

Measurements of Student Progress (MSP) Mathematics Assessment Updates

Grades 3–5

WERA PRESENTATION
December 8, 2011

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Agenda

- ▶ Goal
 - Provide information and resources to educators and students
- ▶ Resources for Teachers
 - 2011 Lessons Learned from Scoring Student Work
 - Updates for 2012
 - Teacher Tool
 - MSP Support Moodle



2011 Lessons Learned

Based on information gathered from:

- ▶ Rangefinding
 - Student responses for short-answer items show common misconceptions and work considered insufficient or unclear
- ▶ Scoring Operational Items
 - Data shows most difficult items
 - Data shows which incorrect responses in multiple-choice items are attractive to a significant number of students
- ▶ Data from Pilot Items
 - Same as “Scoring Operational Items”

List actions students can take to increase scores and describe content difficult for students.




Sample Items in This PowerPoint

Disclaimer:

- ▶ The sample items in this PowerPoint were created without the benefit of committee approval (teacher and bias/fairness), vocabulary checks, student piloting, and data evaluation.
- ▶ These items were created to help illustrate information in this presentation.



2011 Lessons Learned

- ▶ http://www.k12.wa.us/Mathematics/Lessons_Learned.aspx 
- ▶ Multiple-Choice (MC) Items
 - Answer every item; there is no penalty for guessing
- ▶ Completion (CP) Items
 - Erase completely answers students want to change
 - When a scorer cannot read a student's answer because a number is written on top of another number, the student is not given credit
- ▶ Short-Answer (SA) Items
 - Show work.



Information for Grades 3–5

- ▶ Start with the numbers in the prompt and show the operations and results of each step when solving multi-step word problems.

Sample item follows.



Sample Item – 3.2.H

Adrian does a number of sets of push-ups each day to increase his strength. For each set, he does 16 push-ups. |

Adrian's Push-up Record

Mon.	Tues.	Wed.	Thurs.	Fri.
3 sets	2 sets	4 sets	6 sets	7 sets

What is the total number of push-ups Adrian did on Monday and Tuesday?

Show your work using words or numbers.



Sample Rubric–2 pt. response

- ▶ A student shows understanding of solving a multi–step word problem involving multiplication by doing the following:

Understanding:

- uses 3, 2 and 16

Procedure:

- shows a procedure to determine the total number of push–ups

Answer:

- writes 80



Sample Responses

- ▶ Response with full credit:

$$3 + 2 = 5$$

$$5 \times 16 = 80$$

What is the total number of push-ups Adrian did on both days? 80

- Response with full credit:

$$16 + 16 + 16 = 48$$

$$16 + 16 = 32$$

$$48 + 32 = 80$$

What is the total number of push-ups Adrian did on both days? 80



Sample Rubric–1 pt. response

- ▶ A student does one of the following:
 - uses 3, 2, and 16 and shows a procedure that could lead to determining the total number of push-ups
 - writes 80.



Sample Responses cont.

- ▶ Response with partial credit:

$$3 + 2 = 6$$

$$6 \times 16 = 96$$

What is the total number of push-ups Adrian did on both days? 96

- ▶ Response with no credit:

$$6 \times 16 = 96$$

No evidence to show where “6” came from.

What is the total number of push-ups Adrian did on both days? 96



Use Equals Signs Correctly

Incorrect Usage

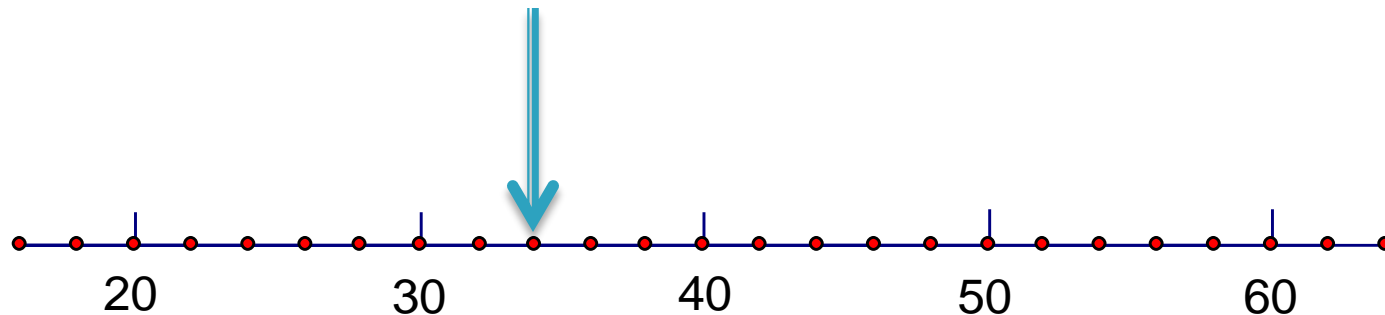
- $4 + 3 = \boxed{7} + 2$
- $3 + 2 = 5 \times 16 = 80$
“Run-on equation”
- $1 = 36$

Correct usage

- $4 + 3 = \boxed{5} + 2$
- $3 + 2 = 5$
 $5 \times 16 = 80$
- $4 \times 15 = 2 \times 30 = 60$
(all expressions are equal)
- $1 \text{ yard} = 36 \text{ inches}$
label conversions



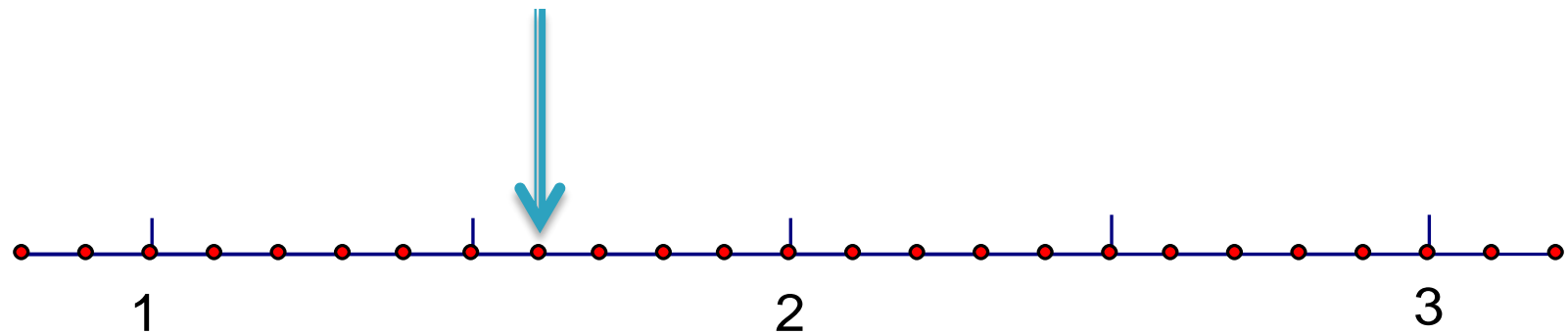
Use Number Lines to Represent Numbers and Operations



Students will mistakenly label this point 32, counting by ones, no matter what the interval.

Students make the same mistake with scales on graphs and measurement devices such as thermometers.

Use Number Lines to Represent Fractions



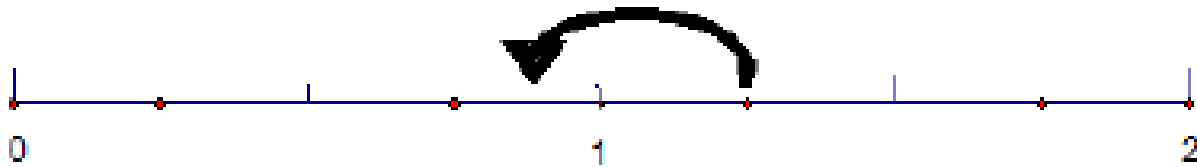
Students should know this point as $1 \frac{6}{10}$ or $1 \frac{3}{5}$

Use Number Lines to Represent Operations

Look at the equation.

$$1\frac{1}{4} - \frac{3}{8} = \square$$

Which number line represents the equation?



Give students opportunities to make sense of problems and persevere in solving them.



Single and Multi-step Word Problems

- ▶ Help students develop connections between operations and actions
 - Addition: joining
 - Subtraction: separating, finding the difference
 - Multiplication: duplicating, scaling, exponentiating
 - Division: fair sharing, measuring
- ▶ Help students develop connections between operations
 - Inverse operations ($+/-$) (\times/\div)
 - Multiplication—repeated addition
 - Subtraction—repeated subtraction, etc.



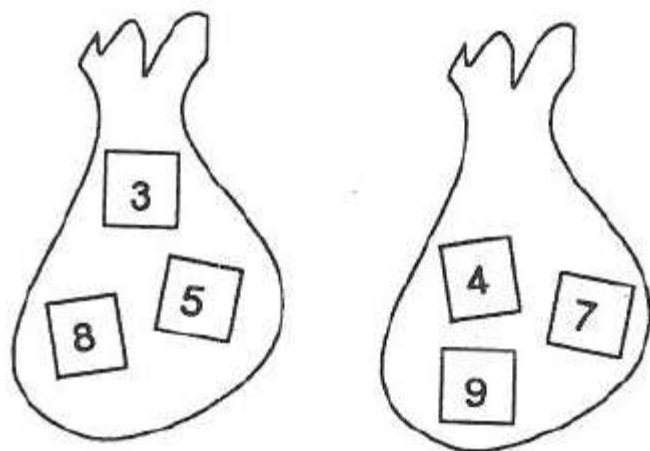
Problem Solving

- ▶ Give students opportunities to tackle problems that they have not been taught explicitly how to solve, but have adequate background to figure out.
- ▶ Give students problems that they don't know how to solve at first--ones that encourage the development of persistence.





Sample Item

The bags can have equal sums by moving one number tile from each bag to the other bag. Which tiles should be moved?



Use Mathematical Vocabulary

- ▶ Provide students with opportunities to explain their thinking with precision in discussions and in writing
- ▶ Use vocabulary in Standards
<http://www.k12.wa.us/Mathematics/Standards.aspx> 
- ▶ See vocabulary in Test and Item Specifications
<http://www.k12.wa.us/Mathematics/TestItemSpec.aspx> 
- ▶ Scroll down to Vocabulary Excel Workbook



Sample Item

Karin and Felix were asked to describe these quadrilaterals.

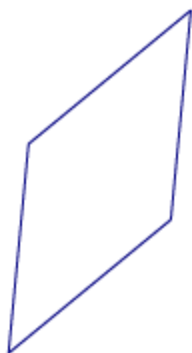


Figure A

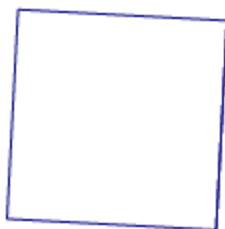


Figure B

Karin described the quadrilaterals in these ways:

- Figure A is a rhombus
- Figure B is not a rhombus because it is a square.

Are Karin's descriptions correct? Explain why or why not.

Sample Item, continued

- ▶ Explain why this statement is correct or not correct: Figure A is a rhombus.
- ▶ Explain why this statement is correct or not correct: Figure B is not a rhombus because it is a square.

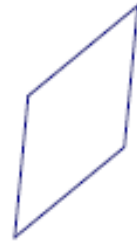


Figure A



Figure B

Sample Response 1 to: Figure A is a rhombus.

- ▶ It is correct to say Figure A is a rhombus because all four sides are the same length.

This response answers the question, uses precise mathematical language to describe attribute that differentiates a rhombus from other quadrilaterals.



Sample Response 2 to: Figure A is a rhombus.

- ▶ Yes, because they're all the same.
- ▶ This response is unclear, does not use language from the item or pertinent mathematical language. Does the student mean “Yes, the statement is correct,” or “Yes, the statement is not correct.”? It is not clear “what” is all the same.



Sample Response 3 to: Figure A is a rhombus.

- ▶ It's a rhombus because the sides slant the same way.
- ▶ This response does not use correct mathematical language and describes an attribute that does not conclusively define a rhombus.
- ▶ “Opposite sides parallel” is an attribute of a rhombus, but is also an attribute of rectangles and parallelograms that are not rhombuses.



Use Vocabulary in Item and Pertinent Math Vocabulary

- ▶ Explain why this statement is correct or not correct: Figure B is not a rhombus because it is a square.

What are pertinent vocabulary words in the item?

correct or not correct, Figure B, rhombus, square, why → because

What are other math terms to use?

attributes of figures: right angles, equal length sides



Sample Response to: Figure B is not a rhombus because it is a square.

- ▶ It is wrong to say Figure B is “not a rhombus” because a rhombus has 4 equal sides and so does Figure B.

It is correct to say Figure B is a square because Figure B has 4 right angles and 4 equal sides.



2011 Lessons Learned

- ▶ Grade 3
 - Develop deeper understanding of fractions, understand geometric vocabulary (attributes), use place value understanding and fact fluency for accurate computation
- ▶ Grade 4
 - Develop concepts of area—figures that can be divided into rectangles, practice conversions in word problems, compute range accurately



2011 Lessons Learned

▶ Grade 5

- Develop conceptual understanding to determine area of triangles and area of non-rectangular parallelograms, develop understanding of regrouping in fraction computation; use place value understanding and fluency with facts to develop accuracy in division computation




Other Resources

- ▶ Updates for 2012
- ▶ Teacher Tool
- ▶ MSP Support Moodle



Updates to 2012

- ▶ <http://www.k12.wa.us/Mathematics/Resources.aspx> 
- ▶ Three documents: Grades 3–5, 6–8 and EOC
- ▶ Content
 - Testing Windows
 - Online Testing*
 - Manipulatives and Tools Allowed
 - Common Core State Standards Initiative
 - Sample Items for Grades 3–5*



Updates to 2012

▶ Online Testing

- Tutorial and Demo Available in January 2012
- Goal: 50% of Grades 4 and 5; 25% of Grade 3
- Mode studies indicate no significant difference in performance
- Online testing saves printing and shipping costs
- Common Core Standards will utilize online assessments



Updates to 2012

▶ Sample Items

- Newly created items
 - Modeled on existing MSP items
 - Format matches MSP items
 - Have not gone through all the reviews an item goes through prior to use on MSP
- Connection to Lessons Learned
 - Items were created to address skill deficiencies identified
 - Items were created to provide samples different than previous years' samples.



Teacher Tool

- ▶ Gives teachers information about test items and state student performance
- ▶ <http://www.k12.wa.us/TeacherResourceTool2009-10/Mathematics/Grade3.aspx>



MSP Support Moodle

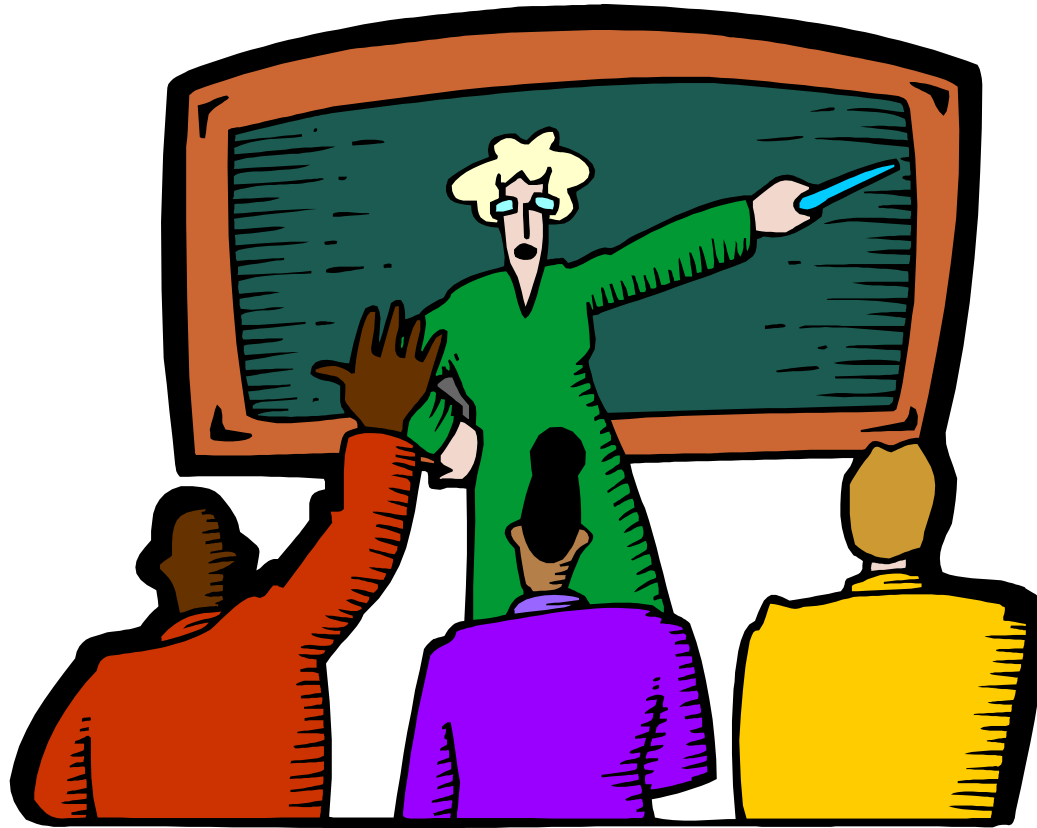
<http://moodle.ospi.k12.wa.us/course/view.php?id=28>



- ▶ Create a free account
- ▶ Sections include:
 - Links to OSPI information and resources
 - Teacher-Created resource database
 - Grade level discussion forums
 - MSP item writing resources
 - MSP online testing information



Questions?





Thank you
for all you do
for the
students
of the State of
Washington!



Mathematics

Learning Standards

Assessments

Educator Resources

Mathematics & Science
Partnership

Contact Information

For more information:

Teaching and Learning

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Assessment

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Mathematics

Mathematics Learning Standards

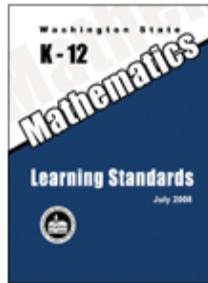
The revised 2008 Washington State K–12 Mathematics Standards describe the mathematics content, procedures, applications, and processes that students are expected to learn.

Online Grade Level Standards and Resources



The [Grade Level Standards & Resources Web site](#) provides quick access to all content standards along with aligned resources to support curriculum development, instructional practices, and assessment of student learning. Choose "Mathematics" from the homepage menu.

View, Print or Download the Standards



[K-12 Mathematics](#) (252 pages, 8.2 MB)

[K-8 Mathematics](#) (124 pages, 6.0 MB)

[6-12 Mathematics](#) - Includes Algebra I, Geometry, Algebra II (112 pages, 3.7 MB)

[6-12 Mathematics](#) - Includes Mathematics 1, 2, 3 (116 pages, 3.8 MB)

Internet | Prote





Mathematics

Mathematics

Learning Standards

Test and Item Specifications

Assessments

The mathematics items on the Measurements of Student Progress (MSP) assessment assess the performance expectations of the Washington State K-8 Mathematics Learning Standards adopted in April 2008.

Educator Resources

- [Grades 3-5 Test and Item Specifications](#) (PDF, 48 pages) - Revised November 18, 2011*
- [Grades 6-8 Test and Item Specifications](#) (PDF, 47 pages) - Revised November 18, 2011*

Mathematics & Science Partnership

Changes to the Grade 3-5 Test and Item Specification

- The Manipulative and Tools Allowed and Not Allowed chart was updated
- Notational Consideration: one bullet removed

Contact Information

Changes to the Grade 6-8 Test and Item Specification

- The Manipulative and Tools Allowed and Not Allowed chart was updated

For more information:

Teaching and Learning

(360) 725-0437

sherrie.cornett@k12.wa.us

The mathematics items on the end-of-course (EOC) exams assess the performance expectations of the Washington State K-12 Mathematics Learning Standards adopted in July 2008.

Assessment

(360) 725-6412

Test specification information included in updated documents. Updated: November 18, 2011

- [Algebra 1 Test and Item Specifications](#) (PDF, 29 pages)





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Superintendent of Public Instruction

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Lessons Learned from Scoring Student Work

The Mathematics Assessment Team shares observations about student responses for the Measurements of Student Progress and the End-of-Course Exams.

[Grades 3-5 Lessons Learned](#) (PDF)

[Grades 6-8 Lessons Learned](#) (PDF)

[End-of-Course Exams Lesson Learned](#) (PDF)

Intern



OSPI
Mathematics Assessment



WERA
Slide 40



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Mathematics

Educator Resources

OSPI provides the following supportive materials for educators.

[Test and Item Specifications](#)

These documents describe guidelines for writing test items, the type and number of items on each test, and specific information about which Performance Expectations will be assessed using multiple-choice, completion, and/or short-answer items. Vocabulary lists for the MSP and EOC Exams are available at the bottom of the webpage in an excel sheet.

[End-of-Course Crosswalks](#)

The purpose of these crosswalk documents is to identify the standards that are assessed on each end-of-course assessment.

Updates for 2012

Updates for 2012 contains pertinent information for Washington educators. This document includes a summary of changes and new information in mathematics assessment, links to resources for teachers, and sample test items. *Updates for 2012* has been customized into grade bands: Grades 3-5, Grades 6-8, and End-of-Course Assessments.

[Grades 3-5](#)

[Grades 6-8](#)

[End-of-Course](#)

Updates for 2011

Updates for 2011, is a document that includes sample items to familiarize teachers and students with the item types on the assessments. There are separate documents for 3-5, 6-8, and end-of-course exams.

[Grades 3-5](#)

[Grades 6-8](#)

[End-of-Course](#)

[Released Items: Samples From Previous Years](#)

These documents contain released WASL items from 2006 to 2008, including information on scoring open-ended items and annotated examples of scored student work. Some of these items align to the new K-12 mathematics standards and can be used in the classroom.



2009-10 Web-based Resource Tool

Diagnostic information from the 2010 MSP/HSPE with resource materials

Main Page

Reading
Writing
Mathematics
Science

Please provide feedback at:

teachertool@k12.wa.us
(360) 725-4974



Grade
Year

2010 Mathematics Assessment Grade 3

The third grade 2010 Mathematics Assessment consisted of 6 areas of emphasis:
(mouse-over to view strand description)

- [3.1-Addition, subtraction, and place value](#) (Numbers, Operations)
- [3.2-Concepts of multiplication and division](#) (Operations, Algebra)
- [3.3-Fraction concepts](#) (Numbers, Algebra)
- [3.4-Geometry](#) (Geometry/Measurement)
- [3.5-Additional key content](#) (Algebra, Geometry/Measurement, Data/Statistics/Probability)
- [3.6-Reasoning, problem solving, and communication](#)

There were 20 multiple choice items (1 point), 6 completion items (1 point), and 4 short answer items (2 points) for a total of 34 points.

Area of Emphasis	Item Description	Item Type **	Cognitive MathComplexity ***	State Performance +
3.1 Addition, subtraction, place value	Solves single-step word problem involving subtraction	MC		67.0%
	Computes multi-digit addition with regrouping	CI		70.3%
	Solves multi-step word problem involving addition	MC		73.1%
	Rounds number to the nearest thousand	CI		67.2%
	Solves multi-step word problem involving addition and subtraction	SA		.84
	Computes multi-digit subtraction with regrouping	CI		52.3%
	Orders number on a number line	MC		77.3%
3.2 Concepts of	Computes single-digit times number from 11 through 19	CI		37.8%

**** Item Type**

MC: Multiple Choice item (1 point)
CI: Completion item (1 point)
SA: Short Answer item (2 points)

***** Cognitive Complexity Levels**

= Recall
 = Basic Application of Skill/Concept

Internet | Protected Mode: On

100%



People

Participants

Activities

- Databases
- Forums
- Glossaries
- Resources

Search Forums

Go
Advanced search ?

Administration

- Turn editing on
- Settings
- Assign roles
- Grades
- Groups
- Backup
- Restore
- Import
- Reset
- Reports
- Questions
- Files
- Profile

Course categories

- Mathematics
- English Language Arts
- CTE
- Science
- Presentations
- Teaching and Learning
- Under Development
- Collection of Evidence
- Child Nutrition
- HIV and Sexual Health
- OSPI Staff Training

Topic outline

Mathematics MSP Supports

Welcome to the WA Mathematics MSP Supports Moodle. This is a place for educators to share resources and collaborate as they prepare students for the Grades 3-8 Mathematics Measurement of Student Progress. Uploaded resources will not be reviewed by OSPI staff, but instead are the responsibility of the teacher to analyze resources and determine if they suit the needs of their students. If there are questions regarding the use of this site, please email mathematics@k12.wa.us.

News forum & General Questions

OSPI Links and Resources

- Measurements of Student Progress
- Mathematics K-12 Learning Standards
- Test & Item Specifications and Mathematics Vocabulary
- Released Item Documents and Quick Guides
- Grades 3-5 and 6-8 Updates for 2012
- Calculator Policy
- Mathematics Systems Improvement Framework
- Parent, Community Communication letters
- Manipulatives and Tools Allowed on Spring 2012 MSP Exams

Latest News

[Add a new topic...](#)
(No news has been posted yet)

Upcoming Events

There are no upcoming events

[Go to calendar...](#)
[New Event...](#)

Recent Activity

Activity since Saturday, 3 December 2011, 11:11 AM
[Full report of recent activity...](#)

Nothing new since your last login

1 Teacher-Created Resources Database

Database: [Teacher-Created Resources](#)

This database is for uploading and sharing of teacher-created MSP support materials and resources. Teachers can search the database using the following fields:

- Date of upload
- File name
- Description
 - Please provide a detailed description of the resource
- URL
 - For teachers who already have resources online, please provide the URL.
- Grades(s)
 - Please identify the grade(s) to which this activity is aligned
- PE(s)

