

Proficiency Class Design

Working with students that have failed the proficiency exam can be a challenging and rewarding experience. Many students that fall into this particular category have severe math anxiety and doubt their own mathematical abilities. It is our philosophy that students who are enrolled in a proficiency remediation program need to work on their own weak areas and reinforce strengths in an independent manner; however, having a self-paced class tends to be unproductive to an extent. When we worked as a team to see what curriculum would work best, we found that if we combined many techniques, then the students have a better chance of success. Before we discuss a possible class design, we must emphatically state that every student in this class must be given some sort of success on any level. This requires the teacher to connect to students personally and examine each student's weaknesses in order to fill in the gaps in their knowledge.

Class Design: In order to give students success a variety of tasks can be offered. A suggested time frame is given:

- a) Two-three hours a week - individual work using the matrix needs assessments.
- b) 1 -2 hours a week - computer time. Whether students are enrolled in a proficiency preparation class on-line or they are working with math manipulatives or games, this allows a different modality to be accessed.
- c) One to three hours once every three weeks - Taking practice/mock exams. This allows students to update their individualized matrices and work toward closing the gap in their weak areas. As a testing date approaches, increase the amount of time dedicated to mock exams.
- d) One hour a week - (this can easily be broken into smaller chunks of time) Manipulative practice or entire class lessons. Students can learn mathematical patterns and alternative algorithms to practice new or pre-requisite skills.
- e) Half hour every other week - Test-taking strategies, math anxiety training. Updating and charting the kid-friendly standards documents.
- f) Once a week - Personal meeting with each student to focus on areas of concern, answer specific questions, and evaluate progress toward goals. Students need to be aware of what they need to know in order to pass the proficiency exam. A list of standards in kid-friendly language are provided for this purpose. As students work through the material in this class, they should write problems that deal with an essential question in the space provided. They can check their knowledge level of the skill frequently.

A) Practice Exams -

Having students take multiple practice exams helps identify areas in which assistance is needed. At the beginning of the class, results from the most recent exam can be used to fill in the Results Matrix. As students take practice exams every three weeks, they can update their Results Matrix accordingly. ****Washoe County Edusoft users can download practice exams from Edusoft (see directions under Practice Exams/Packets sections of this guide)****

B) Results Matrix and Matrix Assignment Sheet -

Once students have results from a proficiency test, either from the state or from Edusoft, they need to fill out their individual Results Matrix. As students identify their areas of greatest need they can work individually on assignments and review materials as shown in the matrix assignment sheet.

C) Whole Group Lessons/Manipulatives -

In this resource guide a sample lesson is provided to review general areas of weakness. Lessons can be short or supplemented for more in depth coverage of the topic. It is important that students are shown alternative ways to solve problems and have chances to discover patterns. This builds confidence in mathematics and is crucial to success.

D) Computer Time -

Students can benefit by using several resources on the computer. Some great programs and resources include:

- 1) Moogie Math
- 2) www.supermathtutor.com
- 3) Virtual Manipulatives website at <http://nlvm.usu.edu/en/nav/vlibrary.html>

E) Test-taking Strategies/Math Anxiety training -

These mini-lessons are designed to increase student confidence and reduce stress level in any testing situation.

F) Updating and Charting the kid-friendly standard documents -

Students can put completed problems in the grid sheet and rate how they feel they are doing to master that particular standard.

Preparing A Proficiency Remediation Class

This section of the resource guide is designed to help a teacher prepare a proficiency remediation course. It can be modified for each individual school's schedule and needs.

Included in this section are the following documents:

- 1) Course Syllabus – Note the most important items on the syllabus are the grading policy (done by daily participation), resource lists, class structure, teacher availability, testing dates for the year, and any additional required attendance times that are not in the school day.
- 2) Parent Night Letter – This letter is designed for a parent night. It is our recommendation to have a separate parent night for students enrolled in this course in order to introduce parents to the unique structure of the course and the requirements for passing the exam.
- 3) Class Contract – The goal of this document is for students and parents to understand the roles of the teacher and student in the proficiency class. By signing the contract each party agrees to fulfill his/her role.

RESOURCES

- 1) Books –
 - a. *Passing the Nevada High School Proficiency Exam in Mathematics* by the American Book Company. For ordering, go to www.americanbookcompany.com
 - b. *Elementary and Middle School Mathematics - Teaching Developmentally* by John A. Van de Walle ISBN: 0-205-48392-5. We have multiple copies of this book in the NW RCTL library. You can contact Joan Collins at jcollins@washoe.k12.nv.us for details on checking out books.
- 2) Computer programs/links –
 - a. Moogie Math - <http://www.emanuelsoftware.com/> This is a hands-on fun practice site for students.
 - b. www.supertutor.com - visit the web-site. For a charge, students can have their own account set-up to work on throughout the year tracking their progress.
 - c. http://svhs.ccsd.k12.nv.us/math_proficiency/mathematics_proficiency.html This Las Vegas school has an excellent web-site with practice exams.

- d. <http://nlvm.usu.edu/en/nav/vlibrary.html> This website has virtual math manipulatives that students can use to practice skills.
- e. <http://www.rpdp.net/HSPE1.htm> - This is the Southern RPDP's website. It has many resources for teachers to use including practice materials.
- f. www.Explorelearning.com - this site has "gizmos" to have students explore difficult topics in all standard strands.

Teacher tip - You need scores for each time your students took the HSPE before enrolling in the class. It helps to put aggregated results in a binder, in order to help students track trends in improvement and areas of weakness. The first day of class, each student can analyze his/her individual scores for each category and set goals. Check with your school's curriculum vice-principal or a counselor to get print-outs of previous scores.

Practice Exams/Practice Packets

Practice Exams and Practice Packets are available on Edusoft for Washoe County School District Teachers. Teachers outside Washoe County, can e-mail Holly Young at hyoung@washoe.k12.nv.us.

Practice Exams should be set-up in a testing environment similar to that of the actual test, whenever possible. Immediate feedback is important and can lead to re-evaluation of goals. Some things to consider – administering the practice test after school (or on a Saturday) in a different classroom, finding a proctor other than the familiar teacher, and reading a prepared testing script. Be sure to account for students with IEP accommodations.

DOWNLOADING TESTS FROM EDUSOFT:

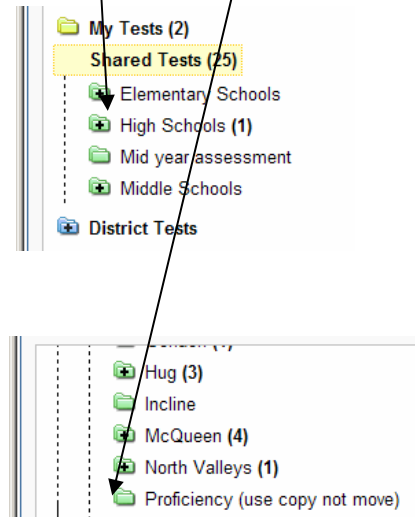
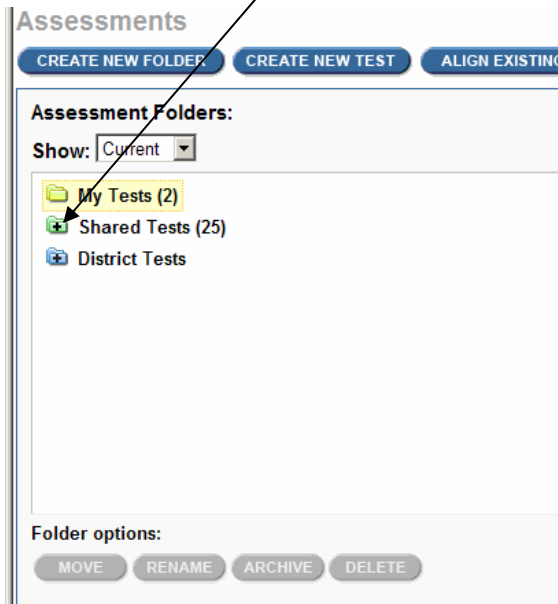
Practice Exams and Practice Packets are available to download off of Edusoft. You can print student answer sheets and scan them for immediate results.

In order to download the test:

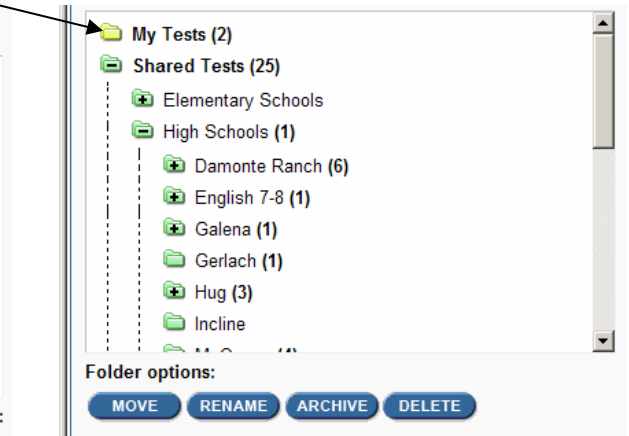
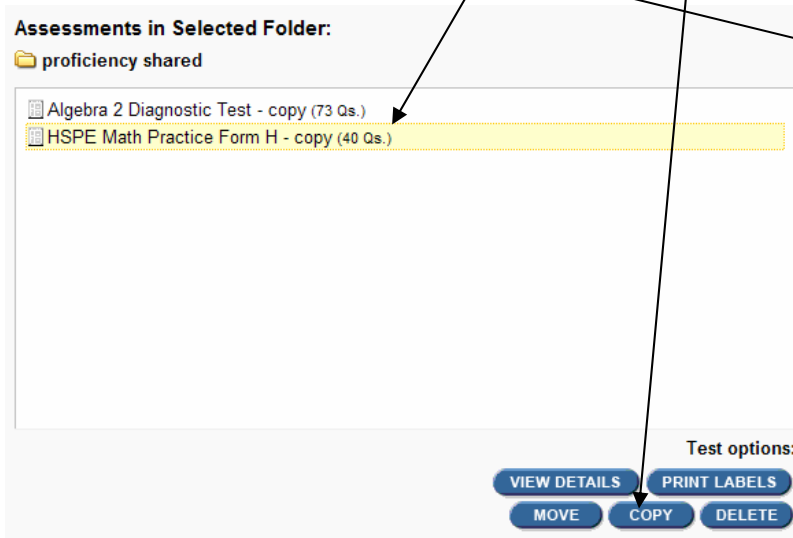
- 1) Go to www.edusoft.com and log-in.
- 2) Go to the Teacher Tools tab at the top, then choose Assessments.

The screenshot shows the Edusoft website interface. At the top, there is a navigation bar with tabs for State Analysis, Benchmark Exams, Teacher Tools, Curriculum, and Admin. Below this is a secondary navigation bar with icons for Assessments, Test Results, Tools & Analysis, and Instructional Resources. The main content area is titled "Teacher" and includes links for Contact Support, Library, Logout, and Help. A section titled "Assessments" is highlighted, with a description: "Find, create and share classroom-based assessments aligned to standards. Administer assessments in paper & pencil fashion." A callout box titled "Student Performance Report" is also visible, with a description: "See how individual students performed on multiple tests." Two arrows from the text above point to the "Teacher Tools" tab and the "Assessments" section.

3) Click the Shared Tests folder, click High School, there is a folder there marked Proficiency (use copy not move). Click on that folder.



3) At the box on the right, choose the test you would like, then look at the bottom of the box and choose COPY. You must put a copy of the test in My Tests at the top of the list of folders, otherwise, you can't print answer sheets!



- 4) Now, go into My Folders where a copy of the test is located. Click on the test. You will get to a screen that has a download button. If you click that button, then you can print out a copy of the test for your students. Also, there is a button for printing answer sheets.

Test Details
< [Back](#) to the Assessments locker

HSPE Math Practice Form H - copy - copy

None

40 Questions:

- 40 Multiple choice
- 0 Short answer
- 0 Long answer - point scale
- 0 Long answer - weighted rubric

[View Question Details](#)

Students with scores: 0

Standards Covered:

- [NVA5--Mathematics \(2006\)--Grades: 9-12--A Indicator 1](#)

Created by:
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PRINT ANSWER SHEETS

EDIT

COPY

DOWNLOAD TEST

UPLOAD TEST

Difficulty: -
Rating: - / 10
[Rate](#)

Manipulatives / Group Lessons & Computer Work Time

The textbook can become monotonous if used as the sole source of information and practice for students. The teacher should creatively mix the textbook with group lessons, manipulatives and computer work time.

Multiplication facts can be an important place to start. The Teacher will interview each student to go over their goals. One can determine quickly if a student needs help memorizing their multiplication facts. Fact triangles are an easy way for students to learn these quickly. Some fact triangles can be found on the internet, the lesson found in this guide was found at:
<http://web001.greece.k12.ny.us/files/1938/Multiplication%2520Division%2520Fact%2520Triangles.pdf>

Group lessons can be very helpful. The teacher needs to assess the students either by their previous scores, or by practice exams. One can determine levels of deficiency on the group level, and prepare a group lesson to address that issue. Some great group lessons about fractions can be planned by using fraction bars. Lessons on place value or decimal value can be implemented using base 10 blocks. Algebra tiles can help with algebra deficiencies. The group lessons are to be used to provide an alternative to individualized instruction.

Manipulatives can be used on the group or individual level. Some helpful manipulatives can be: fraction bars, base 10 blocks, peg boards, unit origami, multi-link cubes. A great source of ideas for using manipulatives can be found in the book *Elementary and Middle School Mathematics: Teaching Developmentally*, Fifth Edition (Paperback) by [John A. Van de Walle](#) (Author) This book is available for check out from RPDP. Call Holly Young for more info.

Computer Time is a great way to get kids to practice in an alternate way. Teachers can have kids work individually in programs such as *Moogie Math*, or *Supermathtutor.com* to get loads of practice in a short amount of time. Both programs provide positive reinforcement and students usually like spending time on them. Teachers can get individualized data on student performance from both programs. *Geogebra* is a free program that is similar to *Geometer's Sketchpad*. Students can be paired or placed in small

groups and given a project corresponding to a specific topic. The teacher can use a jigsaw format to have students present their projects to the class.

CHARTING STUDENT PROGRESS ON KID-FRIENDLY STANDARD DOCUMENTS

A copy of the standards written in kid-friendly language is included in this guide. Each standard is written as a "Can You" question including the item specifications to make each standard very specific. It is our recommendation that students frequently track their progress towards mastering the standards (there is a column for students to rate their personal mastery level). We recommend that students find problems from previous tests or from other resources to copy into these documents. This can be a valuable tool for studying for the HSPE.

Each standard is listed with a number including two decimal points. For example:

1.12.3

The first number (in this case 1) represents the standard in question, either (1) Number Sense & Computation, (2) Patterns, Functions, and Algebra, (3) Measurement, (4) Geometry & Logic, or (5) Data Analysis. These five standards appear at the bottom of each page in the document for immediate reference.

The middle number (12 in the example) represents the grade level. Only standards listed as grade 12 will appear on the proficiency test. However, there are grade 8 standards listed in the following documents. We feel that even though the standard terminates at grade 8, the skill is an important one that can surface imbedded within another problem.

The last number (3 in the example) is a theme that exists across grade levels, such as "lines, angles, and their properties" or "permutations and combinations."

Nevada State Standards for the NV Proficiency Test

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
1.8.1	Can you write numbers using scientific notation in mathematical and real life situations?		
1.8.2	Can you change fractions, decimals, and percents, including percents greater than 100 or less than 1? Can you use them in real life situations?		
1.8.3	Can you compare and order real numbers, including powers of whole numbers?		
1.8.5	Can you identify perfect squares to 225 and their corresponding square roots?		
1.12.6	Can you find the value of a number raised to a power?		
1.12.6	Can you solve an equation that has answers in radical form (perfect squares up to 225 need to be memorized)?		
1.12.7	Can you correctly use the order of operations?		
1.12.7	Can you solve mathematical problems involving exponents and roots?		

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
1.12.7	Can you add two matrices? Can you subtract two matrices? Can you perform scalar multiplication?		
1.12.8	Can you choose the correct property (commutative, associative, distributive) when solving a problem? Can you calculate an absolute value of a number?		
1.12.8	Can you perform the commutative, associative, and distributive property correctly with numbers and variables?		
2.12.1	Can you write an equation that represents a table or number sequence? Can you find the pattern in order to continue a number sequence or table?		
2.12.2	Can you solve for a specific variable given an equation (inequality, proportion, or formula)?		
2.12.3	Can you add/subtract polynomials (expressions with x^2) being the highest power?		

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
2.12.3	<p>Can you multiply polynomials (expressions with x^2)?</p> <p>Can you factor a polynomial where x^2 is the highest term where your answer could be a fraction and there could be a number in front of x^2 (the largest it can be is 3)?</p> <p>Can you multiply powers with the same base including coefficients?</p> <p>Can you raise a power to a power?</p> <p>Can you find the power of a product?</p> <p>Can you divide powers with the same base?</p> <p>Can you raise a fraction to a power?</p> <p>Can you rewrite a negative exponent with all positive exponents?</p>		
2.12.3	<p>Can you add/subtract radicals? Can you breakdown a radical into simplest form? Can you multiply radicals?</p>		

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
2.12.4	<p>Can you find domain and range from a graph, a list of ordered pairs, and from an equation? Including $[f(x) = x^2]$</p> <p>Can you solve absolute value equations and inequalities?</p>		
2.12.5	<p>Can you find all possible intersections of 2 lines using the graphing, substitution and elimination methods?</p>		
2.12.6	<p>Can you solve a quadratic equation by factoring?</p> <p>Can you solve a quadratic equation using the quadratic formula?</p>		
3.12.1	<p>Can you change between measurement units, such as inches to feet and feet to meters?</p> <p>Can you estimate the size of various units?</p>		
3.12.2	<p>Can you explain what precision, error and tolerance are, the differences between them, and when to use each?</p>		

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
3.12.3	<p>Can you calculate and compare rates, distances ($d=rt$)?</p> <p>Can you calculate simple interest ($i=Prt$)?</p> <p>Can you convert temperature between Celsius and Fahrenheit?</p> <p>Can you solve for any variables within any of the above formulas?</p>		
3.12.4	<p>Can you read charts, tables, and graphs that relate to finance, such as profit, loss, debt, income, and taxes?</p> <p>Can you make sound financial decisions after examining data (choose the best deal or predict the graph at some time period in the future)?</p>		
3.12.5	<p>Can you use geometric relationships to find missing measures and angles?</p> <p>Can you use formulas to calculate measures such as area and volume?</p>		
4.12.1	<p>Can you identify and use the properties of interior and exterior angles of polygons to solve problems?</p>		

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
4.12.1	Can you identify and use the parts of a circle to solve problems?		
4.12.2	Can you solve for a missing side or angle of a triangle given a similar triangle using a proportion? Can you solve for a missing side of a right triangle (45-45-90 or 30-60-90) using sine, cosine, or tangent?		
4.8.3	Can you name the transformation (translation, reflection, rotation, dilation) from one figure to another?		
4.12.5	Given the graph or its equation, can you find the slope? Can you find the equation of a line that is parallel or perpendicular to another line? Can you find the slope of a line that is not in $y=mx+b$ form? Can you find the slope of a line between two points? Can you match an equation with its graph? Can you find the solution (x-intercepts of a graph or equation)?		

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
4.12.5	<p>Give the graphs or equations of two lines, can you determine if they are parallel, perpendicular, or neither?</p> <p>Given two equations, can you find the intersection or determine if they are parallel?</p>		
4.12.6	<p>Can you solve problems that have complementary, supplementary, congruent, and vertical angles?</p> <p>Do you know all the relationships of angles when parallel lines are cut by a transversal?</p> <p>Can you solve for the interior and exterior angles of polygons? Do you know the definition of a regular polygon?</p>		
4.12.7	<p>Can you use the Pythagorean Theorem to find one unknown side of a right triangle? Can you use the Pythagorean Theorem to check whether a triangle is a right triangle?</p> <p>Can you use the Pythagorean Theorem to solve a real-life problem (a ladder leaning against a wall)?</p>		

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
4.12.8	Can you construct angle bisectors, segment bisectors, midpoints, perpendicular bisectors with a compass and straight-edge and then solve problems with the relationships they create?		

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
4.12.9	<p>Can you define hypothesis, conclusion and identify them in a conditional statement?</p> <p>Can you represent logical relationships using conditional statements and determine reasonable conclusions?</p> <p>Can you provide or identify counterexamples for a conditional statement?</p> <p>Can you distinguish between inductive and deductive reasoning?</p> <p>Can you analyze and complete a Venn Diagram given multiple facts/rules?</p> <p>Can you determine which counterexample is appropriate to use to disprove a logical argument?</p> <p>Can you examine a series of conditional statements and use deductive reasoning to come to a logical conclusion?</p> <p>Can you examine a pattern and use inductive reasoning to make a conjecture/formula/or rule to extend the pattern?</p>		

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
5.12.1	<p>Can you organize data into a stem and leaf or box & whisker plot?</p> <p>Can you organize data into a bar graph, line graph, or circle graph?</p> <p>Can you take information and organize it into a matrix?</p>		
5.12.2	<p>Can you calculate mean, median, mode, and range on a data set?</p> <p>Can you determine the best measure of central tendency to describe a data set for a certain purpose?</p> <p>What effect does an outlier have on the mean, median, mode, and range?</p> <p>How does a box and whisker graph describe how the data is spread out?</p>		

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
5.12.3	<p>Can you distinguish between a sample and a census?</p> <p>Can you identify sources of bias and their effect on data representations and statistical conclusions?</p> <p>Can you determine the appropriateness of a data display using the shape of a normal distribution to compare and analyze data from a sample?</p>		
5.12.4	<p>Apply permutations and combinations to mathematical and practical situations, including the Fundamental Counting Principle.</p>		
5.12.5	<p>Can you determine the probability of a repeated event with and without replacement?</p> <p>Can you design, conduct, analyze, and effectively communicate the results of a multi-stage probability experiment?</p>		

Standard	Essential Questions	Problems/Examples	Rate It! 1 (needs work) – 4 (know it!)
5.12.6	<p>Using raw data gathered from an experiment can you determine which data display would be most appropriate (bar graph, line graph, stem & leaf, box and whisker, circle graph)?</p> <p>Can you make either a bar graph, line graph, stem & leaf, box and whisker, circle graph from given experimental data?</p> <p>Can you look at a bar graph, line graph, stem & leaf, box and whisker, or circle graph and communicate important points about the data (most, least, rate of change, data spread, etc)?</p>		