Back to the Future

Using Communication Technology
for Mathematics

Outcomes
- Explore the changes that have taken place in our world.
- Explore the uses of the Internet as a tool for helping children in mathematics.
- Become familiar with some resources available for parents through the Internet.

Overview
Back to the Future is a module that takes place in a computer lab. The access for non-English speakers is limited (*see note below). It is an exploration into some of the Internet sites that are of interest to parents. In order to facilitate this workshop, you need to be comfortable with a browser and comfortable with surfing the Internet.

Before the workshop starts, the facilitator needs to check the Web sites mentioned in the workshop and the parent tour. Since Web sites change so often, there will be some sites that have been changed or discontinued.

The session starts with an exploration about how communications have changed through the generations. Participants share how their grandparents communicated and then dream up ideas that might be used in future generations.

The rest of the session is spent on the computers. Participants go on a parent tour. This parent tour starts at Figure This!, a project that provides eye-catching problems for middle school students to explore with their families. This site also has a family corner that is helpful for parents. The National Council of Teachers of Mathematics (NCTM) site is visited. It has an illuminations section that has good problems and it also has a family corner that includes ideas for parents to help their children. There are several places to visit at the Math Forum site, including Ask Dr. Math. Ask Dr. Math is a site where students can ask questions about assignments and look up answers to questions that have been asked by other students. There is a problem of the week contest and a list of old contests and solutions. Finally, there are several links to other mathematical Web sites.

After the tour, parents discuss why technology is important in the schools today and hear about how their school district is preparing students to enter a workplace where the ability to use technology is necessary. The NCTM Technology Principle is discussed.

The take home activities are then reviewed, estimation prizes distributed and any evaluation forms filled out.

*For groups of speakers of other languages:
The access of translations at the national mathematics sites is limited. Figure This! has been translated into Spanish and accessible by clicking an Español button. Spending the whole time on learning to translate on the Internet is a very worthwhile workshop for parents of limited English. The translation sites on the Internet seem to change daily! However, there is usually at least one that works well. Teach parents to use a search engine to find a site that is working. Then teach the parents to translate a sentence. Have them write a simple sentence in their native language. Use the translator site to translate the sentence into English and then back to their native language. Participants will find that the translation services are helpful but not completely accurate. They can also translate a page from any site by using a translator on the Internet. It will take a full workshop to learn the process. However, it is very powerful because they can translate any communication that they do not understand, including progress reports, homework assignments and contracts.

Technology Background
Researching Sites
a) Preparing the "My Web Sites" handout:
   When getting prepared for this workshop, it is imperative that the facilitator visit the Web sites. The sites change constantly and even disappear, even on the parent tour. Do not try to do this workshop without checking each site you plan to visit. Afterwards, update the "My Web Sites" handout for the participants. You can try to find Web sites that have changed by using a "Google" search with the key words of the missing site.

b) District Support:
   Often the district has a Web site that is very useful to parents. Record this Web site on the handout and plan to visit it during the workshop. Sometimes schools and/or teachers also have Web sites. If this is true of your school, be sure to include it.

c) Curriculum Support:
   Most mathematics textbook publishers maintain a support site for their materials. In order to find it, do a search for the publisher or the program name. Sometimes there is a spot that addresses parents' questions.

Background Information
a) Internet History:
   The pre-curser to the Internet was the telegraph system. In 1844 Morris got his telegraph line up and running between Washington and Baltimore and transmitted his first message: "What hath God Wrought?" By 1850, there were 12,000 miles of telegraph lines in the United States and the lines soon connected throughout the world. The idea of an Internet was born in the 1960s when the U.S. Department of Defense became interested in developing an alternative way to communicate. The corporation Bolt, Baranek and Newman was awarded a contract to develop a way for computers to talk to each other. The first networking happened in 1969 between Stanford, UCLA, UC-Santa Barabara, and the University of Utah. The concept of an Internet was born. The networking tool was very limited, and it soon became apparent that a more expansive networking capacity was required. Many view the beginning of the Internet as 1983 when a new system for networking was put into use Transmission Control Protocol / Internet Protocol (TCP/IP).

b) Web History:
   Individuals became interested in using the Internet when it became friendlier through the use of graphical point and click applications that were available for personal computers. In 1994 the first easily-available graphical Web browser was developed by NCSA Mosaic's whiz kid Marc Andreessen and others. Marc was among the founders of the Netscape Communications Corporation, which developed the new Web browser known as Netscape Navigator. Soon, people were using the Internet to find directions on trips, purchase tickets and clothing, help their children with homework, and write to each other. By 1999, the Internet had more than 200 million users world wide, and that number is still growing rapidly. To illustrate how this technology has been accepted, note that from 1969 to 1977, 107 new terminals were added to the network. In contrast, more than one million terminals were added in the first 6 months of 1995 and by 1999 more than 100 countries were linked into the global network.

c) Future:
   IDC (International Data Corportion), a company that analyzes the future, expects that by the year 2007, Internet users will access, download, and share the information equivalent of the entire Library of Congress more than 64,000 times every day.

Room Setup
- Computer Lab (with access to the Internet)
- LCD Projector
- Tables for sign-in, supplies, estimations, and snacks
- Overhead projector and screen
- Chart paper on easel
- Poster of the agenda

This module takes place in a computer lab. Have enough computers for the participants. You will need a display mechanism (LCD projector) that shows the computer screen while you are exploring the Internet. Before advertising the workshops, be sure that the Internet Server is working. Find out what can be done if problems arise.

Materials

Facilitator	Transparencies
• Overhead projector • Overhead pens • Transparencies, write-on • Easel stand • Chart paper • Chart markers • Masking tape • Timer (optional) • Computer • LCD projector (optional) • Estimation questions (prepared by facilitator) • Inexpensive prizes	*BLM 1: Welcome* *BLM 96: Communication Tools* *BLM 97: The Information Age* *BLM 99: NCTM Technology Statement*

Participant	Handouts
Individuals • Paper • Pencil • Reflection • Computer **Group of 2-4** • Chart paper • Chart markers	**One per participant for class** *BLM 96: Communication Tools* *BLM 98: My Web Sites* **One per participant for home** *BLM 100: Internet and Web History* *BLM 101: Exploring the Internet On Your Own* *BLM 102: List of Internet Terms* *BLM 103: Web Sites On Parent Tour*

Timing
2 hours

Preparation and Timing (2 hours and 15 minutes)

Part 1: Getting Started (15 minutes)

Display transparency from workshop one:
BLM 1: Welcome

Part 2: Setting the Stage (25 minutes)

Make transparencies of:
BLM 96: Communication Tools
Make a copy for each participant:
BLM 96: Communication Tools

Part 3: Internet Explorations (60 minutes)

Make transparencies of:
BLM 97: The Information Age
Make a copy for each participant:
BLM 98: My Web Sites (after having entered district and curriculum Web site information)

Part 4: Connections (5 minutes)

Make transparencies of:
BLM 99: NCTM Technology Statement

Part 5: Take Home Applications (5 minutes)

Make a copy for each participant:
BLM 100:   Internet and Web History
BLM 101: Exploring the Internet On Your Own
BLM 102: List of Internet Terms
BLM 103: Web Sites On Parent Tour

Part 6: Closing (5 minutes)

No handouts or transparencies
3-4 Inexpensive prizes for Estimation Question winners
Reflection / evaluations *(provided by the evaluation team)*

Facilitator Resources

Books

Standards 2000 Project, *Principles and Standards for School Mathematics*, The National Council of Teachers of Mathematics, Inc (NCTM), 2000, p. 24, ISBN 0-87353-480-8, www.nctm.org

Resources About the Internet

Growing Up Digital by Don Tapscott, http://www.growingupdigital.com/

Milleanials Rising by Neil Howe and William Strauss, http://www.millennialsrising.com/

Digital Natives, Digital Immigrants by Marc Prensky, On the Horizon, Vol. 9, No. 5, October 2001, http://www.twitchspeed.com/site/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.htm

Digital Natives, Digital Immigrants: Some Thoughts from the Generation Gap by Timothy VanSlyke, The Technology sours, May/June 2003, http://ts.mivu.org/default.asp?show=article&id=1011

Internet Sites for Parents to Explore (site addresses updated 9/25/03)

Parent Tour:
 www.math.arizona.edu/~mapps/

Math Sites on Parent Tour:
www.figurethis.org/index40.htm
www.figurethis.org/challenges/toc.htm
www.nctm.org/corners/family/websites.htm
illuminations.nctm.org/index.html
mathforum.org/pow/
mathforum.org/elempow/
mathforum.org/midpow/
mathforum.org/geopow/
mathforum.org/algpow/
mathforum.org/elempow/solutions/index.html
mathforum.org/elempow/solutions/solution.ehtml
www.ed.gov/pubs/parents/Math/
enc.org/weblinks/math/
mathforum.org/dr.math/
mathforum.org/dr.math/faq/faq.pi.html

Informational Web Sites:
wombat.cod.ic.ac.uk/foldoc/
systransoft.com/
webopedia.com/
www.mcli.dist.maricopa.edu/webhound/index.html

English Search Engines:
www.searchenginecolossus.com/
www.yahoo.com/
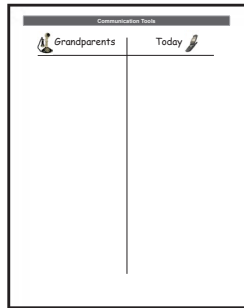www.yahooligans.com/
www.google.com/

Spanish Search Engines:
www.searchenginecolossus.com/Mexico.html
espanol.yahoo.com/
www.iguuana.com.mx/
www.google.com.mx/

Activities

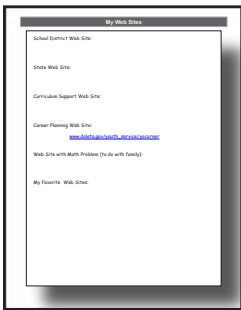| Preparation of Classroom	Notes
1. Before you begin these activities, research the location of libraries or places that have computers available to the public in the area that the participants live. This is so you can give the participants an idea of where they can use computers if they do not have access to one in their home. If the local school has computer times for families, let the participants know. 2. Pick a specific problem from Figure This (www.figurethis.org/challenges/toc.htm) for participants to find. Write this problem on **BLM 98: My Web Sites** before copying it for participants. Also, identify the Web sites of the school district, the state, mathematics curriculum support (often offered by the publisher) or what sites you think wiil be most useful to parents. 3. Set up a table with a sign-in sheet, name tags, and snacks. On another table set up three or four estimation activities. Have pencils, chart paper, markers available to participants for the first activity. 4. This workshop takes place in a computer lab. Have enough computers for each participant or for partners to share. It is helpful to have several student volunteers available to help parents. Find out if participants need a password to get on the Internet. 5. Set up an LCD projector (display mechanism that shows the computer screen) and a computer with an Internet connection. 6. Display the transparency of **BLM 1: Welcome!**. 7. Prepare and display a poster with the agenda and purpose of the session.	BLM 1: Transparency
Part 1: Getting Started (15 minutes)	
Introductions 1. Introduce yourselves and then have the participants introduce themselves. 2. Briefly explain the MAPPS program. Have participants who are involved in the program share their experiences. 3. Give participants an overview of the session. Review the agenda and purpose of the session. 4. Have the volunteer students introduce themselves and their parents if they are present.	

Activities

Part 1: Getting Started (continued)	Notes
Say: *These volunteer students will be tutors tonight as we explore technology. To ask for their help, raise your hand.* 5. **Ask:** • *How many of you have computers at home?* • *How many of you have more than one email address?* • *How many of you have purchased something online?*	
Part 2: Setting the Stage (25 minutes)	
Changes in Mathematics Education and Technology 1. Start by asking participants to do the following: *Life is changing all around us. In an effort to understand the changes in mathematics education today and the reason for those changes, we want you to explore with us some changes in technology and how it has affected our world.* 2. Distribute **BLM 96: Communication Tools** to groups of 3-4 participants. Display the transparency of **BLM 96: Communication Tools** which you will be using in step 4 for group reporting. Start by saying: *The first thing we would like your group to discuss is the difference in communication tools used by your grandparents when they were growing up and those we use today.* Make sure that participants understand the meaning of a communication tool by getting some examples from the groups and list them on the transparency of **Communication Tools.** *Using the **Communication Tools** hand out, record your ideas as a group. List as many communication tools as you can think of for your grandparents and today.* 3. Give participants a few minutes for working on this while you walk around to answer questions and check for understanding. 4. Reporting out: a) Have each group share one communication tool used by their grandparents. Record the ideas on the transparency of **Communication Tools** displayed in step 2. b) Ask groups if they have other ideas to share. Record these. c) After all ideas have been shared, have each group share their ideas for what communication looks like today. Record in the same manner as before.	BLM 96: Transparency / Handout

Activities

Part 2: Setting the Stage (continued)	Notes
5. Ask the participants: *What do you think communication will look like 20 years from now?* a) Discuss this in your group. b) Draw a picture of one or two of your favorite ideas. c) Be ready to share it with other groups, so make it large enough for everyone to see. 6. Have groups report out. After sharing have each group post their picture. 7. Discuss the fact that the world is rapidly changing, and our educational system has to change with it. One of the ways that education is changing is in trying to use technology for teaching. Tonight we will be exploring some of the ways that the Internet can help parents and students with education.	
Part 3: Internet Explorations (60 minutes)	
1. Display **BLM 97: The Information Age.** Say: *Here is an interesting fact and prediction. We are going to do some exploring on the Internet that will help you understand just how true this statement is. The information available today far exceeds the information that was available in 1987.* Discuss how this is true. 2. This activity is best done in a computer lab where individuals have access to a computer and to the Internet. You will lead the participants in the exploration of the Internet by connecting your computer to an LCD panel and conducting a parent tour located on the Office of Public School Programs Web site at www.math.arizona.edu/ ~mapps/. Before you begin this activity it is recommended that you take the tour to make sure everything is setup properly. Web sites change regularly, so some links will not work. 3. Take a quick survey on the surfing skills of the participants. Have participants who are novices team up with those who have Internet experience. Start the tour by saying: *You will be taking a tour that starts on the Web site for the Office of Public School Programs. Type the Web site address www.math.arizona.edu/~mapps/ in the location part of the browser. Click on the Parent Tour button.*	BLM 97: Transparency

Activities

Part 3: Internet Explorations (continued)	Notes

5. Take the tour with the participants. Pay close attention to the time.
    a) Hand out **BLM 98: My Web Sites** for parents to write down Web sites. Prior to class you will have already recorded some important Web sites.
    b) Ask participants to find a specific problem on the NCTM Web site for families, <u>Figure This</u>. Have participants record the problem on the **My Web Sites** handout, and do it with their family at home.
    c) At the <u>Ask Dr. Math</u> site, show parents how they can look for answers to questions in the archives.
 	
6. After the Parent Tour is over, have participants visit their school district Web site and curriculum support Web site . See if they can find specific information such as contact names, links to specific kinds of resources, etc., whatever are the most useful features to parents from a district site.
	BLM 98: Handout

Part 4: Connections (5 minutes)	

1.   Teachers today have the opportunity to explore many different sites on the Internet when looking for meaningful mathematical tasks for their students, including places like Dr. Math and NCTM that we visited on our tour.
 	
2.   Ask parents:
What do you know about how technology is used in your child's school?
Ask students:
How do you use technology in math?
 	
3.   Take some time to explain how technology is used in your school and district.
    a) What equipment is available to students?
    b) How is it used?
    c) Are there sections of your mathematics curriculum that use technology? If so, share that with the participants.
 	
4. Let participants know where they can use computers in their community if they do not have one at home.	

Activities

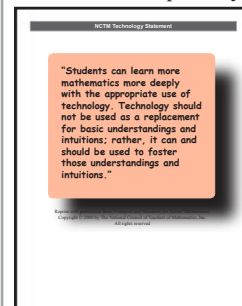| Part 4: Connections (continued)	Notes
5. Display transparency **BLM 99: NCTM Technology Statement**. Explain that the National Council for Teachers of Mathematics has created principles and standards for teaching mathematics in conjunction with business leaders. One of the principles is the technology principle (see Note A) and how it should affect the way that mathematics is taught in order to prepare our children for the work world that they will be entering. 6. Ask: *After your experiences this past two hours, how might you use the Internet to help you help your child in mathematics?* Have participants share their ideas.	BLM 99: Transparency **A. NOTE:** NCTM Technology Principle: *Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.*

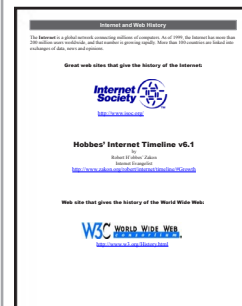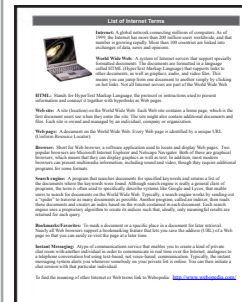| Part 5: Take Home Applications (5 minutes)	
1. Distribute handouts and wrap up the session with an introduction to the handouts for parents: **BLM 100: Internet and Web History** **BLM 101: Exploring the Internet On Your Own** **BLM 102: List of Internet Terms** **BLM 103: Web Sites On Parent Tour** 2. Tell the participants that in this session our goal was for them to begin to understand how the Internet can be used effectively for mathematic educational purposes. 3. Point out that the Web site, http//www.doleta.gov/youth_service/yocorner, is a good site to explore to help their child choose a career. It is listed on the **BLM 98: My Web Sites** handout.	BLM 100: Handout BLM 101: Handout BLM 102: Handout BLM 103: Handout

Part 6: Closing (5 minutes)	
1. Distribute any prizes for Estimation Question winners. 2. If your district does not have an evaluation form to use, you may want to use a reflection similar to: *"Something that I did during this session that made me think of technology differently was . . ."*	