

<b>MATH ON THE JOB</b>		<b>Student/Class Goal</b> Students wonder what kind of math skills are needed as they prepare to enter the job market.
<b>Outcome</b> <i>(lesson objective)</i> The students will investigate occupations to discover the math required on the job. The students will study this math content and complete a job-specific workplace problem. They will write an evaluation essay explaining the importance math plays in their occupation of choice.		<b>Time Frame</b> 4 hours
<b>Standard</b> <i>Use Math to Solve Problems and Communicate</i>		<b>NRS EFL 1-6</b>
<b>COPs</b> Understand, interpret, and work with pictures, numbers, and symbolic information.	<b>Activity Addresses Components of Performance</b> Students will work with a variety of symbolic, pictures and numeric representations depending on the math content studied.	
Apply knowledge of mathematical concepts and procedures to figure out how to answer a question, solve a problem, make a prediction, or carry out a task that has a mathematical dimension.	Students will use the math content they studied to complete a workplace math problem. Students will use calculators to solve problems	
Define and select data to be used in solving the problem.	Students will select and study the skills necessary for a selected occupation.	
Determine the degree of precision required by the situation.	Students will evaluate whether the math required for an occupations requires precise calculations or estimations.	
Solve problem using appropriate quantitative procedures and verify that the results are reasonable.	Students will determine that answers are reasonable.	
Communicate results using a variety of mathematical representations, including graphs, charts, tables, and algebraic models.	Students will write an essay evaluating the math skills needed in an occupation they are investigating.	
<b>Materials</b> Internet connection or printed copies of info about math required on the job <i>Math Needed on the Job</i> Handout		
<b>Learner Prior Knowledge</b> Ability to use a computer for web searches.		
<b>Instructional Activities</b> 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 <a href="#">T-chart</a> 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. <ul style="list-style-type: none"> <li> <a href="#">Vocational Information Center Resource Center</a> and <a href="#">Vocational Information Center</a> Multiple links for Math on the Job – How You use Math at Work.</li> <li> <a href="#">The Mathematical Association of America</a>, Research Sampler 6 Looks at how math is used in the fields of automobile production, nursing, banking, biology and science.</li> <li> <a href="#">The British Columbia Institute of Technology</a> Shows examples of how math is used in technology. Most of these links are high level, but some are for algebra and geometry.</li> <li> <a href="#">The Futures Channel</a> 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.</li> <li> <a href="#">XP Math - Introduction to Math Careers Database</a> Includes 277 careers that employ 88% of the American work force. Select a career, the math necessary for the job is listed.</li> </ul>		

**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.everythingsesl.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](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](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](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.

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)



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)