	Матн с	Student/Class Goal Students wonder what kind of math skills are needed as they prepare to enter the job market. Time Frame 4 hours			
Outcome (lesson objective) The students will investiga	ate occupations				
The students will study th	is math content	and complete a job-specific wo	rkplace		
problem. They will write a	an evaluation es	say explaining the importance r	nath plays in		
their occupation of choice					
Standard Use Math to So	lve Problems and	NRS EFL 1-6			
Number Sense	Benchmarks	Geometry & Measurement	Benchmarks	Processes	Benchmarks
Words to numbers		Geometric figures		Word problems	
connection					
Calculation		Coordinate system		Problem solving strategies	
Order of operations		Perimeter/area/volume		Solutions analysis	
		formulas			
Compare/order numbers		Graphing two-dimensional figures		Calculator	
Estimation		Measurement relationships		Mathematical terminology/symbols	
Exponents/radical		Pythagorean theorem		Logical progression	
expressions					
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, 3.27, 4.34, 5.35, 6.36
Linear equations		Data displays construction		Independence/range/fluency	
Quadratic equations		Central tendency			
		Probabilities			
		Contextual probability			

Materials

Internet connection or printed copies of info about math required on the job *Math Needed on the Job* Handout

Learner Prior Knowledge

Ability to use a computer for web searches.

Instructional Activities

Step 1 - Discuss with the students if they use mathematics on their jobs. If so, what do they do that requires math? With the students, brainstorm a list of occupations that require knowledge of mathematics. After each occupation, list the math skills the job requires. Use a <u>T-chart</u> to organize the jobs and math skills on large chart paper and post in the classroom for reference.

Step 2 - Ask each student to research the math required for one or more jobs they are interested in. The web includes many sites students can use to find this information. The following websites may be helpful.

- Vocational Information Center Resource Center and Vocational Information Center
 - Multiple links for Math on the Job How You use Math at Work.
- The Mathematical Association of America, Research Sampler 6 Looks at how math is used in the fields of automobile production, nursing, banking, biology and science.
- The British Columbia Institute of Technology Shows examples of how math is used in technology. Most of these links are high level, but some are for algebra and geometry.
- The Futures Channel

Online movies showing how algebra is used in the real world. Clicking links on the left side of the page will bring up lessons using a work place context. The lessons on layout of frets on a guitar (patterns) and counting blood cells (estimation) were especially interesting.

XP Math - Introduction to Math Careers Database

Includes 277 careers that employ 88% of the American work force. Select a career, the math necessary for the job is listed.

TEACHER NOTE If you have no classroom computer access, encourage the students to research several occupations on a home or library computer. Internet resources can be overwhelming, so you might want to bookmark several of the best websites or make folders of websites by occupation (health care, manufacturing, etc.). Survey the class regarding their jobs of interest and print off information for the students to read in class. Less time will be required if you have materials already available.

Step 3 – Have each student complete the handout, *Math Needed on the Job* for each job they researched. Then ask students to share what they have learned with the class. These data can be used to expand the list developed during the initial brainstorming activity.

Step 4 - Using the information they learned about the math skills needed for the career they selected, use a math classroom resource to review/study that skill or find a lesson from the Mathematical Learning Conductor. For example, if a student investigated the job of a carpenter, they might study measurement. A student interested in nursing might study ratio and proportions. Encourage students working on the same math content to study together. Students may be working on several math skills as required by the occupation.

Step 5 - Find math problems a worker might encounter in each career selected by the students.

Micron Math in the Workplace Overview

This site divides math into five categories: Numbers and Operations, Measurements, Algebra, Geometry, and Data Analysis and Probability. After clicking each content area, a list of jobs that use that type of mathematics comes up. When you click a specific job, a math problem focused on that occupation appears. Use this site to print problems for your students.

Cord Contextual Lessons

Applied mathematics, algebra and geometry activities.

PBS Teachers Applied Mathematics

Job-specific math resources based on grade level, topic and subject.

Step 6 - Ask students to return to the handout to consider if their math skills match the job requirements they have chosen. Ask students to write an evaluation essay on the importance math plays in their occupation. Ask them to include plans for developing the math skills necessary for the job of their choice.

Assessment/Evidence (based on outcome) Completed workplace problem Evaluation essay

Teacher Reflection/Lesson Evaluation *Not yet completed.*

Next Steps

Students can investigate additional careers.

Technology Integration

T-Chart Graphic Organizer http://www.everythingesl.net/downloads/tchart.pdf Vocational Information Center – Math Resources http://www.khake.com/page47.html Vocational Information Center http://www.khake.com/page56.html The Mathematical Association of America, Research Sampler 6 http://www.maa.org/t_and_l/sampler/rs_6.html The British Columbia Institute of Technology http://commons.bcit.ca/math/examples The Futures Channel http://www.thefutureschannel.com/algebra/algebra_real_world_movies.php XP Math - Introduction to Math Careers Database http://www.xpmath.com/careers/intro.php Mathematical Learning Conductor http://www.ohiorc.org/for/math/learningconductor Micron Math in the Workplace Overview http://www.micron.com/k12/math/ Cord Contextual Lessons http://www.cord.org/example_lessons-and-activities19507 PBS Teachers Applied Mathematics http://www.pbs.org/teachers/math/inventory/appliedmathematics-912.html

Purposeful/Transparent

Students select the occupations they are interested in and focus learning math necessary for those jobs.

Contextual

Students use the Internet and investigate lots of jobs. Most web sites use info from actual people employed in the field

Building Expertise

Students learn how the math they may already know is important and also learn additional math they need to know for the jobs they are interested in. If using the computer to search web sites, students learn to search the web to find career information. They can carry this skill to other learning.

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Math skills required for this job:

Tasks required on the job where you will need to know math:

Sources where I found this information: 1.) _____ 2.) _____ I found the math ___easy ___hard for this job. Explain why: (check which one) Job_____ Math skills required for this job: Tasks required on the job where you will need to know math: Sources where I found this information: 1.) _____ 2.) _____ I found the math ___easy ___hard for this job. Explain why: (check which one)

Math Needed on the Job Handout