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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

Number and Operations

Counting and Quantity Developing an understanding of the magnitude and position of numbers

Unit 1 Math Focus Points
- ordering a set of numbers and quantities up to 12
- comparing two quantities up to 20 to see which is larger
- developing an understanding of how the quantities in the counting sequence are related: each number is 1 more or 1 less than the number before or after it

Unit 6 Math Focus Points
- reasoning about more, less, and equal amounts
- finding a solution that fits several clues

Counting and Quantity Developing strategies for accurately counting a set of objects by ones

Unit 1 Math Focus Points
- counting a set of up to 20 objects by 1s
- practicing the rote counting sequence forward and backward, from 1 to 30
- connecting number names in written numbers to the quantities they represent
- developing and analyzing visual images for quantities up to 10

Unit 2 Math Focus Point
- counting a set of objects

Unit 3 Math Focus Points
- practicing the rote counting sequence forward and backward, starting from any number 1–60
- developing and analyzing visual images for quantities
- accurately counting a set of objects by ones, up to 60
- practicing the oral counting sequence from 1 to 100
- writing the sequence of numbers (as high as students know)
- identifying and using patterns in the sequence of numbers to 100

Unit 6 Math Focus Points
- developing strategies for counting and combining groups of dots
- making connections between counting by tens and place value **(1.2)**

Unit 8 Math Focus Points
- counting and keeping track of amounts up to 60 **(1.3A)**
- counting on from a known quantity
- organizing objects to count them more efficiently
- identifying and using patterns in the number sequence and on the 100 chart **(1.3A)**
- identifying, reading, writing, and sequencing numbers to 120 and beyond **(1.3A)**
- counting and combining things that come in groups of 1, 2, 4, 5, and 10
- counting by 2s, 5s, and 10s
- exploring a 2:1 (the number of hands in a group of people) and a 5:1 relationship (the number of fingers and hands in a group)
- counting by numbers other than 1
- developing strategies for organizing sets of objects so that they are easy to count and combine
- developing meaning for counting by groups of ten
- considering a 2-digit number as tens and ones
- counting by groups of 10 **(4A.1)**
- using a number to represent a set of objects (and vice versa) **(4A.1, 4A.2, 4A.5)**

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Number Composition Composing numbers up to 20 with two or more addends

Unit 1 Math Focus Points
- finding and exploring relationships among combinations of numbers up to 10
- recording combinations of two numbers that make a certain total
- solving a problem with multiple solutions
- solving the problem in which the total and one part are known

Unit 2 Math Focus Point
- finding the sum of multiple addends

Unit 3 Math Focus Points
- finding as many 2-addend combinations of a number as possible
- finding and exploring relationships among combinations of numbers up to 15
- solving a problem in which the total and one part are known
- proving that all the possible combinations have been found
- developing the strategy of counting on

Unit 6 Math Focus Points
- developing fluency with the 2-addend combinations of 10
- finding relationships among different combinations of numbers up to 20
- using 5 + 5 to reason about other combinations of 10
- finding as many 2-addend combinations of a number as possible
- trying to prove that all the possible 2-addend combinations of a number have been found

Unit 8 Math Focus Point
- thinking about numbers to 20 in terms of how they relate to 10 (e.g., 10 + __ or < 10)

Grade 1 Scope and Sequence

Number Composition Representing numbers by using equivalent expressions

Unit 3 Math Focus Points
- generating equivalent expressions for a number
- determining whether equations are true or false **(1.10A, 3.2)**
- using the equal sign in a variety of formats (e.g., a + b = c, c = a + b) **(3.2)**

Unit 6 Math Focus Points
- generating equivalent expressions for a number
- determining whether equations are true or false **(2.6A)**

Unit 8 Math Focus Point
- determining equivalent expressions for a given expression (e.g., 7 + 8 = 10 + __)

Whole Number Operations Making sense of and developing strategies to solve addition and subtraction problems with small numbers, and with 2-digit numbers

Unit 1 Math Focus Points
- visualizing and retelling the action in an addition situation
- modeling the action of an addition problem with counters or drawings
- finding the total of two or more quantities up to a total of 20 by counting all, counting on, or using number combinations
- seeing that adding the same two numbers (e.g., 4 and 3) results in the same total, regardless of context (e.g., number cubes, cards, objects)

Unit 3 Math Focus Points
- visualizing and retelling the action in addition and subtraction situations involving removal
- estimating whether an amount is more or less than a given quantity

- finding the total of two or more quantities up to a total of 20 by counting all, counting on, or using number combinations
- modeling the action of an addition or subtraction (removal) problem with counters or drawings
- developing counting on as a strategy for combining two numbers
- subtracting one number from another, with initial totals of up to 12
- developing strategies for solving addition and subtraction (removal) problems
- seeing that subtracting the same two numbers (e.g., 6 from 10) results in the same difference, regardless of context (e.g., number and dot cubes, cards, objects)
- solving story problems about comparing lengths

Unit 6 Math Focus Points

- solving related story problems
- solving a problem in which the total and one part are known
- adding 2 or more single-digit numbers
- visualizing, retelling, and modeling the action in addition and subtraction (removal) situations
- subtracting one number from another, with initial totals of up to 12
- developing strategies for solving addition and subtraction story problems
- solving addition and subtraction story problems
- developing strategies for solving problems with an unknown change/start **(1.8A, 1.8B)**

Unit 8 Math Focus Points

- adding single-digit numbers
- comparing two two-digit numbers and using notation (> , <) to record the results of the comparison **(4A.1)**
- adding and subtracting 10 to/from two-digit numbers **(4A.2, 4A.5)**
- adding a one-digit number or 10 to a two-digit number **(4A.3, 4A.5)**
- adding a multiple of 10 to a two-digit number **(4A.3)**
- subtracting a multiple of 10 from a multiple of 10 **(4A.4, 4A.5)**
- discussing addition problems that involve regrouping in the ones place **(4A.5)**

Unit 9 Math Focus Point

- counting and adding to compare the distances of different paths **(2.7)**

Whole Number Operations Using manipulatives, drawings, tools, and notation to show strategies and solutions

Unit 1 Math Focus Points

- using the number line as a tool for counting
- introducing standard notation for comparing quantities (greater than, less than, and equal to)
- introducing and using standard notation (+ and =) to represent addition situations
- recording a solution to a problem
- representing number combinations with numbers, pictures, and/or words

Unit 3 Math Focus Points

- using the number line as a tool for counting
- connecting written numbers and standard notation (>, <, +, –, =) to the quantities and actions they represent **(1.10A)**
- using numbers and standard notation (>, <, +, –, =) to record
- recording solutions to a problem
- using the equal sign to show equivalent expressions **(1.10A)**
- developing methods for recording addition and subtraction (removal) strategies
- seeing the 100 chart as a representation of the counting numbers to 100

Unit 6 Math Focus Points

- using numbers and standard notation (+, –, =) to record **(1.8A, 1.8B)**
- developing strategies for recording solutions to story problems **(1.8A, 1.8B)**
- connecting written numbers and standard notation (>, <, +, –, =) to the quantities and actions they represent **(2.6A)**
- using the equal sign to show equivalent expressions **(2.6A)**
- recognizing a variety of formats of equations for missing part problems (e.g., 6 + __ = 10, 6 + ? = 10) **(1.7)**
- recognizing a variety of formats for writing equations (e.g., 9 = 3 + 3 + 3) **(2.3)**

Unit 8 Math Focus Points

- using addition notation (+, =) to record
- recording strategies for counting and combining
- considering notation for equivalent expressions (e.g., 7 + 8 = 10 + 5)
- recognizing a variety of formats of equations for missing part problems (e.g., 8 + 5 = 10 + __) **(3.1, 3.3)**
- using cubes in tens and ones to represent a two-digit number **(4A.3, 4A.4)**

Computational Fluency Knowing addition combinations of 10

Unit 1 Math Focus Point

- developing fluency with adding or subtracting 1, with totals to 10 **(2.5A)**

Unit 6 Math Focus Point

- developing fluency to add and subtract within 10 **(3.1, 3.2)**

Unit 8 Math Focus Points

- developing fluency with the 2-addend combinations of 10
- solving the problem in which the total (10) and one part are known

Patterns and Functions

Repeating Patterns Constructing, describing, and extending repeating patterns

Unit 2 Math Focus Points

- using a repeated unit to create a pattern **(3.2, 3.3)**
- seeing how changing the unit affects the whole pattern **(3.2)**

Unit 7 Math Focus Points

- identifying what comes next in a repeating pattern
- using the word *pattern* to describe some kind of regularity in a sequence

Repeating Patterns Identifying the unit of a repeating pattern

Unit 7 Math Focus Points

- representing a repeating unit in more than one way (for example, a red-blue-red-blue cube pattern with the movements clap-slap knees-clap-slap knees)
- comparing repeating and non-repeating sequences
- describing a repeating pattern as a sequence built from a part that repeats over and over called the *unit*
- identifying the unit of a repeating pattern
- extending a repeating pattern by adding on units to the pattern
- identifying what comes several steps beyond the visible part of the repeating pattern
- comparing repeating patterns that have the same structure (for example, ABC), but different elements (for example, red-blue-green and yellow-orange-black)
- comparing repeating patterns that have the same length of unit, but different structures (for example, red-blue-green and red-red-blue both have 3-element units)

Number Sequences Constructing, describing, and extending number sequences with constant increments generated by various contexts

Unit 7 Math Focus Points
- associating counting numbers with elements of a repeating pattern
- determining the element of a repeating pattern associated with a particular counting number
- determining and describing the number sequence associated with one of the elements in the unit of a repeating pattern (e.g., the numbers associated with B in an AB pattern are 2, 4, 6, 8…)
- modeling a constant rate of increase with concrete materials
- describing how a number sequence represents a situation with a constant rate of change
- extending a number sequence associated with a situation with a constant rate of change
- determining how and why the same number sequences can be generated by different contexts

Data Analysis

Data Analysis Sorting and classifying

Unit 4 Math Focus Points
- describing attributes of objects
- using attributes to sort a set of objects
- looking carefully at a group of objects to determine how they have been sorted

Data Analysis Representing data

Unit 4 Math Focus Points
- making a representation to communicate the results of a survey
- making sense of data representations, including pictures, bar graphs, tallies, and Venn diagrams
- making sense of and comparing what different representations communicate about a set of data **(3.4A)**
- using equations to show how the sum of the responses in each category equals the total responses collected
- organizing data in numerical order **(3.1, 3.2, 3.3)**

Data Analysis Describing data

Unit 4 Math Focus Points
- describing and comparing the number of pieces of data in each category or at each value and interpreting what the data tell you about the group **(3.4A)**
- understanding that the sum of the pieces of data in all the categories equals the number of people surveyed
- using data to compare how two groups are similar or different **(3.3)**

Data Analysis Designing and carrying out a data investigation

Unit 4 Math Focus Points
- interpreting results of a data investigation
- choosing a survey question
- making a plan for gathering data
- collecting and keeping track of survey data

Geometry

Features of Shapes Describing, identifying, and comparing 2-dimensional and 3- dimensional shapes

Unit 1 Math Focus Point
- exploring the characteristics of cubes, pattern blocks, GeoBlocks, and Power Polygons

Unit 2 Math Focus Points

- identifying common attributes of a group of shapes
- describing, comparing, and naming 2-D shapes
- developing visual images of and language for describing 2-D shapes
- recognizing that there are many types of quadrilaterals (e.g., rectangles, trapezoids, squares, rhombuses)
- identifying and making triangles and quadrilaterals of different shapes and sizes
- identifying characteristics of triangles and quadrilaterals
- noticing shapes in the environment
- defining attributes (e.g. number of sides, straight/curved sides, length of sides) of 2-D shapes **(2.1)**

Unit 9 Math Focus Points

- developing vocabulary to describe 3-D shapes and their attributes
- comparing size, shape, and orientation of objects
- identifying the characteristics of 3-D objects by touch
- describing a rectangular prism **(1.6)**
- comparing rectangular prisms **(1.7)**
- observing and describing characteristics of 3-D shapes, including right circular cones and cylinders **(2.3A)**
- recognizing shapes in the world **(2.3A)**
- describing 3-D structures **(2.4, 2.5)**
- defining attributes (e.g., number of sides, straight/curved sides, length of sides) of 3-D shapes **(1.1)**
- relating the size and shape of an object to its use **(1.6, 1.8)**
- planning a geometric structure with limited space and materials **(2.3)**

Shapes Understanding two and four equal shares of a whole

Unit 5 Math Focus Points

- learning the terms *fraction, halves*, and *half* **(3A.1)**
- partitioning a whole into equal parts and naming each part with a fraction **(3A.1, 3A.2, 3A.3, 3A.4)**
- exploring the idea that when you cut a whole into more fractional pieces, the pieces are smaller **(3A.4)**

Features of Shape Composing and decomposing two-dimensional shapes

Unit 2 Math Focus Points

- covering a region without gaps or overlaps using multiple shapes
- decomposing shapes in different ways
- finding different combinations of shapes that fill the same area
- seeing relationships between squares and triangles **(3.1, 3.3)**
- altering designs to use more or fewer pieces to cover the same space
- examining how shapes can be combined to make other shapes

Features of Shape Exploring the relationships between two-dimensional and three-dimensional shapes

Unit 9 Math Focus Points

- matching a 3-D object to a 2-D outline of one of its faces
- matching a 3-D object to a 2-D picture of the object
- making 3-D objects out of 2-D pieces **(1.6, 1.7, 1.8)**
- making a 2-D representation of a 3-D object or structure
- building a 3-D construction from a 2-D representation

- visualizing and estimating the paces and turns required to follow a particular path **(2.6, 2.7)**
- giving, following, and recording directions for following a path **(2.6, 2.7)**

Measurement

Linear Measurement Understanding length

Unit 3 Math Focus Point
- considering attributes that can be measured (e.g., length, perimeter, area)

Unit 5 Math Focus Points
- understanding what length is and how it can be measured
- measuring lengths using different-sized units
- identifying the longest dimension of an object
- comparing lengths to determine which is longer
- identifying contexts in which measurement is used
- understanding the meaning of *at least* in the context of linear measurement **(1.5A)**
- solving problems about comparing lengths **(1.5A)**

Linear Measurement Using linear units

Unit 5 Math Focus Points
- developing accurate measurement techniques
- describing measurements that are in between whole numbers of units
- understanding that measurements of the same length should be the same when they are measured twice or by different people using the same unit
- understanding that measuring an object using different-length units will result in different measurements
- measuring length by iterating a single unit

Linear Measurement Measuring with standard units

Unit 5 Math Focus Points
- developing accurate measurement techniques **(1.5A)**
- using inch tiles to measure objects in inches

Telling Time Telling time to the hour

Unit 5 Math Focus Point
- naming, notating, and telling time to the hour/half hour on a digital and an analog clock **(1.5A, 3A.1)**

Classroom Routines

Start with/Get to

Units 1–8 Math Focus Points
- connecting written numbers and number names
- using the number line as a tool for counting
- practicing the rote counting sequence forward and backward with numbers up to 120 **(U8, 1.1, 1.4, 2.2, 2.6, 4A.1, 4S.2, 4S.3, 4A.4)**
- using the 100 chart as a tool for counting
- counting by 5s and 10s

Morning Meeting

Units 1–9 Math Focus Points
- developing strategies for counting accurately (Attendance, Calendar, Weather)
- using the calendar as a tool for keeping track of time (Calendar, Months of the Year) **(U2, 1.3)**
- using < and > to compare data (Attendance, Calendar, Weather) **(U3 4.7, U6 3.8)**
- using < and > to record comparisons **(U4 1.3)**
- counting by 10s to find totals **(U4 1.3, U6 3.8)**

- representing, comparing, and adding 2-digit numbers (Attendance, Calendar, Weather) **(U8, 4A.5, U9 2.8)**
- developing vocabulary to talk about time (morning, noon, midday, afternoon, night, etc.) and sequence (first, next, last, before, after, etc.) (The Daily Schedule, Calendar) **(U3, 1.1, U9 1.2)**
- collecting and recording data (Weather)
- estimating quantities up to about 30
- adding small amounts to or subtracting small amounts from a familiar number
- investigating numbers that can (and cannot) be made into groups of two
- naming and telling time to the hour on digital and analog clocks
- associating times on the hour (posted in digital (e.g., 2:00) and analog (e.g., 2 o'clock) formats) with daily events **(U4 2.5, U5 1.1, 1.6)**
- associating movement of clock hands with passage of one hour **(U5 1.6)**
- associating times on the half-hour in both analog and digital representations **(U6 1.8A, 1.8B, 2.6A, U7 1.8, U8 3.1, U9 2.3A)**
- counting, describing, and comparing data
- making sense of a variety of representations of data

Quick Images

Units 1–6 and 8–9 Math Focus Points

- developing and analyzing visual images for quantities up to 10
- recreating an arrangement of objects
- finding the total of two or more single-digit quantities
- developing visual images of and language for describing and comparing 2-D shapes **(U2 1.7, U9 2.2)**
- learning the terms (half, quarter, and fourth) to name and compare shapes (U5 3A.1, 3A.2, 3A.3, 3A.4)
- identifying names and attributes of 2-D shapes
- finding the total of two or more equal groups
- identifying and naming coins
- developing fluency with the addition combinations that make 10
- using known combinations (i.e., combinations that make 10) to combine numbers
- using standard notation (+, –, =) to write equations

Tell a Story

Units 7–9 Math Focus Points

- connecting standard notation (+, –, =) to the actions and relationships they represent
- creating a story problem for a given expression
- developing strategies for adding and subtracting small numbers
- solving related problems
- using a variety of formats to represent an equation (e.g., 5 + 4 = 9, 5 + ? = 9, 9 – 5 = __) **(U7 1.4, 2.1, 2.4, U8 1.3A, 2.3, 3.4, U9 1.3, 2.1)**

Quick Surveys

Units 5–7 and 9 Math Focus Points

- collecting, accounting, representing, describing, and comparing data
- using < and > to record comparisons **(U5 2.4, U7 1.3, U9 1.2)**
- interpreting different representations of data including: pictures, bar graphs, tallies, and Venn diagrams
- determining how many more/fewer are in one category than another **(U4 2.1, U6 1.2, U7 1.3, U9 1.2)**