

# GEAR UP TO VOLUNTEER!

*A 12-Month Guide for  
4-H Robotics Volunteers*



## What Is a 4-H Robotics Volunteer?

A 4-H Robotics volunteer is someone who has a heart for youth and a desire to help them grow. A robotics volunteer does not have to be a rocket scientist, engineer, or computer programmer. All it takes is heart, the willingness to persevere when things don't work out, and the ability to have fun.

According to a research study done in 2013, there are three primary factors that influence volunteers to participate in the 4-H Robotics project:

- Volunteers want opportunities for young people to be engaged in positive activities.
- Volunteers want to help create future opportunities for young people.
- Volunteers want young people to know how to persist in the face of difficulty.

Most volunteers do not have a background in robotics. Rather, they have a history of caring and of desiring the very best for the young people they work with. That is what makes the very best volunteer—heart.

So, if HEART is the primary characteristic of a 4-H Robotics volunteer, do you have what it takes?

Many volunteers say, "I think I have the heart, but I don't know how to get started. Can't my Extension agent do this?"

Keep in mind that your Extension agent oversees nearly 100 different 4-H projects, from poultry to land judging, and robotics is just one of those projects. He or she will need committed volunteers like you to make robotics work in your county.

The first step is to sit down with your Extension agent and devise a strategy for your club. This guide is a resource for that meeting.



*"We make a living by what we get, we make a life by what we give."*

- Winston Churchill

# SEPTEMBER . . . Is for Team-Building

***4-H Robotics has to be about more than building and programming. It has to help young people learn how to thrive in today's fast-paced society.***

The 4-H Robotics program brings a diverse body of young people to the county Extension office. A typical group includes high school football players, home-schooled students, young people with special needs, quiet kids with a love of all things LEGO, and a host of parents who hope that this will be beneficial for their children. Everyone comes with different expectations, and your job as the lead volunteer is to help get everyone in the same place.

For starters, get the parents involved. Don't try to do it alone. Give each parent a job. Host a parent and/or volunteer involvement meeting with specific activities or jobs that parents can do to help the club. Your first meeting should be about building relationships. Each young person needs to understand that he or she is an important member of the team, and, together, they can accomplish their goals while having fun.

Use resources like this publication or Kris Bordessa's book *Team Challenges* for ideas on team-building exercises.



The first meeting should have a 2:1 ratio—two team-building exercises for every one robotics or engineering activity. Try not to let the meeting run longer than an hour. A typical meeting might include a 5-minute introduction and pledge, 25 minutes for team building, 15 minutes for a short activity, and 15 minutes for a snack. The goal for the first meeting is to set the tone for the rest of the year.

Teamwork, fun, and 4-H are the primary goals to get your group started. Everything else will develop and build from those goals.

## ***Jobs for Parents and Volunteers***

- Snack leader
- Deadlines and paperwork for events leader
- Logistics and meeting places leader
- Team-building leader
- Finding and procuring supplies leader
- Community service leader
- Robot-building leader
- Programming leader

## ***First Club Meeting***

- Welcome and 4-H pledge (5 minutes)
- Team-building activity #1 (Bordessa, p. 32) (15 minutes)
- Team-building activity #2 (Bordessa, p. 33) (10 minutes)
- Building a circuit (Junk Drawer Robotics, Level 2, p. 34) (15 minutes)
- Create a circuit snack ([www.evilmadscientist.com/2007/circuitry-snacks/](http://www.evilmadscientist.com/2007/circuitry-snacks/)) (15 minutes)
- Set next meeting time
- Dismiss

# OCTOBER... Is for the State Fair!

Don't own a goat to show at the State Fair? Not a problem! Every year, the Robot Round-Up is held at the 4-H Village during 4-H Day at the State Fair. 4-H'ers who attend can get a free ticket to the fair and take part in their first judged event for the year.



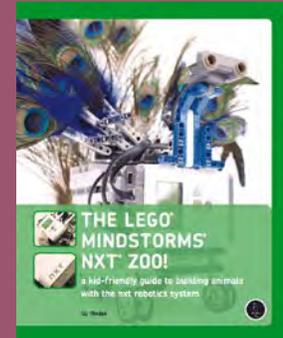
Contact your Extension agent for details on signing up! You don't want to miss the deadline.

4-H'ers can work in groups of two to three to build a robotic animal. Plan on at least one meeting to build and at least one meeting to program.

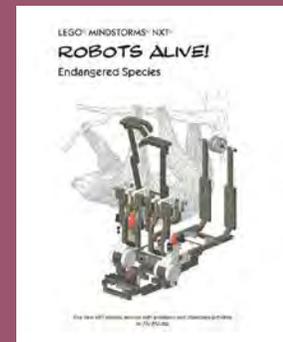
This is also a great time for older 4-H'ers to give back by helping Cloverbuds create a "baby" robotic animal. The highest award given at the Robot Round-Up is Best in Show.

## Robotic Animals

Check out these books to help build your robotic animals:



The Lego Mindstorms NXT Zoo!



Lego Mindstorms NXT Robots Alive! Endangered Species



NXT One-Kit Creatures

Or these websites:  
<http://nxtzoo.com/>  
[www.nxtprograms.com](http://www.nxtprograms.com)

COMING TO THE MISSISSIPPI STATE FAIR OCTOBER 12, 2013

**THE ROBOT ROUND-UP**

The Robot Round-Up is a great opportunity for 4-H roboengineers to show off their building and programming skills at the Mississippi State Fair. 4-H'ers may work in teams of 2-3 youth to build a robotic animal to "show" at the State Fair.

THE ROBOT ROUND-UP  
OCTOBER 12, 2013

Group 1: Baby Animals	Group 2 & 3: NXT Animals
Lion	Rabbit
Monkey	Pepper
Alligator	Alienator
Elephant	Dolphin
Birds	Skunk
Other	Frog
	Snake
	Polar Bear
	Clark
	Deer
	Shark

There are three age groups:

LEVEL	ROBOT TYPE	AGE
Group 1	Baby Animals (WeDo Robotics)	5-7 years old Cloverbud (not 8 in 4-H years)
Group 2	Any Animal (NXT Robotics)	8-13 years old (Junior 4-H'ers)
Group 3	Any Animal (NXT Robotics)	14-18 years old (Senior 4-H'ers)

- All levels will be judged and all levels will have a "Best in Show".
- Details to Note:
- Robots are available to check out on a first come first serve basis. Your 4-H agent may contact Meredith Smith at [mmsmith@ext.msstate.edu](mailto:mmsmith@ext.msstate.edu) to sign-up for a robot. We have 20 NXT robots available and 11 WeDo Robots. Baby animals available.
  - You may begin signing up on September 9th at 8:00 A.M. Once you have signed-up, you may pick up the robot at any point in time after that.
  - Building instructions and programming instructions will be made available either by email or posted on the Facebook page (find us at Mississippi Robo on Facebook).
  - All judging will be based on a rubric. You can find a link to the rubric on the Facebook page or request via email.
  - Please bring your robotic animal to the State Fair 4-H Village on October 12, 2013. Check-in begins at 8:30 A.M. and will continue until 9:30 A.M. Judging starts promptly at 10:00 A.M. Youth are not required to stay with the robotic animals during judging.
- Robots must be picked up by 2:00 P.M. on October 12th.
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# NOVEMBER . . . Is for Voting!

By now, you should have a pretty good feel for which young people will be active participants in your club. Consult with your Extension agent and decide when the club should hold officer elections.

Go over the roles of each officer, and ask 4-H'ers to think about which role they would be most interested in. 4-H'ers should give presentations in front of the group on why they should be elected and how they will best help the club.

Allow 4-H'ers in the club to vote, and announce the officers. Be sure those members who did not win the election have a role to play. Schedule a meeting with the newly elected club officers. These officers should begin the process of taking over the club meetings and planning them with help from the volunteers.

## Questions to Ask

Who will open the meetings? Close?

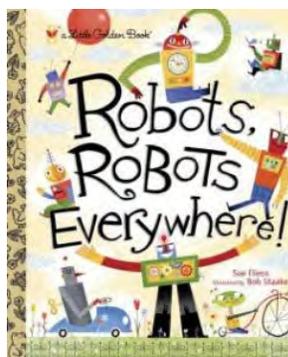
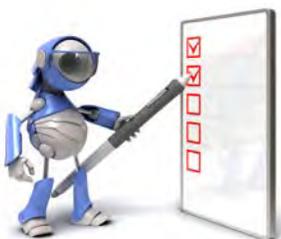
Who will lead the 4-H pledge?

Who will be in charge of the recordbook?

Your job now is to help the 4-H'ers transition into taking responsibility for the club. The degree to which they succeed largely depends on your ability to let them be in control and even sometimes fail.

Failure isn't pleasant and it is hard to watch, but your job as the volunteer is to coach them through it. How do they recover from miscommunication, flared tempers, and bruised egos? Your job is not to let them drown in it, but to offer support, advice, and encouragement.

Also, it is your job, as the adult, to know when to step in and take action when a situation escalates.



November is also for sharing. The robots are already built (from the State Fair), so get your 4-H club out there in the community and let them showcase what they have done. Coordinate a county Robot Zoo and take it to local elementary classes. Incorporate the Parts of a Robot activity and read *Robots, Robots Everywhere!* by Sue Fliess to help teachers meet Common Core standards for the classroom.

## Third Club Meeting

- Team-building activity #1
- Officer elections
- Build the Can Can Robot (Junk Drawer Robotics, Level 2, p. 38)
- Team-building activity #2
- Snack

# DECEMBER . . . Is for socializing!



The weeks leading up to Christmas can be tough to schedule a robotics club meeting, but it can be well worth it for the 4-H'ers. In the hustle and bustle, it's a time for them to connect and recharge while parents are out doing last-minute shopping.

It also provides an opportunity for young people to think about others beyond themselves. It is a great time to practice the "hands to larger service" portion of the 4-H pledge. Can they do a service project in the community together, followed by a Christmas get-together? Or can they say thanks for all of the support they get from their local Board of Supervisors, volunteers, and others who have helped them throughout the year?

## *Ideas for December*



Make an LED ornament  
(<http://makezine.com/projects/led-robot-ornament/>)



Create claybot ornaments from clay and old watch parts



Create a roboclock from old blocks, salt shakers, and clocks

# JANUARY... *Is for New Beginnings!*

January is a time for all 4-H robotineers, volunteers, and agents from across the state to come together to find out what each group is doing. This is also when the robotics curriculum for the next 5 months is revealed. This event is called Robotics Kick-Off. Make sure you register with your Extension agent.

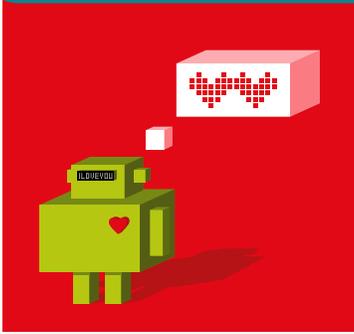
It is very hard for robotics volunteers to catch up if they miss this meeting. This year, the format will be different than in the past. Kick-off this year will feature volunteer-, agent-, and youth-led sessions.

## ***Fifth Club Meeting***

- Team-building activity #1 (Bordessa, p. 35)
- Build an electric highway ([http://pbskids.org/designsquad/parentseducators/resources/electric\\_highway.html](http://pbskids.org/designsquad/parentseducators/resources/electric_highway.html))
- Prep for Kick-Off presentations (deadline to submit is in December). This is a great opportunity for members to polish their speaking skills and build a résumé.



# FEBRUARY... *Is for the Love of All Things Robotics*



If January marks the beginning of the 4-H Robotics season, February is when your club should start cementing as a group. The focus now turns to learning the ins and outs of programming your robot.

At the 4-H Robotics Kick-Off in January, four building challenges and four

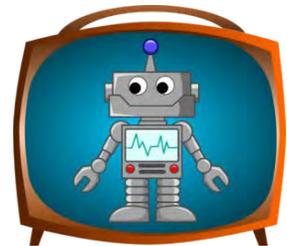
programming challenges will be given: one of each for the months of January, February, March, and April.

Each of these challenges builds on the previous challenge and helps 4-H'ers prepare for contest at 4-H Club Congress and 4-H Project Achievement Days.

Participants will gravitate to building, programming, or other tasks (like creating a presentation or speech). The job of the volunteer is to rotate 4-H'ers through different jobs so that each person gets to experience the design and implementation process. What about young people who just don't do robotics? That's OK, too. We need those 4-H'ers to provide a counterbalance to the intensity that robotics can sometimes bring out of the group. They can lead team-building activities, work on marketing, and help facilitate.



## **Turn On Robot TV**



Each month, all 4-H'ers, volunteers, and agents will meet together on the Extension Center for Technology Outreach distance education interactive video network (say that three times fast!). Each club can meet at their local county Extension office or watch from a computer that has access to the Internet.

Be sure to make arrangements with your local county Extension office before the meeting, as the room may already be reserved.

### *Sixth Club Meeting*

- Team-building activity #1: Team Talk (Bordessa, p. 54)
- Engineering activity: RoboWheel (<http://pbskids.org/designsquad/build/robo-wheel/>)
- Robotics activity: Building and programming challenge will be released at Kick-Off.
- Complete county challenges given at Kick-Off.

### **What are Club Congress and Project Achievement Days (often referred to as PAD)?**

They are competitive events where 4-H'ers can showcase what they have learned. Club Congress is for senior 4-H'ers ages 14–18 as of January 1. Project Achievement Days is for junior 4-H'ers ages 10–13 as of January 1.

# MARCH ... Is for the Great Reveal!



In March, 4-H'ers are starting to separate into different groups. There are participants who only want to program or only want to build. As the volunteer, your job is to make sure each young person is valued for his or her contribution. Hopefully, at this point, they have learned how to work with and respect one another.

Also, 4-H'ers and volunteers may start running into difficulties programming. Programming is often, according to 4-H'ers, the "least fun part." This is because the robot doesn't do what they want it to do; it does what they tell it to do! This can be incredibly frustrating to young programmers.

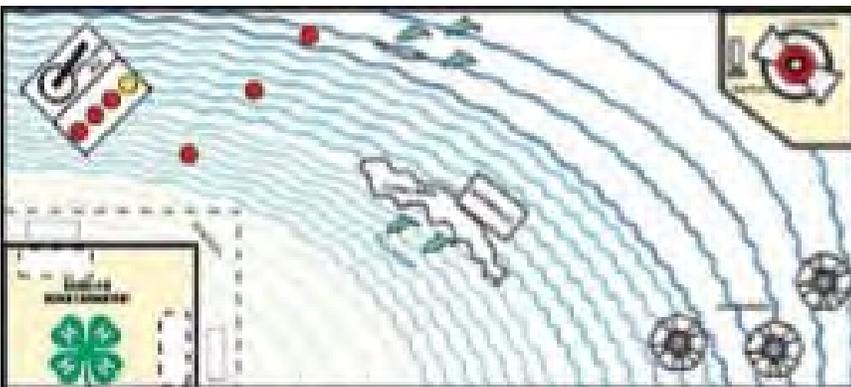
As the volunteer, your job is to guide 4-H'ers through setbacks and failures. Have them draw out the challenge and write out the programming code before working on the computer. This forces them to think it through instead of just hitting buttons and becoming frustrated.

## Seventh Club Meeting

- Go on a field trip, meet an engineer, do something outside of your normal club time together.
- Team-building activity #1: Build a Road (Bordessa, p. 153)
- Engineering activity: Build a paper table that can hold a heavy book and support your snacks! ([http://pbskids.org/designsquad/parentseducators/resources/paper\\_table.html](http://pbskids.org/designsquad/parentseducators/resources/paper_table.html))
- Building and programming challenge to be given at Kick-Off
- Team-building activity #2: Questions & Answers (Bordessa, p. 59)
- Snacks: Trail mix bots



- Attend the Great Reveal! Sign up with your Extension agent.



This is an example of one of the contest mats for Project Achievement Days. Contestants have to solve for robotics challenges and deliver an oral presentation.

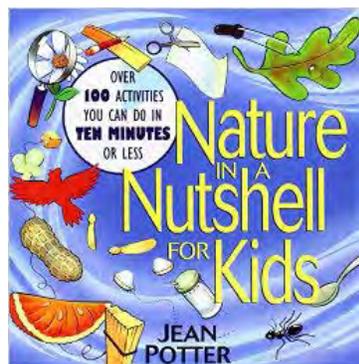
## APRIL . . . Is for Preparing!

Your team has the contest mat and 4-H'ers are vigorously (if not argumentatively) debating how they will complete all of the challenges on the contest mat. The presentation component is an afterthought, as is the PowerPoint or video that accompanies the oral presentation. The focus is entirely on solving the challenges on the contest mat.

Most 4-H'ers forget that 50 percent of the overall score in the 4-H Robotics contest depends on their oral presentation. As a volunteer, your job is to help them manage time. Whether this means dividing up into teams, helping them outline what needs to be done, or scheduling extra sessions, it is important for them to stay focused on the end result and not get lost in small details.

They need to understand that there are more challenges on the mat than they can meet in the designated time. They must selectively choose what they can accomplish to gain points, while avoiding those things that cause them to incur penalty points.

Most of the time, the team with the best strategy is the team that wins the competition because the team has a goal and a plan to execute that goal.



Use a resource such as *Nature in a Nutshell for Kids* by Jean Potter for outdoor ideas.

If things are getting tense while 4-H'ers are discussing contest strategy, make them sing to each other instead. You can't be too serious singing

the programming code back and forth to the tune of "Twinkle, Twinkle, Little Star." It's just silly.

*Life is a joy, learning should be, too.*

*Don't lose sight of that.*



As 4-H'ers prepare for competition, they need help learning how to deal with stress. Team-building activities should be physical in nature so that they can release pent up energy and stress. If possible, get them outside and moving to help them clear the stress and think more clearly.

### *Eighth Club Meeting*

- Team-building activity #1: Remove Your Shoes (Bordessa, p.162)
- Engineering activity: Robot Basketball (<http://www.tryengineering.org/lessons/robotbasketball.pdf>)
- Prep for contest

## MAY... Is for Club Congress!

Edwin Way Teale once said, “The world’s favorite season is the spring. All things seem possible in May,” and, while that is certainly true, it is warp-speed-ahead for those 4-H’ers participating in the robotics contest.

They are finishing up school and state testing, which generally overlaps contest prep time and, for some students, Club Congress itself. Squeezing in time for practice can be difficult. Most volunteers find it difficult to balance prepping both the junior 4-H’ers and senior 4-H’ers at the same time. In the weeks leading up to the contest, the seniors are probably focused and meeting multiple times a week.

As the volunteer, your job is to make sure they are registered for Club Congress with the Extension agent. If they aren’t registered by the deadline, they can’t compete. They must compete in a team of three to four 4-H’ers. Often, volunteers say that there just isn’t enough interest for a team of three to four. There is always a 4-H’er who can work on the presentation, help create the video, or assist the team in other ways. Not everyone on the team has to be robotics-driven, but everyone must contribute something to the team.

Take frequent breaks while prepping for Club Congress, and try to get the team away from the robot for at least one fun activity. This activity should be a time for 4-H’ers to enjoy their camaraderie and relax before the big event. As much as we love robotics, 4-H is also about teaching young people how to thrive as adults. Learning how to handle stress and pressure in a positive manner is part of the learning process.



### *Ninth Club Meeting*

- Register for Club Congress
- Fill out forms (Code of Conduct and Health)
- Save presentation to external hard drive
- Make sure presentation will play on another computer
- Bring batteries and chargers
- Have fun!

## JUNE ... Is for Project Achievement Days!

June is when junior 4-H'ers (ages 10–13 as of January 1) can compete against other counties in their district. This competition is called Project Achievement Days, and it is a chance for 4-H'ers to showcase all of the work they have put into their 4-H projects. There are competitions in the morning and the afternoon, with a break for lunch.

Morning competitions are usually visual presentations. For example, in the computer contest, participants give a 3- to 5-minute presentation on a technology-related topic. Afternoon competitions are usually judging competitions (for example, the robotics contest). 4-H'ers are not required to do both, but it is a good opportunity for them to practice their presentation skills.

Traditionally, the robotics competition starts immediately after lunch. Teams are assigned a time slot for their presentation, practice round, and scored rounds. Each team gets two scored rounds.

As a volunteer, your job is to keep the 4-H'ers focused on the positive and to treat the entire event as a learning opportunity. Volunteers are also responsible for cheering, singing, or other silliness that helps to keep the stress levels down.



Lee County volunteer Neil Monaghan keeps his team loose for competition by employing his secret weapon—fun!

### *Tips for Having Fun at Project Achievement Days*

- Go early and find the location for the general assembly, lunch, and contests.
- Pack snacks and drinks if you plan on working through the morning contests.
- Set up a robotic booth and tell other 4-H'ers what you do in your club.
- Use trees, buildings, and benches to create silly group photos that you can put in your club record book!
- See who can collect the most cities in Mississippi from fellow 4-H'ers.
- Ask your 4-H agent to sing or dance at Share-the-Fun.

Why do 4-H'ers get stressed before and during competition? For many, it is their first competitive event. Even if it's not their first event, it may be the first one with a robot that doesn't always do what they want. Also, participants have to give a presentation on a selected topic dealing with robotics. Most 4-H'ers prefer just working with the robot and leave the presentation until the night before. This is why it is a good idea to have a variety of young people on the team.

Parents and other volunteers also play a key role in keeping stress levels to a minimum. At this point, you have done all the coaching you can do. Your job now is to be the guide. Make sure they break for lunch, and make sure they take a break from last-minute preparations. Let them work the contest mat and presentation on their own, but be there if they need help working through a last-minute change or if they need encouragement to be flexible (letting another team go first, dropping the robot, etc.).

# JULY... Is for Hosting a Camp!

July is a tough time to get your 4-H'ers together to do anything as everyone is on vacation or at the grandparents' house! If time permits, consider having your group host a robotics mini-camp for those in your community. You and the Extension agent will be the lead instructors for the camp. However, you can assign 4-H'ers different teaching roles and make them camp counselors with certain responsibilities.



The key to hosting a camp is to keep it short and as simple as possible. Most young people can spend only 2–3 hours a day building and programming the robot. Periodic breaks are needed. This could mean making the camp a half-day camp, limiting the number of participants, and recruiting enough robotics young people and volunteers to help.

A good ratio is one robot and laptop to every two campers. This isn't always possible, but it does generate the best results. Camp curriculum is available upon request, or your club can create its own to meet specific needs in the county. Most counties report that the success of the camp is heavily dependent on how involved 4-H youth club members are in the planning, development, and implementation of the camp. This is an excellent opportunity for them to work through the experiential model of 4-H learning.

## *A typical camp day should consist of these activities:*

8–8:15 am	Sign in and go over camp rules
8:15–8:20 am	4-H Pledge
8:20–8:30 am	Team-building activity
8:30–10 am	Robot building or programming (you could have the robots pre-built to focus on the more difficult aspect of programming)
10–10:15 am	Snack break
10:15–10:45 am	Creative activity or hands-on lesson from Junk Drawer Robotics (create something they can take home to demonstrate what they have learned)
10:45–11:50 am	Robot building or programming
11:50 am–12 pm	Clean up and dismiss for the day

## *Hosting a Robotics Camp*

- Discuss with your Extension agent and set a tentative date.
- Request additional robotics kits through your Extension agent.
- Decide on a location.
- Determine the number of campers allowed.
- Outline the curriculum and schedule with club members. What are the goals for the camp?
- Recruit necessary volunteers.
- Give 4-H youth counselors a chance to practice their part in the camp.
- Send out emails, flyers, or other publicity about the camp.
- Have campers sign up with the Extension agent.
- Email 4-H code of conduct and 4-H member forms to campers. These should be filled out before camp starts.
- Gather supplies and/or donations and organize by lesson.
- Plan on having fun!
- Contact local media to do a feature story.
- Conduct an end-of-camp evaluation.



Image from University of Minnesota Extension 4-H (<http://www.extension.umn.edu/source/winter-2013/4-h-prepares-youth-to-lead-and-succeed/>). Adapted from D.A. Kolb, 1984.

# AUGUST... Is for New Beginnings!

It's back-to-school time and everyone is busy trying to get into a daily school routine. This might be a fun opportunity to ask for help from a Family Nutrition Program or Family and Consumer Sciences Extension agent. Why not ask them to help you come up with a demonstration of a delicious and healthy robotics-themed lunch box?

Set up a demonstration at the school's open house or PTA meeting. A local grocery store might even allow you to do a demonstration on a Saturday. This is a great opportunity to showcase other educational programs the Extension Service offers. For example, do you know how many germs are in a child's lunchbox? Yuck! Packing healthy lunches is important for any future robotioneer!

August is also a good time to host a robotics open house with hands-on demonstrations for interested young people. Ask if you can pass out flyers at the school for an after-school meeting, or visit local homeschool groups to arrange a Robotics Showcase. Again, this is an excellent opportunity for 4-H'ers already in your club to take a leadership role.

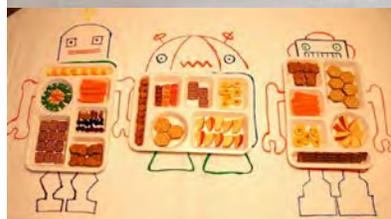
Be aware, however, that as new youth come into the club, they will be looking for a place to belong and a place where their contributions are valued. How will you and your club members include them in the club?

*Here are a few ideas for welcoming new members:*

- Team them up with an older member who can be their mentor.
- Have someone from the group write them a note after the first meeting.
- Introduce them to other club members by name.
- Use a team-building exercise that is designed to help young people get to know each other.
- Give them a schedule, and explain what happens next and how they can contribute.



*Robots for lunch are a fun and healthy way to encourage your child's potential.*



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