

Math Around Us: A Family Math Activity at a Football Game

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Introduction

Marcus, a young student, arrived at the football game with his mom and dad as they usually do each home game Saturday since his mom is a big university football fan and an Alumni of this university. Marcus is a precocious ten-year old. His mom wanted him to participate in the math activities at the football game. Marcus was excited about going onto the field to meet the players at the start of the game and then doing the mathematics activities. He worked during half-time with one of the math event organizers to find the area of the football field.

Before the start of the game, the multi-cultural, elementary students and their parents really enjoyed welcoming the team onto the field and meeting the university president. They then split up and went to watch the game with their families while doing the math activities together. At the end of the game, the families returned the surveys and gave feedback on the event. It was a fun event for all - watching football, spending time with their family, doing math, and seeing how math is all around us - even at a football game.

Math Around Us Defined and its Purpose

Math Around Us (Marinas, Furner, and Su, 2008) is designed to be similar to the *Family Math* Programs developed by Stenmark, Thompson, and Cossey (1986). The program is used to introduce parents and their children to good ideas that help them to improve their math skills and gain appreciation for mathematics while creating learning communities. *Family Math* was first started as a course which included six-to-eight sessions of an hour or two for parents and children to have the opportunity to develop problem-solving skills and to build an understanding with "hands-on" materials. The program originated from the Lawrence Hall of Science at the University of California, Berkeley as part of the EQUALS program. *Family Math* came from teachers' need for ideas and materials for parents to use at home to help their children in learning mathematics. The *Family Math* Program was created to focus entirely on parents and children learning mathematics together. Several schools have adopted this program and organized *Family Math* Nights to encourage student success in mathematics as well as to inform parents about the math curriculum of their children (Fagan, 2008; Lachance, 2007).

This article focuses specifically on the new event/program, *Math Around Us*, developed by Marinas, Furner, and Su (2008). This article will discuss the rationale for such an event along with illustrating how to develop your own family math activity showcasing the math around us (See Appendix A).

A Sample of a *Math Around Us*: The Football Event

University and school partnerships are vital to an ever-changing society where education is a central component, especially in large urban areas with multi-cultures living together. One public and two private universities in the urban South Florida region teamed up with students and parents from a tri-county urban area who participated in this football math event. This program/event addresses the need to have universities assist in school restructuring efforts via school improvement plans and may assist with its curriculum restructuring efforts and state math goals. One of the major goals currently in the Florida schools is to assist teachers and administration in training and implementation of the new Florida *Next Generation Sunshine State Standards* (Florida Department of Education, 2008). The Florida Department of Education, administrators, teachers, and university faculty are working hard to implement these standards as schools have been held accountable since 1999 via the Florida Comprehensive Assessment Test (FCAT).

The remainder of this paper focuses on implementing a *Math Around Us* family math event. A component to this professional development endeavor was to develop positive attitudes and perceptions toward learning math as well as to inform parents about the new *Math Standards*. As Furner (1996) and NCTM (1995) have found, math anxiety exists and needs to be addressed in developing confident learners in our society; we must show students how math surrounds us. Today parents are asked to be more encouraging and involved in the learning of mathematics and science of their child(ren). The role the university professors played in planning the family math event, *Math Around Us*, was instrumental in the implementation of this project. Bringing parents into the learning community and familiarizing them with the new *Math Standards* as well as developing positive attitudes and perception toward learning mathematics were the main goals behind the event. The professors in essence planted the seeds and nurtured their growth. They provided both resources and support for the students, parents, and even the teachers (as local teachers volunteered to help during the event)

Goals:

The *Math Around Us* Program was developed to address positive attitudes toward math, to show young people how math surrounds us, and to promote the *Florida Next Generation Sunshine State Standards*. This type of event can familiarize parents with the new standards and how educators are teaching their children. The emphasis/theme of the math event has been on literacy, math, science, and technology so that parents see the critical need for these areas in our more advancing technological era. Parents attend the family event with their children and as a family do math, reading, writing, while enjoying family time together watching a football game. Parents can see which math standards are emphasized with each math problem in the booklet as well as see how children are learning these topics. Parents doing these activities with their children sends a message that math, literacy, and even science and cooperative learning are important. A major goal of the *Math Around Us* is to increase parental involvement in our urban schools. A booklet containing problems related to the event is given to each child who attends the event. Placing booklets in the hands of our students relates to our state-wide goal to encourage a math environment. The developers of *Math Around Us* are hoping to create other activities like the football event, but in family settings, doing math while at a museum, mall, the beach, the zoo, in a variety of places in everyday life emphasizing how math surrounds us.

Planning (Appendix A):

Ideas for the planning and organization of the event are:

- Letter sent to the appropriate personnel at the host location
- Creation of the web site to disseminate updated information
- Create Math Activity Booklet
- Press Release
- Vendor requests for donation
- E-mails sent to schools, media, and professional organizations
- Registration Forms
- Details to participations the day prior to the event via email
- Thank you notes sent in a timely fashion

Action (Appendix A):

This event/idea was developed out of the desire to involve parents in the school and to show how math is all around us, in this case, even at a football game. The action taken was to assign a date to have a family night at the school to meet the above goals. Teachers, parents, and students are involved in the planning and implementation of this program. The local Parent Teacher Associations (PTA) can help with the promoting such events in the community with the hope that students will show higher motivation to learn mathematics. Please visit the website <http://matharoundus.com/football> for photos of the multi-cultural children and supporting materials from this event.

Mathematics Booklets (Appendix B):

The mathematics booklet was created by highlighting the various subject areas of mathematics as well as questions of differing ability levels. Some questions were just fact finding like "How many quarters are in a game?" while others require problem-solving techniques like "Why are some touchdowns 6, 7, or 8 points?" Remember to include related graphics to create interest for the participants. See Appendix B for more examples.

Evaluation (Appendix C):

The developers of the *Math Around Us* event distributed evaluation forms at the end of the event for parents and students to complete. Parents do not always know about all the various types of problems until participating in such an event. Many parents learned how their children are taught in school and what is emphasized. By participating, parents send a message to their children that literacy, math, science, and technology are necessary for the millennium. Parent evaluations indicate that we have accomplished our goal.

Summary from the survey results as follows:

- *Family Math Around Us: Insights from a Parent*
- *Family Math Around Us: The students found the purpose to learn football mathematics during the game and looked forward to future events.*
- *What Made the Family Math Around Us a Success: The cooperation from the host*

location and the desire from the participants to learn math at a sporting event (See Appendix C).

Summary

The Family *Math Around Us* event's goals are to promote awareness/knowledge of the *Next Generation Sunshine State Standards*, increase parental involvement, and demonstrate the importance of math, and how it surrounds us in all we do in life. Getting parents involved in their children's education sends a message to the children that it is important to learn mathematics for their daily lives. As math educators, we need to help develop students who enjoy and have a sound understanding of mathematics. Math is all around us. We must work to involve parents more and make sure they are aware of the new math standards as well as stress to them the importance of math if their children are going to compete globally for jobs in our high-tech society. For more information about *Math Around Us*, visit: <http://matharoundus.com>.

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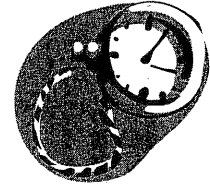
**Appendix A: Checklist of Planning a *Math Around Us* Event
(Preparations and Considerations)**

Items	Notes	Completed
<p>THEME OF THE EVENT</p> <ul style="list-style-type: none"> • Location • Timing • Contacts 		
<p>ADVERTISING (e-mail/phone):</p> <ul style="list-style-type: none"> • Media (TV, Radio, Newspapers) • Schools • Professional Organizations • Website/Bulletin Board • Signs/Posters • Recognition during the event • Camera for Day of Event and to post on Web Site • Thank you notes to everyone after the event directing them to the web site to view the photos 		
<p>MATH MATERIALS:</p> <ul style="list-style-type: none"> • Brochure/Booklet of Activities • Pencils and Paper • Handouts: Tips for Parents • Evaluation Form for Participants • Balloons • Math Standards Covered 		
<p>PERSONNEL:</p> <ul style="list-style-type: none"> • Organizers • Host Personnel • Volunteers 		
<p>DONATIONS:</p> <ul style="list-style-type: none"> • Prizes • Copying of Materials • Vendors 		
<p>OTHER ARRANGEMENTS:</p>		

Appendix B: Sample Problems from the booklet

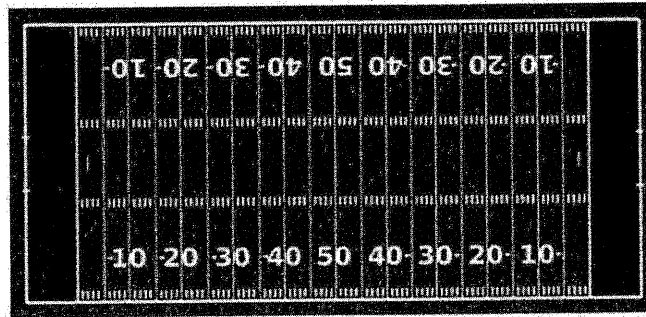
Arithmetic

1. How many quarters are in a game?
2. How long is each quarter?



Geometry

1. What is the shape of the football field?
2. What is the perimeter of the field in yards? Perimeter is the distance around the field.



Problem Solving and Number Sense

How many points for a touchdown?

1. Why are some touchdowns 6, 7, or 8 points?



Statistics

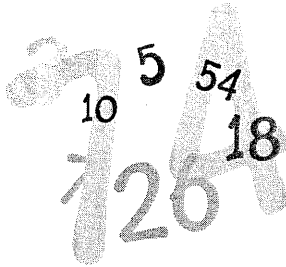
Survey Question: How often do you attend a sporting event in a calendar year (January to December)? (Ask 25 people this question and record the results in the table below.)

Times	Frequency
1-5	
6-10	
10-15	
More than 15	

Note: Related graphics are added to the activity booklet to create interest.

Appendix C: Survey Results

Event Sample Survey RESPONSES on Nov. 8, 2008



Age of Child(ren) _____

Age of Parent _____

Letter for corresponding response below	Child's Age	Parent's Age
A	10	28
B	8	28
C	8	37
D	8	47
E	11	45
F	12	50

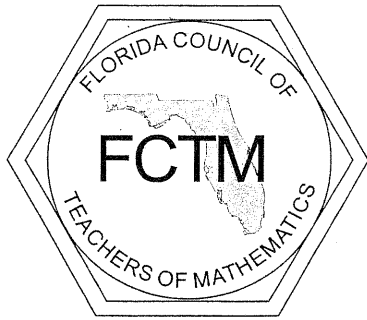
- Do you like math?
A. No B. Yes C. Yes D. Yes E. Kind of F. Yes
- What did you like most about the football game?
A. FAU beating FIU B. Watching fan C. The moves
D. Plays E. -----When we scored
- What did you learn about math at the football game?
A. How it relates to real life B. How math and football go together
C. The plays D. Points E. ----- F. Scores

4. Would you attend another Math Day?
- A. Yes B. Yes C. Yes D. Yes E. Yes F. Yes
5. Where did you hear about “Math Day at FAU Football”?
- A. --- B. --- C. The main entrance D. At the game
E. At game F. At the game
6. Where would you like to have a Math Day?
- A. Yes, so I can learn more B. At a football game C. Super bowl
D. At the game E. UCF F. At FAU
-

Joseph M. Furner, Ph.D. is an Associate Professor of Mathematics Education at Florida Atlantic University in Jupiter, Florida. His research interests are related to math anxiety, the implementation of the NCTM *Standards*, ESOL issues as they relate to math instruction, the use of technology in mathematics instruction, math manipulatives, family math, and children's literature in the teaching of mathematics. Dr. Furner has worked as an educator in New York, Florida, Mexico, and Colombia.

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Dimensions in Mathematics

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