

Coach Clinic

Introduction to Game Strategy and Team Dynamics

Agenda:

- Team Development Stages
- Team Composition
- Team Ground Rules
- FLL Coach Promise
- Season Schedule Overview
- Tournament Day Walk-thru
- Resources
 - FLL Core Values
 - Engineering Design Process
 - Maze Worksheet
 - Robot Flow
- Robot Games Overview
 - Strategy
 - Robot Games Updates
 - Mission Overview
 - Mission Walk-thru

Team Development Stages

The **Forming – Storming – Norming – Performing** model of group/team development

Forming

Forming happens when people first come together. They are initially polite and the conversation is mostly exploratory, finding out about one another and the work that is to be done.

People here are typically in the 'honeymoon' period and are quite excited about the newness and potential of being in the team. Some also may be more fearful and timid, whilst others are less gregarious, observing from the sidelines more than getting in there and exposing themselves.

Storming

As the initial politeness fades, people start to get more into the work and their roles and so start to argue about things that were left unsaid or not realized when they first met.

Storming can be fiercer if one or more conditions exist:

- More than one dominant person who wants to be the leader (formal and/or social).
- Unclear formal roles
- Unclear objectives
- Little or large external threat

Norming

As roles and personal conflicts are sorted out, the focus turns towards the task and what needs to be done. Objectives are clarified and the detail of work is laid out. Feeling more as a team, people start to help one another more.

Socially, group rules develop and are refined. People begin to feel like they are members of the same team and form a clear sense of identity. Internal conflict may be replaced with external conflict as the human focus turns to 'us and them.'

Performing

Finally, a steady-state is achieved, where the team reaches an optimal level of performance. A good team will feel like a happy family whilst other teams reach working agreements where personal differences are managed and largely kept under control. For example, a change in leadership may cause the team to revert to *storming* as the new people challenge the existing norms and dynamics of the team.

Team Organization

By

Dr. Kenneth Berry

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FIRST LEGO League is a team sport not a group sport

- Team members have responsibilities
- Team members make decisions
- Everyone works together
- Everyone communicates
- Everyone contributes
- Everyone plans
- Everyone is valued
- Everyone leads

Team Composition: Every team member has responsibility for their area. This means that they make sure they get the resources they need to complete their task and finish their task on time. They make all decisions regarding their task but they do not do all the work to get their tasks complete.

Coach and Assistant Coach

Captain

Lawyer

Project Lead

Chassis Lead/Chief Builder

Attachments Lead

Chief Programmer

Field Set-up

Coaches Job:

Have a successful team: compete the first year whether or not you feel prepared, manage expectations. Coach is responsible for the hardest part of the Robotics Competition. However, the very best coaches say they don't do anything. They have successfully delegated and trained their team (this is hard work).

Dealing with Parents

Practice – how often and how long – together or separate

Preparation for the competition: supplies, charge the robot

Get the liability release signed ASAP to CYA

Team registration

Team organization

Team safety

Paperwork

Time Management

Teamwork

Communications

Keep up the momentum – project cycle, manage the team's emotions

Logistics

Finance

T-shirts

Computers

Make everyone feel appreciated, responsible and significant

Do not forget the project!

Captain

Characteristics: Nice, helpful, organized, positive, servant leader

Responsibilities: Is responsible for everything and nothing. This person needs to be the most capable person on your team.

Lawyer

Characteristics: Detail person, planner, thoughtful, creative

Responsibilities: Responsible for the rules, and loopholes in the rules. Web searches for team strategies, updates to rules, FLL Forum. Develop game strategy

Project Lead

Characteristics: Organized detail person, good communication skills, good writing skills.

Responsibilities: Organize the project. Brainstorm the project, prepare the team journal, organize the props, organize the actors, organize the costumes, and electronics.

Chassis Lead/Chief Builder

Characteristics: Mechanical engineer, likes to put the robot together, must also like to take the robot apart and rebuild the robot often, not easily frustrated.

Responsibilities: Chief builder is responsible for the chassis design of the robot, the two drive motors, the brick placement and sensor placements.

Attachments Lead

Characteristics: Mechanical engineer, must be willing to work with the chassis builder, work well with others, creative builder, willing to build and rebuild.

Responsibilities: Building with the third (and fourth) motor, creative use of the rubber bands, string, gears, wheels, weights. Chassis gets the robot places, the attachment does stuff like lift, release, capture, push, etc.

Chief Programmer

Characteristics: Computer Science engineer, likes programming, self starter, can work on his/her own early, logical thinker, can break down problems into parts, good at math, can handle pressure. Responsibilities: Robotics programming is embedded programming. It must work with the hardware of the robot. The programmer must understand how the robot works mechanically to program it properly. He/she must understand the programming, understand the strategy, program the robot, understand the sequence of tasks on the field. Help everyone early on to do everything else. Understand how the sensors work and how to get numbers from the sensors. Understand what the numbers mean. Understand the sensors.

Big Jobs:

Lawyer
Captain
Project Lead
Chief Builder: Field and Parts
Chief Programmer
Chief Attachments
Chief Chassis
Chief Awards
Driver
Field Support

Minor Jobs:

Project responsibilities, display, song, video, research
Task Strategies
Task programs
Task attachments
Field parts
Teamwork
Robot Design
Advanced Programming
Scouts

FLL Job Roles and Descriptions:

By:

Jay Jordan

Fellowship Christian Academy

Robotics Club Coach and Club Sponsor

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Captain

The captain must have knowledge of every aspect of the challenge (robot games, project and core values). The captain must also be capable in all areas (building, programming, field setup, mission scoring and strategy and project). The captain is responsible for identifying where they are needed most and help get things done on time. The captain is responsible for holding people to their responsibilities, keeping communication going, prioritizing time and resources so that everything is finished on time. The Captain needs to manage the master schedule and team meetings. The captain must be a servant leader.

Mission Specialist

Responsible for the rules and knowing what each mission is what their point value is for each mission. Responsible for identifying loopholes in the rules. Responsible for doing Web searches for team strategies, keeping up to date on rule changes and updates. Help develop the games strategy based on the rules and values of the missions. Responsible for keeping track of scoring during matches at tournaments.

Software Programmers

Responsibilities: Robotics programming is embedded programming. It must work with the hardware of the robot. The programmer must understand how the robot works mechanically to program it properly. He/she must understand the programming, understand the strategy, understand the sequence of tasks on the field and program the robot. Understand how the sensors work and how to get numbers from the sensors. Understand what the numbers mean. Responsible for briefing team on current mission programming status at the conclusion of each meeting as necessary. Responsible for co-leading Robot Judging presentation at tournaments along with Mechanical Engineers.

Mechanical Engineers - Chassis

Responsible for overall design and building of the main robot chassis and ensuring all attachments fit on the robot properly and securely. Responsible for making modifications to main robot chassis. Responsible for regular maintenance of main robot chassis making sure all parts are secure. Responsible for ensuring that robot brain is charged on a regular basis. Responsible for ensuring that main robot chassis is properly stored at the conclusion of each meeting. Responsible for ensuring all robot kits and spare parts are properly put up at the conclusion of each meeting. Responsible for briefing team on current main robot chassis and attachment status at the conclusion of each meeting as necessary. Responsible for co-leading Robot Judging presentation at tournaments along with Software Programmers.

Mechanical Engineers - Attachments

Responsible for designing and building various motorized and non-motorized attachments to be used on the robot chassis. Works regularly with the chassis mechanical engineer to ensure attachments work properly on the robot. Responsible for making modifications to the attachments as necessary. Responsible for regular maintenance of the attachments including making sure all parts are secure. Responsible for ensuring that the attachments are properly stored at the conclusion of each meeting. Responsible for ensuring all robot kits and spare parts are properly put up at the conclusion of each meeting. Responsible for briefing team on current main robot chassis and attachment status at the conclusion of each meeting as necessary. Responsible for co-leading Robot Judging presentation at tournaments along with Software Programmers.

Robot Technicians/Operators

Responsible for running the missions during the matches at the tournaments. Responsible for making sure that the proper programs for match have been downloaded to the brick before matches. Responsible for practicing matches regularly at meetings and identifying issues that need to be addressed by either the software programmers or mechanical engineers.. Responsible for reviewing scoring sheets with referee and with Mission and Project Specialist at the conclusion of the matches and ensuring proper credit is given for missions and that the referee gives the team the "benefit of the doubt" when applicable.

Project Specialist

Responsible for organizing the research project. Responsible for brainstorming project ideas and leading project discussions. Responsible for preparing a team journal, organizing any necessary props, organizing props, costumes, electronics, etc. Responsible for defining each team members role for project presentation. Responsible for updating team on current project status at the conclusion of each meeting as necessary.

Field Support Specialist

Responsible for making sure the field is properly setup and all field modules are properly put together and positioned in their correct positions. Responsible for resetting all field modules to starting positions during mission trial and practice runs. Responsible for time keeping during practice runs. Responsible for field setup and maintenance at tournaments. Responsible for inspecting the field setup before the start of each match and advising the referee of any discrepancies in field setup.

Video Production Specialist

Responsible for taking pictures and videos during club meetings, tournaments and other events. Responsible for creating and editing club videos and posting them on club website. Responsible for regular updates to team website. Responsible for providing team with status of current video projects at the conclusion of each meeting as necessary.

Robotic Teams Ground Rules

As we work together as a team this robotics season, some of your ideas will be a success. Other times, they will fail. Either result is okay - failure is a part of the design process.

What is not okay: laughing at someone else's ideas or failures.

Rules for working as a team

1. You may not criticize or make fun of another team member's work. This includes laughing, teasing, or comparisons ("My robot is so much better than your robot....").
2. However, you may provide CONSTRUCTIVE criticism. To be constructive, the comment must be specific and offer a possible solution. For example, "Hey your robot doesn't go straight" is not acceptable, but "I noticed that your robot veers to the left. It looks like the back wheel is rubbing against the frame" is welcomed.
3. No designs are private property. Anyone may get ideas from any other design. If someone copies a part of your design, the proper reaction is to be flattered - clearly, the other person has recognized your brilliance.
4. If you get stuck, feel free to look at other people's designs to see how they have solved similar problems. There are many online resource that can get you moving in the right direction.
5. And finally, relax! Things will go wrong - but you will have plenty of time and assistance to fix the any problems.

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Coaches' Promise

1. **The children come first.** My role as a Coach is to inspire my team and help them get excited about science, technology, engineering, and math. This means that I will step in to guide and support them when they need it, but I will make sure my team's robot, Project, and Core Values materials are the work of team members.
2. **The children do the work.** Adults may teach my team new skills, handle logistics for the team, ask questions to get team members thinking, and remind them of the **FLL**® rules. Team members are the only ones who decide on strategy, build, program, research, choose a problem and innovative solution, and present at a tournament.
3. **My team is:**
 - Comprised of 10 or fewer members and all team members participate on only 1 **FLL**® team per season.
 - Comprised of team members no older than the age limit in my region on January 1 of the Challenge year.
 - Registered as an official **FLL**® team.
4. **I am responsible** for reading and relaying all aspects of **FLL**® guidelines and rules to my team, other Coaches, Volunteers, and parents.
5. **I will encourage** my team members, other Coaches, Volunteers, parents, and team supporters to develop and practice a set of **FLL**® Core Values that reflects the **FIRST**® goal to change culture in a positive way by inspiring others through our team's actions and words.

Practice Schedule Recommendation for FLL

By

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This is based on a 6-week practice schedule. Teams generally meet 2 times a week for 2 hours. I do not recommend going longer than 2 hours/session.

Pre-season:

Build several robots: Build for speed, build for torque, rubber band car, automobile car

Go through all the programming tutorials. Build and rebuild robots as often as possible to make the team members comfortable with building and rebuilding.

Week 1: Get organized (Captain in charge)

- Put parts and field together.
- Put together a board.
- Determine a team name.
- Collect email addresses from everyone.
- Hand out liability waivers.
- Set ground rules.
- Develop a design for team T-shirts.

Supplies: Field of parts, 24 ft of 2x4s, 4-8 plywood sheet, black spray paint

Week 2: Develop a strategy: (Lawyer in charge)

- Brainstorm the strategy and the robot building
- Carefully look over the rules.
- Where are the loopholes in the rules? What are the easy points? Hard Points? (Far from base=hard, small target area=hard)
- Play game without a robot.
- What will the presentation be about, research, music, multimedia?
- Who will do what tasks?
- Everyone should take a job or two.
- Schedule your tournaments, qualifiers and finals

Week 3: Building (Master Builder)

- Build chassis: Decide on wheels or treads, 2,3,4 wheels, skids?
- Gather all measurements for ultrasonic, rotation, and light sensors (use the view mode on your NXT).
- Programmers should be able to find a line, follow a line, understand all clues on the way to each mission.
- Lawyers should check Forum for rule clarification.
- Attachments should understand a latch, bulldozer, gripper, and crane attachments.
- Storyboard presentation, complete research, and organize project.

Week 4: Attachments (Attachments Chief)

- Determine game strategy, driver or drivers for each task, assistant or assistants for driver.
- Build all attachments

- Robot should be able to consistently do all easy tasks.
- What tasks are overlapping? Program flow charts should be completed. Start programming the hard tasks.
- Lawyer should account for all possible points
- Check or post to forums if there are questions about the rules.
- All research complete, beginning work on project, multimedia determined and almost complete

Week 5: First Run through (Chief Presenter-Master of Ceremonies)

- Run a 2.5 minute round with robot
- Driver and Assistant driver run through
- Presentation run through
- Be sure all awards covered
- Documentation of teamwork compiled (programmer flowchart, notes on strategy, rules document, sensor measurements, project research, project pictures or findings, team list with jobs)

Week 6: Prepare for competition (Awards Chief)

- Run through each award presentation (robot design, programming, rookie award—if applicable, presentation, robot performance)
- Work on consistency
- All robot tasks work consistently, field marked for starting points
- All programs work consistently
- Everyone knows his/her part for presentation
- Music and multimedia work for presentation
- All documentation for awards collected and packaged nicely
- Rides and maps to tournament prepared
- Scouting teams developed
- Parent volunteers organized
- Each person assigned things to bring (robot –charged, computer, field, field parts, permission slips, etc.)
- Hand out team T-shirts
- Snacks or money for snacks

Tournament!

- Go whether you are ready or not
- Scout out competition—look for loopholes in the rules
- Be sure everyone is aware of schedule (generally there is no down time between presentations, 3 performance rounds, and judging.)
- Have a cheer-Show your teamwork
- Help other teams be the best they can be

Post Tournament

- Rebuild, recreate, reengineer everything:-)

Post Season

- Celebrate all the hard work you all did!



FIRST LEGO® League Regional Qualifier Tournament

Saturday, December 6th, 2014

Hosted by

Fellowship Christian Academy

Schedule of Events

8:00	8:45	Team Check-in and Setup in Pits
8:20	8:45	Coaches Meeting – Competition Floor
8:50	9:05	Welcome & Opening Ceremony
9:10	Noon	Robot Games and Judging Sessions
Noon	1:00	Lunch Break
1:00		Robot Games resume and Judging callback begin
3:00	4:00	Final Judging Deliberations
3:45		Robot Games conclude
4:00	4:20	Closing Ceremonies

2014 FCA Qualifying Tournament Schedule

Team #	Pit #	Official Rounds Match Schedule									Project			Robot			Core Values		
		Match #	Time	Table	Match #	Time	Table	Match #	Time	Table	Slot	Room	Time	Slot	Room	Time	Slot	Room	Time
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FLL® core values

- We are a team.
- We do the work to find solutions with guidance from our Coaches and Mentors.
- We know our Coaches and Mentors don't have all the answers; we learn together.
- We honor the spirit of friendly competition.
- What we discover is more important than what we win.
- We share our experiences with others.
- We display Gracious Professionalism® and Coopertition® in everything we do.
- We have fun!

Gracious Professionalism®

Gracious Professionalism means teams compete like crazy against challenges but appreciate and treat each other with respect. Your enemy is the problem you're trying to solve — not an opposing team or person. Gracious professionals lend a helping hand to an opponent when needed because they want everyone to have a chance to compete.

With Gracious Professionalism, fierce competition and mutual gain are not separate ideas. Gracious professionals learn and compete intensely, but treat one another with kindness in the process. Even when a team wins the competition, they avoid treating anyone like losers.

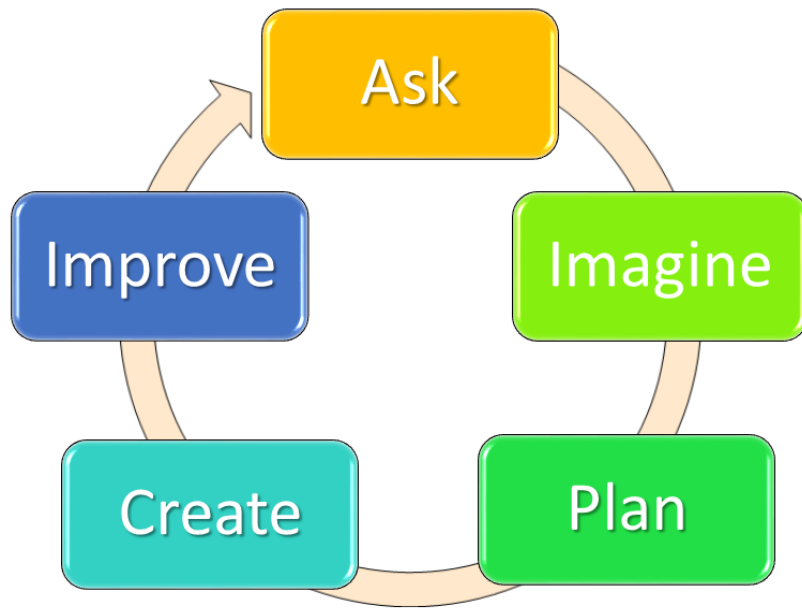
In the long run, Gracious Professionalism is part of pursuing a meaningful life. You can enjoy personal success while also making a contribution to society. FLL team members will learn that they can succeed while still acting with integrity.

Coopertition®

Coopertition® combines the concepts of cooperation and competition. Coopertition is founded on the philosophy that teams can (and should!) cooperate with each other even as they compete.

Once you have mastered a skill, you teach it to someone else so that everyone can do better next time. It will make the competition more meaningful by pushing everyone to excel. Sometimes it even means sharing a spare part or battery charger with another team so they have a chance to compete. You still do your best to win, just not at the other team's expense.

Engineering Design Process



Ask

- What is my design supposed to do?
- How will I test my design?
- How will I know it is doing what I want?
- What could keep me from making it do that?

Imagine

- Apply knowledge and creativity to brainstorm ideas.
- Select one to try.

Plan

- Plan idea with sketches, diagrams, drawings and notes.
- Plan materials and resources.

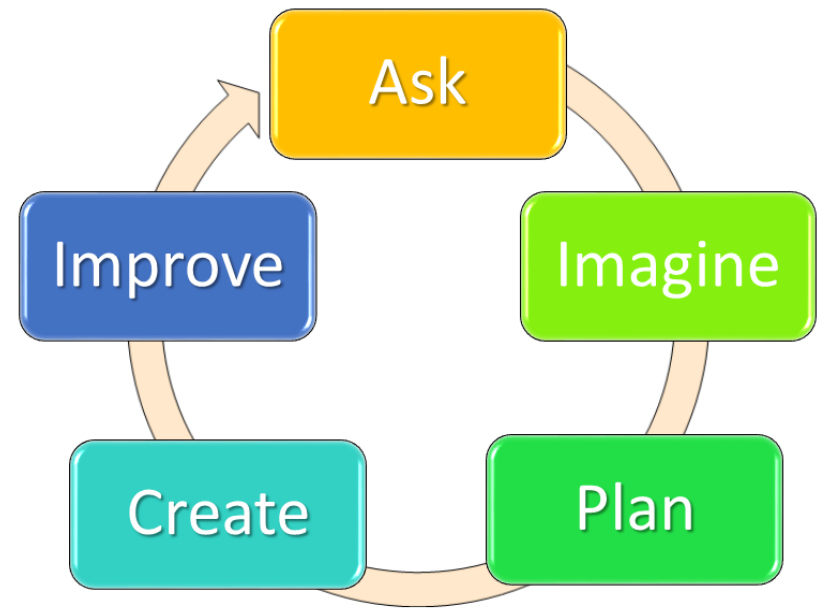
Create

- Create a prototype.
- Test the prototype and record the results.

Improve

- Analyze design and test results.
- What change would make the biggest impact on meeting the goal?

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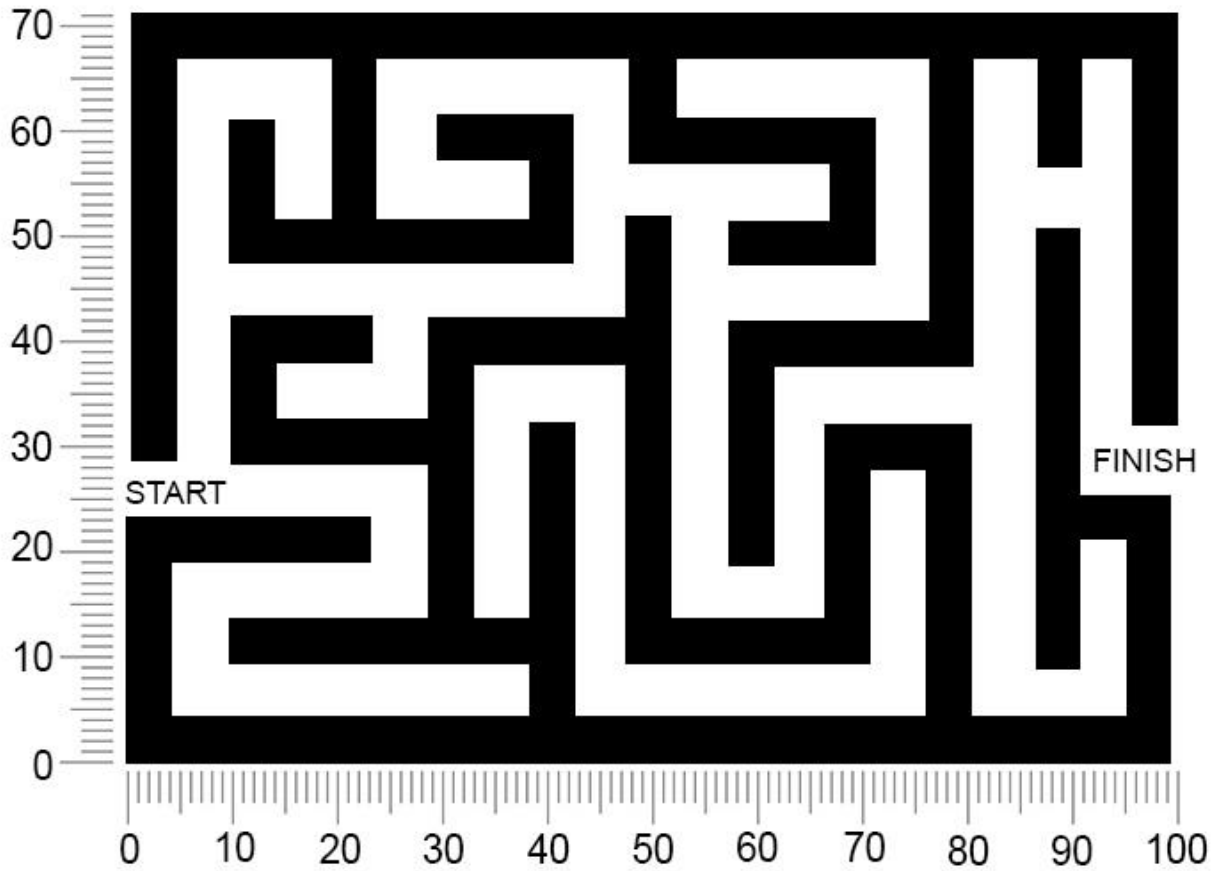
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Robot Maze Challenge

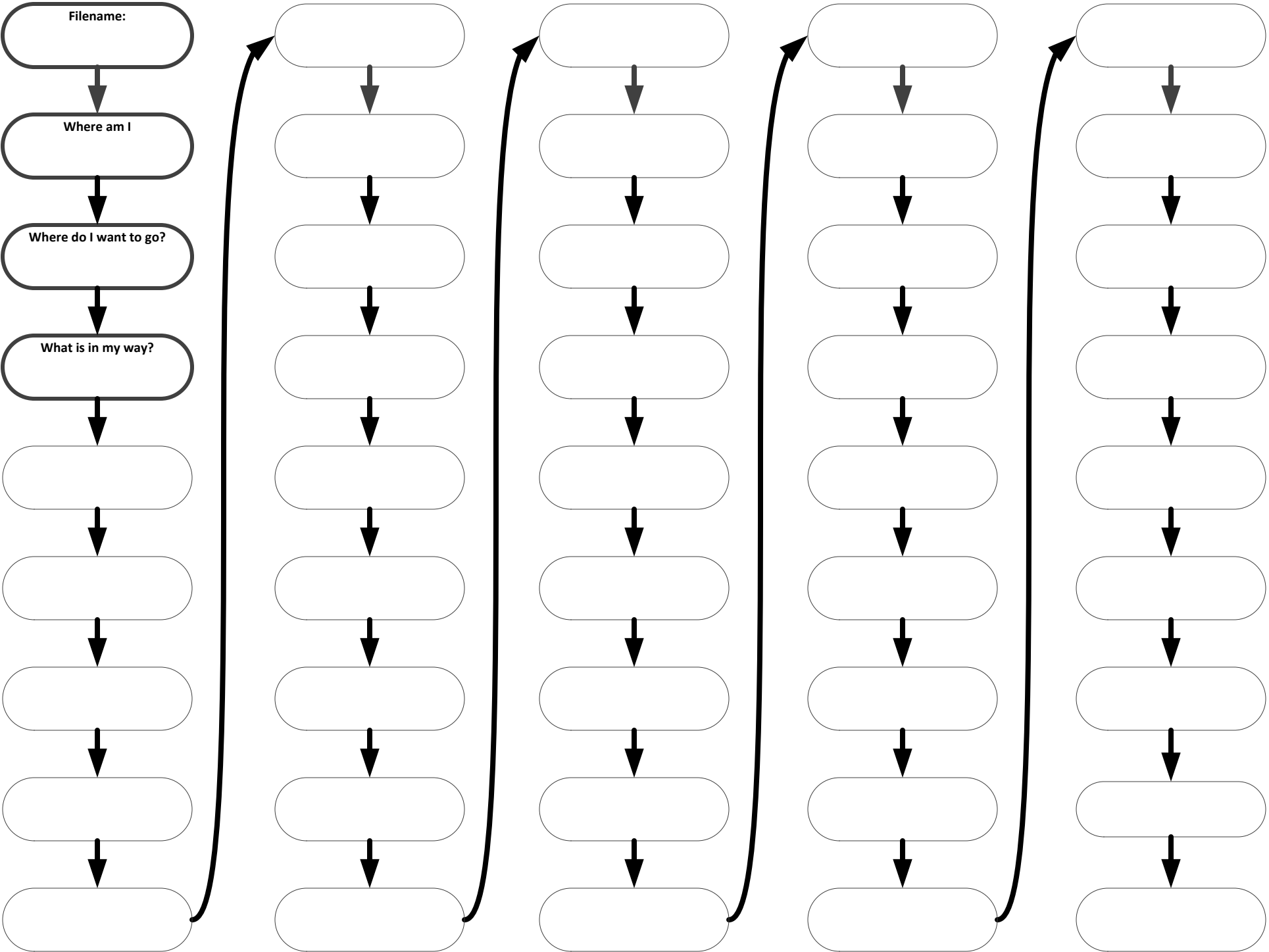
Write instructions to navigate a robot through the maze below. We have done the first two steps as an example.



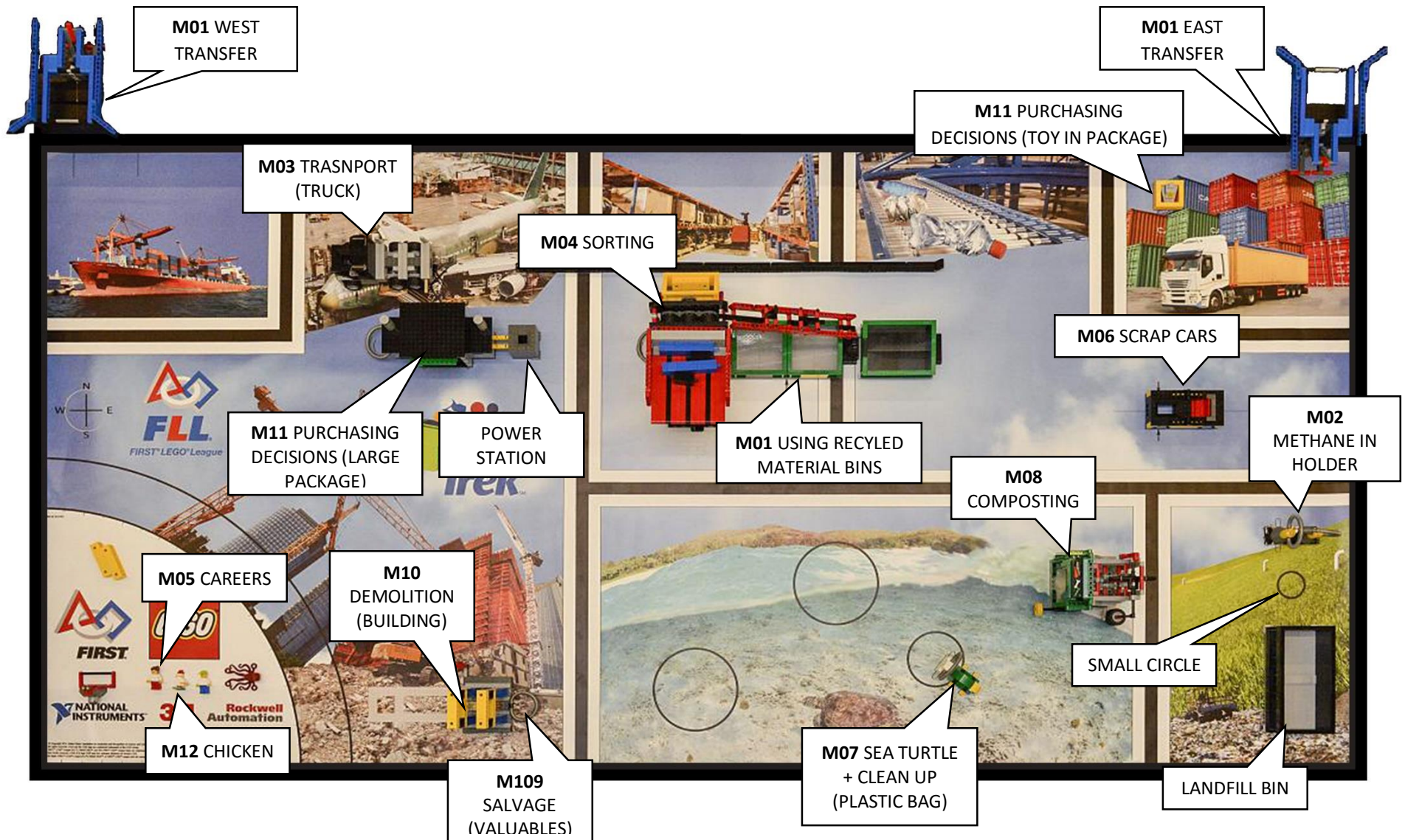
1. At the start move 7 forward, stop, and turn 90° to the left.
2. Move 19 forward, stop, and turn 90° to the right.
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

If you need more space continue on back of sheet.

Robot Programming Step-by-Step Outline



2015 Trash TrekSM Mission Overview



In Base: Octopus, Chicken, Engine/Windshield, two People, and two Yellow Bars.