

*care***FIRST**



Presented by Sparky Team 384

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Introduction

What if you lost all you had? What if that one car ride turned tragic? What would happen to you, your family and your friends? What would happen to your plans and dreams? In many hospitals today, these are common questions and problems. Many children are born or become handicapped physically and emotionally. What can we, the FIRST community, do? SPARKY Team 384 believes that it is important, and possible, to bring all children into the FIRST experience.

History of careFIRST

careFIRST began after the 2004 Championship in Atlanta, Georgia. SPARKY Team 384 continuously searches for new ideas and community service projects to spread the news and spirit of FIRST. In 2004, the FIRST Lego League theme, NO LIMITS, focused attention on the barriers faced by people with disabilities in their everyday lives. While FLL participants turned their creative thinking and problem solving to robotic solutions for these problems, SPARKY 384 looked for ways to include children, teens and young adults living with limits into the FIRST experience. Our goals in beginning this program were:

- *To include a population unable to participate in FIRST and FLL, in learning about, observing and/or participating in robotics.
- *Introduce hospitalized children to the fun and creativity in technology.
- *Provide an active, hands-on activity for hospitalized children.
- *Allow FIRST team members to learn about the barriers that exist for disabled children.
- *Provide a service to the community.
- *Increase visibility of FIRST.
- *Develop a program that other FIRST teams can duplicate in their communities.

careFIRST was initially conceived as a FIRST Lego League team of hospitalized children. Our goals were: to bring the news and experience of FIRST to a new group, to include those who are unable to participate in traditional FIRST robotics or Lego League teams, and to help and encourage all FIRST Robotics teams to bring careFIRST to their communities. With this plan, Team 384 began to work with Children's Hospital in Richmond, Virginia through their recreational rehabilitation/child life department. Since Children's Hospital is a rehabilitation center, it became clear that the level of the children's impairments made our original plan impossible. Our team adapted our original concept to create a program which now includes observation, hands-on building, individual interaction, plenty of robot climbing, pushing of obstacles, dropping marbles, and knocking over of barriers.

What is careFIRST? careFIRST is any program in which FIRST teams share the FIRST experience with children, teens or young adults who cannot participate in FIRST Robotics or the FIRST Lego League. The setting may be an acute care hospital or it may be a residential treatment center. It could also be a group home or juvenile detention center. It exists wherever there are participants who cannot be involved in traditional FIRST programs.

We will outline Sparky Team 384's careFIRST program and describe the goals and purpose of our program. We also include guidelines stating how to adapt this program to other settings. Please join us starting your own careFIRST program.

Mission Statement

The mission of careFIRST is to provide a robotics experience to children and young adults who cannot participate in traditional FIRST Robotics or FIRST Lego League programs.

Getting Started

The goal is to share the FIRST experience in a manner that works for your individual team and benefits the children in the community. Each careFIRST program will be unique. The following are steps we suggest you take in getting started with a careFIRST program

- 1) Brainstorm and Discuss: After looking at this manual and DVD, cultivate ideas of how careFIRST could be part of your community. Think about what commitment the team can make. Think about which groups with whom you would like to share FIRST.
- 2) Assess: Make an honest appraisal of the resources you have. Can you manage an ongoing program or a limited short-term program? It is important that you be clear and realistic, this is important when you discuss offering the program to a specific group.
- 3) Investigate: Learn about the different settings where your program may take place. Find a good contact person to aid in developing your proposal.
- 4) Setting: Before you commit to a careFIRST program, select a setting and visit them to observe what happens there, and to discuss implementation. This information is crucial in developing a program that will fit the setting and work with the population.
- 5) Team goals: Develop your own goals with a lesson plan to guide you in adapting and implementing your program.
- 6) Be flexible. Things happen and things change.

Recruitment

Integrate careFIRST into your whole team: careFIRST is for everyone. It is important that team members with a wide range of abilities, jobs and personalities participate in careFIRST. A well functioning group includes technical people, a person who can lead, a good speaker, and someone able to keep the group on task. Here are jobs needed for our careFIRST program.

Technicians: team members who are able to program, set up and run the Lego robot, and set up the field components. They should be able to reset and fix any last minute problems that should arise.

Main Speaker: someone comfortable speaking before a group and can verbalize ideas well. They should be well versed in the program and personable.

Presenters: team members who can keep the group on task. They work with the participants and keep the program moving forward.

Builders: members who will build the various pieces needed for the program.

Adapting careFIRST

careFIRST programs can be conducted in many different settings such as: acute-care hospitals, long term rehabilitation and treatment facilities, juvenile detention centers and group homes to name a few.

When SPARKY Team 384 brought careFIRST to a children's rehabilitation hospital, we quickly learned that the program we envisioned needed modification. Here are some factors to consider in adapting the program to your setting and the population who will participate.

- 1) What is the nature of the setting?
 - *Does the setting have rules or restrictions that impact the program?
 - *How much space is available?
 - *How often do they want you or will they allow you to come?
 - *Will there be staff on hand if problems should arise?
- 2) What is the nature of the population?
 - *What are the various needs of the children?
 - *What are their ages?
 - *Do they have special needs?
 - *Do the participants have limitations socially, physically or emotionally?
 - *Are there safety issues?
- 3) What will be the nature of the team's participation?
 - *What resources does the team have to acquire needed materials?
 - *How many team members can participate?
 - *How often can team members come to the facility?

Lesson Plans for PROJECT: careFIRST

1. Introduction

- Lesson Topic: FIRST Lego League interaction
- Length of Project: 1 hour visit to a children's unit of a local hospital.
Project lasts 5 months.
- Student Grouping: Whole group lesson plan. Place participating children around the Lego table for hands-on involvement.

2. Objective

The children in the hospital will:

- Learn about FIRST (For Inspiration and Recognition of Science and Technology)
- Learn about FIRST Lego League and FIRST Robotics
- Participate in group demonstrations
- Make positive contributions to the demonstrations by
 - 1) stacking blocks
 - 2) identifying colors
 - 3) engineering simple construction patterns
 - 4) suggest demonstrations

3. Content

- Speaker will introduce the Robotics Team members to the children and staff in the hospital center.
- Speaker will talk about FIRST (For Inspiration and Recognition of Science and Technology) in a way the children can understand. FIRST was founded by inventor Dean Kamen to inspire and foster an appreciation of science and technology. FIRST is an innovative program to build self-confidence, knowledge and life skills while motivating young people in the fields of science, technology and engineering.

- Explain your FIRST team to the children, whether it is a FIRST Lego League team or a FIRST Robotics team.
- Competitions: Explain the FIRST competitions. Explain that in robotics competitions we build robots that weigh 130 pounds. Show the children with hand motions how tall the robots can be. Explain the FLL robots are smaller and can also maneuver and do small tasks.
- If possible, show a movie of Robotics, a homemade movie about your team, or a FIRST movie.
- FIRST Lego teams: Explain FLL challenges students from ages 9 to 14 to face real world engineering problems. Focus on the 2004 challenge “No-Limits”. Help children understand that anything can be possible with Legos and an imagination.
- Show the Mindstorm robot to the children. Tell them how you built it, show the sensors used and explain how the sensors work. Tell them where the motor is located and how the programming tool makes the robot run and do different things.
- General instructions: Invite the children to interact by having them build a wall, or put marbles on one of the pieces that are knocked down. Give the children instructions on how to turn the robot on by pushing the small green button. Let them take turns turning on the robot. Encourage the children to pick out an activity they would like to see performed i.e.: adding pieces or picking out colors.

Demonstration for Month ONE

Demonstration titled OVERCOMING OBSTACLES

1. Tower of Terror: Build a large wall of brick size Legos. Place on the end of the ramp. Have the robots run up and down the ramp and knock the wall down.
2. Ball & Ramp: Build an inclined ramp that holds a small ball at the top. Place the ball and ramp at the end of the table. Run the robot down the

- length of the table and knock into the ramp. Watch the ball run down the ramp. Ask the children if they could explain why the ball went down the ramp. Demonstrate many times until everyone understands.
3. Push a Wheelchair: Build a wheelchair using medium and small sized Lego bricks. Use Lego wheels to make the wheelchair mobile. Place the robot and wheelchair together and have the robot push the wheelchair along the length of the table. Explain to the children how robots can help people accomplish certain tasks.
 4. Marble Breakout: Make a long brick Lego wall and put marbles behind the wall. Run the robot into the wall and see the marbles scatter. Talk to the children about what made the marbles scatter. Build the wall in a few different configurations and repeat the demonstration.

Demonstration for Month TWO

Demonstration titled RAMPS

This demonstration needs a tri-fold ramp that is half the size of the table with a piece of wood under to lift the middle.

1. Marble Madness: Build a wall with sides to hold marbles and place on the top of the ramp. Put dozens of marbles behind the wall. Have the robot climb the ramp, knock into the wall and scatter the marbles. Have the children interact and build different types of walls. Investigate the types of wall that will hold marbles.
2. Tennis Balls; The Great Push: Place tennis balls on top of the ramp. Have the robot climb up the ramp and into the tennis balls. Watch the tennis balls scatter. Talk about why the tennis balls scattered and examine the direction of the balls. Repeat with the children placing the balls on the ramp.
3. Push a Wheelchair: Place the Lego wheelchair from month one on top of the ramp. Have the robot climb up the ramp and push the wheelchair

down the other side of the ramp. Talk about how fast the wheelchair rolled, and repeat putting different objects on the seat. Observe the speeds and discuss with the group.

4. Tennis Ball Fling: Build a little slingshot that can hold a tennis ball. Fling the tennis ball. Discuss how and why it came out of the slingshot.

Demonstration for Month THREE

Demonstration titled BREAKOUT!

This demonstration uses colorful wooden blocks found at any discount retailer.

1. Double Hit: Build two long walls from many blocks in the middle of the table and place a few inches apart. Run the robot across the table to hit into the two walls. Observe the walls hitting into one another. Repeat spacing the walls further apart with each run of the robot. Talk about how far the walls can be apart but still hit into each other.
2. Earthquake: Build a tall wall with the blocks and let the robot hit the wall down. Repeat demonstration with different size walls. Talk about the size of the wall in relation to the noise!
3. Circle of Balls: Make a big circle with the wooden blocks and place many tennis balls in the middle. Watch the robot hit into the circle and the dispersing of tennis balls all over the table.

Demonstration for Month FOUR

Demonstration titled MEGABLOCKS

This month you will need Megablocks. Megablocks are huge plastic interlocking blocks that can be purchased at any discount retailer.

1. Crazy Walls: Create an interlocking wall of megablocks and have the robot push the wall across the table. Create a wall of megablocks without locking them. Let the robot try to push this wall to see the blocks scatter.

2. Ball Wall: Build a wall wide enough to fit the tennis balls on top. Have the robot push into the wall to watch the balls scatter. You can do this demonstration on the tabletop, or use the ramp.
3. Cooperation Wall: Have the children build wall pieces and interlock together. Make one big wall from all the smaller walls on the top of the table. Have the robot push the wall over.
4. High Tower: Have team members build a wall approximately 4 feet tall. The robot will push the wall over and the pieces will scatter. Only do this demonstration if the children are not afraid of loud noises!

Demonstration for Month FIVE

Demonstration titled GRAND FINALE

Bring all of your favorite supplies to the grand finale, the last monthly demonstration. We recommend showcasing all of your favorites!! Also have the children participate as much as possible!

1. Our Robot Rocks: Program the mindstorm robot to dance and play music! Place the mindstorm sensors on the robot and show the children how the sensors can make the robot hit a wall and go backwards.
2. Wheelchair Push: Push the wheelchair down the ramp with the robot! Let the children suggest different ways the robot can help the wheelchair. Relate this to real life.
3. Walls and Balls: Our favorite, as well as the children's favorite, are the wall and tennis ball breakouts. Try variations of setting the walls and balls in different positions.
4. Grand Finale: Put Lego sides on the robot to extend the knock- down ability. Place all of your supplies on the top of the ramp. Set the robot to run up the ramp and scatter everything in its path.

List of Materials:

- 1) MINDSTORM Lego kit
- 1) Table: approximately 3 ft. x 7 ft. with 2 inch deep sides
Hinged in the middle for easier transport.
- 2) Assorted small Legos to change and adapt robot
- 3) Assorted Duplo-style blocks
- 4) Ball marbles, figurines etc.

Conclusion

We invite you to take our ideas and our work. Please change it, expand it, and grow the careFIRST program with us. Our wish is for this program to belong to the entire FIRST community.

For more information about careFIRST and to request a starter kit of Lego's, visit:
www.sparky384.com/carefirst

Dedicated to the Spirit and Memory of

Brandon Smith

1983-2002