READ ME FIRST

Investigations ©2012 for the Common Core State Standards…
A focused, comprehensive, and cohesive program for grades K-5

In updating Investigations 2nd edition to encompass the Common Core State Standards and Mathematical Practice, the TERC authors carefully considered the what, where, when, and how to do this to ensure and maintain its cohesive curriculum. Carefully considering and analyzing the Common Core standards to determine what they actually asked for, the authors then determined where the new content to be added made the best connection for student learning. They added Common Core content at appropriate points by building on current content, contexts and representations already in the curriculum to create the comprehensive and cohesive program: *Investigations ©2012 for the Common Core State Standards*.

- New content is addressed in Teaching Notes and Math Notes where the content already existed, but connection to the standards needs to be more explicit.
- New content is addressed in Classroom Routines and Ten-Minute Math when the content in the Standards is more about practice than deepening understanding.
- New content is addressed in new Sessions when the mathematical idea can be extended and/or explained with one or two new Sessions.
- New content is addressed in a new Investigation when mathematical content extends beyond what was in the curriculum.

All of these new Sessions build on existing contexts and representations within the grade level, rather than introducing new contexts and representations used in a higher grade level. In some instances it may appear that a single new Session addresses a new concept. But, that new concept will be further developed and integrated into subsequent routines, games, homework, and practice pages.

Some sessions are recommended by the authors to be skipped to allow for new Common Core material. Before making these decisions, the authors carefully considered how it would impact the integrity of the grade level, of the curriculum. *Investigations ©2012 for the CCSS* program maintains coherence, focus and clarity to support all K-5 students in making sense of mathematics and learning that they can become mathematical thinkers.

The foundation of this Scope and Sequence is the Scope and Sequence found in the *Implementing Investigations* book at each grade level. This Common Core Scope and Sequence includes all Common Core content new to the Investigations, 2nd edition curriculum.

Math Focus Points from Sessions in ***Investigations and the CCSS*** guidebook are color-coded.
Color Key to *Investigations ©2012 for the Common Core* Scope and Sequence:

BLUE
- indicates new Math Focus Points based on Common Core content in new Sessions
- indicates new Sessions that support Math Focus Points already in the program

GREEN
- indicates new Math Focus Points based on Common Core content in Classroom Routines and Ten-Minute Math
- indicates new Math Focus Points based on Common Core content in the Common Core Adaptations: Teaching Notes, and Math Notes

RED
- indicates Math Focus Points from sessions that the TERC authors recommend to be skipped, based on Common Core State Standards

PEARSON

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Number and Operations

Whole Number Operations Understanding and working with an array model of multiplication

Unit 1 Math Focus Points
- using arrays to model multiplication situations
- breaking an array into parts to find the product represented by the array
- using arrays to find factors of 2-digit numbers
- identifying features of numbers, including prime, square, and composite numbers **(1.3, 2.3, 2.4, 2.5)**

Whole Number Operations Reasoning about numbers and their factors

Unit 1 Math Focus Points
- finding the multiples of a number by skip counting
- determining whether one number is a factor or multiple of another
- identifying the factors of a given number
- identifying all the factors of 100
- using knowledge of the factors of 100 to find factors of multiples of 100
- using known multiplication combinations to find related multiplication combinations for a given product (e.g., if 4 x 50 = 200, then 8 x 25 = 200)
- using representations to show that a factor of a number is also a factor of its multiples (e.g., if 25 is a factor of 100, then 25 is also a factor of 300)

Unit 3 Math Focus Points
- understanding the effect of multiplying by a multiple of 10 (e.g., describing the relationship between 3 x 4 and 3 x 40)
- finding multiples of 2-digit numbers
- describing a sequence of multiples in order to predict other multiples

Grade 4 Scope and Sequence

- determining the effect on the product when a factor is doubled or halved

Whole Number Operations Understanding and using the relationship between multiplication and division to solve problems

Unit 3 Math Focus Points
- solving division story problems
- using and interpreting division notation
- solving division problems by making groups of the divisor
- using known multiplication combinations to solve division problems

Unit 8 Math Focus Points
- representing a multiplication or division problem with pictures or diagrams, including arrays and pictures of groups
- using a story problem represented by a multiplication expression to keep track of parts of the problem

Whole Number Operations Describing, analyzing, and comparing strategies for adding and subtracting whole numbers

Unit 5 Math Focus Points
- representing addition and subtraction on a number line
- identifying, describing, and comparing addition and subtraction strategies by focusing on how each strategy starts
- developing arguments about why two addition expressions are equivalent (e.g., 597 + 375 = 600 + 372)
- using story context and representations to support explanations about equivalent addition expressions
- understanding the meaning of the steps and notation of the U.S. algorithms for addition and subtraction **(4.4A)**
- identifying, describing, and comparing subtraction strategies by focusing on how each strategy starts

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- developing arguments about how the differences represented by two subtraction expressions are related (e.g., 432 – 198 and 432 – 200)
- using story contexts and representations to support explanations about related subtraction expressions

Whole Number Operations Understanding different types of subtraction problems

Unit 5 Math Focus Points
- understanding the action of subtraction problems
- representing subtraction situations

Whole Number Operations Representing the meaning of multiplication and division

Unit 3 Math Focus Points
- representing a multiplication or division problem with pictures, diagrams, or models
- using arrays to model multiplication
- making sense of remainders in terms of the problem context
- creating a story problem to represent a division expression
- comparing visual representations of multiplication situations

Whole Number Operations Understanding division as making groups of the divisor

Unit 8 Math Focus Points
- solving division problems by breaking the problem into parts
- using multiples of 10 to solve division problems
- using the relationship between multiplication and division to solve division problems

Grade 4 Scope and Sequence

Whole Number Operations Developing strategies to multiply/divide 4-digit numbers

Unit 8 Math Focus Points
- multiplying a 4-digit number by a 1-digit number **(2.4A)**
- dividing a 4-digit number by a 1-digit number **(3.5A)**

The Base-Ten System Extending knowledge of the number system to 10,000

Unit 5 Math Focus Points
- reading, writing, and sequencing numbers to 1,000 and 10,000
- using >, =, and < to compare numbers to 1,000 **(1.2, 1.5A)** to 1,000,000 **(3.6A)**
- writing numbers to 1,000 in expanded form (i.e., 435 = 400 + 30 + 5) **(1.3, 1.5A)** to 1,000,000 **(3.6A)**
- understanding the structure of 10,000 equivalence to one thousand 10s, one hundred 100s, and ten 1,000s
- understanding the place value concepts to 1,000,000 **(3.6A)**
- recognizing the place value of digits in large numbers
- rounding numbers to the nearest ten and the nearest hundred **(1.5A)** to 1,000,000 **(3.6A)**

Computational Fluency Fluency with multiplication combinations to 12 x 12

Unit 1 Math Focus Points
- identifying and learning multiplication combinations not yet known fluently
- using known multiplication combinations to determine the products of more difficult combinations
- solving word problems that involve multiplicative comparison **(1.6A)**

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Computational Fluency Solving multiplication problems with 2-digit numbers

Unit 3 Math Focus Points
- developing strategies for multiplying that involve breaking apart numbers
- reviewing multiplication combinations to 12 x 12
- multiplying multiples of 10

Unit 8 Math Focus Points
- estimating solutions to 2-digit multiplication problems
- multiplying multiples of 10
- solving 2-digit multiplication problems by breaking the problem into smaller parts and combining the subproducts
- solving 2-digit multiplication problems by changing one factor to create an easier problem

Computational Fluency Adding and subtracting accurately and efficiently

Unit 5 Math Focus Points
- adding and subtracting multiples of 10, 100, and 1,000
- using multiples of 10 and 100 to find the difference between any 3-digit number and 1,000
- adding 3- and 4-digit numbers
- using clear and concise notation for recording addition and subtraction strategies **(4.4A)**
- finding combinations of 3-digit numbers that add to 1,000
- solving subtraction problems by breaking numbers apart
- solving multistep addition and subtraction problems
- combining positive and negative numbers

Grade 4 Scope and Sequence

Rational Numbers Understanding the meaning of fractions and decimal fractions

Unit 6 Math Focus Points
- finding fractional parts of a rectangular area
- finding fractional parts of a group (of objects, people, etc.)
- interpreting the meaning of the numerator and the denominator of a fraction
- writing, reading, and applying fraction notation
- representing fractions greater than 1
- identifying everyday uses of fractions and decimals
- reading and writing tenths and hundredths
- representing tenths and hundredths as parts of an area

Rational Numbers Comparing the values of fractions and decimal fractions

Unit 6 Math Focus Points
- identifying relationships between unit fractions when one denominator is a multiple of the other (e.g., halves and fourths, thirds and sixths)
- comparing the same fractional parts of different-sized wholes
- identifying equivalent fractions
- ordering fractions in justifying their order through reasoning about fraction equivalencies and relationships
- representing fractions using a number line
- comparing fractions to the landmarks 0, ½, 1, and 2
- ordering decimals and justifying their order through reasoning about representations and meaning of the numbers
- identifying decimal and fraction equivalents

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Computation with Rational Numbers Using representations to add and subtract rational numbers

Unit 6 Math Focus Points
- using representations to add fractions that sum to 1
- estimating sums of fractions
- adding fractions with the same and related denominators (e.g., halves, fourths, and eighths; thirds and sixths)
- using visual representations to subtract fractions with like denominators **(1.8A)**
- subtracting fractions with like denominators **(1.8A)**
- adding and subtracting mixed numbers with like denominators using representations and reasoning about fractions and the operations **(2.7A)**
- estimating sums of decimal numbers
- adding decimal numbers that are multiples of 0.1 and 0.25 (e.g., 2.3 + 3.25)
- using representations to combine tenths and hundredths

Computation with Rational Numbers Using representations to multiply fractions

Unit 6 Math Focus Points
- multiplying a whole number and a fraction **(3A.1, 3A.2, 3A.3)**
- using visual models to solve word problems involving multiplication of a whole number and a fraction **(3A.1, 3A.2, 3A.3)**

Computation with Measurements Solving problems with measurement

Unit 7 Math Focus Point
- using the four operations to solve word problems involving measurements **(3.5B)**

Grade 4 Scope and Sequence

Patterns, Functions, and Change

Using Tables and Graphs Using graphs to represent change

Unit 9 Math Focus Points
- interpreting the points and shape of a graph in terms of the situation the graph represents
- finding the difference between two values on a line graph
- discriminating between features of the graph that represents quantity and those that represent changes in quantity
- plotting points on a coordinate grid to represent a situation in which one quantity is changing in relation to another
- identifying points in a graph with corresponding values in a table and interpreting the numerical information in terms of the situation the graph represents
- comparing situations by describing differences in their graphs
- describing the relative steepness of graphs or parts of graphs in terms of different rates of change
- comparing tables, graphs, and situations of constant change with those of non-constant change

Using Tables and Graphs Using tables to represent change

Unit 9 Math Focus Points
- interpreting numbers in the table in terms of the situation they represent
- using tables to represent the relationship between two quantities in a situation of constant change

Linear Change Describing and representing a constant rate of change

Unit 9 Math Focus Points
- describing the relationship between two quantities in a situation of constant change, taking into account the beginning amount and a constant increase
- creating a representation for a situation of constant change
- finding the value of one quantity in a situation of constant change, given the value of the other
- writing an arithmetic expression for finding the value of one quantity in terms of the other in a situation of constant change
- making rules that relate one variable to another in situations of constant change
- using symbolic letter notation to represent the value of one variable in terms of another

Data **and Probability**

Data Analysis Representing data

Unit 2 Math Focus Points
- organizing ordered numerical data to describe a data set
- using a line plot to represent ordered numerical data
- representing two sets of data in order to compare them

Unit 6 Math Focus Point
- making a line plot to display a data set of measurements involving fractions **(2.7A)**

Data Analysis Describing, summarizing, and comparing data

Unit 2 Math Focus Points
- describing the shape of a data set: where the data are spread out or concentrated,

what the highest and lowest values are, what the range is, and what the outliers are
- determining the range of a data set
- describing and interpreting data that compare to groups
- describing what values are typical or atypical in a data set
- comparing two sets of data using the shape and spread of the data
- finding the median of a data set
- using medians to compare groups
- considering what information a median does and does not provide

Data Analysis Analyzing and interpreting data

Unit 2 Math Focus Points
- drawing conclusions based on data
- developing arguments based on the data

Data Analysis Designing and carrying out a data investigation

Unit 2 Math Focus Points
- recording and keeping track of data
- considering how well a data representation communicates to an audience
- developing and revising a survey question

Probability Describing the probability of an event

Unit 2 Math Focus Points
- associating the word *probability* with the likelihood of an event **(3.1)**
- arranging events along a line representing the range of *certain* to *impossible* **(3.1, 3.2, 3.3, 3.5)**
- associating verbal descriptions of probability with numeric descriptions **(3.2)**
- using numbers from 0 to 1 as measures of probability **(3.2, 3.3, 3.5)**

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- comparing the expected probability of an event with the actual results of repeated trials of that event **(3.3, 3.4)**

Geometry

Features of Shape Describing and classifying two-dimensional figures

Unit 4 Math Focus Points
- defining polygons as closed figures with line segments as sides, and vertices
- classifying polygons by attribute, including number of sides, length of sides, and size of angles
- combining polygons to make new polygons
- recognizing number of sides as a descriptor of various polygons
- identifying parallel lines and perpendicular lines **(2.3A, 2.4, 2.5)**
- identifying right angles, acute angles, and obtuse angles **(2.3A, 2.4, 2.5)**
- identifying right triangles **(2.3A, 2.5)**
- developing vocabulary to describe the attributes and properties of quadrilaterals
- understanding the relationship between squares and rectangles
- making designs with mirror symmetry

Features of Shape Describing and measuring angles

Unit 4 Math Focus Points
- recognizing angle measure as additive (e.g., 45° + 45° = 90°, 90° - 30° = 60°, 60° + 30° + 30° = 120°) **(3.1, 3.2, 3.3)**
- identifying a right angle as 90 degrees
- measuring acute angles by relating them to 90 degrees
- using known angles to find a measure of other angles
- drawing lines, parts of lines, and angles **(3.4A)**

Grade 4 Scope and Sequence

- understanding the relationship between the degree measure of an angle and circular arcs **(3.4A)**
- measuring angles using a protractor **(3.4A)**

Features of Shape Describing properties of three-dimensional shapes

Unit 7 Math Focus Points
- describing attributes of geometric solids **(1.1)**
- naming geometric solids **(1.1)**

Features of Shape Translating between two-dimensional and three-dimensional shapes

Unit 7 Math Focus Points
- understanding how 3-D solids project silhouettes with 2-D shapes (for example, how a cone can produce both triangular and circular silhouettes) **(1.2, 1.3, 1.4)**
- decomposing images of 3-D shapes and then recombining them to make a given structure **(1.3)**
- visualizing what 3-D figures look like from different perspectives **(1.3, 1.4, 2.5)**
- recognizing how components of 3-D cube buildings come together to form the whole building **(2.1)**
- drawing silhouettes of 3-D cube buildings from different perspectives **(2.2, 2.3, 2.5)**
- integrating different silhouettes of an object, both to form a mental model and to build the whole object **(2.4)**

Measurement

Linear Measurement Measuring with standard units

Unit 2 Math Focus Point
- using U.S. standard units to measure lengths longer than the measuring tool

Unit 4 Math Focus Points
- reviewing the lengths of units of measure (inches, feet, yards, centimeters, meters)
- using U.S. standard and metric units to accurately measure length
- estimating lengths based on common units (centimeter, inch, foot, yard, meter)
- determining when estimates or exact measurements are needed
- finding perimeter using standard units
- recognizing in explaining possible sources of measurement error
- comparing different paths that have the same length

Unit 7 Math Focus Points
- converting measurements in larger units to smaller units **(3.5A)**
- making tables of equivalent measurements **(3.5A)**

Unit 9 Math Focus Points
- measuring in centimeters

Area Measurement Finding and understanding area

Unit 4 Math Focus Points
- finding the area of symmetrical designs
- understanding that the larger the unit of area, the smaller the number of units needed to measure the area
- dividing irregular polygons into two shapes that have equal area
- finding the area of polygons by decomposing shapes
- finding the area of polygons using square units
- finding the area of rectangles
- finding the area of triangles in relation to the area of rectangles

Volume Structuring rectangular prisms and determining their volume

Unit 7 Math Focus Points
- seeing that cubes filling a rectangular prism can be decomposed into congruent layers
- finding the volume of cube buildings
- designing patterns for boxes that hold a given number of cubes (volume)
- developing a strategy for determining the volume of rectangular prisms
- finding the number of cubes (volume) that will fit into a box made by a given pattern
- doubling the number of cubes for a given box and considering how that changes the dimensions of the original box

Ten-Minute Math

Closest Estimate

Units 8 and 9 Math Focus Points
- approximating numbers to nearby landmark numbers, e.g., multiples of 10 or 100
- calculating mentally
- comparing answer choices to find the one closest to the actual answer

Counting Around the Class

Units 1, 3, 6, and 8 Math Focus Points
- finding the multiples of numbers through skip counting
- becoming familiar with multiplication patterns
- understanding the relationship between skip counting and multiplication
- skip counting by fractions **(U6 2.7A, 3A.1, 3A.2, 3A.3)**

Practicing Place Value

Units 5, 6, and 7 Math Focus Points
- recognizing and interpreting the value of each digit in three- and four-digit numbers
- reading and writing numbers up to 10,000

- writing numbers in expanded form (i.e., 435 = 400 + 30 + 5) **(U5 1.3, 1.4, 2.1, 2.4, 2.5, 3.4, 3.5, 3.6A, 4.3, 4.4A, 4.4, 4.5; U6 1.8A)**
- adding multiples of 10 to, and subtracting multiples of 10 from, three- and four-digit numbers
- reading and writing decimal fractions and decimal numbers
- adding tenths and hundredths to, and subtracting them from, decimal fractions and decimal numbers
- comparing two 3-, 4-, or 5-digit numbers using <, >, or = (U7 3.5A, 3.5B)

Quick Images

Units 1, 4, and 7 Math Focus Points
- organizing and analyzing visual images
- developing language and concepts needed to communicate about spatial relationships
- writing equations to describe shape patterns (Unit 1)
- decomposing images of 2-D shapes and then recombining them to make a given design (Unit 4)
- identifying parallel lines, perpendicular lines, and right triangles in images **(U4 4.1, 4.2, 4.3, 4.4)**
- decomposing images of 3-D shapes and then recombining them to make a given structure (Unit 7)

Quick Survey

Units 2, 6, and 9 Math Focus Points
- describing features of the data
- interpreting a set of data

Today's Number

Units 1, 2, 4, and 5 Math Focus Points
- generating equivalent expressions for a number using particular constraints
- practicing computation skills
- using notation to record expressions