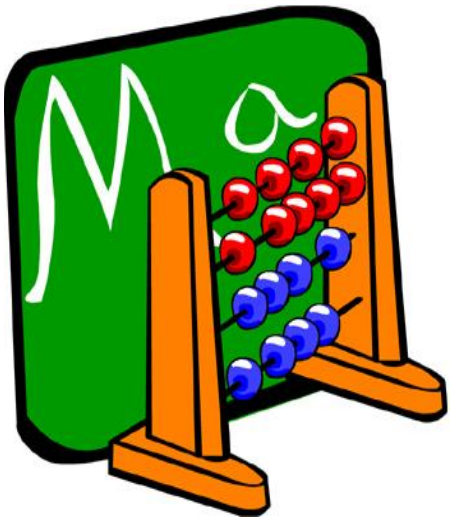
Place Value and Everything in its Place



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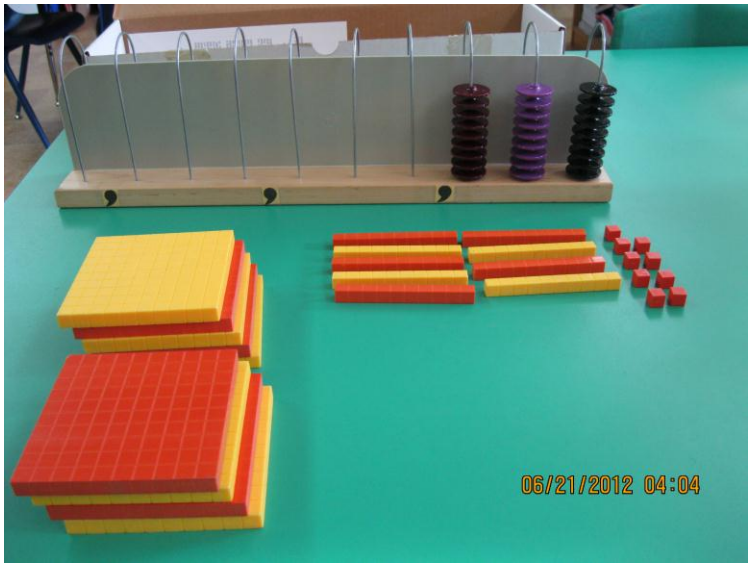
Introduction

Place Value and Everything in its Place is designed for students in Pre-K through Grade 4. It is a Math Unit that starts a new school year positively with review, and new learning of place value concepts. It also works well with multi-grades by showing the patterns learned in the ones, tens, and hundreds, follows in each of the greater periods of numbers.



Place Value and Everything in its Place creates interest by having students work on a project by visualizing how each place to the left is ten times the original place, and the number to the right is one-tenth of the place to the left.

In this unit, students will work with rounding numbers to the nearest place value. Students will also work with the concepts of greater than, less than, and equal to.

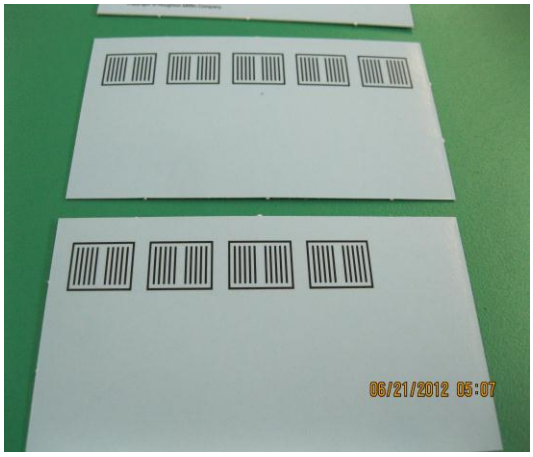
Powers of Ten is a video that could be found on the internet that teachers may use to help the students to visualize how powers of 10 quickly go from on earth into distant outer space. Then it reverses and goes from a person down to parts of an atom.

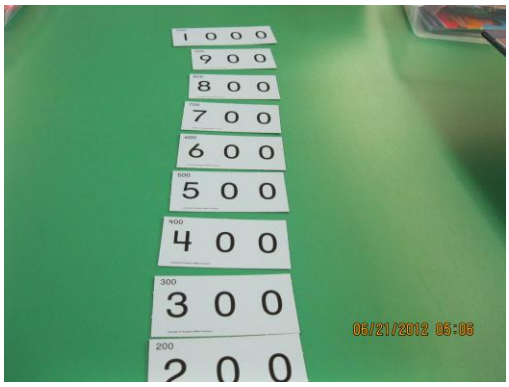
Manipulatives are used throughout the unit to enable students to be personally involved with understanding the concepts and then moving to concrete experiences with numbers and introduces theoretical reasoning with the concepts that have been mastered.

References are made to the new NAD Math Curriculum document which is aligned with the Common Core State Standards and shows how concepts can be taught at each grade level as well as utilized for multi-grade efficiency of instruction. This document makes it easier to see which of the underlying skills necessary for instruction may have been weak or might need additional reteaching because the foundation skills had not yet been mastered.

Additionally, students who quickly and easily master the skills may be enriched by providing activities that will prepare them for the next grade level skills.

Differentiated Instruction options are provided that allow for the teacher to meet the needs of each student. Students will be given opportunity to see demonstrations, hear explanations and make a project that will help the students conceptualize place value.





By utilizing the Essential Questions and Big Ideas from the Math Curriculum Document, teachers and students will see how place value fits into God's plan and organization of our world and universe.

Lift up your eyes on high,
and see who has created these things,
who brings out their host by number.
He calls them all by name,
by the greatness of His might
and the strength of His power:
not one is missing.

Isaiah 40:26 NKJV

NAD Math Curriculum Document

The standards for Grades K-4 Place Value have been taken from the NAD Math Curriculum Document for Elementary Education. They are listed below and also include the alignment to the Common Core State Standards for Mathematics (CCSSM).

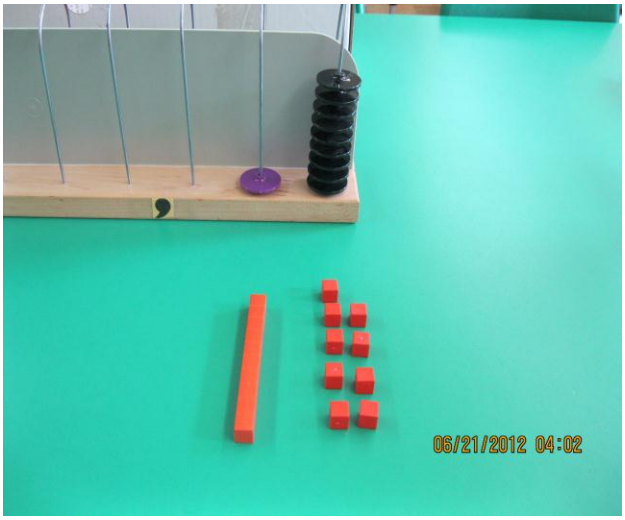
Numbers and Operations

Grade	Content	Skills (CCSSM alignment)
Essential Question: What do numbers represent and how do they help us order and compare things in God's world?		**Big Idea:** Numbers represent an amount that helps us order and compare things in God's world.
K	Place Value	**M.K.NO.5** Begin to organize objects up to 19 into groups of tens and ones (K.NBT.1)
1	Place Value	**M.1.NO.3** Understand and compare two-digit numbers organized as groups of tens and ones (1.NBT.2,3) **M.1.NO.4** Understand and mentally find ten more or ten less than a given two-digit number (1.NBT.5) **M.1.NO.5** Add and subtract multiples of ten within 100 using models or drawings (1.NBT.4,6)
2	Place Value	**M.2.NO.3** Understand and compare three-digit numbers organized as groups of hundreds, tens, and ones; use place value to understand addition and subtraction (2.NBT.1,4,9) **M.2.NO.4** Mentally add and subtract multiples of ten and multiples of a hundred within 1000 (2.NBT.8) **M.2.NO.5** Add and subtract within 1000 with regrouping using models or drawings (2.NBT.7)
Assessments		**Math Interviews;** **Checklists;** **Written Assessments;** **Student Demonstrations;** **Models and Drawings**

Grade	Content	Skills (CCSSM alignment)
Essential Question: What does numerical reasoning involve and what does it demonstrate about God's world?		**Big Idea:** Numerical reasoning with whole numbers and fractions demonstrates dependability and order in God's world.
3	Place Value	**M.3.NO.1** Use place value understanding of up to five-digit whole numbers to round to the nearest 10, 100, and 1,000 (3.NBT.1)
4	Place Value	**M.4.NO.1** Use place value understanding of multi-digit whole numbers to round to any place up to millions (4.NBT.1,3) **M.4.NO.2** Read, write, compare, and understand whole numbers using standard, number name, and expanded forms (4.NBT.2)
Assessments		Journal Entries; Class Discussions; Written Assessments; Open-ended Projects and Problems; Oral Reports; Virtual Models

Standards Coding

The standards have been coded so that educators can easily refer to them in their curriculum, instruction, and assessment practices. The coding system that precedes each standard begins with the content area abbreviation in letters; all are identified with M—Math (**M**.K.NO.5). The second part of the code refers to the grade level (M.**K**.NO.5). The third part of the code refers to the particular math domain (M.K.**NO**.5), with NO standing for Numbers and Operations. The fourth part of the code refers to a particular skill within the math domain (M.K.NO.**5**). The coding system that follows each standard is the Common Core State Standards for Mathematics (CCSSM) that aligns with the NAD standard. Where no CCSSM is noted, there is no corresponding CCSSM.

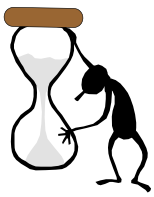


Correlations of Place Value in Grades 1-4

to the GO Math Common Core ©2012 Textbook Series

Numbers and Operations

Grade	Content	Skills (CCSSM alignment)	GO Math Lesson Correlation
1	Place Value	**M.1.NO.3** Understand and compare two-digit numbers organized as groups of tens and ones (1.NBT.2,3) **M.1.NO.4** Understand and mentally find ten more or ten less than a given two-digit number (1.NBT.5) **M.1.NO.5** Add and subtract multiples of ten within 100 using models or drawings (1.NBT.4,6)	**Chapter 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 7.1, 7.2, 7.3, 7.4** **Chapter 7.5** **Chapter 8.2, 8.3, 8.4, 8.5 8.6, 8.7, 8.8, 8.9**
2	Place Value	**M.2.NO.3** Understand and compare three-digit numbers organized as groups of hundreds, tens, and ones; use place value to understand addition and subtraction (2.NBT.1,4,9) **M.2.NO.4** Mentally add and subtract multiples of ten and multiples of a hundred within 1000 (2.NBT.8) **M.2.NO.5** Add and subtract within 1000 with regrouping using models or drawings (2.NBT.7)	**Chapter 2.1, 2.2, 2.3, 2.4, 2.5, 2.11, 2.12, 4.4, 5.3** **Chapter 2.9, 2.10** **Chapter 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10**
3	Place Value	**M.3.NO.1** Use place value understanding of up to five-digit whole numbers to round to the nearest 10, 100, and 1,000 (3.NBT.1)	**Chapter 1.2, 1.3, 1.8**
4	Place Value	**M.4.NO.1** Use place value understanding of multi-digit whole numbers to round to any place up to millions (4.NBT.1,3) **M.4.NO.2** Read, write, compare, and understand whole numbers using standard, number name, and expanded forms (4.NBT.2)	**Chapter 1.1, 1.5, 1.4** **Chapter 1.2, 1.3**

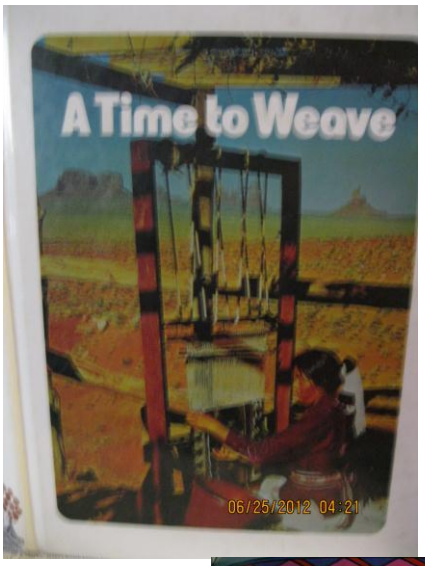


Lord, remind me
how brief my time on earth will be.
Remind me that my days are numbered,
and that my life is fleeing away.
My life is no longer than
the width of my hand.
An entire lifetime
is just a moment to you.
Human existence is but a breath.

Psalm 39: 4.5 New Living Translation

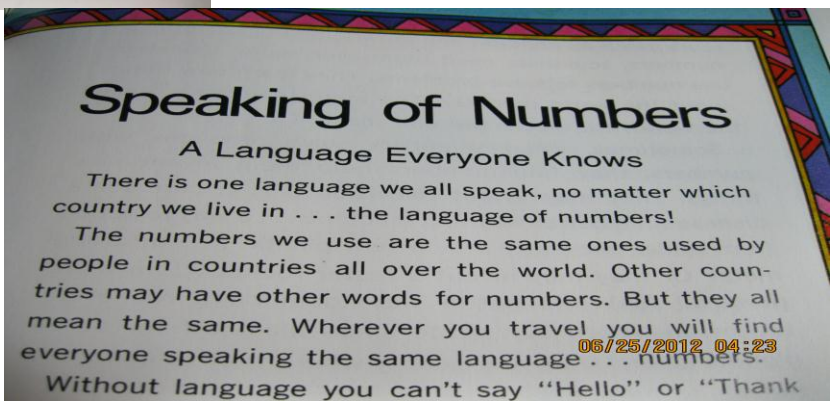
Background History for Place Value

is

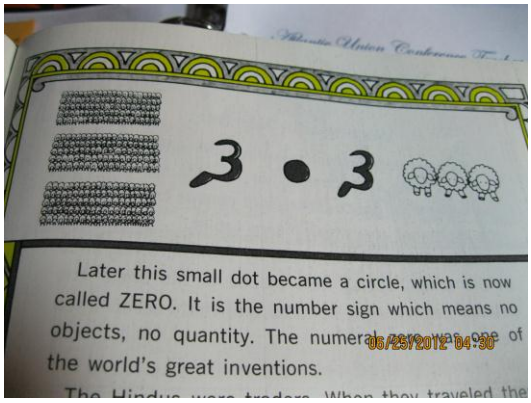


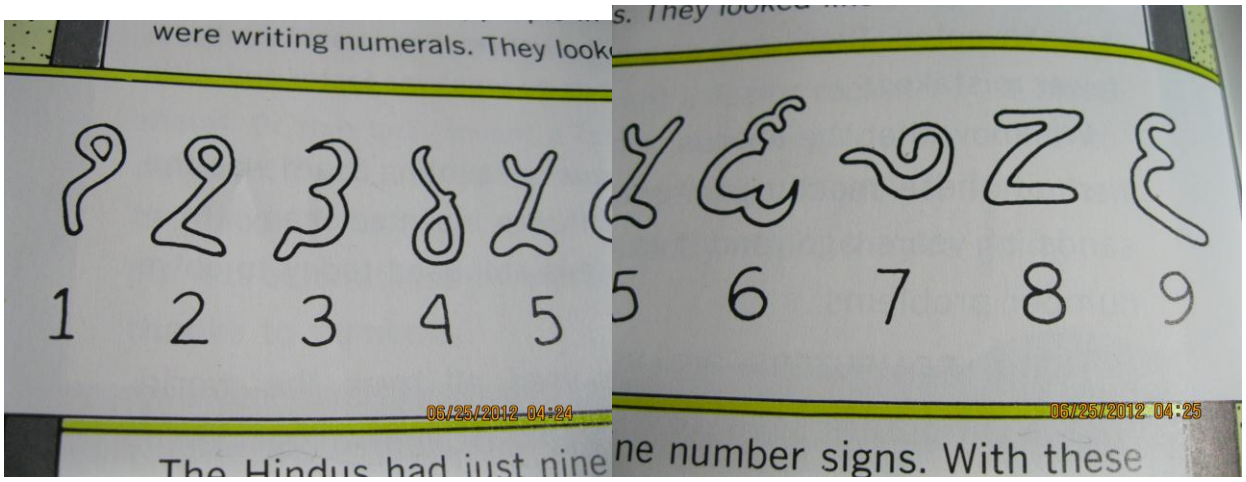
This background history for place value is taken from the Life Series Reading book, Level 10, A Time to Weave ©1983 by Department of Education, General Conference of Seventh-day Adventists, Silver Spring, Maryland 20904-6600. The following excerpts are taken from the story, Speaking of Numbers, the subheading, Numerals are found on pp. 156-159.

In



"Long before the Romans were using letters like **I, II, III,** to express number ideas, people in India, called Hindus, were writing numerals…The Hindus had just nine number signs. With these number signs they could write any numeral. These numerals were easy to read and easy to work with…They had a simple number pattern based on ten. As time went on, the Hindus began using a dot where there were no elements – nothing - in a column…Later this small dot became a circle, which is now called ZERO. It is the number sign that means no objects, no quantity. The numeral zero was one of the world's great inventions.

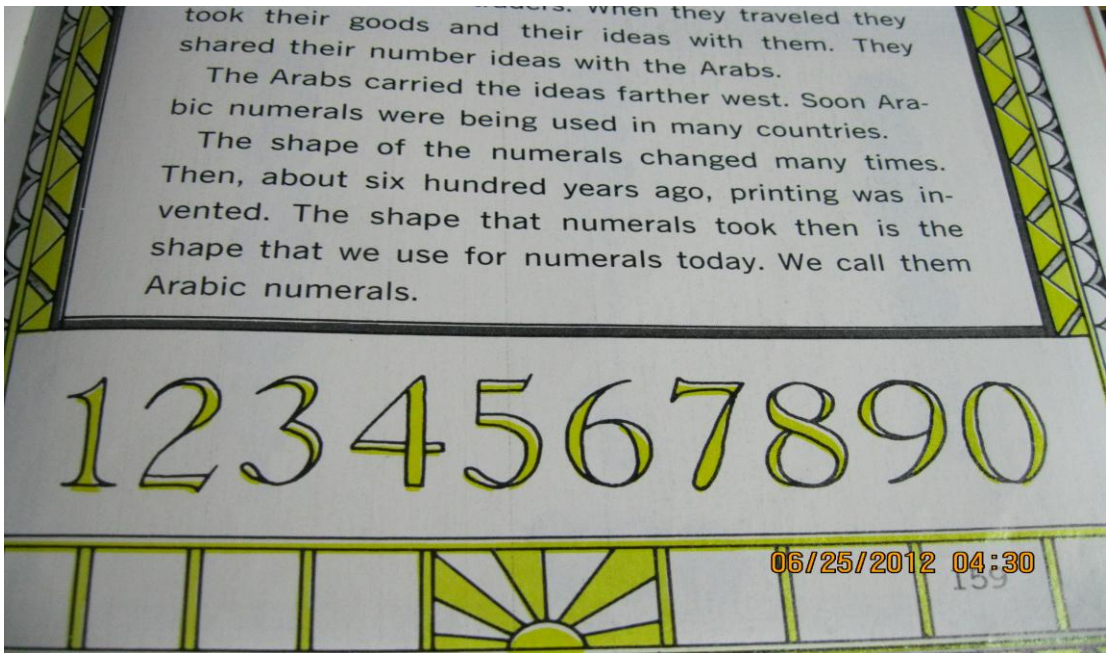




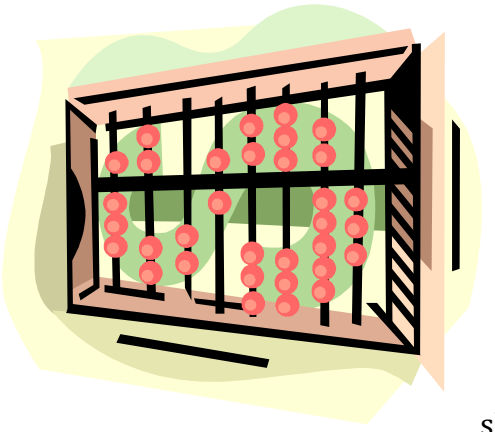
The Hindus were traders. When they traveled they took their goods and their ideas with them. They shared their number ideas with the Arabs.

The Arabs carried the ideas farther west. Soon Arabic numerals were being used in many countries.

The shape of the numerals changed many times. Then, about six hundred years ago, printing was invented. The shape that numerals took then is the shape that we use for numerals today. We call them Arabic numerals."



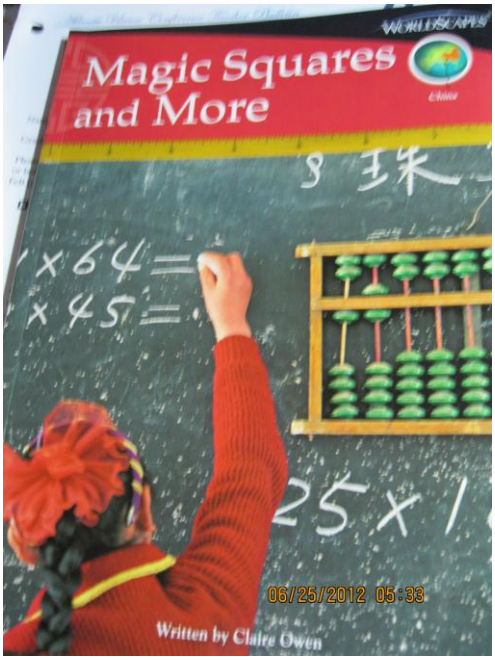
The Chinese Abacus



"The suan-pan, or Chinese abacus, was invented about 800 years ago. Using 'columns' of beads in a frame, it is possible to do sums very quickly. The abacus is still used in Asia today, although many young people prefer to use an electronic calculator.

Starting from the right, the 'columns' of a Chinese abacus show ones, tens, hundreds, and so on. To show a number, beads are pushed up or down to the crossbar. Each bead below the crossbar shows one. Each bead above the crossbar shows five."

WorldScapes Magic Squares and More, by Claire Owen, ETA/Cuienaire, Vernon Hills, IL 60061-1862, pp.12, 14



Visually Impaired Use of the Abacus

An adapted abacus, invented by Tim Cranmer, called a Cranmer abacus is still commonly used by individuals who are blind. A piece of soft fabric or rubber is placed behind the beads so that they do not move inadvertently. This keeps the beads in place while the users feel or manipulate them. They use an abacus to perform the mathematical functions multiplication, division, addition, subtraction, square root and cubic root.[34]

Although blind students have benefited from talking calculators, the abacus is still very often taught to these students in early grades, both in public schools and state schools for the blind. The abacus teaches mathematical skills that can never be replaced with talking calculators and is an important learning tool for blind students. Blind students also complete mathematical assignments using a braille-writer and Nemeth code (a type of braille code for mathematics) but large multiplication and long division problems can be long and difficult. The abacus gives blind and visually impaired students a tool to compute mathematical problems that equals the speed and mathematical knowledge required by their sighted peers using pencil and paper. Many blind people find this number machine a very useful tool throughout life.[

http://en.wikipedia.org/wiki/abacus#cite_note-aph-33 Terlau, Terrie; Gissoni, Fred (July 20, 2006), *Abacus: Position Paper*, APH.org, http://www.aph.org/tests/abacus.html, retrieved 2009-10-23

When a man's steps follow the Lord,
God is pleased with his ways.
If he stumbles,
he will not fall,
because the Lord holds his hand.

Psalm 37: 23, 24 ICB

Roman Numerals

The United States and most countries now use Arabic Numerals. However, when learning about place value it is valuable to realize that Roman numerals are not based on the Base 10 number system, but are a number system that uses letters to represent numbers.

A letter placed on the left side of a larger valued letter is subtracted from the larger letter's value. A letter placed on the right side of larger valued letter is added to the larger letter's value.
For example, the Roman numeral MMXIII is equal to 2013.

Roman Numerals Number System	
Roman Numeral	**Base 10 Arabic Numeral Meaning**
I	1
V	5
X	10
L	50
C	100
D	500
M	1,000
IV	4
VI	6
XL	40
CD	400
CM	900