**Resources to Support Implementation of the**

 **Common Core State Standards for Mathematics \***

*Oregon’s adoption of the Common Core State Standards for Mathematics provides an opportunity to tap expert knowledge from a variety of resources. Because the Common Core State Standards in Mathematics (CCSSM) are national standards, a glut of available online resources has been created. How is the ordinary classroom teacher to discern what is valuable? Experienced teachers have reviewed the following hyperlinks and found the resources connected to them helpful in understanding how to teach aligned to CCSSM. In this article, we will tell you the highlights of what important features can be found on each site. The resources listed below are grouped by:*

* *State and National Professional Mathematics Organizations*
* *Common Core State Standards*
* *Progression and Unpacking Documents*
* *Curriculum Resources and Sample Tasks*
* *Vocabulary Lists*
* *Teacher Content Knowledge Resources*
* *Math Tools*
* *Instructional Materials*
* *Assessment*

*Other than membership in the professional mathematics organizations listed below, all other resources listed below are free.*

**STATE PROFESSIONAL MATHEMATICS ORGANIZATIONS**

**Membership in Professional Mathematics Organizations:**

* Oregon Council of Teachers of Mathematics – (OCTM)

<http://www.octm.org/>

* National Council of Teachers of Mathematics – (NCTM)

<http://www.nctm.org/>

* National Council of Supervisors of Mathematics – (NCSM)

<http://www.mathedleadership.org/>

**COMMON CORE STATE STANDARDS**

The original version of the Common Core State Standards can be found at: <http://corestandards.org>

Placemat Versions (Page at a Glance from South Carolina Department of Education)

<http://ed.sc.gov/agency/programs-services/190/ccss-support/documents/K-8_Math_Standards_by_Grade_on_a_Page.pdf>

To support teachers as they plan for implementation of the Common Core State Standards, the mathematics standards for grades K-8 have been condensed to a page at a glance. Scroll to the grade of interest and individual grades can be printed on 8.5 in. x 14 in. (legal size) paper. These “placemat” versions of the standards contain all the standards. However, they do not contain overview information stated on the first page of the original version at corestandards.org as sited above.

**ODE CCSSM Toolbox**

<http://www.ode.state.or.us/search/page/?=3403>

The landing page for this site allows the visitor to springboard from Awareness, Transition or Implementation of the CCSSM resources pages. Under Implementation we like to jump from this site to the Teaching Channel. The link to Common Core Conversations takes you to a mega site that organizes multiple math links. If you are still having questions about how to transition to CCSSM, check out the CCSS Needs Assessment.

**PROGRESSION and UNPACKING DOCUMENTS**

**Progression Documents**

<http://math.arizona.edu/~ime/progressions/>

When at that site scroll to the bottom of the page to access documents.

The progression documents give detailed information about how the CCSS progress across grades for a domain. In addition, they include teaching ideas. The documents were developed at the University of Arizona, Institute for Mathematics and Education by a working team including Dr. William McCallum, lead writer of the Common Core State Standards for Mathematics. According to the site:

 “The Common Core State Standards in mathematics were built on progressions: narrative documents describing the progression of a topic across a number of grade levels, informed both by research on children's cognitive development and by the logical structure of mathematics. These documents were spliced together and then sliced into grade level standards.

The progression documents currently included at this site include:

* [Draft K–6 Progression on Geometry](http://commoncoretools.files.wordpress.com/2012/06/ccss_progression_g_k6_2012_06_27.pdf)
* [Draft K–5 Progression on Measurement and Data (measurement part)](http://commoncoretools.files.wordpress.com/2012/07/ccss_progression_gm_k5_2012_07_21.pdf)
* [Draft K–5 progression on Measurement and Data (data part)](http://commoncoretools.files.wordpress.com/2011/06/ccss_progression_md_k5_2011_06_20.pdf)
* [Draft K–5 Progression on Number and Operations in Base Ten](http://commoncoretools.files.wordpress.com/2011/04/ccss_progression_nbt_2011_04_073.pdf)
* [Draft K–5 Progression on Counting and Cardinality and Operations and Algebraic Thinking](http://commoncoretools.files.wordpress.com/2011/05/ccss_progression_cc_oa_k5_2011_05_302.pdf)
* [Draft 3–5 progression on Number and Operations—Fractions](http://commoncoretools.files.wordpress.com/2012/02/ccss_progression_nf_35_2011_08_12.pdf)
* [Draft 6–8 Progression on Statistics and Probability](http://commoncoretools.files.wordpress.com/2011/12/ccss_progression_sp_68_2011_12_26_bis.pdf)
* [Draft 6–8 Progression on Expressions and Equations](http://commoncoretools.files.wordpress.com/2011/04/ccss_progression_ee_2011_04_25.pdf)
* [Draft 6–7 Progression on Ratios and Proportional Relationships](http://commoncoretools.files.wordpress.com/2012/02/ccss_progression_rp_67_2011_11_12_corrected.pdf)
* [Draft High School Progression on Statistics and Probability](http://commoncoretools.files.wordpress.com/2012/04/ccss_progression_sp_hs_2012_04_21.pdf)

**Progression Document Drafts
[http://commoncoretools.wordpress.com](http://commoncoretools.wordpress.com/%22%20%5Ct%20%22_blank)**

**Keep an eye on this for more info on the Standards progressions (final versions) being written by members of the original work team. This is actually Bill McCallum’s site. He is one of the main authors of the Math CCSS.**

**CC Math Learning Trajectories**

[*https://www.turnonccmath.net*](https://www.turnonccmath.net)

This hyperlinked visual map shows Learning Trajectories for the K-8 Common Core Math Standards

**Unpacking Documents**

**North Carolina Department of Education**

<http://www.ncpublicschools.org/acre/standards/common-core-tools/#unmath>

On this site the state of NC has “unpacked” the CCSSM. Some grade levels/math subjects are better than others but it is worth exploration.

**Kansas Association of Teachers of Mathematics** **Flip Books**

<http://www.katm.org/baker/pages/common-core-resources.php>

When you visit this link, be sure to scroll down on the home page to find the Flip Book section. There is a Flip Book for every grade level K-8 and High School. The Flip Books are intended for each teacher to understand what is meant by each standard for their particular grade level. Samples of instructional strategies and mathematical examples are provided. The emphasis is on helping teachers to make sense of the mathematics in their grade level standards. One of our favorite elements of these Flip Books is that each book starts with the mathematical practices and lists questions to develop mathematical thinking. The common misconceptions listed for each standard are also invaluable. The Flipbooks are written with support and links to the Mathematical Practices. That makes this resource the only one with stated emphasis on the practices. These flipbooks are in the process of being revised so not all grade levels are currently uploaded to the site.

**Minnesota STEM Teacher Center**

<http://scimathmn.org/stemtc/frameworks>

This site houses frameworks that were developed to assist teachers in translating the CCSSM standards into classroom practice. They are searchable by grade, subject/strand or key word. Once a standard is loaded, look for the tabs across the middle of the page. The topics on the tabs are organized by: Misconceptions, Resources, Assessment, Differentiation and Parent/Administrators. We’d recommend looking at the Differentiation Tab. If you are an administrator, coach or department chair, you may find the charts that discriminate between student and teacher actions to be particularly valuable.

**CURRICULUM RESOURCES AND SAMPLE TASKS**

**Illustrative Mathematics**

<http://www.illustrativemathematics.org/>

This site contains excellent sample tasks. The tasks are aligned to specific Common Core State Standards. When using this site it is a good idea to click on “Show only illustrated standards” which leads directly to only the standards that have illustrations.

**Inside Mathematics**

<http://www.insidemathematics.org/>

The link above takes you to the “Home” page. The following is a specific link to excellent sample tasks related to specific Common Core standards. However, it is recommended that the entire “Tools for Educators” tab at the Home site be explored to see sample video lessons that exemplify the mathematical practices, problem of the month, etc.

<http://insidemathematics.org/index.php/mathematical-content-standards>

**Common Core Tools from the Dana Center at UT Austin-**

**[http://www.ccsstoolbox.org/](http://www.ccsstoolbox.org/%22%20%5Ct%20%22_blank)**

There are links on this collection of resource from the Dana Center for the Mathematical Practices including sample assessment tasks. Another resource housed on this site has “key visualizations” that are animations of the key concepts for middle school, and high school algebra and geometry. This site also includes performance assessments and tasks for grades 6-12. The sample curriculum frameworks documents housed on the Resources for Implementation tab is also invaluable.

**Yummy Math**[www.yummymath.com](http://www.yummymath.com) -

This site is a great source for rich math tasks appropriate for grades 3 through High School.

**Dan Meyer Three Acts**

<http://blog.mrmeyer.com>

On this site, look at the three act tasks link listed under My Curricula, and sign up for his updates. Many math educators believe his work is some of the best out there for engaging all students in math thinking. Direct link to a three-act tasks spreadsheet with a brief description of the three acts can be found at:

<http://www.watsonmath.com/2012/04/24/spreadsheet-of-dan-meyers-tasks-in-three-acts/>

**Mathalicious**

<http://www.mathalicious.com/>

This site contains lessons that teach Common Core standards-based math through real-world topics for middle and high school students. it has a $185/teacher annual subscription fee that can be used w/ unlimited numbers of students. This is a great database of real-world, rich math problems. Can you find a lot of great problems online for free? Yes, but if you’ve got the bucks it might be nice to have someone do that work for you.

**Balanced Assessment**

[http://balancedassessment.concord.org](http://balancedassessment.concord.org/%22%20%5Ct%20%22_blank)

The tasks on this site are from an NSF and Harvard project. These innovative mathematics assessment tasks are appropriate for grades K to 12. A note on the site says the tasks may be viewed in .pdf format but published copies must be purchased through Corwin Press.

**Math Assessment Project**

<http://map.mathshell.org/materials/index.php>

Dig around on the site under the tabs for lessons, tasks and tests to find challenging student problems intended for students in grades 6 through 10.

**Opus Math**

 <http://www.opusmath.com/common-core>

 This site contains a growing listing by common core standard of math word problems and tasks. Most are for 7th and 8th grade, but it’s growing for grades 4-6 and HS.

***Other Sources for finding good Word Problems and Problem Solving Tasks include:***

* [**NRICH**](http://nrich.maths.org/frontpage)
* [**HCPSSMathWikiK-5**](https://smart.wikispaces.hcpss.org/SMART%2BPages)
* [**NCTM Illuminations**](http://illuminations.nctm.org/)
* [**Engage NY Problem Sets, Application Problems and Homework**](https://www.engageny.org/)

**VOCABULARY LIST**

**Common Core Word Lists by Grade**

<http://www.spellingcity.com/kindergarten-math-vocabulary.html>

This site lists words from the Common Core State Standards that are potentially new vocabulary for students at each grade. This site will take you to the kindergarten word list. However, to find other grade lists, scroll down the page and look for the grade list chart on the right hand side of the page. The lists are also grouped by domain. **Caution:** Since student needs and the knowledge each brings to a class varies by school, teachers across grades are encouraged to discuss and agree upon a word list that could be considered new student vocabulary as it relates to the Common Core State Standards for Mathematics for a given grade.

**TEACHER CONTENT KNOWLEDGE RESOURCES**

**Learn Zillion**

<http://learnzillion.com/>

These are excellent video lessons tied directly to CCSSM that are approximately 5 minutes in length. They also include a Guided Practice section for students and lesson plans along with sample tasks. If you view in smaller than full screen don’t “close” the feedback box that appears below the video because your screen will go black and you’ll need to “go back” and restart.

For teacher – start with “Coaches Commentary”, move to the “Video Lesson” and then view the “Guided Practice”.

**Kahn Academy**

<http://www.kahnacademy.org/>

While this site is process focused, it does give quick, simple demonstrations as to how to perform mathematical procedures. The site also has a practice section. The work on this site is organized by mathematical concepts rather than specific CCSSM standards. There are pre and post assessments that can be used to determine which lessons students should focus on.

**SEDL**

<http://www.sedl.org/pubs/catalog/items/ms104.html>

When at this site click on the “Common Core Box” near the top of the page (small green and white box that states Common Core State Standards) and then either sign up for updates or click on the “Go to Free Resource” tab. Select the grade for which you are interested. According to that site: “The intent of each content-focused video is to clarify the meaning of the individual standard rather than to be a guide on how to teach each standard, although the examples can be adapted for instructional use.”

**Institute of Education Sciences (IES) Practice Guide (Fraction Resource)**

[http://ies.ed.gov/ncee/wwc/practiceguide.aspx?sid=15](https://webmail.ed.sc.gov/owa/redir.aspx?C=99137bd50fff4fada0a29f021e83dd05&URL=http%3a%2f%2fies.ed.gov%2fncee%2fwwc%2fpracticeguide.aspx%3fsid%3d15" \t "_blank)

According to the site:

This practice guide presents five recommendations intended to help educators improve students’ understanding of fractions. Recommendations include strategies to develop young children’s understanding of early fraction concepts and ideas for helping older children understand the meaning of fractions and the computations involved. The guide also highlights ways to build on students’ existing strategies to solve problems involving ratios, rates, and proportions.

**Center for Algebraic Thinking**

<http://algebraicthinking.org/>

This website states that the resources available on this site include of this center an online encyclopedia of algebraic thinking, a catalog of formative assessment problems, a database of technological tools, iPad apps, modules for math methods courses that incorporate research, and a collaborative social network for teachers of algebra

**MATH TOOLS**

**NCTM Math Tools**

<http://www.nctm.org/resources/content.aspx?id=32702>

As noted in the following quote from the web site, the tools are designed primarily for secondary classrooms. However, some of the tools are applicable to middle level classrooms as well. “Core Math Tools is a downloadable suite of interactive software tools for algebra and functions, geometry and trigonometry, and statistics and probability. The tools are appropriate for use with any high school mathematics curriculum and compatible with the Common Core State Standards for Mathematics in terms of content and mathematical practices. Java required. Core Math Tools can be saved on a computer or USB drive, making it possible to use without Internet access.  Files can be saved and reloaded by students and teachers. Its portability allows easy access for students, teachers and parents outside the classroom. Core Math Tools will automatically check for updates when launched and Internet access is available.”

**Shodor Interactivate**

<http://www.shodor.org/interactivate/>

The goals of this site are the creation, collection, evaluation, and dissemination of java-based courseware for exploration in science and mathematics.

**National Library of Virtual Manipulatives** (NLVM)
<http://nlvm.usu.edu/en/nav/vlibrary.html>

This site is contains a huge collection of interactive online math virtual manipulatives and math lessons.

**INSTRUCTIONAL MATERIALS ADOPTION**

**K-8 Publishers Criteria for the Common Core State Standards for Mathematics**

<http://www.corestandards.org/assets/Math_Publishers_Criteria_K-8_Summer%202012_FINAL.pdf>

 The document at this site is an excellent tool for judging instructional materials as they relate to and support implementation of the Common Core State Standards for Mathematics. While this tool and the one below are endorsed by the Council of Chief State School Officers, the two documents differ somewhat. It is recommended that both be reviewed and adapted to meet individual school needs.

**NCSM -- CCSS Curriculum Analysis Tool and Professional Development Materials**

<http://www.mathedleadership.org/ccss/materials.html>

 According to the web site “Lead by Bill Bush, University of Louisville, and initiated at the request of Council of Chief State School Officers (CCSSO), this project is developing tools for assessing the potential of curriculum materials to support students’ attainment of the CCSS, including the Standards for Mathematical Practice.” While this tool and the one above are endorsed by the CCSSO, the two documents differ somewhat. It is recommended that both be reviewed and adapted to meet individual school needs.

**ASSESSMENT**

**MARS – Mathematics Assessment Resource Service**

<http://www.mygroupgenius.org/mathematics/instructional-tools/>

This site is funded by the Bill and Melinda Gates Foundation and contains a huge variety of formative assessment lessons. Do a site search to find information related to particular standards.

**Smarter Balanced Assessment Consortium**

 <http://www.smarterbalanced.org/>

There are two assessment consortia that are developing standardized testing related to CCSSM – Smarter Balanced and PARCC. Oregon is working with the Smarter Balanced Consortium.

This site gives a great deal of information from explanations about Depth of Knowledge to Item Specifications. There are short videos that explain the types of questions that will be used on the standardized test. Because the locations of those various components may be moved, it is recommended that the Home site be explored by sections of personal interest/need. (NOTE: A good place to start is to double click on “Smarter Balanced Assessments” on the bar near the top of the page. Do not use that tab as a drop down box, but double click for additional resources and then scroll down to the mathematics section.) If visitors to this site click on the Smarter Balanced Assessment Pull Down Menu there are links to practice and pilot tests as well as sample items and performance tasks.

There is a 25 minutes You Tube Video on Item Types – benefits, etc.

<http://www.youtube.com/watch?v=COTpymxy_S0>

While watching the video, to see the sections that explain the specific assessment item types fast forward based on the following video times:

* Selected Response Type 1:57 – 5:34
* Constructed Response 5:35 – 6:36 (Not very useful)
* Technology Enabled and Technology Enhanced Type 13:49 – 16:54
* Comparing Technology Enabled versus Technology Enhanced Types 20:34 – 21:44
* Extended Response and Performance Tasks Videos will be available shortly – according to the Smarter Balanced Web Site.

**Math Assessment Project**

<http://map.mathshell.org/materials/tasks.php>

This site has tabs for Lessons, Tasks and Professional Development that are extremely helpful. You can search by grade in the navigation pane on the left. The Professional Development resources are organized by a variety of modules such as Formative Assessments or Improving Learning Through Questioning.

**New York Sample Test Items**

<https://www.engageny.org/resource/new-york-state-common-core-sample-questions>

This link takes you to a page that explains the use of and types of sample questions by grade level. If you look at the right hand side of the table, you will find .pdf downloadable sample CCSSM-aligned questions organized by grade level. If you look at the Annotated State Grade Level Test Questions, this document lists the domain and item type, has achievement level descriptors and also includes a discussion about student’s error patterns.

**ODE Assessment Page**
<http://www.ode.state.or.us/search/results/?id=239>

This is a separate page on the ODE site dedicated to math assessment. This is the place to go if you are looking for support for mathematics problem-solving tasks and scoring. Downloadable tasks and the scoring guide are available on this site. ODE has organized the sample Smarter Balanced items by claim and thus they are in an easier to find format.

The link for that site is <http://www.ode.state.or.us/search/page/?id=3747>

**Mastery Connect**
 <http://www.masteryconnect.com/>

You can join this site for free. Once registered, this site gives educators a place to share and discover common assessments. The common assessments are searchable by grade level and content.

\* Author’s Note: An earlier version of this article was co-written by Jackie Cooke and Jane Osborne, was funded by the OCTM Writer’s Retreat, and published in the November/December 2013 issue of the [*TOMT*](http://www.octm.org/publications/tomt/) professional journal. The article has been expanded and all the links have been checked as of Nov. 2014.