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Common Core
State Standards Initiative
Kindergarten – Grade 5



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STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
GRADE K						
Counting & Cardinality						
Know number names and the count sequence.						
1. Count to 100 by ones and by tens.	LA7-LA8	243-244, 245-246, 249-252, 261-262, 429-430				
2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	117-118, 167-168, 215-216	39-40, 249-252, 445-446				
3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	45-46, 49-50, 55-56, 105-106, 111-112, 153-154, 155-156, 157-158, 163-164	23-26, 27-28, 29-30, 243-244				
Count to tell the number of objects.						
4. Understand the relationship between numbers and quantities; connect counting to cardinality.	43-44, 47-48, 59-60, 101-102, 103-104, 109-110	23-26, 27-28, 29-30				

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<ul style="list-style-type: none"> When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. 	43-44, 55-56, 59-60, 101-102, 103-104, 109-110, 117-118	23-26, 27-28, 29-30				
<ul style="list-style-type: none"> Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. 	43-44, 55-56, 101-102, 103-104, 109-110	23-26, 27-28, 29-30				
<ul style="list-style-type: none"> Understand that each successive number name refers to a quantity that is one larger. 	43-44, 47-48, 101-102	23-26, 27-28, 29-30				

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5. Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.	43-44, 45-46, 47-48, 49-50, 53-54, 57-58, 59-60, 101-102, 103-104, 105-106, 109-110, 111-112, 113-114, 115-116, 117-118, 153-154, 155-156, 157-158, 161-162, 163-164, 165-166	23-26, 27-28, 29-30, 39-40, 243-244				
	Compare numbers.					
6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. ¹ ¹ Include groups with up to ten objects.	27-28, 29-30, 31-32, 57-58, 115-116, 165-166	35-36, 443-444				
7. Compare two numbers between 1 and 10 presented as written numerals.	57-58, 115-116	35-36, 443-444				

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	Operations & Algebraic Thinking					
	Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.					
1. Represent addition and subtraction with objects, fingers, mental images, drawings ¹ , sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	283-286, 287-288, 317-320, 321-322, LA3-LA4, LA5-LA6	51-52, 55-56, 87-88, 91-92, 95-96, 101-102, 103-104, 107-108, 161-162				
2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	283-286, 287-288, 305-306, 317-320, 321-322, 339-340	51-52, 55-56, 61-62, 73-74, 87-88, 97-98, 105-106, 325-326				
3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).	293-296, 297-298, 299-300, 301-302, 303-304, 325-328, 331-332, 333-334, 335-336, 337-338	53-54, 65-66, 67-68, 89-90, 101-102, 103-104, 107-108				

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4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.		LA3-LA4				
5. Fluently add and subtract within 5.		With teacher assistance, the following pages can be used to meet this standard. 54, 60, 63				

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	Number & Operations in Base Ten					
	Work with numbers 11-19 to gain foundations for place value.					
1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	LA9-LA10	155-156, 157-158, 163-164, 165-166, 185-186, 189-190, 199-200, 323-324, 423-424				

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Measurement & Data						
Describe and compare measurable attributes.						
1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	179-180, 183-184, 185-186	277-278, 279-280, 281-282, 285-286				
2. Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. <i>For example, directly compare the heights of two children and describe one child as taller/shorter.</i>	179-180, 183-184, 185-186	277-278, 285-286, 287, 289, 291-294, 295-298, 301-304				
Classify objects and count the number of objects in each category.						
3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. ¹ ¹ Limit category counts to be less than or equal to 10.	131-132, 133-134, 139-140, 141-142	123-124, 125-126, 129-130, 133-134, 137-140				

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	Geometry					
	Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).					
1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as <i>above</i> , <i>below</i> , <i>beside</i> , <i>in front of</i> , <i>behind</i> , and <i>next to</i> .	255-256, 257-258, 261-262, 263-264, 271-272	385-386, 395-396, 401-404				
2. Correctly name shapes regardless of their orientations or overall size.	255-256, 257-258, 261-262, 263-264, 271-272	385-386, 387-388, 395-396				
Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").	259-260	385-386, 387-388, 391-392				

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Analyze, compare, create, and compose shapes.						
4. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).	255-256, 257-258, 259-260, 261-262, 263-264, 271-272	385-386, 387-388, 391-392, 395-396				
5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	261-262, 263-264, 268-269	385-386, 391-392, 395-396				
6. Compose simple shapes to form larger shapes. <i>For example, "Can you join these two triangles with full sides touching to make a rectangle?"</i>	271-272, LA11-LA12	405-406				

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GRADE 1						
Operations & Algebraic Thinking						
Represent and solve problems involving addition and subtraction.						
1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. ¹ ¹ See Glossary, Table 1.	283-286, 305-306, 317-320, 339-340	51-52, 61-62, 73-74, 87-88, 97-98, 105-106, 141-142, 161-162, 173-174, 187-188, 193-194, 257-258, 299-300, 325-326, 333-334	61-62, 75-76, 77-78, 93-94, 105-106			
2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.		299-300	75-76			

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Understand and apply properties of operations and the relationship between addition and subtraction.						
3. Apply properties of operations as strategies to add and subtract. ² <i>Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)</i>	With Teacher intervention, the following pages could illustrate the Commutative Property: 293-296, 297-298, 299-300, 301-302	155-156, 323-324	55-56, 73-74			
4. Understand subtraction as an unknown-addend problem. <i>For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8. Add and subtract within 20.</i>		197-198, 199-200, 331-332, 335-338	97-98, 103-104, 107-108			

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Add and subtract within 20						
5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	43-44	157-158, 163-164, 171-172	57-58, 67-68			
6. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).	283-286, 287-288, 317-320	155-156, 157-158, 163-164, 165-166, 169-170, 171-172, 185-186, 189-190, 195-196, 197-198, 199-200, 317-318, 319-320, 323-324, 329-330, 331-332, 335-338	55-56, 57-58, 63-64, 67-68, 71-72, 73-74, 87-88, 89-90, 91-92, 97-98, 103-104			

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Work with addition and subtraction equations.						
7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.	341-342	55-56, 59-60, 91-92, 95-96	35-36, 55-56, 89-90, 185-186			
8. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = _ - 3$, $6 + 6 = _$.		LA3-LA4	101-102			

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Number & Operations in Base Ten						
Extend the counting sequence.						
1. Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	LA7-LA8	245-246, 249-252, 259-260, 261-262	27-28, 43-44			
Understand place value.						
2. Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:		419-422, 423-424, 429-432, 433-436				
■ 10 can be thought of as a bundle of ten ones — called a “ten.”	LA9-LA10	419-422	17-20, 21-24			
■ The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.	LA9-LA10	423-424	17-20			

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<ul style="list-style-type: none"> The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones). 	LA9-LA10	419-422	21-24			
3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.		443-444	35-36			

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Use place value understanding and properties of operations to add and subtract.						
4. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.		485-486, 487-488, 489-490, 491-492, 499-500, 501-502, 504	55-56, 147-148, 149-150, 153-155, 157-158, 159-160, 165-166, 179-180, 181-182, 189-190, 191-192, 195-196			
5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	With Teacher assistance, LA7-LA8 could introduce this standard.	251, LA5-LA6	43-44, 147-148, 149-150, 179-180			

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6. Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	With Teacher assistance, LA7-LA8 could introduce this standard.	485-486	179-180, 195-196			

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	Measurement & Data					
	Measure lengths indirectly and by iterating length units.					
1. Order three objects by length; compare the lengths of two objects indirectly by using a third object.	181-182	277-278	385-386			
2. Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. <i>Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.</i>	185-186	279-280, 281-282	379-380, 381-382, 391-392			

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	Tell and write time.					
3. Tell and write time in hours and half-hours using analog and digital clocks.	239-240, 241-242, 243	215-216, 217-218, 219-220, 223-226, 227-228, 231-232	253-254			
	Represent and interpret data.					
4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	131-132, 133-134, 135-136, 139-140, 141-142	125-126, 127-128, 129-130, 133-134, 136-140	119-120, 121-122, 123-124, 127-128, 129-130			
	Geometry					
	Reason with shapes and their attributes.					
1. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size) ; build and draw shapes to possess defining attributes.	257-258, 259-260, 261-262, 263-264, 271-272	387-388, 391-392, 395-396, 405-406	347-348, 357-358, 359-360			

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<p>2. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.¹</p> <p>¹ Students do not need to learn formal names such as “right rectangular prism.”</p>	267-268, LA11-LA12	405-406	361-362			

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3. Partition circles and rectangles into two and four equal shares, describe the shares using the words <i>halves</i> , <i>fourths</i> , and <i>quarters</i> , and use the phrases <i>half of</i> , <i>fourth of</i> , and <i>quarter of</i> . Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	279-380	457-458, 459-460, 461-462, 463-464	283-284, 287-288, 295	279-380		

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GRADE 2						
Operations & Algebraic Thinking						
Represent and solve problems involving addition and subtraction.						
<p>1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.¹</p> <p>¹ See Glossary, Table 1.</p>		485, 487-488, 491-492, 495, 499-500, 501-502	147, 149, 153, 157, 159, 163, 165, 179, 184, 183, 189, 194, 195, 199	72-73, 78-80, 82-85, 88-89, 111-113, 118-120		
Add and subtract within 20.						
<p>2. Fluently add and subtract within 20 using mental strategies.² By end of Grade 2, know from memory all sums of two one-digit numbers.</p> <p>²See standard 1.OA.6 for a list of mental strategies.</p>		155-156, 165-166, 169-170, 171-172, 189-190, 195-196, 199-200, 317-318, 319-320, 323-324, 329-330, 331-332, 335-338	57, 63, 67, 71, 87, 89, 91, 97, 101, 103	The following pages could be used as an application of this standard. 69-71		

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Work with equal groups of objects to gain foundations for multiplication.						
3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.		With Teacher intervention, introduction to this standard can be found on the following pages. 259-260, 263-264	With Teacher intervention, the following pages can be used to introduce this standard. 475-476			
4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.		With Teacher intervention, the following pages can be used to meet this standard. 323-324	With teacher assistance, the following pages can be used to meet this standard. 71-72			

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Number & Operations in Base Ten						
Understand place value.						
1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:		LA7-LA8	313, 315, 319	4, 14, 22-23		
<ul style="list-style-type: none"> 100 can be thought of as a bundle of ten tens — called a “hundred.” 		With Teacher assistance the following pages can be used to meet this standard. 419-422	313	4, 22-23		
<ul style="list-style-type: none"> The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones). 			With Teacher assistance the following pages can be used to meet this standard. 313-314			
2. Count within 1000; skip-count by 5s, 10s, and 100s.						

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3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.			323	The following pages can be used as an application of this standard. 24-27		
4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.			329	34-37		
	Use place value understanding and properties of operations to add and subtract.					
5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.		The following pages can be used as an application of this standard. 155-156	55	69-71		
6. Add up to four two-digit numbers using strategies based on place value and properties of operations.		487-488, 491-492	157, 159	74-77, 78-80		

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7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.			439, 441, 443, 447, 451, 453, 457, 459	90-91, 92-94, 114-117, 126-127, 128-131, 138-141, 142-143		
8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.			439, 451			

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9. Explain why addition and subtraction strategies work, using place value and the properties of operations. ¹ ¹ Explanations may be supported by drawings or objects.		The following pages provide introduction to this standard via ones and tens. 197-198, 331-332	55	69-71		
Measurement & Data						
Measure and estimate lengths in standard units.						
1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.		LA11-LA14	387, CS7	373-374, 375-377, 384-385, 386-389		
2. Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.		LA11-LA14				

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
3. Estimate lengths using units of inches, feet, centimeters, and meters.		LA11-LA14	387, 393	375-377, 378-381		
4. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.						
	Relate addition and subtraction to length.					
5. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.						

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
6. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.						
Work with time and money.						
7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.			261	454-455		
8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?		357-358, 359-360, 369-370, 371-372, 375-376, CS3, CS4	219-220, 233-234, 235-236, CS9-CS10	52-55, 82-85, 118-120		

STANDARDS	PAGE REFERENCES					
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Represent and interpret data.						
9. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.						
10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems ¹ using information presented in a bar graph. ¹ See Glossary, Table 1.		125-126, 133-134, 137-138	119, 121, 127, 129	513-514, 515-517, 526-527, 528-531		

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
Geometry						
Reason with shapes and their attributes.						
1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. ¹ Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. ¹ Sizes are compared directly or visually, not compared by measuring.		385-386, 387-388, 391-392, 395-396	345, 347, 351, 357	467-471, 472-473		
2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.			395			

STANDARDS	PAGE REFERENCES					
	<i>MATH CONNECTS</i> GRADE K	<i>MATH CONNECTS</i> GRADE 1	<i>MATH CONNECTS</i> GRADE 2	<i>MATH CONNECTS</i> GRADE 3	<i>MATH CONNECTS</i> GRADE 4	<i>MATH CONNECTS</i> GRADE 5
3. Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.		The following pages help introduce this concept. 457, 461, 463	283, 285, LA7			

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
	GRADE 3					
	Operations & Algebraic Thinking					
	Represent and solve problems involving multiplication and division.					
1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7 .			473-474, 475-476, 479-480, 481-482, LA5-LA6, CS11-CS12	157-158, 159-161, 162-164, 168-170, 174-176, 178-181, 186-188, 201-202, 203-205, 206-209, 214-216, 218-221, 230-233	145-146, 154-157, 160-162, 166-169, 176-179	
2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.			487-488, 489-490, LA3-LA4, LA5-LA6	251-252, 253-255, 256-257, 258-261, 264-266, 270-273, 278-280, 282-283, 295-296, 297-299, 300-303, 306-308, 312-314	145-146, 154-157, 160-162	

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
<p>3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.¹</p> <p>¹ See Glossary, Table 2.</p>			473-474, 475-476, 479-480, 481-482, 487-488, 489-490, LA3-LA4, LA5-LA6	157-158, 159-161, 162-164, 168-170, 174-176, 201-202, 203-205, 206-209, 214-216, 218-221, 234-237, 251-252, 253-255, 256-257, 258-261, 270-273, 297-299, 300-303, 306-308, 316-319	145-146, 154-157, 160-162, 166-169, 176-179	
<p>4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$</p>			481-482	159-161, 186-188, 206-209, 214-216, 218-221, 222-224, 234-237, 258-261, 300-303, 306-308, 312-314, 316-319, 344-347, 356-359	147-149, 160-162, 166-169, 220-223	

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
Understand properties of multiplication and the relationship between multiplication and division.						
<p>5. Apply properties of operations as strategies to multiply and divide.² Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)</p> <p>² Students need not use formal terms for these properties.</p>			Introduction of concept on pages 481-482, LA5-LA6	159-161, 186-188, 201-202, 214-216, 218-221, 230-233, 234-237, 282-283	150-153, 166-169, 282-283	
6. Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.			LA5-LA6	256-257, 258-261, 270-273, 278-280, 297-299, 300-303, 306-308, 312-314, 316-319	147-149, 154-157, 160-162, 311-312, 316-319	

STANDARDS	PAGE REFERENCES					
	<i>MATH CONNECTS</i> GRADE K	<i>MATH CONNECTS</i> GRADE 1	<i>MATH CONNECTS</i> GRADE 2	<i>MATH CONNECTS</i> GRADE 3	<i>MATH CONNECTS</i> GRADE 4	<i>MATH CONNECTS</i> GRADE 5
	Multiply and divide within 100.					
7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.			The following pages can be used to introduce this concept. LA5-LA6	162-164, 168-170, 174-176, 178-181, 186-188, 203-205, 206-209, 214-216, 218-221, 222-224, 234-237, 253-255, 256-257, 258-261, 264-266, 270-273, 278-280, 282-283, 297-299, 300-303, 306-308, 312-314	147-148, 154-157, 160-162, 166-169	

STANDARDS	PAGE REFERENCES					
	<i>MATH CONNECTS</i> GRADE K	<i>MATH CONNECTS</i> GRADE 1	<i>MATH CONNECTS</i> GRADE 2	<i>MATH CONNECTS</i> GRADE 3	<i>MATH CONNECTS</i> GRADE 4	<i>MATH CONNECTS</i> GRADE 5
Solve problems involving the four operations, and identify and explain patterns in arithmetic.						
8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. ³			157-158, 159-160, 163-164, 165-166, 167-168, 180-181, 189-190, 191-192, 197-198, 199-200, 441-442, 447-448, 453-454, 457-458, 459-460, 461-462, 473-474, 487-488	74-77, 92-94, 96-99, 114-117, 126-127, 128-131, 134-136, 138-141, 168-170, 174-176, 178-181, 203-205, 206-209, 214-216, 218-221, 222-224, 258-261, 264-266, 270-273, 297-299, 300-303, 306-308, 312-314	26-27, 58-61, 76-77, 158-159, 170-171, 242-244, 276-279, 322-324, LA2-LA5	
9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.			39-40, 43-44, 103-104, 123-124, 397-398, 445-446, 481-482	17-19, 69-71, 159-161, 162-164, 174-176, 178-181, 201-202, 222-224, 264-266, 344-347, 348-351, 356-359	6, 40-41, 55-57, 102-103, 118-119, 144, 145-146, 150-153, 208-211, 218-219, 220-223, 237-239, 273-275, 316-319	

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
	Number & Operations in Base Ten					
	Use place value understanding and properties of operations to perform multi-digit arithmetic. ¹					
	¹ A range of algorithms may be used.					
1. Use place value understanding to round whole numbers to the nearest 10 or 100.			163-164, 199-200	22-23, 24-27, 44-46, 74-76, 114-117	36-39	
2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.			67-68, 73-74, 87-88, 91-92, 97-98, 163-164, 165-166, 179-180, 189-190, 195-196, 199-200, 229-230, 441-442, 443-444, 447-448, 451-452, 453-454, 457-458, 459-460	69-71, 74-77, 78-80, 82-85, 90-91, 92-94, 96-99, 111-113, 114-117, 118-120, 126-127, 128-131, 134-136, 138-141	55-57, 58-61, 62-63, 64-67, 70-71, 72-75, 80-83	
3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.				635-637	237-239	

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
	Number & Operations—Fractions ¹					
	¹ Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, 8.					
	Develop understanding of fractions as numbers.					
1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.			283-284	559-560, 561-563	534-535, 537-539, 540-543	
2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.			LA9-LA10	584-587	547	
<ul style="list-style-type: none"> ■ Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line. 			LA9-LA10	584-587	547	

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
<ul style="list-style-type: none"> Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. 			LA9-LA10	584-587	547	
3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.			293-294, LA7-LA8	570-571, 572-574, 580-583	554-557	
<ul style="list-style-type: none"> Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. 			299-300, LA7-LA8	572-574	548-551	
<ul style="list-style-type: none"> Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$. Explain why the fractions are equivalent, e.g., by using a visual fraction model. 			299-300	570-571, 572-574	548-551	

STANDARDS	PAGE REFERENCES					
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<ul style="list-style-type: none"> Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form $3 = \frac{3}{1}$; recognize that $\frac{6}{1} = 6$; locate $\frac{4}{4}$ and 1 at the same point of a number line diagram. 						
<ul style="list-style-type: none"> Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model. 			293-294	580-583	554-547	

STANDARDS	PAGE REFERENCES					
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	Measurement & Data					
	Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.					
1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.			261-262	454-455		

STANDARDS	PAGE REFERENCES					
	<i>MATH CONNECTS</i> GRADE K	<i>MATH CONNECTS</i> GRADE 1	<i>MATH CONNECTS</i> GRADE 2	<i>MATH CONNECTS</i> GRADE 3	<i>MATH CONNECTS</i> GRADE 4	<i>MATH CONNECTS</i> GRADE 5
<p>2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).¹ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.²</p> <p>¹ Excludes compound units such as cm³ and finding the geometric volume of a container.</p> <p>² Excludes multiplicative comparison problems (problems involving notions of “times as much”; see Glossary, Table 2).</p>			411-412, 417-418	432-434, 444-447	508-510, 512-515	

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	Represent and interpret data.					
3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.			119-120, 121-122, 127-128, 129-130, 269-270, CS1, CS2	513-514, 515-517, 518-521, 526-527, 532-535	12-13, 94, 108-110, 159	
4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.						

STANDARDS	PAGE REFERENCES					
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Geometric measurement: understand concepts of area and relate area to multiplication and to addition.						
5. Recognize area as an attribute of plane figures and understand concepts of area measurement.			395-396	396-397, 398-401	460-462	
<ul style="list-style-type: none"> ■ A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area. 			395-396	396-397, 398-401	460-462	
<ul style="list-style-type: none"> ■ A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. 			395-396	396-397, 398-401	460-462	
6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).				398-401	460-462	
7. Relate area to the operations of multiplication and addition.					460-462	

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
<ul style="list-style-type: none"> Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. 					460-462	
<ul style="list-style-type: none"> Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. 					460-462	
<ul style="list-style-type: none"> Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. 						

STANDARDS	PAGE REFERENCES					
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<ul style="list-style-type: none"> Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems. 						
Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.						
8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.				392-395	456-459	

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Geometry						
<i>Reason with shapes and their attributes.</i>						
1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.			345-346, 347-348, 351-352, 357-358		376-378	
2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.			279-280	559-560, 561-563	537-539, 540-543	

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	GRADE 4					
	Operations & Algebraic Thinking					
	Use the four operations with whole numbers to solve problems.					
1. Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.						116-118, 122-124, 126-129, 138-142
2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. ¹ ¹ See Glossary, Table 2.						116-118, 122-124, 126-129, 136-137, 138-142, 149-151, 158-161, 162-164, 170-173, 182-186, 242-243, 244-247, 248A

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3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.				32-33, 88-89, 124-125, 228- 229, 262-263, 276-277, 320- 321, 354-355, 382-383, 402- 403, 436-437, 486-487, 546- 547, 568-569, 614-615, 648-649	64-67, 72-74, 196-197, 198- 201, 208-211, 220-223, 240- 241, 246-248, 252-255, 258- 261, 273-275, 282-283, 284- 286, 311-312, 313-315, 316- 319, 322-324, 326-329, 332- 334, 336-338, 342-345	108-111, 112A, 112-115, 122- 124, 125, 126- 129, 130-131, 132-135, 168- 169, 170-173, 174-176, 178- 179, 237-239, 242-243, 244-247

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Gain familiarity with factors and multiples.						
4. Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.					176-179, 237-239, 273-275	373-375, 378A, 396-399, 400A

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Generate and analyze patterns.						
5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. <i>For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.</i>				17-19, 20A, 212-213, 344-347, 478-481, 484A	204-206, 208-211, 220-223, 237-239, 316-319, 366-367, 380-381	208-209, 210-213

STANDARDS	PAGE REFERENCES					
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	Number & Operations in Base Ten¹					
	¹ Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.					
	Generalize place value understanding for multi-digit whole numbers.					
1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.				24-27, 28-30, 31, 635-637	17-19, 20-21, 22-25, 237-239, 316-319	17-19, 20A, 103-105, 149-151, 152A
2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.				24-27, 28-30, 31, 34-37, 38-41	17-19, 22-25, 28-30	20-23, 24A
3. Use place value understanding to round multi-digit whole numbers to any place.				44-46, 47, 48-51, 52A, 74-77	36-39, 68-71, 242-244, 276-279, 322-324	61-63, 64A, 64-67, 73, 112-115

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	<i>MATH CONNECTS</i> GRADE K	<i>MATH CONNECTS</i> GRADE 1	<i>MATH CONNECTS</i> GRADE 2	<i>MATH CONNECTS</i> GRADE 3	<i>MATH CONNECTS</i> GRADE 4	<i>MATH CONNECTS</i> GRADE 5
Use place value understanding and properties of operations to perform multi-digit arithmetic.						
4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.				69-71, 74-77, 78-80, 81, 82-85, 90-91, 92-94, 95, 96-99, 100-104, 111-113, 118-120, 121, 126-127, 128-131, 134-136, 137, 138-141, 142-143	55-57, 58-61, 64-67, 70-71, 72-74, 80-83	70-72, 73, 74A
5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.				162-164, 165-166, 167, 168-170, 171, 174-177, 178-181, 186-189, 201-202, 203-205, 206-210, 211, 214-216, 218-221, 222-225, 230-233, 234-237, 644-647, 650-651, 652-655, 656-658, 659	150-153, 154-157, 160-162, 166-169, 172-174, 237-239, 242-244, 246-248, 252-255, 258-261, 273-275, 276-279, 282-283, 284-286	116-118, 120A, 122-124, 126A, 126-129, 138-142, 143

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	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.				251-252, 255, 256-257, 258-261, 264-266, 267-268, 270-273, 278-280, 281, 282-283, 297-299, 300-303, 306-308, 312-314, 315, 316-319	150-153, 154-157, 160-162, 166-169, 311-312, 313-315, 316-319, 322-324, 326-329, 332-334, 336-338, 342-345	156-157, 158, 161, 162A, 162-164, 165, 166A, 182-185, 187
	Number & Operations--Fractions¹					
	¹ Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, 100.					
	Extend understanding of fraction equivalence and ordering.					
1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.				570-571, 572-574, 575, 576, 577, 578A	546-547, 548-551	382-384, 385, 386A

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2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.				580-583, 584A, 584-587	554-557	382-384, 385, 386A, 402-403, 404-407, 414

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.					
3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.						
<ul style="list-style-type: none"> Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. 						421-422, 423-425, 426-427, 428A, 428-431, 432-433, 434A, 434-436, 437-438, 439-441, 442A
<ul style="list-style-type: none"> Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2\ 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$. 					560-563	

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	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
<ul style="list-style-type: none"> ■ Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. 						448-451, 452A, 452-454, 455, 456A, 458-461
<ul style="list-style-type: none"> ■ Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem. 						
4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.						LA6-LA9, LA10A

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
<ul style="list-style-type: none"> Understand a fraction a/b as a multiple of $1/b$. For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$. 						LA6-LA9, LA10A
<ul style="list-style-type: none"> Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.) 						

STANDARDS	PAGE REFERENCES					
	<i>MATH CONNECTS</i> GRADE K	<i>MATH CONNECTS</i> GRADE 1	<i>MATH CONNECTS</i> GRADE 2	<i>MATH CONNECTS</i> GRADE 3	<i>MATH CONNECTS</i> GRADE 4	<i>MATH CONNECTS</i> GRADE 5
<ul style="list-style-type: none"> ■ Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat $\frac{3}{8}$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie? 						

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
	Understand decimal notation for fractions, and compare decimal fractions.					
<p>5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.² For example, express $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$.</p> <p>² Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.</p>				601-602, 603-606, 607, 608-610, 616-617	577-578, 579-581, 596-599	26-27, 28-30, 31, 32A, 32-35, 391-393

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
6. Use decimal notation for fractions with denominators 10 or 100. <i>For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</i>				601-602, 603-606, 607, 608-610, 616-617	579-581, 596-599, 602-604	26-27, 28-30, 31, 32A, 32-35, 391-393
7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.					579-581, 596-599, 602-604	36-39

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	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
	Measurement & Data					
	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.					
1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...				373-374, 375-377, 378-380, 384-385, 386-389, 423-424, 425-428, 429, 432-434, 438-441, 442-443, 444-447, 454-455	439-440, 441-443, 444-445, 448-449, 450-452, 485-486, 486-489, 490-491, 492-495, 496-497, 498-500, 504-507, 508-510	475-476, 477-480, 481, 484-487, 488-490, 491, 492-495, 500-503, 504-508, 515-516, 517-521, 524-526, 527-530, 531, 532, 542-543

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	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.				373-374, 375-377, 378-380, 384-385, 386-389, 423-424, 425-428, 429, 432-434, 438-441, 442-443, 444-447, 454-455	441-443, 444-445, 446-447, 450-452, 466-467, 486-489, 490-491, 492-495, 498-500, 504-507, 508-510, 520-523, 594-595, 596-599, 602-604, 617-620, 622-625, 630-632, 638-641	475-476, 477-480, 481, 484-487, 488-490, 491, 492-495, 500-503, 504-508, 515-516, 517-521, 524-526, 527-530, 531, 532, 542-543
3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.				392-395, 396-397, 398-401	456-459, 460-462	607, 608-611, 612A, 616-619, 622, 623

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Represent and interpret data.						
4. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.				536-539		284-288, 289A
Geometric measurement: understand concepts of angle and measure angles.						
5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:					368-370	564-565

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	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
<ul style="list-style-type: none"> An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles. 					368-370	564-565
<ul style="list-style-type: none"> An angle that turns through n one-degree angles is said to have an angle measure of n degrees. 						
6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.						564-565

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7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.						
	Geometry					
	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.					
1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.					372-375, 398-399, 400-403	557-560, 561, 562A

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2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.				472-475, 476A	368-370, 372-375, 376-378	566-569, 570A, 570-574, 575
3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.				488-490, 491, 492A	422-424	10

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	GRADE 5					
	Operations & Algebraic Thinking					
	Write and interpret numerical expressions.					
1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.					193-195, 198A, 201 #29-#30, 207, 214-216, 218A, 225	LA18-LA21, LA22-LA25
2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.					193-195, 214-216, 217, 225, 229, 231	193-195, 198-201, 202-204, 210-213, 218-222, LA18-LA21, LA22-LA25

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Analyze patterns and relationships.						
3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.					208-211, 214A, 220-223, 228, 230	

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	Number & Operations in Base Ten					
	Understand the place value system.					
1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.					17-19, 20-21, 22-25, 45, 579-581	17-19, 32-35
2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.					237-239, 240A, 273-275, 276A, 316-319	103-105
3. Read, write, and compare decimals to thousandths.					579-581, 582A, 582-585, 590-592, 593, 602-604, 605, 607, 609, 611	26-27, 28-30, 32-35

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<ul style="list-style-type: none"> Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$. 					579-581, 582A, 582-585, 593, 607, 611	32-35
<ul style="list-style-type: none"> Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons. 					590-592, 593, 602-604, 605, 609, 611	36-39, 42-46
4. Use place value understanding to round decimals to any place.					617-620, 621, 622A, 622-625	61-63

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	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
	Perform operations with multi-digit whole numbers and with decimals to hundredths.					
5. Fluently multiply multi-digit whole numbers using the standard algorithm.					237-239, 246-248, 249, 252-255, 258-261, 262-266, 273-275, 282-283, 284-286, 287, 288A, 288-291, 294A, 296-298, 299, 300-304, 305	116-118, 122-124
6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.					147-149, 150A, 150-153, 154-157, 160-162, 163, 166-169, 170A, 311-312, 313-315, 316-319, 325, 326-329, 332-334, 335, 336-338, 339, 342-345, 346-352, 353	149-151, 152-155, 156-157, 158-161, 162-164, 168-169, 170-173

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7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.					628-629, 630-632, 533, 636-637, 638-641, 647-648, 649	64-67, 78-79, 80-82, 84-87, 88-91

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	Number & Operations—Fractions					
	Use equivalent fractions as a strategy to add and subtract fractions.					
1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$. (In general, $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$.)						432-433, 434-436, 437-438, 439-441, 448-451, 452-454, 458-461

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2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.						421-422, 423-425, 426-427, 428-431, 432-433, 434-436, 437-438, 439-441, 444-446, 448-451, 452-454, 458-461

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Apply and extend previous understandings of multiplication and division to multiply and divide fractions.						
3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret $3/4$ as the result of dividing 3 by 4, noting that $3/4$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $3/4$. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?						333-335, 336-337, 338-342

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4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.						LA6-LA9, LA10A
<ul style="list-style-type: none"> Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.) 						

STANDARDS	PAGE REFERENCES					
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<ul style="list-style-type: none"> Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. 						LA6
5. Interpret multiplication as scaling (resizing), by:						
<ul style="list-style-type: none"> Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. 						

STANDARDS	PAGE REFERENCES					
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<ul style="list-style-type: none"> Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1. 						
6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.						LA6-LA9, LA10A

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<p>7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.¹</p> <p>¹ Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.</p>						
<p>■ Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.</p>						

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
<ul style="list-style-type: none"> Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$. 						
<ul style="list-style-type: none"> Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $1/3$-cup servings are in 2 cups of raisins? 						

STANDARDS	PAGE REFERENCES					
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Measurement & Data						
Convert like measurement units within a given measurement system.						
1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.					444-445, 446A, 453, 490-491, 492A, 492-495, 504-507	477-480, 484-487, 488-490, 517-521, 524-526, 527-530
Represent and interpret data.						
2. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.						

STANDARDS	PAGE REFERENCES					
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	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.					
3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.					512-515, 518A	630, 631-635
<ul style="list-style-type: none"> ■ A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume. 					512-515, 518A	631-635
<ul style="list-style-type: none"> ■ A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. 					512-515, 518A	631-635
4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.					512-515, 518A	630
5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.					512-515, 518A	631-635

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
<ul style="list-style-type: none"> Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. 					512-515, 518A	631-635
<ul style="list-style-type: none"> Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. 					512-515, 518A	631-635

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
Geometry						
Graph points on the coordinate plane to solve real-world and mathematical problems.						
1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).					406-408, 409, 415, 430	250-252, 254-257

STANDARDS	PAGE REFERENCES					
	MATH CONNECTS GRADE K	MATH CONNECTS GRADE 1	MATH CONNECTS GRADE 2	MATH CONNECTS GRADE 3	MATH CONNECTS GRADE 4	MATH CONNECTS GRADE 5
2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.					406-408, 409, 415, 430	250-252, 254-257
Classify two-dimensional figures into categories based on their properties.						
3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.					362-365, 366A, 371, 372-375, 376-378, 379, 385, 387, 388, 389	570-574
4. Classify two-dimensional figures in a hierarchy based on properties.					362-365, 366A, 371, 372-375, 376-378, 379, 385, 387, 388, 389	566-569, 570-574