

MATH! WHAT'S IT ALL ABOUT?

Student/Class Goal
Students will expand their understanding of the ways they use math in their adult roles and recognize that they use all the components of the math standard when they use math in their daily lives.

Outcome *(lesson objective)*
Students will understand what it means to solve problems and communicate in real life situations.

Time Frame
30-60 minutes

Standard *Use Math to Solve Problems and Communicate*

NRS EFL 1-2

Number Sense	Benchmarks	Geometry & Measurement	Benchmarks	Processes	Benchmarks
Words to numbers connection		Geometric figures		Word problems	
Calculation		Coordinate system		Problem solving strategies	
Order of operations		Perimeter/area/volume formulas		Solutions analysis	
Compare/order numbers		Graphing two-dimensional figures		Calculator	
Estimation		Measurement relationships		Mathematical terminology/symbols	
Exponents/radical expressions		Pythagorean theorem		Logical progression	
Algebra & Patterns	Benchmarks	Measurement applications		Contextual situations	
Patterns/sequences		Measurement conversions		Mathematical material	
Equations/expressions		Rounding		Logical terms	
Linear/nonlinear representations		Data Analysis & Probability	Benchmarks	Accuracy/precision	
Graphing		Data interpretation		Real-life applications	1.19, 2.22
Linear equations		Data displays construction		Independence/range/fluency	
Quadratic equations		Central tendency			
		Probabilities			
		Contextual probability			

Materials

Math Standard Overhead
Large chart paper, post-a-notes
Newspapers, sale ads, flyers, magazines, maps, etc.
Math! What's It All About Learning Objects

Learner Prior Knowledge

The purpose of this activity is to help students understand the standard "Use Math to Solve Problems and Communicate." This lesson will unveil misconceptions and anxiety that adults bring to the learning experience.

Instructional Activities

Step 1 - Preparation before class: Before class gather 6-12 sheets of chart paper (or as large a sheet as possible). On six of the sheets write one of the six questions:

1. Do you use math on your job? If yes, how do you use it?
2. How do you use math at home?
3. How do you use math when you are out in your community?
4. Do you always need an exact answer when you do math? When might an "about" answer be good enough?
5. What area of math do you find the most challenging/difficult?
6. Using a word, phrase, and or picture explain how you feel about math.

On the back of each sheet or on additional paper write one of the 6 components that go along with the math standard, *Use Math to Solve Problems and Communicate*. Post the sheets around the classroom (question side up) before the students arrive.

TEACHER NOTE The ABLE Standards and Benchmarks were created based on the Equipped for the Future standard's performance of components. These 6 parts together represent what it means to Use Math to Solve Problems and Communicate and can be talked about as our definition of math in the ABLE classroom. Use the Math Standard Overhead to discuss math in your classroom.

Step 2 - After the students arrive in class, divide the class into 6 groups. Explain that today the class will be looking at how math is used in our lives (as a worker, family member and community member). Each group will visit each chart and answer the question on the chart. Answers can be written directly on the chart (use a different color marker for each group) or on post-a-notes (give each group a different color, one idea per note). Groups do not need to repeat the answers of previous groups, but may wish to indicate if they agree with a response. Inform the class how long each group will have to respond to each question (5-7 minutes is usually enough). Allow students to answer all the questions.

Step 3 – After the students have completed the activity, walk around the room and read the student responses to the class. Commend the students on their many responses to the questions. At this point the lesson can continue in either of two ways:

A – Using questions, lead the students to recognize other ways math might be used in each of their life roles and when an “about” answer can be used (Questions 1-4). or

B – Pass out newspapers, sale ads, magazines, maps, instruction manuals, etc. Encourage the students use the resources to find additional ways math is used in each adult role.

As the new ideas are generated, have the students who suggested the ideas write (either directly or with a post-a-note) it on the appropriate paper.

TEACHER NOTE Be sure there is at least one activity on each sheet for each component.

TEACHER NOTE Questions 5 and 6 are useful for your/teacher preliminary assessment of your students’ attitudes about math, math anxiety, topics of concern, etc.

Step 4 - Next, using the question chart or the post-a-notes from each chart, reclassify the responses on the COP charts in which they correspond. Discuss the results of the reclassification with the students. Stress the idea that in order to use math effectively you must be able to use math in all the ways indicated by the Components of Performance (COPs). Stress to the students that doing math requires that all the COPs be used.

TEACHER NOTE Many students think of math only as COP 1 (Understand, interpret, and work with pictures, numbers, and symbolic information). This lesson can be very freeing for students with math anxiety as they learn math is more than computation.

Step 5 - Finally, ask the students to write a brief summary on what they have learned or to write an explanation of how math is used in their life. Encourage the students to reflect on what COP they feel their skills are the strongest? The weakest? This self assessment by the students will be useful to revisit throughout their ABLE experience.

Assessment/Evidence *(based on outcome)*

Chart paper questions with student responses on post-a-notes.

Additional post-a-notes with responses to questions.

Charts with math uses grouped by components of performance.

Teacher Reflection/Lesson Evaluation

This activity can be adjusted and used to assess student knowledge in a particular content area. Use similar questions but substitute a content area (e.g., geometry) for the word “math” in the question. This is a very effective way to determine the level of your students and what skills they want to know.

Next Steps

Math! What's It All About Learning Objects will give students additional practice with number sense, algebra and problem solving.

Technology Integration

Purposeful/Transparent

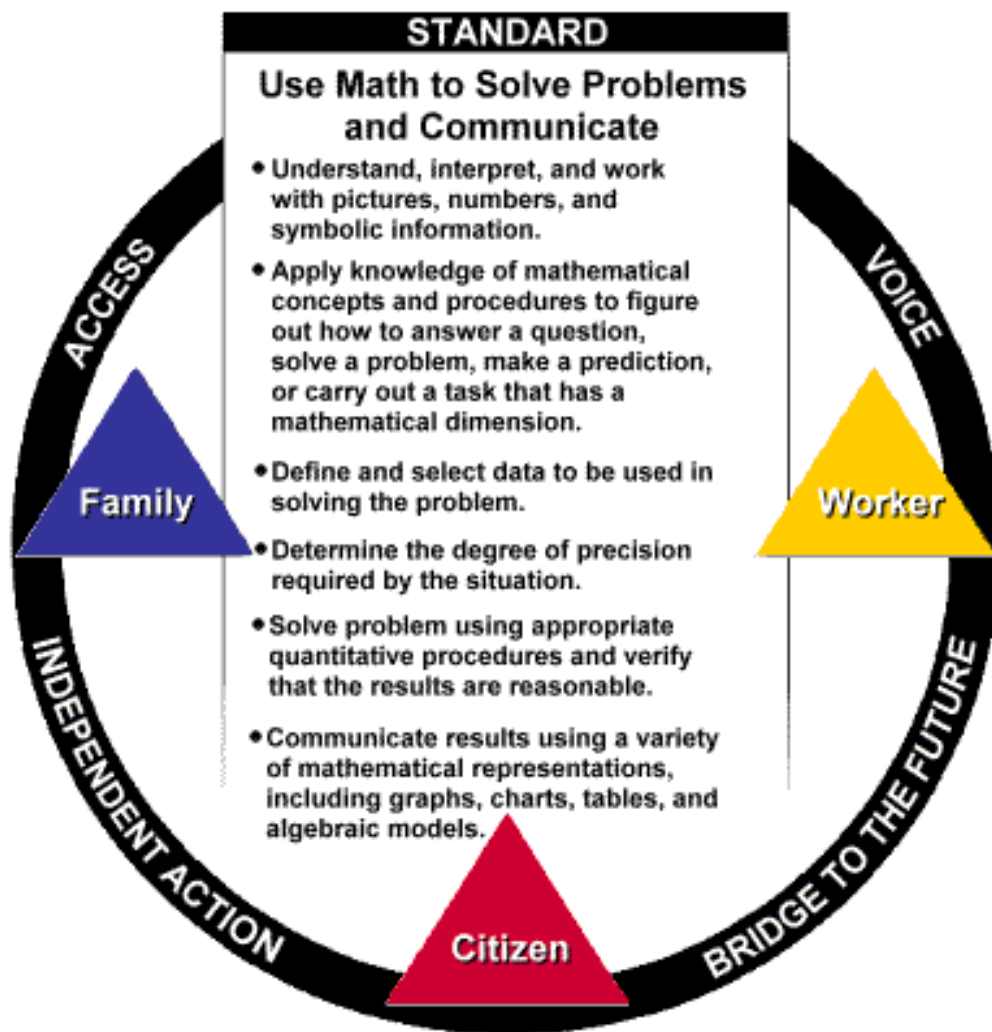
Students will expand their view of math by sharing their ideas on what math is.

Contextual

The plan is related to real world experiences of the students. Using realia insures the students continue to feel linked to practical situations.

Building Expertise

Students are using their personal background and experience to expand their understanding of the Math Standard and components of performance.



Math Standard Overhead



<http://www.wisconline.org>

Adding and Subtracting Signed Numbers

Author: Mona Wenrich

School: Fox Valley Technical College **Date:** 6/26/2003

Description: Learners follow the steps for adding and subtracting signed numbers and complete practice exercises.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM540

Adding Fractions with Unlike Denominators

Author: Tina Dietzman

School: Northcentral Technical College **Date:** 4/24/2006

Description: Learners follow steps to add fractions with different denominators. They also review fraction concepts, do a drag-and-drop exercise involving fraction terms, and add fractions with common denominators.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM5905

Basic Terms in Division

Author: Barbara Laedtke

School: Fox Valley Technical College **Date:** 2/12/2004

Description: In this interactive object, the learner examines the basic terms used in division. A quiz completes the activity.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM601

Fraction Basics

Author: Mary LeBrun

School: Northcentral Technical College **Date:** 9/28/2001

Description: Students view illustrations of fractions and identify fractions.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM501

Least Common Multiple

Author: Barb Hummel

School: Fox Valley Technical College **Date:** 3/20/2003

Description: Learners practice a technique for finding the least common multiple of a group of numbers.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM4902

Let's Count! (number 1-5)

Author: Bonnie Spilker

School: Fox Valley Technical College **Date:** 7/9/2003

Description: Learners match the numeral to the corresponding picture in a drag and drop exercise. This object includes audio and covers the numbers 1 to 5. It is designed to help parents to be the primary

teachers of their children.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM5002

Long Division – Step-by-Step

Author: Barbara Laedtke

School: Fox Valley Technical College **Date:** 10/8/2001

Description: This learning object explains the steps in a long division problem. Students learn where to put the quotient and how to find it.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM1001

Multiplication of a String of Signed Numbers

Author: Mona Wenrich

School: Fox Valley Technical College **Date:** 6/26/2003

Description: Students read how to organize their work when multiplying more than two signed numbers. A review and practice problems complete the activity.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM5202

Multiplying and Dividing Signed Numbers

Author: Mona Wenrich

School: Fox Valley Technical College **Date:** 6/24/2003

Description: Students read the rules used in multiplying and dividing signed numbers. They view examples and work practice problems.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM5102

Multiplying Monomials

Author: Roy Peterson

School: Northeast Wisconsin Technical College **Date:** 12/17/2001

Description: This activity provides instruction and practice problems on the multiplication of monomials.

http://www.wisc-online.com/objects/index_tj.asp?objID=TMH1201

Operations with Zero

Author: Douglas Jensen and Allen Reed

School: Northeast Wisconsin Technical College **Date:** 3/15/2005

Description: Learners review the basic math operations involving zero, emphasizing that division by zero is undefined. Examples are given.

http://www.wisc-online.com/objects/index_tj.asp?objID=GEM804

Order of Operations

Author: Barb Hummel

School: Fox Valley Technical College **Date:** 5/21/2001

Description: This activity shows students why the order of operations is necessary, what it is, and how it works. Students are given a mnemonic device for remembering the order, and they work through guided examples and practice problems.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM101

Ratios and Proportions

Author: Douglas Jensen and Allen Reed

School: Northeast Wisconsin Technical College **Date:** 5/2/2005

Description: In this interactive object, learners simplify ratios and solve problems using proportions. All terms are defined.

http://www.wisc-online.com/objects/index_tj.asp?objID=GEM2004

Simplifying Ratios with Fractions

Author: Mona Wenrich

School: Fox Valley Technical College **Date:** 5/1/2002

Description: The student views sample problems and then simplifies ratios in an interactive exercise.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM2702

Sorting Out Math Symbols

Author: Barbara Laedtke

School: Fox Valley Technical College **Date:** 4/26/2002

Description: Students read about what different math symbols mean and identify them in a matching exercise.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM1601

Subtracting Fractions with Unlike Denominators

Author: Bill Truttschel

School: Northcentral Technical College **Date:** 1/9/2007

Description: In this animated and interactive object, learners view two examples of how to subtract fractions with unlike denominators and then work five similar problems.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM6007

Subtracting Mixed Number Fractions with Borrowing

Author: Pat Walker

School: Fox Valley Technical College **Date:** 12/17/2001

Description: Students review examples of borrowing with mixed number fractions using the concept of borrowing the whole number 1. They then complete four practice problems.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM701

Understanding Place Value

Author: Laurie Jarvis

School: Fox Valley Technical College **Date:** 5/28/2002

Description: Students read about the place values of whole numbers. In an interactive exercise, they enter numbers in a chart to demonstrate their knowledge of place values and complete a matching exercise.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM1901

Understanding Rounding

Author: Laurie Jarvis

School: Fox Valley Technical College **Date:** 6/27/2002

Description: Students practice the skill of rounding.

http://www.wisc-online.com/objects/index_tj.asp?objID=ABM2001

Welcome to the World of Prime Numbers

Author: Jeganathan Sriskandarajah

School: Madison Area Technical College **Date:** 4/16/2001

Description: Using a chart on the screen and a calculator, the learner follows instructions to become familiar with and generate prime numbers between 1 and 100.

http://www.wisc-online.com/objects/index_tj.asp?objID=TMH301