clear roles are helpful, but the team should be prepared to communicate, problem-solve, and support one another throughout the event.
4. **Develop a Match Strategy** — Encourage students to think beyond robot performance and consider how they will approach different match situations. Discuss team roles, communication, decision-making, and how their two robots can work together effectively.
5. **Practice Adapting** — Competition won't always go according to plan. Give students opportunities to troubleshoot quickly, adjust their strategy, and make decisions when a robot behaves unexpectedly or a match develops differently than anticipated.
6. **Learn From the Competition** — Encourage students to watch other matches, connect with other teams, notice different engineering and strategic approaches, and demonstrate good sportsmanship. Competition day is an opportunity to test their work, learn from others, and come away with ideas for what they would improve next.



TEAM COORDINATOR TIP:

Competition Day is about **much more than your team's final ranking!** Encourage students to take in the full experience by connecting with other teams, demonstrating good sportsmanship, watching other matches, and seeing the different engineering and strategic approaches teams bring to the competition. Every team will approach Team vs Team Matches and Tech Trials differently, and there's a lot to learn from seeing those strategies in action. Help your students arrive ready to complete, adapt, learn from others, be proud of what they've accomplished, and most importantly—**have fun!**

Team Roles

We recommend teams of **five to ten students** so everyone has opportunities to participate, contribute, and build teamwork skills. Teams may include more than ten students; however, awards are provided based on the recommended maximum of ten students per team, so additional awards may not be available.

Team roles are a great way to help every student find ways to contribute! It's common for SRC students to take on more than one role based on their interests and strengths. Roles can also change throughout the season as students try new things, build new skills, and discover where they can best support their team. Suggested roles could include, but are not limited to the following:



Programmers

Programmers are responsible for developing the code that brings the team's robots to life. They work with their teammates to program, test, and improve robot performance for both Team vs Team Matches and Tech Trials. Programmers should understand how their code works and be ready to make adjustments as the team tests new strategies and designs.



Engineers

Engineers focus on the mechanical design, construction, and performance of the team's robots. They build and modify the robots, test mechanisms, and work closely with programmers to make sure the hardware and code work together. Engineers should also be familiar with the Competition Rules so robot designs remain competition-ready.



Debuggers

Debuggers are the team's troubleshooters. When something doesn't work as expected, they systematically help determine why. They test possible solutions, isolate problems, and work with programmers and engineers to resolve issues with code, mechanisms, sensors, or overall robot performance.



Designers

Designers help turn ideas into practical robot solutions. They consider how components should be arranged, how mechanisms can accomplish a specific task, and how the overall robot design can support the team's strategy. Designers collaborate closely with engineers, programmers, and CAD Designers as the team develops and improves its robots throughout the season.

Competition Managers



A Competition Manager helps the team turn its ideas into a plan for competition. They lead game strategy discussions, analyze scoring opportunities, and help the team prioritize robot designs, features, and code based on where the team wants to focus its efforts. They should be very familiar with the Competition Rules and help the team prepare strategies for both Team vs Team Matches and Tech Trials.

Competition Managers also help keep the team organized and ready. They track progress and important deadlines, help prepare equipment, tools, and spare parts for events, and make sure batteries are charged and robots are ready to compete. At an event, they keep track of the schedule and help make sure the team gets to each Match and Tech Trial on time.

CAD Designers & 3D Printing Specialists



CAD Designers and 3D Printing Specialists turn ideas into custom parts for the team's robots. They use 3D modeling software to design, prototype, print, test, and improve components that support the team's strategy. With unlimited 3D printing allowed in SRC, this role gives students plenty of opportunities to experiment, iterate, and develop creative engineering solutions.

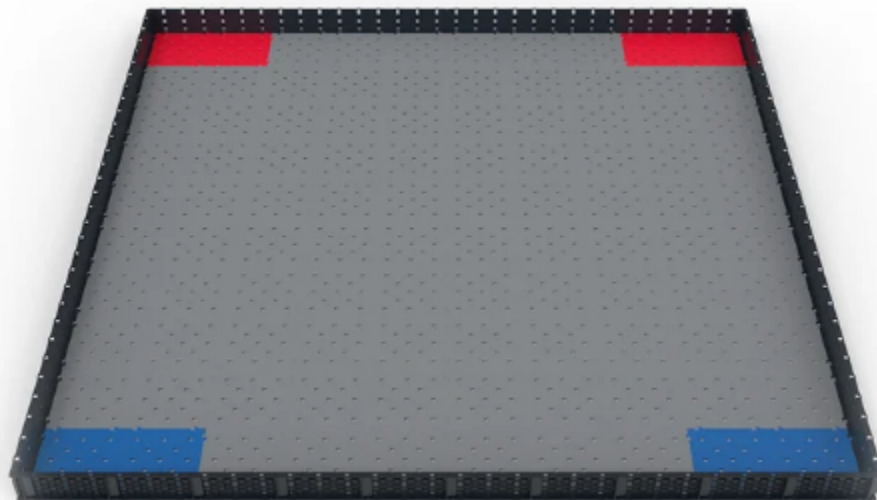
Match Crew



Match Crew members are the students in the action on competition day! They work together during Team vs Team Matches and Tech Trials to put the team's robots and strategies to the test. Depending on the competition activity, Match Crew members may drive robots, load scoring objects, keep track of the score, watch the action for opportunities, or share strategy advice with the robot drivers. With up to six students on the Match Crew, practice together and decide how everyone can contribute so the team can communicate, make quick decisions, and adapt as the action unfolds.

SRC Competition Field

The SRC Competition Field is made up of 100 square tiles (each 300mm x 300mm), giving a total playing surface of approximately 3m x 3m. Each season there are additional competition specific “Field and Game Elements” used to play that year’s game. Review [this year’s equipment](#) for more details.



In-Person Events and Live Remote Events must use the official SRC Field Tiles & Perimeter and the current SRC Field & Game Elements for the SRC Competition Field. **Event Hosts** will supply the SRC Competition Fields at In-Person Events.

Competition Materials

In order to participate in an SRC Competition, you will need the following items:

Required Materials for Competition

- Two (2) [Sphero Robotics Competition BPR robots](#) (or [Classroom BPR robots](#))
- Access to [Blueprint Studio](#) and coding devices

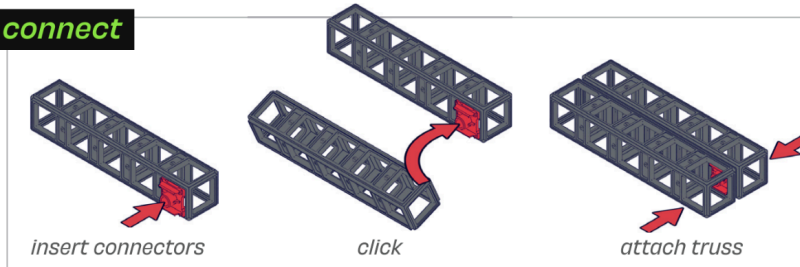
Recommended Materials for Competition

- [SRC Field Tiles & Perimeter](#)
- [Season Specific SRC Field & Game Elements](#)
- A 3 x 3 meter hard, flat surface for a SRC Competition Field
- Spare parts, motors and extra batteries

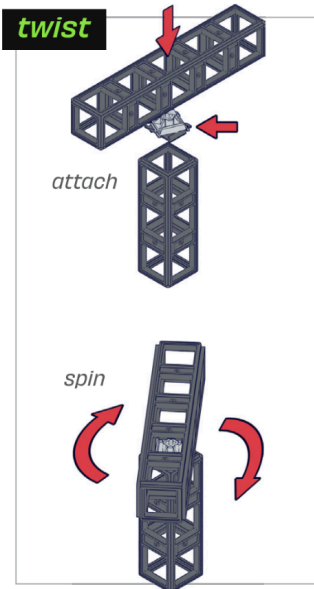
Blueprint Key Building Practices

Blueprint was designed to make building complex structures and mechanical systems intuitive. The best way to learn is to take it out and play!

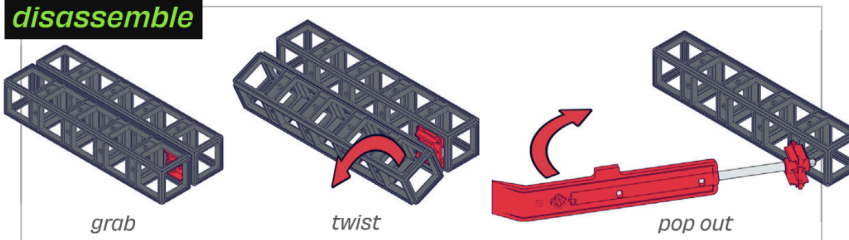
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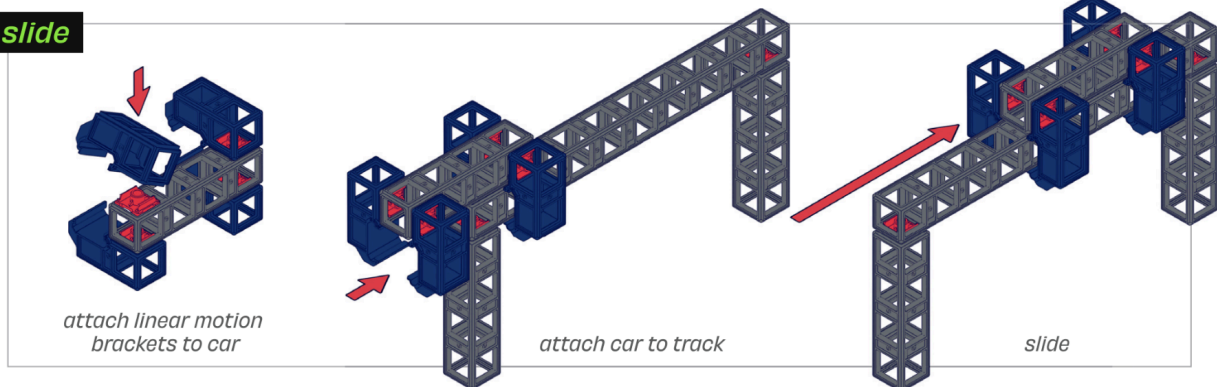
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disassemble



slide



Meeting Agendas

The meeting agendas in this Team Coordinator Guide will help familiarize your students with Blueprint Robotics (BPR) building and coding, and prepare your students for tackling the SRC game.

There are three types of agendas in this coordinator guide:

- In **Intro Sessions**, students get comfortable with BPR.
- In **Learning Sessions**, students are introduced to key building, design and coding concepts that will help them tackle the Sphero Robotics Competition.
- In **Competition Sessions**, students are given dedicated time to apply what they have learned to prepare for their Sphero Robotics Competition.

<i>Intro Sessions</i>	<i>Learning Sessions</i>	<i>Competition Sessions</i>
Agenda 1: Welcome to Sphero Robotics Competitions Agenda 2: Intro to the Engineering Design Process Agenda 3: Intro to Rapid Robots	Agenda 4: Getting Started with Blueprint Studio Agenda 5: Motor Mechanics Agenda 6: Gears for Lifting Agenda 7: Introducing Chains & Sprockets Agenda 8: Intake Mechanisms Agenda 9: Sensors	Agenda 10: Design from the Game Agenda 11: Making Decisions Agenda 12: Example Competition Sessions

Learning Sessions

Every team starts with different skills and knowledge bases. Pick and choose from the meeting agendas to meet the needs and timeline for your team. If your team is new to the Sphero Robotics Competitions and BPR, you might choose to complete every agenda. However, you do not need to complete them all or in a specific order. Review the full collection of [BPR lessons in Sphero Central](#) to customize your agendas with the lessons interest your students the most.

Competition Sessions

Competition Sessions give students dedicated time to apply what they have learned and prepare for the competition. Unlike Intro and Learning Sessions, these meetings can be more flexible and should be Student-Powered, with Team Coordinators serving as facilitators rather than leading a structured lesson. These agenda's can be provided to students on the team so they can lead the meetings. Encourage students to set goals for each session and divide their time among coding and testing their robot, and practicing under competition-like conditions. Build in plenty of opportunities for students to test their ideas, identify what is and isn't working, make adjustments, and try again.

Welcome to the Sphero Robotics Competitions

Meeting Agenda #1

SESSION TYPE: INTRO SESSION

TIME REQUIRED: 45-60 minutes

REQUIRED MATERIALS: • BPR Swerve Drive robot & controller • Let's Drive Lesson Materials	LEARNING OBJECTIVES: Students will be able to: • Learn more about the current SRC Game • Charge their robot and pair their controller • Learn about field- and robot-centric drive modes
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WARM - UP

1. Introduce the Sphero Robotics Competition for the current season.
 - Watch the [SRC Game Reveal Video](#) for the current season to generate excitement.
 - Explain that this activity will get them started with learning how to drive their BPR Swerve Drive robot.
2. Conduct the Getting Started and Learning to Drive Activities in the [Let's Drive Lesson](#).

WORK TIME

1. Have the students complete one or more of the Driving Challenges in the [Let's Drive lesson](#).
 - Ensure all students have the opportunity to try the different styles of driving.
 - Some students may think they are “not good drivers” at first, but encourage them to keep practicing. Remember an expert was once a beginner that kept on learning!
 - The “robot driver” role is one of the most desired roles on a robot team. It's recommended to not assign this role too early so that more students have the opportunity to practice and have fun.

WRAP-UP

1. Have students share what they liked or didn't like about the field- and robot-centric driving modes.
2. Ask the students if they think a certain driving mode would be more advantageous for this season's game. This may change as they design their robots!



TEAM COORDINATOR TIP:

If your students would like more practice driving the swerve base, they can also complete the [Strikes with Swerve](#) lesson.

Intro to the Engineering Design Process (EDP)

Meeting Agenda #2

SESSION TYPE: INTRO SESSION

TIME REQUIRED: 45-60 minutes

REQUIRED MATERIALS: • Blueprint Robot Kit(s) • BPR Challenge 1: Push It Lesson Materials or • BPR Challenge 2: Launch It Lesson Materials	LEARNING OBJECTIVES: Students will be able to: • Use the engineering design process to build, test, and iterate on a prototype • Connect using the engineering design process to developing their robot design for the competition
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Prior to the meeting, review the BPR Challenge 1: Push It and Challenge 2: Launch It activities. Either activity can be used for this meeting agenda based on your preferences.

WARM-UP

1. Share with the students that this activity is an open-ended challenge, similar to the SRC game, where they will work through the engineering design process to develop a prototype that meets a set of success criteria.
2. Students new to robotics may assume that they have to know the “answer” before they get started, but engineers actually use a process for developing new ideas that involves a series of steps that typically involves multiple rounds of trying an idea, testing the idea, and then learning from what works and what doesn’t work to continue to improve the idea. Rarely does the first attempt work and that’s okay! In fact, it’s expected!

WORK TIME

1. Use the provided lesson slides to introduce the engineering design process and discuss the success criteria for the challenge.
2. Give students time to sketch a few different ideas in their handout. Sometimes having Blueprint parts handy helps with generating ideas. If you have multiple

groups of students, have them share their initial ideas. Hearing other ideas often helps to see different perspectives to build upon their ideas.

3. Have students prototype and test their ideas against the success criteria. They can document these in their handout.

WRAP UP

1. If you have more than one group of students, have them share their design and demonstrate how it works. Encourage them to discuss what works well and if they were given more time, what they would continue to improve.
2. Connect this activity back to how they will approach the SRC game.
 - The SRC games are intentionally designed so that there is no “one right answer” and there are multiple ways to complete the challenge.
 - If time, start to brainstorm initial success criteria for this year’s SRC game. Keep in mind that your team will be bringing two robots that can compliment each other.

Intro to Rapid Robots

Meeting Agenda #3

SESSION TYPE: LEARNING SESSION

TIME REQUIRED: (1 - 2) 45-60 minute sessions

REQUIRED MATERIALS: • Blueprint Robotics Kits • Rapid Robot Build Lessons & Instructions (Flux, Mach, and/or Nova) • SRC Launch Party Competition Field and 26-27 SRC Launch Party Field and Game Elements (or similar Classroom Competition Launch Party Field) • Devices for students to view assembly instructions	LEARNING OBJECTIVES: Students will be able to: • Build a Rapid Robot to play Launch Party • Modify the robot to improve how it completes the challenge
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The goal of this agenda is to introduce students to the Rapid Robot designs, which can build their confidence in playing the game while having them learn various mechanical design skills. This can help provide the “hook” for novice students to get them even more excited to play this season’s competition. The Learning Lesson agendas following this agenda focus on specific design or programming concepts, and this requires disassembling the Rapid Robots. You can save this agenda until after the Learning Lessons are completed, if desired.

Depending on the number of students and Blueprint Robotics Kits you have, divide the students into groups - ideally with 2-3 students each. Have each group of students pick one of the Rapid Robot designs to build. If you have more than one group, have them pick different designs so that they can compare them.

This activity may take more than one meeting. If you are limited on time, it’s recommended to use one meeting to build the Rapid Robots and another meeting to test and improve their Rapid Robots.

WARM UP

1. Introduce the [Rapid Robots](#) to students. These are robot designs provided by Sphero to help them learn about different robot designs that can play Launch Party. They

are designed to play the game okay, but not great. This is intentional so that you'll want to improve them!

2. Either assign or let the groups of students choose the Rapid Robot design they would like to build for Launch Party: Flux, Nova or Mach.
3. Provide the Student View of the Lesson for their Rapid Robot Design:
 - Flux: <https://edu.sphero.com/bpr/blueprint-robotics-flux-a-conveyor-robot>
 - Nova: <https://edu.sphero.com/bpr/blueprint-robotics-nova-a-cargo-robot>
 - Mach: <https://edu.sphero.com/bpr/blueprint-robotics-mach-a-launcher-robot>
4. Have each group of students review the initial Slides to get an overview of their Rapid Robot (stop at the Build Instructions Slide). Have each group share an overview of how their Rapid Robot works and their Rapid Robot Ratings.

WORK TIME

1. Have students select the Assembly Instructions link and build their Rapid Robots.
2. Return to their Slides to learn how to pair the controllers and load their Rapid Robot programs. They should be able to start to test drive their Rapid Robots!
3. Set up the Competition Field per the [SRC Manual](#). If you have the Classroom Competition Field, refer to the [Launch Party Overview Lesson](#) for more information on how to set up that version.
4. Set a two-minute timer and have teams play Launch Party!
 - You can either play 2 vs 2 (SRC Competition version) or 1 vs 1 (Classroom Competition version).
 - Keeping track of exact scoring is not as important for this activity, but rather getting students used to the game dynamics and identifying areas for improvement in the robot design.
5. After each group has played 1 - 2 Matches, have them brainstorm ideas on how to improve their robot design. Have students add their ideas to their robot and perform testing.
6. If time permits, have students play additional matches.

WRAP UP

1. Remind students that these Rapid Robots are only starting points, and that their competition robots can be a version of these or they can start completely from scratch.
2. Have students review the engineering design process initial steps:
 - Define: List what you are trying to solve for this year's SRC game.
 - Ask: Identify what's needed to solve the challenge
 - Imagine: Start to sketch out potential solutions to solve the challenge



TEAM COORDINATOR TIP:

Build Skills, Then Let Students Lead Start by helping students learn the coding, engineering, and problem-solving skills they need to get going. As they gain confidence, step back and give them room to explore their own ideas, make decisions, and learn from what works—and what doesn't. You can always support them by asking helpful questions and encouraging them through challenges, while keeping the design and competition work in their hands. That's what makes the experience truly [Student-Powered™](#) !

Getting Started with Blueprint Studio

Meeting Agenda #4

SESSION TYPE: LEARNING SESSION

TIME REQUIRED: 45-60 minutes

REQUIRED MATERIALS: • Blueprint Robotics Kits • Coding device(s) • Blueprint Studio • Intro to Blueprint Studio Lesson Materials • BPS Project Link "Drive in a Square"	LEARNING OBJECTIVES: Students will be able to: • Deploy and run a python program on the Swerve Drive Unit • Modify a program
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This learning lesson provides a high-level overview of Blueprint Studio (BPS), which is the programming application for Blueprint Robotics. If your students have experience with programming in BPS, they can skip this agenda.

WARM UP

1. Provide the Slides to the students from the Intro to Blueprint Studio Lesson materials.
2. Review the Slides on how to connect to the Swerve Drive Unit and have each group of students verify they can connect to their robot.
 - a. Discuss the pros and cons of connecting the robot by Bluetooth and USB.
 - b. What connection type may be best to use at in-person competitions?
3. Next, share that they will now learn more about how to program their robot in Blueprint Studio using Python.



TEAM COORDINATOR TIP:

This lesson is best completed in teams where each team has their own drive unit. If there are enough drive units for each student to have their own, then it can be completed individually. It is not recommended to have multiple students on different devices trying to connect to a single drive unit.

WORK TIME

1. Continue to review the Slides with the Students, and have them deploy and run the “Drive in a Square” program (Share the BPS program link with the students: <https://bps.sphero.com/share/wosogh>).
2. Have the students review the code and discuss what they think the lines of code do to make the robot behave the way it did.
3. Review the Dashboard and Data Widget Slides, and have the students complete the activities on each Slide.
4. Next, students will learn how to modify a program. Review the Modify a Program and the Discuss & Try Slide, and have students modify the program.
 - Have students demonstrate their modified programs.
 - Optional: Have students try other modifications to their programs.
5. Optional: If you have time and want to learn more about Blueprint Studio functionality, review the remaining Slides with the students.

WRAP UP

1. Discussion:
 - a. **Notice:** What is one thing you noticed about how the program controlled the robot?
 - b. **Wonder:** What is one thing about the code or Blueprint Studio that you are curious about?
 - c. **Next:** If you could change one more thing about the robot’s behavior, what would you want to try?
2. Close with a short message that intentionally sets expectations:
 - a. Today was a first look at Blueprint Studio—you were not expected to understand every line of code you saw. You learned how to connect to your robot, run a program, see how code affects what the robot does, and even make a change of your own. In future lessons, we’ll break programming down into smaller pieces and learn how to use them to make your robot do what you want it to do.

Motor Mechanics

Meeting Agenda #5

SESSION TYPE: LEARNING SESSION

TIME REQUIRED: 45-60 minutes

REQUIRED MATERIALS: • Blueprint Robotics Kits • Coding device(s) • Blueprint Studio • Motor Mechanics Lesson Materials	LEARNING OBJECTIVES: Students will be able to: • Investigate how a DC motor works • Build a motor testing mechanism • Compare high-torque and high-speed motors attributes
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WARM UP

1. Introduce the Motor Mechanics lesson:
 - Motors are one of the most important components of any robot. Besides navigation, they are used in a variety of mechanisms, including robotic arms, intakes, end effectors, conveyors, and manipulators. Because of their wide usage, there are different types of motors. In this lesson, you will investigate how DC motors work. You will also compare speed and torque characteristics of Blueprint High-Torque and High-Speed Motors.
2. Review the lesson Slides 1 - 8 with the students to learn more about how DC motors work.

WORK TIME

1. Students will build a motor testing mechanism that will test the speed and torque of their Blueprint motors.
2. Have students follow the instructions on Slides 9 - 22.
 - The Build Instructions and Blueprint Studio program are included in the lesson materials.
 - The Student View of the lesson can be shared directly with students, which includes the Slides, Build Instructions and the Blueprint Studio program: <https://edu.sphero.com/bpr/blueprint-robotics-motor-mechanics>

WRAP UP

1. Have students compare high-speed and high-torque motors using the questions on Slide 22.
2. Review this year's SRC game. Have the students brainstorm ideas on where high-speed and high-torque motors may be used to solve this year's competition objectives.



TEAM COORDINATOR TIP:

If your students want to dive deeper into motor mechanics, consider completing the [“Motor Mechanics 2: Position”](#) lesson.

Gears for Lifting

Meeting Agenda #6

SESSION TYPE: LEARNING SESSION

TIME REQUIRED: 45-60 minutes

REQUIRED MATERIALS: • Blueprint Robotics Kits • Coding device(s) • Blueprint Studio • Gears for Lifting Lesson Materials	LEARNING OBJECTIVES: Students will be able to: • Explain how gears transfer motion and create mechanical advantage • Build and test robotic arms with different gear ratios to compare lifting ability • Calculate the gear ratio of a gear train • Describe the relationship between gear ratio, torque and payload weight
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WARM UP

1. Introduce the Gears for Lifting Lesson:
 - a. Today you will investigate how gear ratios, or the relationship between the driving and driven gears in a gear train, affect a robotic arm's torque and lifting capacity. You'll build and test a robotic arm with 20T, 60T, and 100T driven gears, collecting data on speed, resistance, and load. By the end of the lesson, you will connect gear ratio to mechanical advantage and have another tool for manipulating the rotational speed or torque of a mechanism.
2. Provide the students with the Student View for this lesson:

<https://edu.sphero.com/bpr/blueprint-robotics-gears-for-lifting>

 - a. Review with the students how to find the Slides, Build Instructions, BPS Project, and Handout in the Student View.
3. Review the Define Slides (1-7) to learn more about gears.
4. When you get to Slide 8, have the students predict:
 - a. Which gearing will lift the heaviest load?
 - b. Which gearing will lift the load the fastest?

WORK TIME

1. Have the students follow the build instructions to build the robot arm and bucket, and have them pause when they see the red stop sign icon.
2. Have the students follow the wiring instructions and deploy the BPS Project for this lesson (Slides 10-11).
3. Review and have students conduct the activities on Slides 12 - 18.

WRAP UP

1. Have students share their results.
2. Discuss with the students:
 - Describe how the robotic arm acts as a lever. Use the terms fulcrum, effort, and load in your answer.
 - How did changing the gear ratio affect the arm's lifting ability? Use data from your testing to support your answer.
 - Review the Nova, Flux, and Mach Rapid Robot cards in your kit. Which one showcases what you learned about gears in this lesson?
3. Review this year's SRC game. How may gears be used to solve this year's competition objectives?

Introducing Chains & Sprockets

Meeting Agenda #7

SESSION TYPE: LEARNING SESSION

TIME REQUIRED: 45-60 minutes

REQUIRED MATERIALS: • Blueprint Robotics Kits • Coding device(s) • Blueprint Studio • Introducing Chains & Sprockets Lesson Materials • Launch Party Ball(s)	LEARNING OBJECTIVES: Students will be able to: • Explain how chains and sprockets work together to transfer motion • Calculate gear ratios between a driving and driven sprocket • Determine how gear ratios affect speed
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WARM UP

1. Introduce the Chains and Sprockets Lesson:
 - a. Today, you will explore chains and sprockets for transferring rotational motion. We will explore how the number of teeth on a driving and driven sprocket creates a gear ratio that increases rotational speed or torque. Then you will build a chain-driven flap mechanism and iterate by swapping sprockets to observe the effect on intake speed and the robot's ability to pick up balls.
2. Provide the [Student View](#) of the lesson to the students so they have access to the Slides, Build Instruction, BPS Project link and Handout.
3. Review the Define slides with the students.
 - a. Introduce chains and sprockets and discuss real-world examples beyond bicycles, motorcycles, and chainsaws.
 - b. Reinforce that the driving sprocket is the input and driven sprockets is the output.
 - c. Introduce rotational speed and torque as key concepts students will investigate during the lesson.
4. When you get to the Ask slide, have the students predict how the number of teeth of the driving and driven sprocket affect rotational speed and torque.
 - a. Which of the following bikes uses sprockets for speed?
 - b. Which do you think uses sprockets for torque?



TEAM COORDINATOR TIP:

Do not confirm or correct student predictions at this stage. The goal is to activate prior knowledge and generate curiosity, not to frontload the answer. By the end of the lesson, students should be able to answer this question on their own:

- Bicycle #1 has a larger driving sprocket and a smaller driven sprocket, meaning it is geared for speed. Every time the crank is pedaled, the rear wheel rotates more times.
- Bicycle #2 has a smaller driving sprocket and a larger driven sprocket, meaning it is geared for torque. Every time the crank is pedaled, the rear wheel rotates fewer times.

Consider returning to this slide at the end of the lesson and asking students to revisit their predictions using what they learned. You can also use this slide as an exit tick to assess student learning.

WORK TIME

1. Review Slides 10 - 12 to learn how to measure, build and attach chains. Have the students practice these steps.
2. Have the students follow the Build Instructions and BPS Project for this lesson to build a robot that uses chain and sprockets to drive an intake (mechanism to pick up balls). Slides 13 - 15.
3. Have the students test their mechanism to intake and eject balls.
 - Is the mechanism faster or slower than they expected? Why?
4. Review and complete the activities for Slides 17 - 20 to learn more about calculating gear ratios and torque.

WRAP UP

1. Have students review their results and share their answers to the questions on the Communicate Slides.
2. Review this year's SRC game. How may chains and sprockets be used to solve this year's competition objectives?

Intake Mechanisms

Meeting Agenda #8

SESSION TYPE: LEARNING SESSION

TIME REQUIRED: 45-60 minutes

REQUIRED MATERIALS: • Blueprint Robotics Kits • Coding device(s) • Blueprint Studio • Intake Mechanisms Lesson Materials • Launch Party Ball(s)	LEARNING OBJECTIVES: Students will be able to: • Explain how intake mechanisms convert rotational motion to translational motion to pick up objects. • Describe the relationship between intake speed to ball speed. • Calculate and compare theoretical and experimental ball speed.
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WARM UP

1. Introduce the Intake Mechanisms lesson:
 - a. Intakes are the mechanisms robots use to collect objects and move them where they're needed—they show up everywhere from factory conveyors to competition robots. In this lesson, you will build a roller intake on top of your swerve drive base and figure out what makes a ball move through it faster or slower. Then you will run it at four different motor speeds and compare the speed you'd expect on paper (theoretical) to the speed you actually measure (experimental).
2. Provide the [Student View](#) of the lesson to the students so they have access to the Slides, Build Instruction, BPS Project link and Handout.
3. Review the Define slides with the students.
 - a. Introduce intakes as mechanisms that pull an object into a robot and move it where it's needed.
 - b. Share real-world examples: combine harvesters, street sweepers, and the brush on the end of a vacuum cleaner.
 - c. Introduce how intakes are classified:

- i. By axis of rotation: horizontal intakes rotate around shafts that are parallel to the ground and vertical intakes rotate around shafts that are perpendicular to the ground.
 - ii. By intake material: flaps or flex wheels.
 - d. Have students classify the Pivot and Delta intakes on their handout.
 - e. Explain how this build works: the High-Speed Motor drives a chain that turns four roller stages in sync at a 1:1 ratio, so every roller spins at the same speed and carries the ball up the tower without jamming between stages.
 - f. Walk through the single-wall mechanism: the front rollers grip the ball and push it against the back wall, and the ball spins opposite the rollers as it travels.
4. When you review the Ask slide, have students predict how changing the motor's rotational speed may change the ball's speed.

WORK TIME

5. Have the students follow the Build Instructions, and deploy the BPS Project for this lesson (Slides 10-12).
6. Have students review and conduct the activities in the Test slides.

WRAP UP

7. Have students review their results and answer questions in the Communicate slides.
8. Have the students review the [Rapid Robot](#) designs and discuss the different intake mechanisms.
9. Have the students brainstorm intake mechanism ideas for this year's SRC game.

Sensors

Meeting Agenda #9

SESSION TYPE: LEARNING SESSION

TIME REQUIRED: 45-60 minutes (or more depending on the number of sensor lessons)

The Sphero Central Blueprint Robotics Basic Mechanisms collection includes three sensor lessons:

1. [Meet the Magnetic Proximity Switch](#)
2. [Meet the Distance Sensor](#)
3. [Meet the Beam Break Sensor](#)

Review these sensor options with the students and determine if they want to focus on one of the sensors or complete all three of the sensor lessons. If you have three groups of students, each group can complete one of the sensor lessons and then use a follow-up meeting to teach the other groups what they have learned.

REQUIRED MATERIALS: • Blueprint Robotics Kits • Coding device(s) • Blueprint Studio • Meet the Magnetic Proximity Switch • Meet the Distance Sensor • Meet the Beam Break Sensor	LEARNING OBJECTIVES: Students will be able to: • Explain how intake mechanisms convert rotational motion to translational motion to pick up objects. • Describe the relationship between intake speed to ball speed. • Calculate and compare theoretical and experimental ball speed.
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WARM UP

1. Introduce sensors:
 - a. So far, you've learned how to tell your Robot what to do—but how can your Robot know what is happening around it? That's where sensors come in! A sensor is a device that measures something in its environment and sends that information to the Robot. Your program can then use that information to help the Robot decide what to do next. Your Blueprint Robotics Kit includes three different sensors: the Distance Sensor, Beam Break Sensor, and

Magnetic Proximity Switch. Each one detects something different and can give your Robot new ways to interact with the Competition Field and Game Elements. In this meeting, you'll explore how one or more of these sensors works and begin thinking about how sensors could help your Team complete competition challenges. You don't need to become a sensor expert today. The goal is to experiment, observe, and start imagining what your robot could do with the information its sensors provide.

2. Determine which of the sensor lessons to explore either as a whole group or assign smaller groups to individual sensor lessons.
3. Provide the Student View of the lesson(s) to the students so they have access to the Slides, Build Instruction, BPS Project link and Handout.
 - a. [Meet the Magnetic Proximity Switch](#)
 - b. [Meet the Distance Sensor](#)
 - c. [Meet the Beam Break Sensor](#)
4. Have the students review the Define slides and make predictions on the Ask slides.

WORK TIME

1. Have the students follow the Build Instructions, and deploy the BPS Project for the lesson.
2. Have students review and conduct the activities in the Test slides.

WRAP UP

1. Have students review their results and answer questions in the Communicate slides.
2. If groups of students learned about different sensors, have them share what they learned about their sensor.
3. Have the students brainstorm ideas on how sensors can be used for the Coding Tech Trials where the robot will run autonomously.
4. Have the students brainstorm ideas on how sensors may be beneficial even when they are driving the robot.

Design from the Game

Meeting Agenda #10

SESSION TYPE: COMPETITION SESSION

TIME REQUIRED: 1-2 Meetings (45-60 minutes each)

REQUIRED MATERIALS: • Blueprint Robotics Kits • Coding device(s) • Blueprint Studio • Current SRC Game Manual and Video RECOMMENDED MATERIALS: • SRC Field Tiles & Perimeter • Current SRC Field & Game Elements	LEARNING OBJECTIVES: Students will be able to: • Analyze competition scoring opportunities to inform robot design • Prioritize robot capabilities based on strategy and scoring potential • Define complementary roles and capabilities for both robots.
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Great robot designs start with understanding the game. Before deciding what to build, your team will work backward from the Competition to determine which robot capabilities could give you the best opportunities for success.

During this Competition Meeting, your team will examine the Tech Trials and Team vs Team Matches, analyze scoring opportunities, and use what you discover to begin defining roles and design priorities for your two robots.

Before starting this meeting, students should familiarize themselves with the [Rapid Robot](#) design(s) for the current SRC game as a starting point (see [Intro to Rapid Robots lesson](#)).

WARM UP

Analyze the Competition

As a team, use the SRC Competition Manual and scoring information to identify the different ways you can earn points.

Start by reviewing the competition and discussing:

- What actions can robots perform to score?
- How many points is each action worth?
- Which scoring opportunities are part of the **Operating and Coding Tech Trials**?
- Which scoring opportunities are part of **Team vs Team Matches**?

- Are there robot capabilities that could be valuable in both?
- What competition rules or constraints could influence your robot designs?

Choose a way to record and organize the scoring opportunities so everyone on the team can refer to them throughout the activity.

WORK TIME

Turn Scoring Opportunities Into Robot Capabilities

Now, work backward. Choose scoring opportunities your team thinks are worth exploring and determine what a robot would need to do to accomplish each one.

For each scoring opportunity, consider:

- **Value:** How many points could you earn?
- **Action:** What does a robot physically need to do?
- **Speed:** How quickly would it need to perform the action?
- **Precision:** How accurately does it need to move or manipulate something?
- **Reliability:** How consistently would it need to perform the action?
- **Design:** What mechanisms, sensors, or other capabilities might be useful?
- **Difficulty:** How challenging might it be to design and program?

Don't assume the highest-scoring action is automatically your best strategy. Consider how often you could perform an action and how reliably you could score those points.

Set Your Priorities

Discuss the Robot capabilities you identified and sort them into three categories:

MUST DO	COULD DO	WON'T DO - FOR NOW
Capabilities your Team believes are essential to its Competition strategy.	Capabilities that could improve your performance if you have time to develop them reliably.	Capabilities your Team is intentionally choosing not to prioritize right now.

Be prepared to explain your choices. If Team members disagree, return to the Competition information and use scoring, rules, difficulty, and other evidence to support your ideas.

Think in Two Robots

You will bring **two Robots** to the competition. Instead of assuming both robots should do the same things, decide how you could use two Robots to your advantage.

Discuss:

- Should the robots specialize in different tasks?

- Which important capabilities, if any, should both robots have?
- Could one robot be better suited for certain aspects of the Coding or Operating Tech Trials?
- What strengths should each robot bring to Team vs Team Matches?
- How can the robots coordinate together to score more points?
- Could speed, precision, maneuverability, defense, or scoring ability be more important for one robot than the other?
- Where would overlapping capabilities give you useful flexibility or backup?
- What tradeoffs would come with specializing your robots?

Create a **Robot 1 / Robot 2 capability chart** and assign your priority capabilities to Robot 1, Robot 2, both, or neither. This type of chart can be recreated in a spreadsheet or can be done as a dry erase board activity let by the students.

Example Capability Chart

Robot 1 / Robot 2 Capability Chart			Different strengths. A stronger team.
EXAMPLE – YOUR TEAM'S STRATEGY MAY LOOK VERY DIFFERENT!			
Priority Capability	Robot 1	Robot 2	Why?
 Fast, maneuverable driving	MUST	MUST	Important during Team vs Team Matches.
 Collect scoring objects	MUST	Could	Robot 1 will focus on collecting and scoring.
 Manipulate/place scoring objects	MUST	Could	Supports Robot 1's primary scoring role.
 Precise autonomous movement	Could	MUST	Robot 2 will specialize in precision tasks.
 Use sensors to detect objects	Could	MUST	Supports Tech Trial performance.
 Defensive positioning	Could	MUST	Gives Robot 2 another Match role.
 Specialized high-value scoring mechanism	Won't Do — For Now	Won't Do — For Now	Complexity may outweigh scoring benefit.



Robot 1: Scoring Specialist

- Designed primarily to quickly collect, manipulate, and score Game Elements during Team vs Team Matches.
- Also capable of reliable, maneuverable driving to support multiple Match scenarios.



Robot 2: Precision & Strategy Specialist

- Designed for precise movement and sensor-based tasks, with a focus on Tech Trial performance.
- Also provides a complementary role during Team vs Team Matches, including defensive positioning and reliable driving.


Both Robots: Reliable, maneuverable driving is a priority so either Robot can contribute effectively during a Match.
 

For each decision, ask yourselves: **Why?** Your robot designs should be based on the competition strategy your team has developed—not simply on what seems interesting to build.

WRAP UP

Make Your First Design Decisions

Review your analysis as a team and make your first set of competition design decisions.

Discuss:

- What scoring opportunities are most important to our strategy, and why?
- What does Robot 1 need to do really well?
- What does Robot 2 need to do really well?
- Which capabilities should both robots have?
- What tradeoffs are we making?
- What are we still unsure about?
- What could we build, program, or test to help answer those questions?

Record your **Must Do, Could Do, and Won't Do — For Now** priorities and the proposed capabilities for each Robot. Identify one or two ideas your Team wants to investigate or test next.

These decisions aren't permanent. **Your strategy should evolve as you build, program, test, compete, and learn.** If the evidence tells you that an idea isn't working—or that you've discovered a better approach—use what you've learned to adjust your strategy and your robots. For a more detailed look at how to make engineering design decisions, review the **Making Design Decisions** agenda.



TEAM COORDINATOR TIP:

During this activity, your primary role is to provide **logistical support** and **let students lead the strategy and decision-making process**. Help students access materials, manage time, and clarify competition rules when needed.

When students ask what they should do, try turning the decision back to the team with questions such as:

- “What evidence from the game supports that choice?”
- “How could you test that idea?”
- “What would you gain or give up with that decision?”

There isn't one “right” robot design. The goal is for students to make thoughtful decisions they can explain, test, and improve.

Making Design Decisions

Meeting Agenda #11

SESSION TYPE: COMPETITION SESSION

TIME REQUIRED: 45-60 minutes

REQUIRED MATERIALS: • Blueprint Robotics Kits • Coding device(s) • Blueprint Studio RECOMMENDED MATERIALS: • SRC Field Tiles & Perimeter • Current SRC Field & Game Elements	LEARNING OBJECTIVES: Students will be able to: • Compare robot design ideas using meaningful criteria in a Pugh Chart. • Use evidence to make and explain engineering decisions. • Recognize tradeoffs between different robot design solutions.
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Engineers rarely have just one idea for solving a problem. The challenge is deciding which idea to pursue.

A **Pugh Chart** is a *decision-making tool* that helps engineers compare different design ideas using a common set of criteria. Instead of choosing a design because it looks coolest or because one person likes it best, your Team can use a Pugh Chart to have a more **objective discussion about the strengths and tradeoffs of each idea.**

For SRC, this can be especially useful when deciding between mechanisms, sensors, Robot configurations, or other design ideas for your **Tech Trials and Team vs Team Matches.**

WARM - UP

How Do You Choose?

Imagine your team has three different ideas for a mechanism that collects a Game Element. Everyone has a favorite.

How should you decide which one to build?

As a team, brainstorm factors that could make one design a better choice than another. For example:

- How reliably will it work?
- How quickly can it complete the task?
- How difficult will it be to build?
- How difficult will it be to program?

- How much space will it require on the Robot?
- How much will it weigh?
- Could it help with more than one Competition task?
- How easy will it be to repair or adjust?

These factors can become your **design criteria**—the characteristics your team believes are important to a successful solution.

Meet the Pugh Chart

A Pugh Chart organizes your design alternatives and criteria into a table so you can compare ideas systematically.

Start by choosing one design as your baseline, or the design the other ideas will be compared against. This could be your current design, the simplest solution, or another reasonable starting point.

Then compare each alternative to the baseline for every criterion:

+ = Better than the baseline

0 = About the same as the baseline

- = Worse than the baseline

An example Baseline robot design may be one of the [Rapid Robots](#).

For example:

Design Criteria	Baseline: Design A	Design B	Design C
Reliability	0	+	+
Speed	0	+	-
Easy to Build	0	-	+
Easy to Program	0	-	0
Works for Multiple Tasks	0	+	0

The symbols aren't the answer—they are a way to make your team's thinking visible.

WORK TIME

Build Your Team's Pugh Chart

Choose a Robot design decision your Team needs to make. You might compare:

- Different mechanisms for manipulating a Game Element.
- Different sensor configurations.
- Different ways to accomplish a Tech Trial.
- Different Robot layouts or configurations.
- Different designs for a subsystem.
- Different approaches for making one Robot more specialized.

Identify at least **three possible solutions**. Sketch, prototype, or describe each idea well enough that everyone understands how it is intended to work.

Next, agree on the criteria you will use to compare them.

Aim for **approximately 4–7 criteria** that actually matter to the problem you're solving. Use what your Team learned during Design From the Game to help identify them.

Compare the Designs

Choose one design as your baseline (or use one of the Rapid Robots as a baseline).

Then work through the chart one criterion at a time. For each alternative, decide whether it is better than (+), about the same as (0), or worse than (–) the baseline.

Don't just vote. Discuss your evidence.

Ask each other:

- What makes us think this design is better?
- Have we tested that, or are we making an assumption?
- What evidence could we collect?
- Does this criterion really matter to our Competition strategy?
- What are we gaining with this design?
- What might we be giving up?

When your team doesn't have enough information to make a comparison, mark it as something you need to test or investigate rather than guessing.



TEAM COORDINATOR TIP:

Let students lead the discussion and complete the chart. Your role is primarily to provide materials, help manage time, and clarify Competition rules when needed. If students ask which design they should choose, encourage them to return to their criteria and evidence.

Look for Tradeoffs

When your chart is complete, count the **+**, **0**, and **–** ratings for each design.

But don't automatically choose the design with the most plus signs.

Look more closely at the results:

- Which design performs well on your most important criteria?
- Does one design have an important weakness?
- Are some criteria more important than others?
- Did your team discover something it needs to test?
- Could you combine the best features of two designs?
- Would changing one idea eliminate one of its weaknesses?

A Pugh Chart helps inform an engineering decision—it doesn't make the decision for you.

Optional: Add Weights

Not every design criterion is equally important.

If your team is ready for another level of analysis, assign each criterion an **importance weight**. For example:

1 = Helpful

2 = Important

3 = Critical

A criterion such as **reliability** might receive a 3, while a less important criterion might receive a 1.

For each design, assign a base score, typically from a scale of 1 to 5, to indicate how well the design meets that criterion. Multiply the design criterion Weight by the design's Base Score to calculate the Weighted Score. Then sum each design's Weighted Scores to help compare the design ideas.

Use those weights when reviewing your comparisons. A design that performs better on a critical criterion may be a stronger choice than one that performs better on several lower-priority criteria.

Example Pugh Chart with Weights:

Design Criteria	Weight	Design A		Design B		Design C	
		Base Score	Weighted Score	Base Score	Weighted Score	Base Score	Weighted Score
Reliability	3	2	6	5	15	1	3
Speed	3	1	3	4	12	2	6
Easy to Build	1	4	4	1	1	5	5
Easy to Program	2	5	10	1	2	1	2
Works for Multiple Tasks	2	3	6	3	6	1	2
Total Score		29		36		18	

Be careful: adding numbers can make a decision look more objective than it really is. Your ratings and weights still represent team judgments, so you should be able to explain the reasoning behind them.

As you compare designs, look at **why** each one earned a higher or lower score. You may discover that one design is strong in one area while another is strong somewhere else.

Ask yourselves: **Could we combine the best features of two or more designs?**

Your Pugh Chart can help you identify promising features to combine into a new design. Then, add that new idea to your chart and compare again!



TEAM COORDINATOR TIP:

The value of this activity isn't the final score or which design "wins." Listen for students explaining why they gave a design a particular rating, questioning assumptions, identifying tradeoffs, and asking for data. If a discussion becomes stuck on opinions, try asking: "How could you test that?" Turning a disagreement into an experiment is exactly what engineers do.

WRAP-UP

Use your Pugh Chart to decide what your team should do next.

You might choose to:

- Move forward with one design.
- Build prototypes of the strongest alternatives.
- Test something you weren't sure about.
- Combine features from multiple designs.
- Improve an idea and compare it again.

Before finishing, have someone on the Team explain:

“We are choosing to explore _____ because _____.”

Support the explanation with evidence from your Pugh Chart and your Competition strategy.

Then identify what you need to **build, program, measure, or test next** to determine whether your assumptions were correct.

Remember: a **Pugh Chart doesn't prove that you chose the perfect design**. It helps your Team make a thoughtful engineering decision based on the information you have right now.

As you prototype and test, you'll collect new evidence. If that evidence changes your thinking, **update your chart and reconsider your decision**. Changing your mind because you learned something new is part of the engineering process.

Example Competition Session Agenda

Meeting Agenda #12

SESSION TYPE: COMPETITION SESSION

TIME REQUIRED: 45-60 minutes

REQUIRED MATERIALS: • Blueprint Robotics Kits • Coding device(s) • Blueprint Studio RECOMMENDED MATERIALS: • SRC Field Tiles & Perimeter • Current SRC Field & Game Elements	LEARNING OBJECTIVES: Students will be able to: • Apply design, coding and problem-solving skills to complete the SRC competition objectives. • Test, evaluate, and improve robot programs and designs. • Build teamwork and confidence through competition practice.
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TEAM COORDINATOR TIP:

Competition Sessions should be flexible! Adjust the amount of time spent coding, designing, building, testing, and practicing based on your team's progress and how close you are to competition day. If your students already have the fundamental skills covered in the Intro and Learning sessions, they can skip those and start with the Competition Sessions.

WARM - UP

Review Progress & Set Goals

Bring the team together to review progress from the previous Competition Session and decide what they want to accomplish today.

- Discuss what worked, what challenges remain, and what the team learned from its most recent testing or practice.
- Review the Tech Trials and Team vs Team Matches the Team is preparing for and identify areas that need attention.

- Consider both Robots. Are they designed and programmed to take advantage of their individual strengths? Are there changes that could make the Team more effective across the different competition challenges?
- Have students identify one or two specific, achievable goals for the session.

As the competition day approaches, encourage students to prioritize their goals based on what will have the greatest impact on their team's overall performance.

WORK TIME

Design, Code, Test & Improve

Give students dedicated time to work toward their goals. Depending on where they are in the season, students may:

- Design, build, program, and test either robot.
- Experiment with different robot designs, mechanisms, sensors, or programs.
- Develop and test strategies for the Tech Trials.
- Develop strategies for how the two robots can contribute during Team vs Team Matches.
- Troubleshoot problems and improve robot reliability and consistency.
- Compare the strengths of their two robots and determine how each can best contribute across the competition.
- Practice Match Crew roles, communication, and strategy.
- Complete timed practice runs under competition-like conditions.

Encourage students to use the Engineering Design Process to help with generating ideas, testing their ideas and improving their ideas: **Try → Observe → Adjust → Try Again**. Rather than solving problems for students, ask questions that help them analyze what happened, consider possible solutions, and decide what they want to try next – keep it [Student-Powered™!](#)

Remind students that competition preparation is not only about making a robot perform a task once. Reliability, adaptability, teamwork, and strategy matter too.

WRAP-UP

Test, Reflect & Plan Ahead

Finish the session with a practice run, timed challenge, or demonstration of what the team accomplished. When possible, give students opportunities to practice under conditions similar to what they will experience at the competition.

Bring the Team together for a quick reflection:

- What improved during this session?
- What did we learn from testing our robots?
- What is working reliably, and what still needs attention?
- Are we making the best use of both robots for the Tech Trials and Team vs Team Matches?
- What should be our priority at the next Competition Session?

Have the students record the Team's progress, decisions, and next steps so they can quickly pick up where they left off at their next session.

Support

We couldn't be more excited about your team's participation in Sphero Robotics Competitions. For more information about Sphero Robotic Competitions and to get involved in our community, you can find links to additional resources below.

Contact Us: support@teamalliance.org

BPR Resources: <https://edu.sphero.com/blueprint-robotics/resources>

Sphero Equipment or Coding Support: support.sphero.com