

**Mathematics Alignment:  
Moving from  
Opening the World of Learning™ (OWL) ©2011  
to  
enVisionMATH™ ©2009 Kindergarten**

by  
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The content of mathematics for young children has recently been a subject of much debate. The National Council of Teachers of Mathematics in its *Focal Points* document included pre-kindergarten in their recommendations, and these recommendations have provided a framework for teaching and learning mathematics in early childhood settings. In 2009, *Mathematics Learning in Early Childhood* published by the National Research Council reported the implications of high-quality mathematics programs to the future success of our young children; their research findings indicate that mathematics for young children is foundational to all mathematics learning.

This document aligns the mathematics instruction in Opening the World of Learning (OWL) ©2011, a comprehensive pre-kindergarten program, to the kindergarten level of enVisionMATH, a core mathematics program, and demonstrates how OWL provides the introduction to mathematics that will help children succeed in kindergarten. *Nita's Notebook*, an optional math component available for OWL, extends instruction and offers fresh suggestions for hands-on practice for the math lessons in OWL. Aligned content found in *Nita's Notebook* is called out in the document. The connections between the programs are illustrated in the following charts across seven categories: 1) mathematics content, 2) mathematical processes, 3) assessment strategies, 4) pedagogy, 5) integration/ connections, 6) organization, and 7) materials. Specific research sources are cited for each of the seven categories; these sources are referenced following the alignment charts.

	<b>Research</b>	<b>Opening the World of Learning ©2011</b>	<b>enVisionMATH Kindergarten</b>
<b>Mathematics Content</b>	<b><i>Focal Points</i> (National Council of Teachers of Mathematics, 2006)</b>	Identified in the program Scope and Sequence for Mathematics  <b>Nita's Notebook</b> Provides activities that extend and expand all the topics identified below.	Identified in the program Scope and Sequence for kindergarten
	○ Number and Operations	○ Counting (Units 1–8), including rote counting to 30 ○ Adding To/Taking Away (Units 2–8) ○ Decomposing and Composing Number (Units 1–8)	○ One to Five (Topic 2) ○ More and Fewer (Topic 3) ○ Six to Ten (Topic 4) ○ Comparing Numbers (Topic 5) ○ Addition (Topic 6) ○ Subtraction (Topic 7) ○ Numbers to 20 (Topic 8) ○ Numbers to 30 (Topic 9)
	○ Geometry	○ Geometry and Spatial Sense (Units 3–8)	○ Geometry (Topic 11)
	○ Measurement	○ Measurement: Length, capacity, weight (Units 6–8) ○ Language to describe time	○ Length (Topic 12) ○ Capacity and Weight (Topic 13) ○ Time (Topic 14)
	<b><i>Connections to Focal Points</i> (National Council of Teachers of Mathematics, 2006)</b>		
	○ Data Analysis	○ Sorting/Classification (Units 1–8) ○ Graphing appears in the Science strand.	○ Sorting/Classifying (Topic 1) ○ Graphing (Topic 16)
	○ Algebra	○ Patterns (Units 3–8)	○ Patterns (Topic 10)

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<b>Mathematical Processes</b>	<p><b>National Research Council</b> (Clements and Sarama, 2009) <b>Mathematizing:</b> reinventing, redescribing, reorganizing, quantifying, structuring, abstracting, and generalizing what is first understood on an intuitive and informal level in the context of everyday activities.</p> <p><i>Focal Points</i> <b>(NCTM, 2006)</b></p> <ul style="list-style-type: none"> <li>○ use mathematics to <b>solve problems</b></li> <li>○ apply <b>logical reasoning</b> to justify procedures and solutions</li> <li>○ use <b>multiple representations</b> to learn, make <b>connections</b> among, and <b>communicate</b> about math ideas</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>Mathematize</b> Centers for mathematics (as well as other centers) are primarily exploratory in nature and help children understand mathematics at an informal level in the context of everyday activities.</li> <li>○ <b>Solve Problems and Use Representations</b> Children use concrete models for adding and subtracting and creating verbal word problems.</li> <li>○ <b>Apply Reasoning</b> Children use logical reasoning to sort objects and then describe how the groups are similar and different.</li> <li>○ <b>Use Representations</b> Children collect data and organize in it graphic representations.</li> <li>○ <b>Communicate</b> Mathematical vocabulary is emphasized, modeled, used, and repeated. (Units 1–8)</li> <li>○ <b>Communicate</b> The Team Talk Routine pairs children to discuss math topics and to work together to solve</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>Solve Problems</b> Problem Solving is emphasized throughout the program with strategy lessons, word problems, and visual representations to enable successful problem-solving experiences.</li> <li>○ <b>Apply Reasoning</b> Questions in each lesson require reasoning and explanations through written and oral work.</li> <li>○ <b>Use Representations</b> Use of visual models, animations, and an emphasis on student work and journals focus on this process.</li> <li>○ <b>Make Connections</b> Conceptual and skill connections are emphasized throughout the program by teaching for understanding. Prior knowledge as well as skill practice is contained in every lesson. Real-life applications are included in every topic.</li> <li>○ <b>Communicate</b> The language of mathematics</li> </ul>

		<p>problems.</p> <p><b>Nita’s Notebook</b>  “Fourth Read” lessons included in <i>Nita’s Notebook</i> focus on math concepts related to the weekly program literature. Each “Fourth Read” lesson ties directly to the math objectives for the week.</p> <ul style="list-style-type: none"> <li>○ <b>Solve Problems and Apply Reasoning</b>  In most lessons, students are required to pose and/or solve problems. In the “Fourth Read” lessons, children work with partners to increase their interactions and reasoning. The manipulative lessons frequently involve explanation or justification responses.</li> <li>○ <b>Use Representations</b>  “Fourth Read” lessons require children to represent the mathematics in the lesson for a class book.</li> <li>○ <b>Make Connections and Communicate</b>  Each of the “Fourth Read” lessons is connected to the week’s trade book so that vocabulary and reading/ listening comprehension is enhanced as well as the mathematics.</li> </ul>	<p>is emphasized throughout the program with vocabulary cards, connections to everyday vocabulary, and activities in every topic.</p>
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	<b>Research</b>	<b>Opening the World of Learning ©2011</b>	<b>enVisionMATH Kindergarten</b>
<b>Assessment Strategies</b>	<ul style="list-style-type: none"> <li>○ Ongoing assessment prevents misconceptions and provides valuable information to guide data-driven instruction. (Vye et al., 1998)</li> <li>○ Frequent progress monitoring gives students valuable feedback and course corrections while giving teachers information about students that can guide instruction. (Black and Black, 1998)</li> </ul>	<ul style="list-style-type: none"> <li>○ Monitors progress on success predictors in math: counting, use of basic mathematical operations, numeral recognition, and knowledge of geometry and measurement.</li> <li>○ Progress monitoring occurs <ul style="list-style-type: none"> <li>○ at the start of the year with a screening assessment</li> <li>○ after Units 2, 4, and 6</li> <li>○ at the end of the year</li> </ul> </li> <li>○ An observational checklist incorporates four indicators for mathematical thinking. It is used after units 2, 4, and 6, and at the end of the year.</li> <li>○ “If/then” statements provide informal progress monitoring on Days 2, 3, and 5.</li> <li>○ Differentiated instruction is provided in the “Make It Easier” and “Make It Harder” features that appear with math lessons every week. Instruction targeting English language learners is provided weekly.</li> </ul>	<ul style="list-style-type: none"> <li>○ Monitors progress for each lesson.</li> <li>○ Frequent progress monitoring occurs <ul style="list-style-type: none"> <li>○ at the start of the year</li> <li>○ at the start of a topic</li> <li>○ during a lesson</li> <li>○ at the end of a lesson</li> <li>○ at the end of a topic</li> <li>○ every four topics</li> <li>○ at mid-year</li> <li>○ at the end of the year</li> </ul> </li> <li>○ Differentiated instruction follows assessment opportunities.</li> <li>○ A variety of intervention lessons/activities are suggested throughout the program.</li> </ul>

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<b>Pedagogy</b>	<ul style="list-style-type: none"> <li>○ Use a variety of instructional methods, such as a combination of small groups, the whole group, play, routines and transitions, and computer activities. (National Research Council, 2009)</li> <li>○ Training children in the process of using diagrams to solve problems results in more improved problem-solving performance than training students in any other strategy. (Yancey, Thompson, and Yancey, 1989)</li> </ul>	<ul style="list-style-type: none"> <li>○ Math is taught daily in Math Circle (whole group), in small groups, in Morning Meeting, and in Centers. It is built into the Transitions that are suggested each week in “Make Every Minute Count.” It is incorporated into games and computer activities and may be tied to program trade books.</li> <li>○ Lesson design: <ul style="list-style-type: none"> <li>○ Introduce</li> <li>○ Model</li> <li>○ Guide Practice</li> <li>○ Your Turn (independent practice)</li> <li>○ Feedback (If...then)</li> <li>○ Day 4 Review</li> </ul> </li> <li>○ Visual models and/or diagrams (for example, five frames, ten frames, and pictographs) are used in Math, Science, and Social Studies lessons.</li> <li>○ Manipulative activities are designed for whole groups, small groups, and the Math Center.</li> </ul> <p><b>Nita’s Notebook</b></p> <ul style="list-style-type: none"> <li>○ “Fourth Read” lessons, tied to the program trade books, are all</li> </ul>	<ul style="list-style-type: none"> <li>○ Lesson design: <ul style="list-style-type: none"> <li>○ Daily review</li> <li>○ Interactive problem solving</li> <li>○ Visual learning bar</li> <li>○ Guided practice</li> <li>○ Independent practice</li> <li>○ Assess and differentiate</li> </ul> </li> <li>○ Visual models and/or diagrams for addition, subtraction, part-part-whole, and number (for example, ten frames, Venn diagrams, grids, part-part-whole bar diagrams) are used.</li> <li>○ Center ideas are provided for every math topic.</li> </ul>

		<p>introduced to the whole group, then progress to a partner activity, and finally move to an independent activity.</p> <ul style="list-style-type: none"> <li>○ Visual models and/or diagrams (for example, ten frames, Venn diagrams, grids, part-part-whole) are used.</li> </ul>	
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<b>Integration /Connections</b>	<ul style="list-style-type: none"> <li>○ Book reading can be an effective learning context for mathematics instruction. Children exposed to a seven-week pull-out mathematics program using storybooks, rhymes, and games made greater gains pre-to posttest on mathematical knowledge than did children not receiving this program. (Casey, Kersh, and Young, 2004; Young-Loveridge, 2004)</li> </ul>	<ul style="list-style-type: none"> <li>○ Program trade books and big books are occasionally used to connect mathematics and literature in the Math Circle lessons.</li> <li>○ Integrated Math Centers are included every week to provide hands-on practice with the math objectives for the week.</li> </ul> <p><b>Nita’s Notebook</b> Provides 32 lessons that focus on math with the weekly trade books (one per week) in “Fourth Read.” Each lesson ties directly to the math objectives for the week.</p>	<ul style="list-style-type: none"> <li>○ Topic stories for each unit connect mathematics and literature; the mathematics in each topic is directly connected to the story.</li> <li>○ In addition, a collection of Stuart Murphy’s books provides additional connections.</li> </ul>

	<b>Research</b>	<b>Opening the World of Learning ©2011</b>	<b>enVisionMATH Kindergarten</b>
<b>Organization</b>	Most early childhood programs rely on integrated mathematics experiences in which mathematics is a secondary goal and often incidental. This reliance on incidental or integrated mathematics may contribute to the fact that little time is spent on math. (National Research Council, 2009, p. 269)	<p>Math is taught every day with suggested schedules for half- or full-day programs.</p> <p>Eight units cover mathematics content in 180 lessons:</p> <ul style="list-style-type: none"> <li>○ 8 units cover Number and Operations</li> <li>○ 6 units cover Geometry</li> <li>○ 3 units cover Measurement</li> </ul> <p>Success predictors for math are assessed throughout the year.</p> <p><b>Nita’s Notebook</b> 32 “Fourth Read” lessons connect mathematics to theme-based trade books.</p>	<p>Sixteen mathematics topics are covered in 120 lessons:</p> <ul style="list-style-type: none"> <li>○ 7 topics cover Number and Operations</li> <li>○ 3 topics cover Geometry</li> <li>○ 3 topics cover Measurement</li> <li>○ 2 topics cover Algebraic Thinking</li> <li>○ 1 topic covers Probability and Statistics</li> </ul>

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<b>Materials</b>	<ul style="list-style-type: none"> <li>○ Computers increase students' and teachers' access to math concepts and enable students to work in different modalities. (Cognition and Technology Group, Vanderbilt University, 1996)</li> <li>○ Concrete objects (manipulatives) give meaning to math tasks. (Clements and Sarama, 2007)</li> <li>○ Teachers should be thoughtful about the most appropriate manipulative for a specific lesson. (Grupe and Bray, 1999)</li> </ul>	<ul style="list-style-type: none"> <li>○ Digital student materials and teacher's editions are provided online.</li> <li>○ Digital content includes conceptual and vocabulary animations and math games.</li> <li>○ Developmentally appropriate math manipulatives included in the program include attribute shapes, two-colored counters, farm animal counters, jumbo rods, color cubes, measuring worms, and tangrams. They are used and referenced throughout the program.</li> </ul> <p><b>Nita's Notebook</b> An additional 35 Lessons use manipulatives from the OWL program:</p> <ul style="list-style-type: none"> <li>○ Attribute shapes</li> <li>○ Two-colored counter</li> <li>○ Farm animal counters</li> <li>○ Jumbo rods</li> <li>○ Color cubes</li> <li>○ Measuring worms</li> <li>○ Tangrams</li> </ul>	<ul style="list-style-type: none"> <li>○ Digital student and teacher's editions are provided online and on a CD-ROM.</li> <li>○ Digital content includes visual learning animations, an animated glossary, and eTools.</li> <li>○ A variety of manipulatives is used and referenced throughout the program.</li> </ul>

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