# 2017 vs 2010

# Mathematics Standards Comparison Document

**Updated 7/9/2018**

| 2017 Tag | 2017 Standard | Changes | 2010 Tag | 2010 Standard |
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| K.CC.1 | Count to 100 by ones and by tens and **identify as a growth pattern.** | The words “and identify as a growth pattern” were added to the standard. | K.CC.1 | Count to 100 by ones and by tens. |
| K.CC.2 | Count forward beginning from a given number within the known sequence (instead of having to begin at 1). | NO CHANGES | K.CC.2 | Count forward beginning from a given number within the known sequence (instead of having to begin at 1). |
| K.CC.3 | **Read** and write **numerals** from 0 to 20. | The word “read” was added, the word “numbers” was changed to “numerals”.<br><br>**Standard was broken into two standards K.CC.3 & K.CC.4d** | K.CC.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). |
| K.CC.4 | Understand the relationship between numbers and quantities; connect counting to cardinality. | NO CHANGES | K.CC.4 | Understand the relationship between numbers and quantities; connect counting to cardinality. |
| K.CC.4a | When counting objects, **say each number’s name in sequential order**, pairing each object with one and only one number name and each number name with one and only one object. | The words “say the number names in the standard order” were changed to “say each number’s name in sequential order”. | K.CC.4a | 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. |
| K.CC.4b | 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. | NO CHANGES | K.CC.4b | 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. |
| K.CC.4c | Understand that each successive number name refers to a quantity that is one larger. | NO CHANGES | K.CC.4c | Understand that each successive number name refers to a quantity that is one larger. |
| K.CC.4d | **Understand the relationship between numbers and quantities; connect counting to cardinality.**<br>Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). | “Write numbers from 0 to 20” was changed to “Understand the relationship between numbers and quantities; connect counting to cardinality.”<br><br>**K.CC.3 was broken into two standards K.CC.3 & K.CC.4d** | K.CC.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). |
| K.CC.5 | Count to answer “how many?” **up to20 concrete or pictorial objects** arranged in a line, a rectangular array, or a circle, or as many as 10 objects in a scattered configuration (**subitizing**); given a number from 1 to 20, count out that many objects. | The words “questions about as many as 20 things” was reworded to “up to20 concrete or pictorial objects”.<br><br>The word “subitizing” was added. | K.CC.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. |

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| K.CC.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, include groups with up to ten objects. | NO CHANGES | K.CC.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. (Include groups with up to ten objects.) |
| K.CC.7 | Compare two numbers between 1 and 10 presented as written numerals. | NO CHANGES | K.CC.7 | Compare two numbers between 1 and 10 presented as written numerals. |
| K.OA.1 | Represent addition and subtraction with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations. | NO CHANGES | K.OA.1 | Represent addition and subtraction with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations. |
| K.OA.2 | Solve addition and subtraction word problems, and add and subtract within 10. | NO CHANGES | K.OA.2 | Solve addition and subtraction word problems, and add and subtract within 10. |
| K.OA.3 | Decompose numbers less than or equal to 10 into pairs in more than one way. | NO CHANGES | K.OA.3 | Decompose numbers less than or equal to 10 into pairs in more than one way. |
| K.OA.4 | For any number from 1 to 9, find the number that makes 10 when added to the given number | NO CHANGES | K.OA.4 | For any number from 1 to 9, find the number that makes 10 when added to the given number. |
| K.OA.5 | Fluently (**efficiently, accurately, and flexibly**) add and subtract within 5. | The words “efficiently, accurately, and flexibly” were added. | K.OA.5 | Fluently add and subtract within 5. |
| K.NBT.1 | Compose and decompose numbers from 11 to 19 into ten ones and some further ones; understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. | NO CHANGES | K.NBT.1 | Compose and decompose numbers from 11 to 19 into ten ones and some further ones; understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. |
| K.MD.1 | Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. | NO CHANGES | K.MD.1 | Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. |
| K.MD.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 | NO CHANGES | K.MD.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. |
| K.MD.3 | Classify objects into given categories; count the numbers of objects in each category and sort the categories by count (**Limit category counts to be less than or equal to 10**). | The words “Limit category counts to be less than or equal to 10” were added. | K.MD.3 | Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.3 |

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| K.G.1 | Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to. | NO CHANGES | K.G.1 | Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to. |
| K.G.2 | Correctly gives most precise name of shapes regardless of their orientations (**position and direction in space**) or overall size. | The words “position and direction in space” were added. | K.G.2 | Correctly name shapes regardless of their orientations or overall size. |
| K.G.3 | Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”). | NO CHANGES | K.G.3 | Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”). |
| K.G.4 | Analyze and compare two- and three-dimensional shapes, in different sizes and orientations (**position and direction in space**), using informal language to describe their similarities, differences, parts and other attributes. | The words “position and direction in space” were added. | K.G.4 | Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts and other attributes. |
| K.G.5 | Model shapes in the world by building shapes from components and drawing shapes. | NO CHANGES | K.G.5 | Model shapes in the world by building shapes from components and drawing shapes. |
| K.G.6 | Compose simple shapes to form larger shapes. | NO CHANGES | K.G.6 | Compose simple shapes to form larger shapes. |
| 1.OA.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. | NO CHANGES | 1.OA.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. |
| 1.OA.2 | Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20. | NO CHANGES | 1.OA.2 | Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20. |
| 1.OA.3 | Apply (**not necessary to name**) properties of operations as strategies to add and subtract. | The words “not necessary to name” were added. | 1.OA.3 | Apply properties of operations as strategies to add and subtract. |
| 1.OA.4 | Understand subtraction as an unknown-addend problem. | NO CHANGES | 1.OA.4 | Understand subtraction as an unknown-addend problem. |

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| 1.OA.5 | Relate counting to addition and subtraction | NO CHANGES | 1.OA.5 | Relate counting to addition and subtraction. |
| 1.OA.6 | Add and subtract within 20, demonstrating fluency (**efficiently, accurately, and flexibly**) for addition and subtraction within 10. Use mental strategies such as counting on; making *ten*; decomposing a number leading to a ten*;* using the relationship between addition and subtraction; and creating equivalent but easier or known sums. | The words "efficiently, accurately, and flexibly" were added. | 1.OA.6 | Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use mental strategies such as counting on; making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; and creating equivalent but easier or known sums. |
| 1.OA.7 | Understand the meaning of the equal sign (**the value is the same on both sides of the equal sign**), and determine if equations involving addition and subtraction are true or false. | The words "the value is the same on both sides of the equal sign" were added. | 1.OA.7 | Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. |
| 1.OA.8 | **Using related equations**, Determine the unknown whole number in an addition or subtraction equation. | The words "using related equations" were added. | 1.OA.8 | Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. |
| 1.NBT.1 | Count to 120 (**recognizing growth and repeating patterns**), starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral. | The words "recognizing growth and repeating patterns" were added. | 1.NBT.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. |
| 1.NBT.2 | Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: | NO CHANGES | 1.NBT.2 | Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: |
| 1.NBT.2a | 10 can be thought of as a grouping of ten ones—called a "ten." | NO CHANGES | 1.NBT.2a | 10 can be thought of as a bundle of ten ones—called a "ten." |
| 1.NBT.2b | The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. | NO CHANGES | 1.NBT.2b | The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. |
| 1.NBT.2c | 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). | NO CHANGES | 1.NBT.2c | 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). |

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| 1.NBT.2d | Show flexibility in composing and decomposing tens and ones. | **New standard for 2017.** | | |
| 1.NBT.3 | Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the relational symbols >, <, =, **and ≠**. | The words "and ≠" were added. | 1.NBT.3 | Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <. |
| 1.NBT.4 | Add within 100 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 **including**: | The words " including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10" and "Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten" were removed.<br><br>The word "including" was added.<br><br>**Standard 1.NBT.4 was broken into multiple standards (1.NBT.4a, 1.NBT.4b, 1.NBT4c).** | 1.NBT.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.** |
| 1.NBT.4a | Adding a two-digit number and a one-digit number. | Contains the adding of a two-digit number and a one-digit number.<br><br>**Standard 1.NBT.4 was broken into multiple standards (1.NBT.4a, 1.NBT.4b, 1.NBT4c).** | 1.NBT.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. |

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| 1.NBT.4b | Adding a two-digit number and a multiple of 10 | Contains the adding of a two-digit number and a multiple of 10.<br><br>**Standard 1.NBT.4 was broken into multiple standards (1.NBT.4a, 1.NBT.4b, 1.NBT4c).** | 1.NBT.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. |
| 1.NBT.4c | Understanding that **when** adding two-digit numbers, **combine like base-ten units such as** tens and tens, ones and ones; and sometimes it is necessary to compose a ten | The word “in” was replaced with “when”. The words “one adds” were replaced with “combine like base-ten units such as”.<br><br>**Standard 1.NBT.4 was broken into multiple standards (1.NBT.4a, 1.NBT.4b, 1.NBT4c).** | 1.NBT.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. |
| 1.NBT.5 | Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. | NO CHANGES | 1.NBT.5 | Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. |
| 1.NBT.6 | Subtract multiples of 10 in the range 10 to 90 from multiples of 10 in the range 10 to 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. | NO CHANGES | 1.NBT.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. |
| 1.MD.1 | Order three objects by length; compare the lengths of two objects indirectly by using a third object. | NO CHANGES | 1.MD.1 | Order three objects by length; compare the lengths of two objects indirectly by using a third object. |

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| 1.MD.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. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps. | NO CHANGES | 1.MD.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. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps. |
| 1.MD.3 | Tell and write time in hours and half-hours using analog and digital clocks. | NO CHANGES | 1.MD.3 | Tell and write time in hours and half-hours using analog and digital clocks. |
| 1.MD.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. | NO CHANGES | 1.MD.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. |
| 1.G.1 | Distinguish between defining attributes versus non-defining attributes; build and draw shapes that possess defining attributes | NO CHANGES | 1.G.1 | Distinguish between defining attributes versus non-defining attributes; build and draw shapes that possess defining attributes. |
| 1.G.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. Students do not need to learn formal names such as “right rectangular prism.” | NO CHANGES | 1.G.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. (Students do not need to learn formal names such as “right rectangular prism.”) |
| 1.G.3 | Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. **Note: fraction notation ($\frac{1}{2}, \frac{1}{4}$) is not expected at this grade level.** Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares. | The words “Note: fraction notation ($\frac{1}{2}, \frac{1}{4}$) is not expected at this grade level” were added. | 1.G.3 | Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares. |

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| 2.OA.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. | NO CHANGES | 2.OA.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. |
| 2.OA.2 | Fluently (**efficiently, accurately, and flexibly**) add and subtract within 20 using mental strategies (**counting on, making a ten, decomposing a number, creating an equivalent but easier and known sum, and using the relationship between addition and subtraction**) **Work with equal groups of objects to gain foundations for multiplication.** | The words "efficiently, accurately, and flexibly)" were added. The strategies "counting on, making a ten, decomposing a number, creating an equivalent but easier and known sum, and using the relationship between addition and subtraction" were added. The words "Work with equal groups of objects to gain foundations for multiplication" were also added. | 2.OA.2 | Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers. |
| 2.OA.3 | Determine whether a group of objects (up to 20) has an odd or even number of members; write an equation to express an even number as a sum of two equal addends. | NO CHANGES | 2.OA.3 | Determine whether a group of objects (up to 20) has an odd or even number of members; write an equation to express an even number as a sum of two equal addends. |
| 2.OA.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. | NO CHANGES | 2.OA.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. |
| 2.NBT.1 | Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; Understand the following as special cases: | NO CHANGES | 2.NBT.1 | Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; Understand the following as special cases: |
| 2.NBT.1a | 100 can be thought of as a bundle of ten tens—called a "hundred." | NO CHANGES | 2.NBT.1a | 100 can be thought of as a bundle of ten tens—called a "hundred." |
| 2.NBT.1b | The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds. | The words "(and 0 tens and 0 ones)" were removed | 2.NBT.1b | 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)**. |
| 2.NBT.1c | Show flexibility in composing and decomposing hundreds, tens and ones | **New standard for 2017.** | | |
| 2.NBT.2 | Count within 1000; skip-count by **2s**, 5s, 10s, and 100s; **explain and generalize the patterns.** | The words "2s" and "explain and generalize the patterns" were added. | 2.NBT.2 | Count within 1000; skip-count by 5s, 10s, and 100s. |
| 2.NBT.3 | Read and write numbers within 1000 using base-ten numerals, number names, expanded form, and unit form. | NO CHANGES | 2.NBT.3 | Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. |

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| 2.NBT.4 | Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, <, =, and ≠ relational symbols to record the results of comparisons. | The relational symbol "≠" was added. | 2.NBT.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. |
| 2.NBT.5 | Fluently (**efficiently, accurately, and flexibly**) add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. | The words "efficiently, accurately, and flexibly" were added. | 2.NBT.5 | Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. |
| 2.NBT.6 | Add up to four two-digit numbers using strategies based on place value and properties of operations. | NO CHANGES | 2.NBT.6 | Add up to four two-digit numbers using strategies based on place value and properties of operations. |
| 2.NBT.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, **like base-ten units such as** hundreds and hundreds, tens and tens, ones and ones **are used**; and sometimes it is necessary to compose or decompose tens or hundreds. | The words "one adds or subtracts" were replaced with "like base-ten units such as". The words "are used" were added. | 2.NBT.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. |
| 2.NBT.8 | Mentally add 10 or 100 to a given number 100 – 900, and mentally subtract 10 or 100 from a given number 100 – 900. | NO CHANGES | 2.NBT.8 | Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900. |
| 2.NBT.9 | Explain why addition and subtraction strategies work using place value and the properties of operations. The explanations **given** may be supported by drawings or objects. | The word "given" was added. | 2.NBT.9 | Explain why addition and subtraction strategies work, using place value and the properties of operations. (Explanations may be supported by drawings or objects.) |
| 2.MD.1 | Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. | NO CHANGES | 2.MD.1 | Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. |
| 2.MD.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. | NO CHANGES | 2.MD.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. |
| 2.MD.3 | Estimate lengths using whole units of inches, feet, centimeters, and meters. | NO CHANGES | 2.MD.3 | Estimate lengths using units of inches, feet, centimeters, and meters. |

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| 2.MD.4 | Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit (**inches, feet, centimeters, and meters**). | The units "inches, feet, centimeters, and meters" were added. | 2.MD.4 | Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. |
| 2.MD.5 | Use addition and subtraction within 100 to solve **one- and two-step** word problems involving lengths that are given in the same units | The words "one- and two-step" were added. | 2.MD.5 | Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units. |
| 2.MD.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. | NO CHANGES | 2.MD.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. |
| 2.MD.7 | Tell and write time from analog and digital clocks to the nearest five minutes. | The words "using a.m. and p.m." were removed. | 2.MD.7 | Tell and write time from analog and digital clocks to the nearest five minutes**, using a.m. and p.m**. |
| 2.MD.8 | Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately (**Do not use decimal point, if showing 25 cents, use the word cents or ¢**). | The phrase "(Do not use decimal point, if showing 25 cents, use the word cents or ¢)" was added. | 2.MD.8 | Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. |
| 2.MD.9 | Identify coins and bills and their values | **New standard for 2017.** | | |
| 2.MD.10 | Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object **using different units**. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units. | The phrase "using different units" was added. | 2.MD.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. |
| 2.MD.11 | 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 using information presented in a bar graph. | NO CHANGES | 2.MD.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 using information presented in a bar graph. |

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| 2.G.1 | Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. | The phrase "(Sizes of lengths and angles are compared directly or visually, not compared by measuring.)" was removed. | 2.G.1 | Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. (**Sizes of lengths and angles are compared directly or visually, not compared by measuring.**) |
| 2.G.2 | Partition a rectangle into rows and columns of same-size squares and count to find the total number of them. | NO CHANGES | 2.G.2 | Partition a rectangle into rows and columns of same-size squares and count to find the total number of them. |
| 2.G.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. ***Note: fraction notation*** $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ ***is not expected at this grade level.*** Recognize that equal shares of identical wholes need not have the same shape. | The phrase "Note: fraction notation $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ is not expected at this grade level." was added. | 2.G.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. |
| 3.OA.1 | Interpret products of whole numbers. | NO CHANGES | 3.OA.1 | Interpret products of whole numbers. |
| 3.OA.2 | Interpret whole-number quotients of whole numbers. | NO CHANGES | 3.OA.2 | Interpret whole-number quotients of whole numbers. |
| 3.OA.3 | Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. | NO CHANGES | 3.OA.3 | Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. |
| 3.OA.4 | Determine the unknown whole number in a multiplication or division equation **by using related equations**. | "**relating three whole numbers**" was replaced with "**by using related equations**" | 3.OA.4 | Determine the unknown whole number in a multiplication or division equation **relating three whole numbers**. |
| 3.OA.5 | Apply properties of operations as strategies to multiply and divide. *Students need not use formal terms for these properties.* | NO CHANGES | 3.OA.5 | Apply properties of operations as strategies to multiply and divide. (Students need not use formal terms for these properties.) |

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| 3.OA.6 | Understand division as an unknown-factor problem. | NO CHANGES | 3.OA.6 | Understand division as an unknown-factor problem. |
| 3.OA.7 | **Fluently (efficiently, accurately, and flexibly) multiply and divide with single digit multiplications and related divisions using strategies or properties of operations.** | Entire standard was reworded. | 3.OA.7 | Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. |
| 3.OA.8 | Solve two-step word problems using any of the four operations. Represent these problems using **both situation equations and/or solution equations with a letter or symbol standing for the unknown quantity**. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. This standard is limited to problems posed with whole numbers and having whole-number answers. | The phrase "equations with a letter standing for the unknown quantity" was replaced with "both situation equations and/or solution equations with a letter or symbol standing for the unknown quantity"<br><br>The phrase "students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations)" was removed. | 3.OA.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. (This standard is limited to problems posed with whole numbers and having whole-number answers; **students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations)**.) |
| 3.OA.9 | Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. | NO CHANGES | 3.OA.9 | Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. |
| 3.NBT.1 | Use place value understanding to round whole numbers to the nearest 10 or 100. | NO CHANGES | 3.NBT.1 | Use place value understanding to round whole numbers to the nearest 10 or 100. |

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| 3.NBT.2 | Fluently (**efficiently, accurately, & flexibly**) add and subtract within 1000 using strategies and algorithms (**including, but not limited to: traditional, partial-sums, etc.**) based on place value, properties of operations, and/or the relationship between addition and subtraction. | The words "(efficiently, accurately, & flexibly)" were added.<br><br>The phrase "(including, but not limited to: traditional, partial-sums, etc.)" was added. | 3.NBT.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. |
| 3.NBT.3 | Multiply one-digit whole numbers by multiples of 10 in the range 10 to 90 using strategies based on place value and properties of operations. | NO CHANGES | 3.NBT.3 | Multiply one-digit whole numbers by multiples of 10 in the range 10–90 using strategies based on place value and properties of operations. |
| 3.NF.1 | Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by *a* parts of size $\frac{1}{b}$. | NO CHANGES | 3.NF.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. |
| 3.NF.2 | Understand a fraction as a number on the number line; represent fractions on a number line diagram. | NO CHANGES | 3.NF.2 | Understand a fraction as a number on the number line; represent fractions on a number line diagram. |
| 3.NF.2a | Represent a fraction $\frac{1}{b}$ 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 $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line. | NO CHANGES | 3.NF.2a | 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. |
| 3.NF.2b | Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off *a* lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line (***a* is the countable units of $\frac{1}{b}$ that determines the place on the number line**). | The phrase "(a is the countable units of $\frac{1}{\mathrm{b}}$ that determines the place on the number line)" was added. | 3.NF.2b | 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. |

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| 3.NF.3 | Explain equivalence of fractions, and compare fractions by reasoning about their size **(it is a mathematical convention that when comparing fractions, the whole is the same size**). | The phrase "in special cases" was removed.<br><br>The phrase "(it is a mathematical convention that when comparing fractions, the whole is the same size)" was added. | 3.NF.3 | Explain equivalence of fractions **in special cases**, and compare fractions by reasoning about their size. |
| 3.NF.3a | Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. | The phrase "Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8" was removed and placed in Cluster title. | 3.NF.3a | Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. (**Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)** |
| 3.NF.3b | Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent. | The phrase "Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8" was removed and placed in Cluster title. | 3.NF.3b | Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent. (**Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.**) |
| 3.NF.3c | Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. | NO CHANGES | 3.NF.3c | Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. |
| 3.NF.3d | 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 relational symbols >, <, =, or **≠,** and justify the conclusions. | The relational symbol "≠" was added. | 3.NF.3d | 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. |
| 3.MD.1 | Tell and write time to the nearest minute using **a.m. and p.m.** and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes. | The words "a.m. and p.m." were added. | 3.MD.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. |
| 3.MD.2 | Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l) (**Excludes cubed units such as $cm^3$ and finding the geometric volume of a container**). | The phrase "(Excludes cubed units such as $\mathrm{cm}^3$ and finding the geometric volume of a container)" was added.<br><br>**Standard 3.MD2 was broken into multiple standards 3.MD.2 & 3.MD.3.** | 3.MD.2 | Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units. |
| 3.MD.3 | Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units (**Excludes multiplicative comparison problems**) | **Standard 3.MD2 was broken into multiple standards 3.MD.2 & 3.MD.3.**<br><br>The words "Excludes multiplicative comparison problems" were added. | 3.MD.2 | Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units. |

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| 3.MD.4 | 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. | NO CHANGES | 3.MD.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. |
| 3.MD.5 | 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. | NO CHANGES | 3.MD.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. |
| 3.MD.6 | Recognize area as an attribute of plane figures and understand concepts of area measurement. | NO CHANGES | 3.MD.5 | Recognize area as an attribute of plane figures and understand concepts of area measurement. |
| 3.MD.6a | 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 (**does not require standard square units**). | The phrase "(does not require standard square units)" was added. | 3.MD.5a | 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. |
| 3.MD.6b | 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 (**does not require standard square units**). | The phrase "(does not require standard square units)" was added. | 3.MD.5b | 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. |
| 3.MD.7 | Measure areas by counting unit squares (square cm, square m, square in, square ft, and **non-standard square units**). | The phrase "improvised units" was replaced with "non-standard square units" | 3.MD.6 | Measure areas by counting unit squares (square cm, square m, square in, square ft, and **improvised units**). |
| 3.MD.8 | Relate area to the operations of multiplication and addition | NO CHANGES | 3.MD.7 | Relate area to the operations of multiplication and addition. |
| 3.MD.8a | 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. | NO CHANGES | 3.MD.7a | 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. |

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| 3.MD.8b | 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. | NO CHANGES | 3.MD.7b | 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. |
| 3.MD.8c | 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 $a \cdot b$ and $a \cdot c$. Use area models to represent the distributive property in mathematical reasoning. | NO CHANGES | 3.MD.7c | 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 aXb and aXc. Use area models to represent the distributive property in mathematical reasoning. |
| 3.MD.8d | 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. | NO CHANGES | 3.MD.7d | 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. |
| 3.MD.9 | 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. | NO CHANGES | 3.MD.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. |
| 3.G.1 | Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. **Refer to inclusive definitions noted in the glossary.** | Phrase “Refer to inclusive definitions noted in the glossary” was added. | 3.G.1 | Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. |
| 3.G.2 | Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. | NO CHANGES | 3.G.2 | Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. |

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| 4.OA.1 | Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations. | NO CHANGES | 4.OA.1 | Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations. |
| 4.OA.2 | Multiply or divide to solve word problems involving multiplicative comparison. | NO CHANGES | 4.OA.2 | Multiply or divide to solve word problems involving multiplicative comparison |
| 4.OA.3 | Solve multi-step word problem 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 **situation** equations **and/or solution equations** with a letter **or symbol** standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. | The word “situation” was added.<br><br>The phrase “and/or solution equations” was added.<br><br>The phrase “or symbol” was added. | 4.OA.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. |
| 4.OA.4 | Find all factor pairs for a whole number in the range 1 to 100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1 to 100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1 to 100 is prime or composite. | NO CHANGES | 4.OA.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. |
| 4.OA.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. Explain informally why the numbers will continue to alternate in this way. | NO CHANGES | 4.OA.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. Explain informally why the numbers will continue to alternate in this way. |
| 4.NBT.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. | NO CHANGES | 4.NBT.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. |

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| 4.NBT.2 | Read and write multi-digit whole numbers using base-ten numerals, number names, expanded form, **and unit form**. Compare two multi-digit numbers based on meanings of the digits in each place, using >, <, =, and **≠** symbols to record the results of comparisons. | The phrase “and unit form” was added.<br><br>The relational symbol “≠” was added. | 4.NBT.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. |
| 4.NBT.3 | Use place value understanding to round multi-digit whole numbers to any place. | NO CHANGES | 4.NBT.3 | Use place value understanding to round multi-digit whole numbers to any place. |
| 4.NBT.4 | Fluently **(efficiently, accurately, and flexibly)** add and subtract multi-digit whole numbers using an efficient algorithm **(including, but not limited to: traditional, partial-sums, etc.), based on place value understanding and the properties of operations**. | The words “(efficiently, accurately, and flexibly)” were added.<br><br>The phrases “(including, but not limited to: traditional, partial-sums, etc.), based on place value understanding and the properties of operations” were added. | 4.NBT.4 | Fluently add and subtract multi-digit whole numbers using the standard algorithm. |
| 4.NBT.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. | NO CHANGES | 4.NBT.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. |
| 4.NBT.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. | NO CHANGES | 4.NBT.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. |

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| 4.NF.1 | Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{(n \cdot a)}{(n \cdot b)}$ 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. | NO CHANGES | 4.NF.1 | Explain why a fraction a/b is equivalent to a fraction (n X a)/(n X 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. |
| 4.NF.2 | Compare two fractions with different numerators and different denominators. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with relational symbols >, <, =, or ≠, and justify the conclusions | The relational symbol "≠" was added. | 4.NF.2 | Compare two fractions with different numerators and different denominators. 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. |
| 4.NF.3 | Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$. | NO CHANGES | 4.NF.3 | Understand a fraction a/b with a > 1 as a sum of fractions 1/b. |
| 4.NF.3a | Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. | NO CHANGES | 4.NF.3a | Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. |
| 4.NF.3b | 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. | NO CHANGES | 4.NF.3b | 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. |

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| 4.NF.3c | Add and subtract mixed numbers with like denominators. | NO CHANGES | 4.NF.3c | Add and subtract mixed numbers with like denominators. |
| 4.NF.3d | Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators. | NO CHANGES | 4.NF.3d | Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators. |
| 4.NF.4 | Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. | NO CHANGES | 4.NF.4 | Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. |
| 4.NF.4a | Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. | NO CHANGES | 4.NF.4a | Understand a fraction a/b as a multiple of 1/b. |
| 4.NF.4b | Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. | NO CHANGES | 4.NF.4b | Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. |
| 4.NF.4c | Solve word problems involving multiplication of a fraction by a whole number. | NO CHANGES | 4.NF.4c | Solve word problems involving multiplication of a fraction by a whole number. |
| 4.NF.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. | NO CHANGES | 4.NF.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. |
| 4.NF.6 | Use decimal notation for fractions with denominators 10 or 100. | NO CHANGES | 4.NF.6 | Use decimal notation for fractions with denominators 10 or 100. |

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| 4.NF.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 relational symbols >, < =, or ≠, and justify the conclusions. | The relational symbol "≠" was added. | 4.NF.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. |
| 4.MD.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. | NO CHANGES | 4.MD.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. |
| 4.MD.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. | NO CHANGES | 4.MD.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. |
| 4.MD.3 | Apply the area and perimeter formulas for rectangles in real world and mathematical problems **explaining and justifying the appropriate unit of measure**. | The phrase "explaining and justifying the appropriate unit of measure" was added. | 4.MD.3 | Apply the area and perimeter formulas for rectangles in real world and mathematical problems. |
| 4.MD.4 | Make a **data display (line plot, bar graph, pictograph)** to **show a** set of measurements in fractions of a unit $\left(\frac{1}{2}, \frac{1}{4}, \frac{1}{8}\right)$. Solve problems involving addition and subtraction of fractions by using information presented in the data display. | "Line plot" was replaced with "data display (line plot, bar graph, pictograph)".<br><br>The phrase "display a data" was replaced with "show a". | 4.MD.4 | Make a line plot to **display a data** set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. |
| | | **Standard was moved to 8th grade 8.G.1.** | 4.MD.5 | Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. |
| | | **Standard was moved to 8th grade 8.G.1a** | 4.MD.5a | 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 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. |

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| | | **Standard was moved to 8th grade 8.G.1b** | 4.MD.5b | An angle that turns through n one-degree angles is said to have an angle measure of n degrees. |
| | | **Standards was moved to 8th grade 8.G.2.** | 4.MD.6 | Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. |
| | | **Standard was moved to 8th grade 8.G.3.** | 4.MD.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. |
| 4.G.1 | Draw points, lines, line segments, rays, angles (right, acute, obtuse, straight, reflex), and perpendicular and parallel lines. Identify these in two-dimensional figures. | NO CHANGES | 4.G.1 | Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. |
| 4.G.2 | Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles **(right, acute, obtuse, straight, reflex)**. **Recognize and categorize triangles based on angles (right, acute, obtuse, and equiangular) and/or sides (scalene, isosceles, and equilateral)**. | The phrase "of a specified size" was replaced with "(right, acute, obtuse, straight, reflex)".<br><br>The sentence "Recognize right triangles as a category, and identify right triangles" was replaced with "Recognize and categorize triangles based on angles (right, acute, obtuse, and equiangular) and/or sides (scalene, isosceles, and equilateral)." | 4.G.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**. |
| 4.G.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. | NO CHANGES | 4.G.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. |
| 5.OA.1 | Use parentheses in numerical expressions and evaluate expressions with these symbols. | Removed the words "brackets, or braces" | 5.OA.1 | Use parentheses, **brackets, or braces** in numerical expressions, and evaluate expressions with these symbols. |
| 5.OA.2 | Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. | NO CHANGES | 5.OA.2 | Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. |

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| 5.OA.3 | | **Removed because content is covered in 6.RP.3a.** | 5.OA.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. |
| 5.NBT.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 $\frac{1}{10}$ of what it represents in the place to its left. | NO CHANGES | 5.NBT.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. |
| 5.NBT.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. | NO CHANGES | 5.NBT.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. |
| 5.NBT.3 | Read, write, and compare decimals to thousandths. | NO CHANGES | 5.NBT.3 | Read, write, and compare decimals to thousandths. |
| 5.NBT.3a | Read and write decimals to thousandths using base-ten numerals, number names, expanded form, and unit form. | NO CHANGES | 5.NBT.3a | Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. |
| 5.NBT.3b | Compare two decimals to thousandths based on meanings of the digits in each place, using >, <, =, and ≠ relational symbols to record the results of comparisons. | The relational symbol "≠" was added. | 5.NBT.3b | Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. |
| 5.NBT.4 | Use place value understanding to round decimals to any place **(Note: In fifth grade, decimals include whole numbers and decimal fractions to the hundredths place.)** | The note "In fifth grade, decimals include whole numbers and decimal fractions to the hundredths place" was added. | 5.NBT.4 | Use place value understanding to round decimals to any place. |

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| 5.NBT.5 | Fluently **(efficiently, accurately, and flexibly)** multiply multi-digit whole numbers using **an efficient algorithm based on place value understanding and the properties of operations**. | The words "(efficiently, accurately, and flexibly)" were added.<br><br>The words "the standard algorithm" were replaced with "an efficient algorithm based on place value understanding and the properties of operations". | 5.NBT.5 | Fluently multiply multi-digit whole numbers using **the standard algorithm**. |
| 5.NBT.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. | NO CHANGES | 5.NBT.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. |
| 5.NBT.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. | NO CHANGES | 5.NBT.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. |
| 5.NF.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. | NO CHANGES | 5.NF.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. |
| 5.NF.2 | Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. | NO CHANGES | 5.NF.2 | Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. |
| 5.NF.3 | Interpret a fraction as division of the numerator by the denominator ($\frac{a}{b} = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers. | NO CHANGES | 5.NF.3 | Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers |

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| 5.NF.4 | Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. | NO CHANGES | 5.NF.4 | Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. |
| 5.NF.4a | Interpret the product $\frac{a}{b} \cdot q$ as $a$ parts of a partition of $q$ into $b$ equal parts; equivalently, as the result of a sequence of operations $a \cdot q \div b$. | NO CHANGES | 5.NF.4a | Interpret the product (a/b) X q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations. |
| 5.NF.4b | 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. | NO CHANGES | 5.NF.4b | 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. |
| 5.NF.5 | Interpret multiplication as scaling (resizing), by: | NO CHANGES | 5.NF.5a | Interpret multiplication as scaling (resizing), by: |
| 5.NF.5a | Comparing the size of a product to the size of one factor based on the size of the other factor, without performing the indicated multiplication. | NO CHANGES | 5.NF.5a | 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. |
| 5.NF.5b | Explain 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); explain 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 $\frac{a}{b} = \frac{na}{nb}$ to the effect of multiplying $\frac{a}{b}$ by 1. | NO CHANGES | 5.NF.5b | 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 = (nXa)/(nXb) to the effect of multiplying a/b by 1. |
| 5.NF.6 | Solve real world problems involving multiplication of fractions and mixed numbers. | NO CHANGES | 5.NF.6 | Solve real world problems involving multiplication of fractions and mixed numbers. |
| 5.NF.7 | Apply and extend previous understandings of division, to divide unit fractions by whole numbers and whole numbers by unit fractions. **Division of a fraction by a fraction is not a requirement at this grade**. | The sentence “Division of a fraction by a fraction is not a requirement at this grade” was brought up from the footnote. | 5.NF.7 | Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. |

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| 5.NF.7a | Interpret division of a unit fraction by a non-zero whole number, and compute such quotients | NO CHANGES | 5.NF.7a | Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. |
| 5.NF.7b | Interpret division of a whole number by a unit fraction, and compute such quotients. | NO CHANGES | 5.NF.7b | Interpret division of a whole number by a unit fraction, and compute such quotients. |
| 5.NF.7c | Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions. | NO CHANGES | 5.NF.7c | Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions. |
| 5.MD.1 | Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real world problems. | NO CHANGES | 5.MD.1 | Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real world problems. |
| 5.MD.2 | Make a **data display (line plot, bar graph, pictograph) to show** a data set of measurements in fractions of a unit ($\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$). Use operations **(add, subtract, multiply)** on fractions for this grade to solve problems involving information presented in **the data display**. | The words “line plot to display” were replaced with “data display (line plot, bar graph, pictograph) to show”.<br><br>The words “(add, subtract, multiply)” was added.<br><br>$\left(\frac{1}{16}\right)$ was added.<br><br>The words “line plots” were replaced with “the data display”. | 5.MD.2 | Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in **line plots**. |
| 5.MD.3 | Recognize volume as an attribute of solid figures and understand concepts of volume measurement. | NO CHANGES | 5.MD.3 | Recognize volume as an attribute of solid figures and understand concepts of volume measurement. |
| 5.MD.3a | 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. | NO CHANGES | 5.MD.3a | 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. |
| 5.MD.3b | 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. | NO CHANGES | 5.MD.3b | 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. |

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| 5.MD.4 | Measure volumes by counting unit cubes such as cubic cm, cubic in, cubic ft. **or non-standard cubic units**. | Replaced the words "and improvised units" with "or non-standard cubic units". | 5.MD.4 | Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, **and improvised units**. |
| 5.MD.5 | Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. | NO CHANGES | 5.MD.5 | Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. |
| 5.MD.5a | 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 **three-dimensional** whole-number products as volumes. | The word "threefold" was replaced with "three-dimensional". | 5.MD.5a | 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. |
| 5.MD.5b | Apply the formulas $V = l \cdot w \cdot h$ and $V = B \cdot h$ **(*B represents the area of the base)*** 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. | The clarifier "(B represents the area of the base)" was added. | 5.MD.5b | Apply the formulas V = l X w X h and V = b X 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. |
| 5.MD.5c | Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems. | NO CHANGES | 5.MD.5c | Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems. |
| 5G.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 | NO CHANGES | 5.G.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. |

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| 5.G.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. | NO CHANGES | 5.G.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. |
| 5.G.3 | Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. | NO CHANGES | 5.G.3 | Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. |
| 5.G.4 | Classify two-dimensional figures in a hierarchy based on properties. | NO CHANGES | 5.G.4 | Classify two-dimensional figures in a hierarchy based on properties. |
| 6.RP.1 | Use ratio language to describe a relationship between two quantities. **Distinguish between part-to-part and part-to-whole relationships**. | The words "understand the concept of a ratio" were removed.<br><br>The sentence "Distinguish between part-to-part and part-to-whole relationships" was added. | 6.RP.1 | **Understand the concept of a ratio** and use ratio language to describe a ratio relationship between two quantities. |
| 6RP.2 | **Use unit rate language ("for each one", "for every one" and "per") and unit rate notation to demonstrate understanding the concept of a unit rate $\frac{a}{b}$ associated with a ratio $a: b$ with $b \neq 0$. (Expectations for unit rates in this grade are limited to non-complex fractions.)** | Standard was completely reworded.<br><br>Clarifier "Expectations for unit rates in this grade are limited to non-complex fractions" was added. | 6.RP.2 | Understand the concept of a unit rate a/b associated with a ratio a:b with b≠0, and use rate language in the context of a ratio relationship |
| 6.RP.3 | Use ratio and rate reasoning to solve real-world and mathematical problems. | NO CHANGES | 6.RP.3 | Use ratio and rate reasoning to solve real-world and mathematical problems |
| 6.RP.3a | Make tables of equivalent ratios relating quantities with whole-number measurements, find the missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. Solve unit rate problems including those involving unit pricing and constant speed. | **Standard 6.RP.3b was combined with standard 6.RP.3a.** | 6.RP.3a | Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. |

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| | | Was combined with standard 6.RP.3a. | 6.RP.3b | Solve unit rate problems including those involving unit pricing and constant speed. |
| 6.RP.3b | Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percent. | NO CHANGES | 6.RP.3c | Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percent. |
| 6.RP.3c | Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. | NO CHANGES | 6.RP.3d | Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. |
| 6.NS.1 | Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, requiring multiple exposures connecting various concrete and abstract models. | NO CHANGES | 6.NS.1 | Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. |
| 6.NS.2 | Fluently **(efficiently, accurately, and flexibly)** divide multi-digit numbers using **an efficient** algorithm. | The words "(efficiently, accurately, and flexibly)" were added.<br><br>The words "the standard" were replaced with "an efficient". | 6.NS.2 | Fluently divide multi-digit numbers using **the standard** algorithm. |
| 6.NS.3 | Fluently **(efficiently, accurately, and flexibly)** add, subtract, multiply, and divide multi-digit decimals using **an efficient** algorithm for each operation. | The words "(efficiently, accurately, and flexibly)" were added.<br><br>The words "the standard" were replaced with "an efficient". | 6.NS.3 | Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. |
| 6.NS.4 | Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. | NO CHANGES | 6.NS.4 | Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. |
| 6.NS.5 | Understand positive and negative numbers to describe quantities having opposite directions or values. | **Standard 6.NS.5 was broken into three standards 6.NS.5, 6.NS.5a, and 6.NS.5b.** | 6.NS.5 | Understand that positive and negative numbers are used together to describe quantities having opposite directions or values. Use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation |

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| 6.NS.5a | Use positive and negative numbers to represent quantities in real-world contexts. | **Was originally part of 6.NS.5** | 6.NS.5 | |
| 6.NS.5b | Explaining the meaning of 0 in each situation. | **Was originally part of 6.NS.5** | 6.NS.5 | |
| 6.NS.6 | Understand a rational number as a point on the number line **and a coordinate pair as a location on a coordinate plane**. | The words "and a coordinate pair as a location on a coordinate plane" were added.<br><br>The sentence "Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates" was removed. | 6.NS.6 | Understand a rational number as a point on the number line. **Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.** |
| 6.NS.6a | Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, and that 0 is its own opposite | NO CHANGES | 6.NS.6a<br>6.NS.6b | Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, and that 0 is its own opposite. |
| 6.NS.6b | **Recognize** signs of numbers in ordered pairs indicate locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. | The word "Understand" was replaced with "Recognize". | 6.NS.6c | **Understand** signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. |
| 6.NS.6c | Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. | NO CHANGES | 6.NS.6d | Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. |
| 6.NS.7 | Understand ordering and absolute value of rational numbers. | NO CHANGES | 6.NS.7a | Understand ordering and absolute value of rational numbers. |
| 6.NS.7a | Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. | NO CHANGES | 6.NS.7a | Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. |
| 6.NS.7b | Write, interpret, and explain statements of order for rational numbers in real-world contexts. | NO CHANGES | 6.NS.7b | Write, interpret, and explain statements of order for rational numbers in real-world contexts. |

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| 6.NS.7c | **Explain** the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. | The word “Understand” was replaced with “Explain”. | 6.NS.7c | **Understand** the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. |
| 6.NS.7d | Distinguish comparisons of absolute value from statements about order. | NO CHANGES | 6.NS.7d | Distinguish comparisons of absolute value from statements about order. |
| 6.NS.8 | Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. | NO CHANGES | 6.NS.8 | Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. |
| 6.EE.1 | Write and evaluate numerical expressions involving whole-number exponents. | NO CHANGES | 6.EE.1 | Write and evaluate numerical expressions involving whole-number exponents. |
| 6.EE.2 | Write, read, and evaluate expressions in which letters stand for numbers. | NO CHANGES | 6.EE.2 | Write, read, and evaluate expressions in which letters stand for numbers. |
| 6.EE.2a | Write expressions that record operations with numbers and with letters standing for numbers | NO CHANGES | 6.EE.2a | Write expressions that record operations with numbers and with letters standing for numbers. |
| 6.EE.2b | Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. | NO CHANGES | 6.EE.2b | Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. |
| 6.EE.2c | Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). | NO CHANGES | 6.EE.2c | Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). |
| 6.EE.3 | Apply the properties of operations **and combine like terms, with the conventions of algebraic notation, to identify and generate equivalent expressions**. | The words “to generate equivalent expressions” were replaced with “and combine like terms, with the conventions of algebraic notation, to identify and generate equivalent expressions”.<br><br>**Standards 6.EE.3 and 6.EE.4 were combined into 6.EE.3.** | 6.EE.3 | Apply the properties of operations **to generate equivalent expressions**. |

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| | | **Was combined with standard 6.EE.3.** | 6.EE.4 | Identify when two expressions are equivalent. |
| 6.EE.4 | Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. | NO CHANGES | 6.EE.5 | Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. |
| 6.EE.5 | Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. | NO CHANGES | 6.EE.6 | Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. |
| 6.EE.6 | **Solve one-step equations involving non-negative rational numbers using addition, subtraction, multiplication and division.** | Reworded standard for clarity. | 6.EE.7 | Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers. |
| 6.EE.7 | Write an inequality of the form $x > c$ *or* $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ *or* $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams. | NO CHANGES | 6.EE.8 | Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams. |
| 6.EE.8 | Use variables to represent two quantities in a real-world problem that change in relationship to one another. | **Standard 6.EE.9 was broken into four standards 6.EE.8, 6.EE.8a, 6.EE.8b, and 6.EE.8c.** | 6.EE.9 | Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation |
| 6.EE.8a | Identify the independent and dependent variable. | Was originally part of standard 6.EE.9. | | |

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| 6.EE.8b | Write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. | **Was originally part of standard 6.EE.9.** | | |
| 6.EE.8c | Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. | **Was originally part of standard 6.EE.9.** | | |
| 6.G.1 | Find the area of **all triangles**, special quadrilaterals **(including parallelograms, kites and trapezoids)**, and polygons **whose edges meet at right angles (rectilinear figure)** by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. | The words "right triangles, other triangles" were replaced with "all triangles".<br><br>The words "(including parallelograms, kites and trapezoids)" were added.<br><br>The words "whose edges meet at right angles (rectilinear figure)" were added. | 6.G.1 | Find the area of **right triangles, other triangles**, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. |
| 6.G.2 | **Find the volume of a right rectangular prism with fractional edge lengths by applying the formulas $V = lwh$ and $V = Bh$ ($B$ is the area of the base and $h$ is the height) to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.** | Standard was reworded. | 6.G.2 | Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. |
| 6.G.3 | Draw polygons **whose edges meet at right angles (rectilinear figure polygons)** in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. | The words "whose edges meet at right angles (rectilinear figure polygons)" were added. | 6.G.3 | Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. |
| 6.G.4 | Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. | NO CHANGES | 6.G.4 | Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. |

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| 6.SP.1 | Recognize **and generate** a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. | The words “and generate” were added. | 6.SP.1 | Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. |
| 6.SP.2 | **Analyze** a set of data collected to answer a statistical question with a distribution which can be described by its center **(mean, median and/or mode)**, spread **(range and/or interquartile range)**, and overall shape **(cluster, peak, gap, symmetry, skew (data) and/or outlier).** | The words “Understand that” were replaced with “Analyze”.<br><br>The words “(mean, median and/or mode)” were added.<br><br>The words “(range and/or interquartile range)” were added.<br><br>The words “(cluster, peak, gap, symmetry, skew (data) and/or outlier)” were added. | 6.SP.2 | **Understand that** a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and over- all shape. |
| 6.SP.3 | Recognize that a measure of center **(mean, median and/or mode)** for a numerical data set summarizes all of its values with a single number, while a measure of variation **(range and/or interquartile range)** describes how its values vary with a single number. | The words “(mean, median and/or mode)” were added.<br><br>The words “(range and/or interquartile range)” were added. | 6.SP.3 | Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. |
| 6.SP.4 | Display numerical data on dot plots, histograms, **stem-and-leaf plot**s, and box plots. | **Stem-and-leaf plots** were added. | 6.SP.4 | Display numerical data in plots on a number line, including dot plots, histograms, and box plots. |
| 6.SP.5 | Summarize numerical data sets in relation to their context, such as by | NO CHANGES | 6.SP.5 | Summarize numerical data sets in relation to their context, such as by |
| 6.SP.5a | Reporting the number of observations. | NO CHANGES | 6.SP.5a | Reporting the number of observations. |
| 6.SP.5b | Describing the nature of the attribute under investigation, including how it was measured and its units of measurement | NO CHANGES | 6.SP.5b | Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. |
| 6.SP.5c | Giving quantitative measures of center (mean, median and/or mode) and variability (**range** and/or interquartile range), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. | The words “mean absolute deviation” were replaced with “range”. | 6.SP.5c | Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or **mean absolute deviation**), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. |

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| 6.SP.5d | Relating the choice of measures of center and variability **to the distribution of the data**. | The words "to the shape of the data distribution and the context in which the data were gathered" were replaced with "to the distribution of the data". | 6.SP.5d | Relating the choice of measures of center and variability **to the shape of the data distribution and the context in which the data were gathered**. |
| 7.RP.1 | Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. | NO CHANGES | 7.RP.1 | Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. |
| 7.RP.2 | Recognize and represent proportional relationships between quantities | NO CHANGES | 7.RP.2 | Recognize and represent proportional relationships between quantities. |
| 7.RP.2a | **Determine** whether two quantities are in a proportional relationship. | The word "Decide" was changed to "Determine". | 7.RP.2a | **Decide** whether two quantities are in a proportional relationship. |
| 7.RP.2b | **Analyze a table or graph and recognize that, in a proportional relationship, every pair of numbers has the same unit rate (referred to as the "m").** | Standard completely reworded. | 7.RP.2b | Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. |
| 7.RP.2c | Represent proportional relationships by equations. | NO CHANGES | 7.RP.2c | Represent proportional relationships by equations. |
| 7.RP.2d | Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate. | NO CHANGES | 7.RP.2d | Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate. |
| 7.RP.3 | Use proportional relationships to solve multistep ratio and percent problems. | NO CHANGES | 7.RP.3 | Use proportional relationships to solve multistep ratio and percent problems. |
| 7.NS.1 | Represent addition and subtraction on a horizontal or vertical number line diagram. | The words "Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers" were removed. | 7.NS.1 | **Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers**; represent addition and subtraction on a horizontal or vertical number line diagram. |
| 7.NS.1a | Describe situations in which opposite quantities combine to make 0. **Show that a number and its opposite have a sum of 0 (are additive inverses).** | The phrase "Show that a number and its opposite have a sum of 0 (are additive inverses)." was removed from standard 7.NS.1b and placed into standards 7.NS.1a. | 7.NS.1a | Describe situations in which opposite quantities combine to make 0. |
| 7.NS.1b | **Show** $p + q$ as the number located a distance $\|q\|$ from $p$, in the positive or negative direction depending on whether $q$ is positive or negative. | The word "Understand" was changed to "Show". | 7.NS.1b | **Understand** p + q as the number located a distance \|q\| from p, in the positive or negative direction depending on whether q is positive or negative. **Show that a number and its opposite have a sum of 0 (are additive inverses).** |

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| | | The phrase "Show that a number and its opposite have a sum of 0 (are additive inverses)." was removed from standard 7.NS.1b and placed into standards 7.NS.1a.<br><br>The phrase "Interpret sums of rational numbers by describing real-world contexts." was removed. | | **Interpret sums of rational numbers by describing real-world contexts.** |
| 7.NS.1c | **Model** subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. | **Standard 7.NS.1C was broken into two standards 7.NS.1c and 7.NS.1d.**<br><br>The word "Understand" was changed to "Model".<br><br>The phrase "Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts." was rewritten and became standard 7.NS.1d. | 7.NS.1c | **Understand** subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). **Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.** |
| 7.NS.1d | **Model** subtraction as the distance between two rational numbers on the number line where the distance is the absolute value of their difference. | **Standard 7.NS.1C was broken into two standards 7.NS.1c and 7.NS.1d.**<br><br>The phrase "Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q)." is standard 7.NS.1c.<br><br>The word "Show" was changed to "Model" and standard was reworded. | 7.NS.1c | **Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show** that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. |
| 7.NS.1e | Apply properties of operations as strategies to add and subtract rational numbers. | NO CHANGES | 7.NS.1d | Apply properties of operations as strategies to add and subtract rational numbers. |
| 7.NS.2 | Apply and extend previous understandings of multiplication and division of positive rational numbers to multiply and divide **all** rational numbers. | The word "all" was added. | 7.NS.2 | Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. |

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| 7.NS.2a | **Describe how** multiplication is extended from positive rational numbers to **all** rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. | The words "Understand that" was changed to "Describe how".<br><br>The word "all" was added. | 7.NS.2a | **Understand that** multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. |
| 7.NS.2b | **Explain** that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. Leading to situations such that if *p* and *q* are integers, then $-\left(\frac{p}{q}\right) = \frac{-p}{q} = \frac{p}{-q}$. | The word "Understand" was replaced with "Explain".<br><br>The phrase "Interpret products of rational numbers by describing real-world contexts." was removed. | 7.NS.2b | **Understand** that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). **Interpret quotients of rational numbers by describing real-world contexts.** |
| 7.NS.2c | Apply properties of operations as strategies to multiply and divide rational numbers. | NO CHANGES | 7.NS.2c | Apply properties of operations as strategies to multiply and divide rational numbers. |
| 7.NS.2d | Convert a rational **number in the form of a fraction to its decimal equivalent** using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. | The phrase "to a decimal using long division" was changed to "in the form of a fraction to its decimal equivalent". | 7.NS.2d | Convert a rational number **to a decimal using long division**; know that the decimal form of a rational number terminates in 0s or eventually repeats. |
| 7.NS.3 | Solve **and interpret** real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.) | The words "and interpret" were added. | 7.NS.3 | Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.) |
| 7.EE.1 | Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. **Note: factoring is limited to integer coefficients.** | The **Note: factoring is limited to integer coefficients.** was added/ | 7.EE.1 | Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. |
| 7.EE.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. | NO CHANGES | 7.EE.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. |

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| 7.EE.3 | Solve multi-step real-life and mathematical problems **with rational numbers**. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. | The phrase "posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically" was reworded to "with rational numbers". | 7.EE.3 | Solve multi-step real-life and mathematical problems **posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically**. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. |
| 7.EE.4 | Use variables to represent quantities in a real-world or mathematical problem, and construct two-step equations and inequalities to solve problems by reasoning about the quantities. | NO CHANGES | 7.EE.4 | Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities |
| 7.EE.4a | Solve word problems leading to equations of the form $px + q = r$, and $p(x + q) = r$ where *p, q,* and *r* are specific rational numbers. Solve equations of these forms fluently **(efficiently, accurately, and flexibly).** Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. | The words "(efficiently, accurately, and flexibly)" were added. | 7.EE.4a | Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. |
| 7.EE.4b | Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$ where *p*, *q*, and *r* are specific rational numbers and $p > 0$. Graph the solution set of the inequality and interpret it in the context of the problem | NO CHANGES | 7.EE.4b | Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. |
| 7.G.1 | Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. | NO CHANGES | 7.G.1 | Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. |
| 7.G.2 | **Identify three-dimensional objects generated by rotating a two-dimensional (rectangular or triangular) object around one edge.** | **This standards was brought down from the HS standard G.GMD.4.**<br><br>Standard reworded. | G.GMD.4 | Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. |

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| | | This standard was moved to 8th grade 8.G.6. | 7.G.2 | Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. |
| 7.G.3 | Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right **cylinder**. | "rectangular pyramids" was replaced with "cylinder". | 7.G.3 | Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right **rectangular pyramids**. |
| 7.G.4 | **Use** the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle. | The word "Know" was changed to "Use". | 7.G.4 | **Know** the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle. |
| | | **Standard was moved to 8th grade 8.G.4.** | 7.G.5 | Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and use them to solve simple equations for an unknown angle in a figure. |
| 7.G.5 | Investigate the relationship between three-dimensional geometric shapes | **New standard for 2017.** | | |
| 7.G.5a | Generalize the volume formula for prisms and cylinders ($V = Bh$ where *B* is the area of the base and *h* is the height). | **New standard for 2017.** | | |
| 7.G.5b | Generalize the surface area formula for prisms and cylinders ($SA = 2B + Ph$ where *B* is the area of the base, *P* is the perimeter of the base, and *h* is the height (in the case of a cylinder, perimeter is replaced by circumference)). | **New standard for 2017.** | | |

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| 7.G.6 | Solve real-world and mathematical problems involving **area of two-dimensional objects** and **volume and surface area of three-dimensional objects including cylinders and right prisms**. (Solutions should **not** require students to take square roots or cube roots.) | The word "area" was changed to "area of two-dimensional objects" were added.<br><br>The words "volume and surface area of two- and three-dimensional objects" were replaced with "volume and surface area of three-dimensional objects".<br><br>The phrase "composed of triangles, quadrilaterals, polygons, cubes, and right prisms" was changed to "objects including cylinders and right prisms". | 7.G.6 | Solve real-world and mathematical problems involving **area**, **volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms**. |
| 7.SP.1 | **Use statistics to** gain information about a population by examining a sample of the population | **Standard 7.SP.1 was broken into three standards 7.SP.1, 7.SP.1a, and 7.SP.1b**.<br><br>The phrase "Understand that statistics can be used to" was reworded to "Use statistics to". | 7.SP.1 | **Understand that statistics can be used to** gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. |
| 7.SP.1a | **Know that** generalizations about a population from a sample are valid only if the sample is representative of that population and generate a valid representative sample of a population | **Standard 7.SP.1 was broken into three standards 7.SP.1, 7.SP.1a, and 7.SP.1b.**<br><br>The words "Know that" was added. | 7.SP.1 | Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. |
| 7. SP.1b | Identify if a particular random sample would be representative of a population and justify your reasoning. | **Standard 7.SP.1 was broken into three standards 7.SP.1, 7.SP.1a, and 7.SP.1b.**<br><br>**Standard reworded**. | 7.SP.1 | Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences~~.~~ |

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| 7.SP.2 | Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to informally gauge the variation in estimates or predictions. | NO CHANGES | 7.SP.2 | Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. |
| 7.SP.3 | Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability **(requires introduction of mean absolute deviation).** | The phrase "(requires introduction of mean absolute deviation)" was added. | 7.SP.3 | Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. |
| 7.SP.4 | Use measures of center **(mean, median and/or mode)** and measures of **variability (range, range, interquartile range and/or mean absolute deviation)** for numerical data from random samples to draw informal comparative inferences about two populations. | The words "(mean, median and/or mode)" were added.<br><br>The words "variability (range, interquartile range and/or mean absolute deviation)" were added. | 7.SP.4 | Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. |
| 7.SP.5 | Express the probability of a chance event as a number between 0 and 1 that represents the likelihood of the event occurring. (Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.) | NO CHANGES | 7.SP.5 | Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. |
| 7.SP.6 | **Collect data from a chance process (probability experiment). Approximate the probability by observing its long-run relative frequency. Recognize that as the number of trials increase, the experimental probability approaches the theoretical probability. Conversely, predict the approximate relative frequency given the probability**. | The phrase "Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency" was reworded to "Collect data from a chance process (probability experiment). Approximate the probability by observing its long-run relative frequency. Recognize that as the number of trials increase, the experimental probability approaches the theoretical probability."<br><br>The phrase "predict the approximate relative frequency given the probability" was replaced with "Conversely, predict the approximate relative frequency given the probability". | 7.SP.6 | **Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency**, and **predict the approximate relative frequency given the probability**. |

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| 7.SP.7 | Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. | NO CHANGES | 7.SP.7 | Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. |
| 7.SP.7a | Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. | NO CHANGES | 7.SP.7a | Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events |
| 7.SP.7b | Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. | NO CHANGES | 7.SP.7b | Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. |
| 7.SP.8 | Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. | NO CHANGES | 7.SP.8 | Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. |
| 7.SP.8a | **Know** that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. | The word “Understand” was replaced with “Know”. | 7.SP.8a | **Understand** that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. |
| 7.SP.8b | Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language, identify the outcomes in the sample space which compose the event. | NO CHANGES | 7.SP.8b | Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language, identify the outcomes in the sample space which compose the event. |
| 7.SP.8c | Design and use a simulation to generate frequencies for compound events. | NO CHANGES | 7.SP.8c | Design and use a simulation to generate frequencies for compound events. |
| 8.NS.1 | Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. | NO CHANGES | 8.NS.1 | Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. |
| 8.NS.2 | Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions. | NO CHANGES | 8.NS.2 | Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions. |

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| | | **Moved to high school N.RN.1** | 8.EE.1 | Know and apply the properties of integer exponents to generate equivalent numerical expressions. |
| 8.EE.1 | Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where $p$ is a positive rational number. Evaluate square roots of whole number perfect squares **with solutions between 0 and 15** and cube roots of **whole number perfect cubes with solutions between 0 and 5**. Know that $\sqrt{2}$ is irrational. | The phrase "with solutions between 0 and 15" was added.<br><br>The words "small perfect cubes" were replaced with "whole number perfect cubes with solutions between 0 and 5". | 8.EE.2 | Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of **small perfect cubes**. Know that √2 is irrational. |
| 8.EE.2 | Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. | NO CHANGES | 8.EE.3 | Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. |
| 8.EE.3 | **Read and write** numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology. | The phrase "Perform operations with" was replaced with "Read and write". | 8.EE.4 | **Perform operations with** numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology. |
| 8.EE.4 | Graph proportional relationships, interpreting its unit rate as the slope (m) of the graph. Compare two different proportional relationships represented in different ways. | NO CHANGES | 8.EE.5 | Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. |
| 8.EE.5 | Use similar triangles to explain why the slope (m) is the same between any two distinct points on a non-vertical line in the coordinate plane **and extend to include the use of the slope formula ($m = \frac{y_2-y_1}{x_2-x_1}$) when given two coordinate points ($x_1$, $y_1$) and ($x_2$, $y_2$))**. **Generate** the equation $y = mx$ for a line through the origin (proportional) and the equation $y = mx + b$ for a line with slope $m$ intercepting the vertical axis at **y-intercept $b$ (not proportional when $b \neq 0$)**. | The phrase "and extend to include the use of the slope formula ($m = \frac{y_2-y_1}{x_2-x_1}$ when given two coordinate points ($x_1$, $y_1$) and ($x_2$, $y_2$))" was added.<br><br>The words "and the" were replaced with "Generate". The phrase "through the origin (proportional) and the equation $y = mx + b$ for a line with slope m" was added.<br><br>The word "y-intercept" was added.<br><br>The phrase "b (not proportional when $b \neq 0$)" was added. | 8.EE.6 | Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin **and the** equation y = mx + b for a line intercepting the vertical axis at b. |

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| 8.EE.6 | Describe the relationship between the proportional relationship expressed in $y = mx$ and the non-proportional linear relationship $y = mx + b$ as a result of a vertical translation. *Note: be clear with students that all linear relationships have a constant rate of change (slope), but only the special case of proportional relationships (line that goes through the origin) continue to have a* ***constant of proportionality****.* | **New standard for 2017.** | | |
| 8.EE.7 | **Fluently (efficiently, accurately, and flexibly) solve one-step, two-step, and multi-step** linear equations and **inequalities** in one variable, **including situations with the same variable appearing on both sides of the equal sign**. | The phrase "Fluently (efficiently, accurately, and flexibly) solve one-step, two-step, and multi-step" was added.<br><br>The word "inequalities" was added.<br><br>The Phrase "including situations with the same variable appearing on both sides of the equal sign" was added. | 8.EE.7 | Solve linear equations in one variable. |
| 8.EE.7a | Give examples of linear equations in one variable with one solution **($x = a$)**, infinitely many solutions **($a = a$),** or no solutions **($a = b$)**. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a, a = a, or\ a = b$ results (where *a* and *b* are different numbers). | "(x = a)" was added.<br><br>"(a = a)" was added.<br><br>"(a = b)" was added. | 8.EE.7a | Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers). |
| 8.EE.7b | Solve linear equations **and inequalities** with rational number coefficients, including equations**/inequalities** whose solutions require expanding **and/or factoring expressions** using the distributive property and collecting like terms. | The words "and inequalities" were added.<br><br>The word "/inequalities" was added.<br><br>The phrase "and/or factoring expressions" was added. | 8.EE.7b | Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. |
| | | Was moved to high school A.REI.6. | 8.EE.8a | Analyze and solve pairs of simultaneous linear equations. |
| | | Was moved to high school A.REI.6a. | 8.EE.8a | Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. |

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| | | Was moved to high school A.REI.6b. | 8.EE.8b | Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. |
| | | Was moved to high school A.REI.6c. | 8.EE.8c | Solve real-world and mathematical problems leading to two linear equations in two variables. |
| 8.F.1 | **Explain** that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. | The word "Understand" was changed to "Explain". | 8.F.1 | **Understand** that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. |
| 8.F.2 | Compare properties of two **linear** functions represented in a **variety of ways** (algebraically, graphically, numerically in tables, or by verbal descriptions). | The word "linear" was added.<br><br>The word "each" was removed.<br><br>The phrase "different way" was replaced with "variety of ways". | 8.F.2 | Compare properties of two functions **each** represented in a **different way** (algebraically, graphically, numerically in tables, or by verbal descriptions). |
| 8.F.3 | Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. | NO CHANGES | 8.F.3 | Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. |
| 8.F.4 | Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (*x*, *y*) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. | NO CHANGES | 8.F.4 | Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. |
| 8.F.5 | Describe qualitatively the functional relationship between two quantities by analyzing a graph. Sketch a graph that exhibits the qualitative features of a function that has been described verbally. | NO CHANGES | 8.F.5 | Describe qualitatively the functional relationship between two quantities by analyzing a graph. Sketch a graph that exhibits the qualitative features of a function that has been described verbally. |
| | | Moved to high school G.CO.1 | 8.G.1 | Verify experimentally the properties of rotations, reflections, and translations. |
| 8.G.1 | Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement | **Moved from 4th grade 4.MD.5**<br><br>NO CHANGE. | **4.MD.5** | Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. |

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| | | Moved to high school G.CO.1a | 8.G.1a | Lines are taken to lines, and line segments to line segments of the same length. |
| 8.G.1a | 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. | **Moved from 4th grade 4.MD.5a**<br><br>NO CHANGE. | **4.MD.5a** | 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 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. |
| | | Moved to high school G.CO.1b | 8.G.1b | Angles are taken to angles of the same measure. |
| 8.G.1b | An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees. | **Moved from 4th grade 4.MD.5b**<br><br>NO CHANGE. | 4.MD.5b | An angle that turns through n one-degree angles is said to have an angle measure of n degrees. |
| | | Moved to high school G.CO.1c | 8.G.1c | Parallel lines are taken to parallel lines. |
| | | Moved to high school G.CO.3 | 8.G.2 | Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. |
| 8.G.2 | Measure angles in whole-number degrees using a protractor. **Draw** angles of specified measure **using a protractor and straight edge**. | **Moved from 4th grade 4.MD.6**<br><br>The word "Sketch" was replaced with "Draw".<br><br>The phrase "using a protractor and straight edge" was added. | 4.MD.6 | Measure angles in whole-number degrees using a protractor. **Sketch** angles of specified measure. |
| | | Moved to high school G.SRT.2 | 8.G.3 | Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. |

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| 8.G.3 | 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 | **Moved from 4th grade 4.MD.7**<br><br>NO CHANGE. | 4.MD.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. |
| | | Moved to high school G.SRT.3 | 8.G.4 | Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. |
| 8.G.4 | Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and use them to solve simple equations for an unknown angle in a figure. | **Moved from 7th grade 7.G.5**<br><br>NO CHANGE. | 7.G.5 | Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and use them to solve simple equations for an unknown angle in a figure. |
| 8.G.5 | Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. | NO CHANGES | 8.G.5 | Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. |
| 8.G.6 | Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on **drawing** triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. | **Moved from 7th grade 7.G.2**<br><br>The word “constructing” was replaced with “drawing”. | 7.G.2 | Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on **constructing** triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. |
| 8.G.7 | Explain a proof of the Pythagorean Theorem and its converse | NO CHANGES | 8.G.6 | Explain a proof of the Pythagorean Theorem and its converse. |
| 8.G.8 | Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions | NO CHANGES | 8.G.7 | Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. |
| 8.G.9 | Apply the Pythagorean Theorem to find the distance between two points in a coordinate system | NO CHANGES | 8.G.8 | Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. |

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| 8.G.10 | **Use** the formulas or informal reasoning to find the arc length, areas of sectors, surface areas and volumes of pyramids, cones, and spheres. | "Know" changed to "Use".<br><br>Standard reworded.<br><br>This does not include the real world application.<br><br>Added in two dimensional content.<br><br>**Standard broken into two standards 8.G.10 and 8.G.12.** | 8.G.9 | **Know** the formulas for the volumes of cones, cylinders, and spheres and use them to **solve real-world and mathematical problems.** |
| 8.G.11 | Investigate the relationship between the formulas of three dimensional geometric shapes; | **New standard for 2017.** | | |
| 8.G.11a | Generalize the volume formula for pyramids and cones ($V = \frac{1}{3}Bh$). | **Came down from high school G.GM.3.**<br><br>Reworded to be grade appropriate. | G.GMD.3 | Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. |
| 8.G.11b | Generalize surface area formula of pyramids and cones ($SA = B + \frac{1}{2}Pl$). | **Came down from high school G.GM.3.**<br><br>Reworded to be grade appropriate. | G.GMD.3 | Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. |
| 8.G.12 | **Solve real-world and mathematical problems involving arc length, area of two-dimensional shapes including sectors, volume and surface area of three-dimensional objects including pyramids, cones and spheres.** | It is the real world application of 8.G.9 reworded.<br><br>**Standard broken into two standards 8.G.10 and 8.G.12.** | 8.G.9 | Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. |
| 8.SP.1 | Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. | NO CHANGES | 8.SP.1 | Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. |
| 8.SP.2 | Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. | NO CHANGES | 8.SP.2 | Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. |

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| 8.SP.3 | Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. | NO CHANGES | 8.SP.3 | Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. |
| | | This content is already in high school S.ID.4 so it was removed from middle school. | 8.SP.4 | Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two- way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. |
| A.SSE.1 | **(all)** Interpret expressions that represent a quantity in terms of its context. | NO CHANGES | A.SSE.1 | Interpret expressions that represent a quantity in terms of its context. |
| A.SSE.1a | **(all)** Interpret parts of an expression, such as terms, factors, and coefficients. | NO CHANGES | A.SSE.1a | Interpret parts of an expression, such as terms, factors, and coefficients. |
| A.SSE.1b | **(all)** Interpret complicated expressions by viewing one or more of their parts as a single entity. | NO CHANGES | A.SSE.1b | Interpret complicated expressions by viewing one or more of their parts as a single entity. |
| A.SSE.2 | **(all)** Use the structure of an expression to identify ways to rewrite it. | NO CHANGES | A.SSE.2 | Use the structure of an expression to identify ways to rewrite it. |
| A.SSE.3 | Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. | NO CHANGES | A.SSE.3 | Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. |
| A.SSE.3a | **(9/10)** Factor a quadratic expression to reveal the zeros of the function it defines. | NO CHANGES | A.SSE.3a | Factor a quadratic expression to reveal the zeros of the function it defines. |
| A.SSE.3b | **(11)** Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. | NO CHANGES | A.SSE.3b | Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. |
| A.SSE.3c | **(11)** Use the properties of exponents to transform expressions for exponential functions. | NO CHANGES | A.SSE.3c | Use the properties of exponents to transform expressions for exponential functions. |

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| | | Combined with F.BF.2 | A.SSE.4 | Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. |
| A.APR.1 | **(9/10)** Add, subtract, and multiply polynomials. | Standard completely reworded.<br><br>Closure emphasis dropped. | A.APR.1 | Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. |
| A.APR.2 | **(11)** Factor higher degree polynomials; identifying that some polynomials are prime. | **New standard for 2017.** | | |
| A.APR.3 | **(11)** Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number $\boldsymbol{c}$, the remainder on division by $(x - \boldsymbol{c})$ is $p(\boldsymbol{c})$, so $p(\boldsymbol{c}) = 0$ if and only if $(x - \boldsymbol{c})$ is a factor of $p(x)$. | The variable "a" was replaced with "c". | A.APR.2 | Know and apply the Remainder Theorem: For a polynomial p(x) and a number **a**, the remainder on division by x – **a** is p(**a**), so p(**a**) = 0 if and only if (x – **a**) is a factor of p(x). |
| | | Content is already addressed in F.IF.7E. | A.APR.3 | Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial. |
| A.APR.4 | **(9/10/11)** Generate polynomial identities from a pattern. | NO CHANGES | A.APR.4 | Prove polynomial identities and use them to describe numerical relationships. |
| A.APR.5 | **(+)** Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of *x* and *y* for a positive integer *n*, where *x* and *y* are any numbers, with coefficients determined for example by Pascal's Triangle. The Binomial Theorem can be proven by mathematical induction or by a combinatorial argument. | NO CHANGES | A.APR.5 | (+) Know and apply the Binomial Theorem for the expansion of (x + y)^n in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle. (The Binomial Theorem can be proved by mathematical induction or by a combinatorial argument.) |
| A.APR.6 | **(+)** Rewrite simple rational expressions in different forms; write $\frac{a(x)}{b(x)}$ in the form $q(x) + \frac{r(x)}{b(x)}$, where *a*(*x*), *b*(*x*), *q*(*x*), and *r*(*x*) are polynomials with the degree of *r*(*x*) less than the degree of *b*(*x*), using inspection, long division, or, for the more complicated examples, a computer algebra system. | NO CHANGES | A.APR.6 | Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system. |
| A.APR.7 | **(+) Add, subtract, multiply, and divide rational expressions** | Standard completely reworded.<br><br>Closure emphasis dropped. | A.APR.7 | (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a |

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| | | | | nonzero rational expression; add, subtract, multiply, and divide rational expressions. |
| A.CED.1 | **(all) Apply and extend previous understanding to** create equations and inequalities in one variable and use them to solve problems. | The phrase "Apply and extend previous understanding to" was added.<br><br>The phrase "Include equations arising from linear and quadratic functions, and simple rational and exponential functions" was removed. | A.CED.1 | Create equations and inequalities in one variable and use them to solve problems. **Include equations arising from linear and quadratic functions, and simple rational and exponential functions.** |
| A.CED.2 | **(all) Apply and extend previous understanding to** create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. | The phrase "Apply and extend previous understanding to" was added. | A.CED.2 | Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. |
| A.CED.3 | **(all)** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. | NO CHANGES | A.CED.3 | Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. |
| A.CED.4 | **(all)** Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. | NO CHANGES | A.CED.4 | Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. |
| A.REI.1 | **(all)** Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. | NO CHANGES | A.REI.1 | Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. |
| A.REI.2 | **(all) Apply and extend previous understanding to solve compound inequalities in one variable, including literal equations and inequalities.** | Standard completely reworded. | A.REI.3 | Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. |
| A.REI.3 | Solve equations in one variable **and give examples showing how extraneous solutions may arise**. | The word "quadratic" was removed.<br><br>The phrase "and give examples showing how extraneous solutions may arise" was added. | A.REI.4 | Solve **quadratic** equations in one variable. |

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| A.REI.3a | **(9/10/11)** Solve rational, absolute value and **square root equations**. **(9/10)** Limited to simple equations such as, $2\sqrt{x-3}+8=16, \frac{x+3}{2x-1}=5, x\neq\frac{1}{2}$. | **Standard A.REI.2 was broken into two standards A.REI.3a and A.REI.4**<br><br>This is part of A.REI.2.<br><br>Removed "radical equations" and added "square root equations". | A.REI.2 | Solve simple rational and **radical equations** in one variable, and give examples showing how extraneous solutions may arise. |
| A.REI.3b | **(+)** Solve exponential and logarithmic equations. | **New standard for 2017.** | | |
| A.REI.4 | **(11)** Solve radical and rational exponent equations and inequalities in one variable, and give examples showing how extraneous solutions may arise. | **This is part of A.REI.2.**<br><br>Adds more complicated equations and inequalities. | A.REI.2 | Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. |
| A.REI.5 | Solve quadratic equations **and inequalities.** | "and inequalities" was added.<br><br>"In one variable" removed. | A.REI.4 | Solve quadratic equations **in one variable**. |
| A.REI.5a | **(9/10)** Solve quadratic equations by inspection, taking square roots, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives **no real solutions**. | **A.REI.4b was broken into two standards A.REI.5a and A.REI.5b.**<br><br>This standard removed "completing the square".<br><br>Replaced "complex solutions and write them as a ± bi for real numbers a and b" with "no real solutions". | A.REI.4b | Solve quadratic equations by inspection, taking square roots, **completing the square**, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives **complex solutions and write them as a ± bi for real numbers a and b**. |
| A.REI.5b | **(11)** Solve quadratic equations with complex solutions written in the form $a \pm bi$ for real numbers *a* and *b.* | **A.REI.4b was broken into two standards A.REI.5a and A.REI.5b.**<br><br>This standard focused on the complex solutions portion. | A.REI.4b | Solve quadratic equations by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b. |
| A.REI.5c | **(11)** Use the method of completing the square to transform and solve any quadratic equation in *x* into an equation of the form $(x-p)^2=q$ that has the same solutions. | Removed "Derive the quadratic formula from this form". | A.REI.4a | Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)^2 = q$ that has the same solutions. **Derive the quadratic formula from this form**. |
| A.REI.5d | **(+)** Solve quadratic inequalities and identify the domain. | **New standard for 2017.** | | |

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| | | Was removed once 8.EE.8, 8.EE.8a, 8.EE.8b, 8.EE.8c was brought up from 8th grade because content was covered in those standards. | A.REI.5 | Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. |
| | | Was removed once 8.EE.8, 8.EE.8a, 8.EE.8b, 8.EE.8c was brought up from 8th grade because content was covered in those standards. | A.REI.6 | Solve systems of linear equations exactly and approximately, focusing on pairs of linear equations in two variables. |
| | | Was removed once 8.EE.8, 8.EE.8a, 8.EE.8b, 8.EE.8c was brought up from 8th grade because content was covered in those standards. | A.REI.7 | Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. |
| A.REI.6 | **(9/10)** Analyze and solve pairs of simultaneous linear equations. | Moved up from 8.EE.8.<br><br>No Changes. | 8.EE.8 | Analyze and solve pairs of simultaneous linear equations. |
| A.REI.6a | **(9/10)** Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. | Moved down from 8.EE.8a.<br><br>No Changes. | 8.EE.8a | Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. |
| A.REI.6b | **(9/10)** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. | Moved down from 8.EE.8b.<br><br>No Changes. | 8.EE.8b | Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. |
| A.REI.6c | **(9/10)** Solve real-world and mathematical problems leading to two linear equations in two variables. | Moved down from 8.EE.8c.<br><br>No Changes. | 8.EE.8c | Solve real-world and mathematical problems leading to two linear equations in two variables. |
| A.REI.7 | **(+)** Represent a system of linear equations as a single matrix equation and solve (incorporating technology) for matrices of dimension $3 \times 3$ or greater. | **Combined standards A.REI.8 and A.REI.9.**<br><br>Removed finding the inverse of a matrix. | A.REI.8 | (+) Represent a system of linear equations as a single matrix equation in a vector variable. |
| | | Combined standards A.REI.8 and A.REI.9.<br><br>Removed finding the inverse of a matrix. | A.REI.9 | (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 X 3 or greater). |

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| A.REI.8 | **(all)** Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). | NO CHANGES. | A.REI.10 | Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). |
| A.REI.9 | **(9/10/11) Solve an equation $f(x) = g(x)$ by graphing $y = f(x)$ and $y = g(x)$ and finding the *x*-value of the intersection point. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. For (9/10) focus on linear, quadratic, and absolute value.** | Standard was reworded.<br><br>Limitations placed in 9/10. | A.REI.11 | Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. |
| A.REI.10 | **(9/10)** Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. | NO CHANGES. | A.REI.12 | Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. |
| F.IF.1 | **(all)** Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then $f(x)$ denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation $y = f(x)$. | NO CHANGES. | F.IF.1 | Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x). |
| F.IF.2 | **(all)** Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. | NO CHANGES. | F.IF.2 | Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. |
| F.IF.3 | **(9/10/11)** Recognize **patterns** in order to write functions whose domain is a subset of the integers. **(9/10)** Limited to linear and quadratic. | "Sequences" was replaced with "patterns".<br><br>"Recursively" was removed.<br><br>Limitations placed in 9/10. | F.IF.3 | Recognize that **sequences** are functions, sometimes defined **recursively**, whose domain is a subset of the integers. |
| F.IF.4 | **(all)** For a function that models a relationship between two quantities, interpret key features of expressions, graphs and tables in terms of the quantities, and sketch graphs showing key features given a description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or | NO CHANGES. | F.IF.4 | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; |

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| | negative; relative maximums and minimums; symmetries; end behavior; and periodicity. | | | relative maximums and minimums; symmetries; end behavior; and periodicity. |
| F.IF.5 | **(all)** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. | NO CHANGES. | F.IF.5 | Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. |
| F.IF.6 | **(9/10/11)** Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. **(9/10)** limited to linear functions. | Limitations placed in 9/10. | F.IF.6 | Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. |
| F.IF.7 | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. | NO CHANGES. | | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. |
| F.IF.7a | **(9/10)** Graph linear, quadratic and **absolute value functions** and show intercepts, maxima, minima and **end behavior.** | "Absolute value functions" was added.<br><br>"End behavior" was added. | F.IF.7a | Graph linear and quadratic functions and show intercepts, maxima, and minima. |
| F.IF.7b | **(11)** Graph square root, cube root, and **exponential functions**. | "Exponential functions" was added.<br><br>Piecewise-defined functions, including step functions and absolute value functions were removed and placed into F.IF.7d.<br><br>First part of F.IF.7b that had been broken into two standards: F.IF.7b and F.IF.7d | F.IF.7b | Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. |
| F.IF.7c | **(11)** Graph logarithmic functions, emphasizing the **inverse relationship with exponentials** and showing intercepts and end behavior. | Added "inverse relationship with exponentials".<br><br>Removed "trigonometric functions, showing period, midline, and amplitude" and placed into F.IF.7g. | F.IF.7e | Graph exponential and logarithmic functions, showing intercepts and end behavior, and **trigonometric functions, showing period, midline, and amplitude**. |
| F.IF.7d | **(+)** Graph piecewise-defined functions, including step functions. | Second part of F.IF.7b that had been broken into two standards: F.IF.7b and F.IF.7d. | F.IF.7b | Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. |

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| F.IF.7e | **(11)** Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. | NO CHANGES. | F.IF.7c | Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. |
| F.IF.7f | **(+)** Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. | NO CHANGES. | F.IF.7d | (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. |
| F.IF.7g | **(+)** Graph trigonometric functions, showing period, midline, and amplitude | Second part of F.IF.7e that had been broken into two standards: F.IF.7c and F.IF.7g. | F.IF.7e | Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. |
| F.IF.8 | Write a function in different but equivalent forms to reveal and explain different properties of the function. | Removed "defined by an expression". | F.IF.8 | Write a function **defined by an expression** in different but equivalent forms to reveal and explain different properties of the function. |
| F.IF.8a | **(9/10)** Use different forms of linear functions, such as slope-intercept, standard, and point-slope form to show rate of change and intercepts. | **New standard for 2017.** | | |
| F.IF.8b | **(11)** Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. | NO CHANGES. | F.IF.8a | Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. |
| F.IF.8c | **(11)** Use the properties of exponents to interpret expressions for exponential functions, **and classify them as representing exponential growth or decay**. | The phrase "and classify them as representing exponential growth or decay" was added. | F.IF.8b | Use the properties of exponents to interpret expressions for exponential functions. |
| F.IF.9 | **(all)** Compare properties of two functions using a variety of representations (algebraically, graphically, numerically in tables, or by verbal descriptions). | NO CHANGES. | F.IF.9 | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). |
| F.BF.1 | Use functions to model **real-world relationships**. | Reworded and added "real-world relationships". | F.BF.1 | Write a function that describes a relationship between two quantities. |
| F.BF.1a | **(9/10) Combine multiple functions to model complex relationships.** | Reworded. | F.BF.1b | Combine standard function types using arithmetic operations. |

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| F.BF.1b | **(11)** Determine an explicit expression, a recursive **function**, or steps for calculation from a context. | "Process" was replaced with "function". | F.BF.1a | Determine an explicit expression, a recursive **process**, or steps for calculation from a context. |
| F.BF.1c | **(11)** Compose functions. | NO CHANGES. | F.BF.1c | (+) Compose functions. |
| F.BF.2 | **(+)** Write arithmetic and geometric sequences **and series** both recursively and with an explicit formula, use them to model situations, and translate between the two forms. | "and series" was added.<br><br>A.SSE.4 was deleted because content was included in F.BF.2. | F.BF.2 | Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. |
| F.BF.3 | **(9/10/11)** Transform parent functions $\big(f(x)\big)$ by replacing $f(x)$ with $f(x)+k,\ kf(x),\ f(kx),$ and $f(x+k)$ for specific values of *k* (both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. For **(9/10)** focus on linear, quadratic, and absolute value functions. | "Identify the effect on the graph of replacing" was replaced with "Transform parent functions".<br><br>Limitations placed in 9/10. | F.BF.3 | Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. |
| F.BF.4 | Find inverse functions. | NO CHANGES. | F.BF.4 | Find inverse functions. |
| F.BF.4a | **(11)** Write an expression for the inverse of a function. | "Solve an equation of the form f(x) = c for a simple function f that has an inverse and" was removed.<br><br>"of a function" was added. | F.BF.4a | Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. |
| F.BF.4b | **(11)** Read values of an inverse function from a graph or a table, given that the function has an inverse. | NO CHANGES. | F.BF.4c | (+) Read values of an inverse function from a graph or a table, given that the function has an inverse. |
| F.BF.4C | **(+)** Verify by composition that one function is the inverse of another. | NO CHANGES. | F.BF.4b | (+) Verify by composition that one function is the inverse of another. |
| F.BF.4d | **(+)** Produce an invertible function from a non-invertible function by restricting the domain. | NO CHANGES. | F.BF.4d | (+) Produce an invertible function from a non-invertible function by restricting the domain. |
| F.BF.5 | **(11)** Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents. | NO CHANGES. | F.BF.5 | (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents. |
| F.LQE.1 | Distinguish between situations that can be modeled with linear functions and with exponential functions. | NO CHANGES. | F.LQE.1 | Distinguish between situations that can be modeled with linear functions and with exponential functions. |

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| F.LQE.1a | **(11)** Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. | NO CHANGES. | F.LQE.1a | Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. |
| F.LQE.1b | **(11)** Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. | NO CHANGES. | F.LQE.1b | Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. |
| F.LQE.1c | **(11)** Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. | NO CHANGES. | F.LQE.1c | Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. |
| F.LQE.2 | **(11)** Construct exponential functions, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). | Removed "linear functions, arithmetic and geometric sequences and description of a relationship".<br><br>Retained "exponential functions". | F.LQE.2 | Construct **linear** and exponential functions, including **arithmetic and geometric sequences, given a graph, a description of a relationship**, or two input-output pairs (include reading these from a table). |
| | | **Moved to an example in F.IF.9 did not need its own standard.** | F.LQE.3 | Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. |
| | | **Was deleted because content is included in included in A.REI.3b.** | F.LQE.4 | For exponential models, express as a logarithm the solution to a bct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology. |
| | | **Standard was not needed content was in F.IF.4.** | F.LQE.5 | Interpret the parameters in a linear, quadratic, or exponential function in terms of a context. |
| F.TF.1 | **(+)** Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle. | NO CHANGES. | F.TF.1 | Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle. |
| F.TF.2 | **(+)** Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle. | NO CHANGES. | F.TF.2 | Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle. |
| F.TF.3 | **(+)** Use special triangles to determine geometrically the values of sine, cosine, tangent for $\frac{\pi}{3}, \frac{\pi}{4}, and\ \frac{\pi}{6}$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi - x, \pi + x, and\ 2\pi - x$ in terms of their values for *x*, where *x* is any real number. | NO CHANGES. | F.TF.3 | (+) Use special triangles to determine geometrically the values of sine, cosine, tangent for π /3, π/4 and π/6, and use the unit circle to express the values of sine, cosine, and tangent for π-x, π+x, and 2π-x in terms of their values for x, where x is any real number. |

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| F.TF.4 | **(+)** Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions. | NO CHANGES. | F.TF.4 | (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions. |
| F.TF.5 | **(+)** Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. | NO CHANGES. | F.TF.5 | Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. |
| F.TF.6 | **(+)** Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed. | NO CHANGES. | F.TF.6 | (+) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed. |
| F.TF.7 | **(+)** Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context. | NO CHANGES. | F.TF.7 | (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context. |
| F.TF.8 | **(+)** Prove the Pythagorean identity $sin^2(\theta) + cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant. | NO CHANGES. | F.TF.8 | Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant. |
| F.TF.9 | **(+)** Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems. | NO CHANGES. | F.TF.9 | (+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems. |
| | | **Removed because terms are embedded in other Geometry standards.** | G.CO.1 | Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. |
| G.CO.1 | **(9/10)** Verify experimentally the properties of rotations, reflections, and translations: | **Brought up from 8th grade.**<br><br>NO CHANGES | 8.G.1 | Verify experimentally the properties of rotations, reflections, and translations |
| G.CO.1a | **(9/10)** Lines are taken to lines, and line segments to line segments of the same length. | **Brought up from 8th grade.**<br><br>NO CHANGES | 8.G.1a | Lines are taken to lines, and line segments to line segments of the same length. |
| G.CO.1b | **(9/10)** Angles are taken to angles of the same measure. | **Brought up from 8th grade.**<br><br>NO CHANGES | 8.G.1b | Angles are taken to angles of the same measure. |

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| G.CO.1c | **(9/10)** Parallel lines are taken to parallel lines. | **Brought up from 8th grade.**<br><br>NO CHANGES | 8.G.1c | Parallel lines are taken to parallel lines. |
| G.CO.1d | **(9/10) Identify any line of reflection and/or rotational symmetry within a figure.** | Completely reworded. | G.CO.3 | Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. |
| G.CO.2 | **(9/10) Recognize transformations as functions that take points in the plane as inputs and give other points as outputs and describe the effect of translations, rotations, and reflections on two-dimensional figures.** | Reworded for clarity. | G.CO.2 | Represent transformations in the plane using; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not. |
| G.CO.3 | **(9/10)** Given two congruent figures, describe a sequence of rigid motions that exhibits the congruence (isometry) between them using coordinates and the non-coordinate plane. | Brought up from 8th grade. | 8.G.2 | Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. |
| | | **Incorporated in earlier standard G.CO. 1a-c** | G.CO.4 | Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. |
| | | **Encompassed in G.CO.1 and G.CO.3.** | G.CO.5 | Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. |
| G.CO.4 | **(9/10)** Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. | NO CHANGES | G.CO.7 | Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. |
| G.CO.5 | **(+) Given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.** | Reworded for clarity | G.CO.6 | Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. |

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| G.CO.6 | **(+) Demonstrate triangle congruence using rigid motion (ASA, SAS, and SSS).** | Reworded for clarity. | G.CO.8 | Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. |
| G.CO.7 | **(9/10) Construct arguments about lines and angles using theorems**. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints. (Building upon standard in 8th grade Geometry.) | "Prove theorems about lines and angles" was replaced with "Construct arguments about…using theorems". | G.CO.9 | **Prove theorems about lines and angles**. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints. |
| G.CO.8 | **(9/10) Construct arguments about** the relationships within one triangle using theorems. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point; angle sum and exterior angle of triangles. | "Prove theorems about triangles" was replaced with "Construct arguments about…using theorems".<br><br>The angle sum and exterior angle of triangles theorems were added. | G.CO.10 | **Prove theorems about triangles**. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point. |
| G.CO.9 | **(9/10)** Construct arguments about the relationships between two triangles using theorems. Theorems include: SSS, SAS, ASA, AAS, and HL | **New standard for 2017.** | | |
| G.CO.10 | **(9/10) Construct arguments about parallelograms using theorems**. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. (Building upon prior knowledge in elementary and middle school.) | "Prove theorems about parallelograms" was replaced with "Construct arguments about…using theorems". | G.CO.11 | **Prove theorems about parallelograms**. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. |
| G.CO.11 | **(9/10)** Make formal geometric constructions with a variety of tools and methods. Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line. | NO CHANGES. | G.CO.12 | Make formal geometric constructions with a variety of tools and methods. Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line. |

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| G.CO.12 | **(+)** Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle. | NO CHANGES | G.CO.13 | Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle. |
| G.SRT.1 | **(9/10) Use geometric constructions to** verify the properties of dilations given by a center and a scale factor. | "Use geometric constructions to" was added.<br><br>"Experimentally" was removed. | G.SRT.1a | Verify **experimentally** the properties of dilations given by a center and a scale factor. |
| G.SRT.1a | **(9/10)** A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. | NO CHANGES. | G.SRT.1a | A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. |
| G.SRT.1b | **(9/10)** The dilation of a line segment is longer or shorter in the ratio given by the scale factor. | NO CHANGES. | G.SRT.1b | The dilation of a line segment is longer or shorter in the ratio given by the scale factor. |
| G.SRT.2 | **(9/10)** Recognize transformations as functions that take points in the plane as inputs and give other points as outputs and describe the effect of dilations on two-dimensional figures. | **Brought up from 8th grade** and reworded for clarity. | 8.G.3 | Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. |
| G.SRT.3 | **(9/10)** Given two similar figures, describe a sequence of transformations that exhibits the similarity between them using coordinates and the non-coordinate plane. | **Brought up from 8th grade** and reworded for clarity. | 8.G.4 | Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. |
| G.SRT.4 | **(9/10) Understand the meaning of similarity for two-dimensional figures as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.** | Reworded for clarity. | G.SRT.2 | Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. |
| | | **Was incorporated into G.SRT.5 to make one standard.** | G.SRT.3 | Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar. |
| G.SRT.5 | **(9/10) Construct arguments** about triangles **using theorems**. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity, and **AA**. | "Prove theorems" was replaced with "Construct arguments".<br><br>"Using theorems" was added.<br><br>"AA" was added to incorporate G.SRT.3 | G.SRT.4 | **Prove theorems** about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity. |

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| G.SRT.6 | **(9/10)** Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. | NO CHANGES. | G.SRT.5 | Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. |
| G.SRT.7 | **(9/10) Show** that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. | "Understand" was replaced with "Show". | G.SRT.6 | **Understand** that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. |
| G.SRT.8 | **(9/10)** Explain and use the relationship between the sine and cosine of complementary angles. | NO CHANGES. | G.SRT.7 | Explain and use the relationship between the sine and cosine of complementary angles. |
| G.SRT.9 | **(9/10)** Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. | NO CHANGES | G.SRT.8 | Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. |
| G.SRT.10 | **(+)** Derive the formula $A = \frac{1}{2}ab\sin C$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side. | NO CHANGES | G.SRT.9 | (+) Derive the formula A = ½ ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side. |
| G.SRT.11 | **(+)** Prove the Laws of Sines and Cosines and use them to solve problems. | NO CHANGES. | G.SRT.10 | (+) Prove the Laws of Sines and Cosines and use them to solve problems. |
| G.SRT.12 | **(+)** Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles. | NO CHANGES. | G.SRT.11 | (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles. |
| G.C.1 | **(9/10) Construct arguments** that all circles are similar. | "Prove" was replaced with "Construct arguments". | G.C.1 | **Prove** that all circles are similar. |
| G.C.2 | **(9/10)** Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle. | NO CHANGES. | G.C.2 | Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle. |
| G.C.3 | **(9/10) Construct arguments** using properties of polygons inscribed and circumscribed about circles. | **Standard G.C.3 was broken into two standards G.C.3 and G.C.4.**<br><br>"Prove" was replaced with "Construct arguments".<br><br>Reworded for clarity. | G.C.3 | Construct the inscribed and circumscribed circles of a triangle, and **prove** properties of angles for a quadrilateral inscribed in a circle. |

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| G.C.4 | **(+)** Construct inscribed and circumscribed circles for triangles. | **Standard G.C.3 was broken into two standards G.C.3 and G.C.4.** | G.C.3 | Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle. |
| G.C.5 | **(+) Construct inscribed and circumscribed circles for polygons** and tangent lines from a point outside a given circle to the circle. | "Construct inscribed and circumscribed circles for polygons" was added. | G.C.4 | (+) Construct a tangent line from a point outside a given circle to the circle. |
| G.C.6 | **(+)** Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector. | NO CHANGES. | G.C.5 | Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector. |
| G.GPE.1 | **(9/10) Write** the equation of a circle given the center and radius or a graph of the circle; use the center and radius to graph the circle in the coordinate plane. | **Standard G.GPE.1 was broken into three standards G.GPE.1, G.GPE.2, and G.GPE.3.**<br><br>"Derive" was replaced with "Write". | G.GPE.1 | **Derive** the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. |
| G.GPE.2 | **(+)** Derive the equation of a circle of given center and radius using the Pythagorean Theorem; graph the circle in the coordinate plane; | **Standard G.GPE.1 was broken into three standards G.GPE.1, G.GPE.2, and G.GPE.3.** | | |
| G.GPE.3 | **(+)** Complete the square to find the center and radius of a circle given by an equation. | **Standard G.GPE.1 was broken into three standards G.GPE.1, G.GPE.2, and G.GPE.3.** | | |
| G.GPE.4 | **(+)** Derive the equation of a parabola given a focus and directrix; **graph the parabola in the coordinate plane**. | "Graph the parabola in the coordinate plane" was added. | G.GPE.2 | Derive the equation of a parabola given a focus and directrix. |
| G.GPE.5 | **(+)** Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant; **graph the ellipse or hyperbola in the coordinate plane**. | "Graph the ellipse or hyperbola in the coordinate plane" was added. | G.GPE.3 | (+) Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant. |
| G.GPE.6 | **(9/10)** Use coordinates to prove simple geometric theorems algebraically, **including the use of slope, distance, and midpoint formulas**. | "Including the use of slope, distance, and midpoint formulas" was added. | G.GPE.4 | Use coordinates to prove simple geometric theorems algebraically. |
| G.GPE.7 | **(9/10)** Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems. | NO CHANGES. | G.GPE.5 | Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems. |
| | | Removed because it is embedded in G.GPE.6. | G.GPE.6 | Find the point on a directed line segment between two given points that partitions the segment in a given ratio. |

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| G.GPE.8 | **(9/10)** Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, **including the use of the distance and midpoint formulas**. | "Including the use of the distance and midpoint formulas" was added. | G.GPE.7 | Use coordinates to compute perimeters of polygons and areas of triangles and rectangles. |
| G.GMD.1 | **(+)** Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments and informal limit arguments. | "Cavalieri's principle" was removed. | G.GMD.1 | Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, **Cavalieri's principle**, and informal limit arguments. |
| G.GMD.2 | **(+)** Give an informal argument using Cavalieri's principle for the formulas for the volume of a solid figure. | "Sphere" was removed. | G.GMD.2 | (+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a **sphere** and other solid figures. |
| | | **Moved to 8th grade 8.G.11a.** | G.GMD.3 | Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★ |
| | | **Removed because it is covered in 7th grade 7.G2 and 7.G3** | G.GMD.4 | Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. |
| G.MG.1 | **(9/10)** Use geometric shapes, their measures, and their properties to describe objects. | NO CHANGES. | G.MG.1 | Use geometric shapes, their measures, and their properties to describe objects. |
| G.MG.2 | **(9/10)** Apply concepts of density and displacement based on area and volume in modeling situations. | NO CHANGES. | G.MG.2 | Apply concepts of density based on area and volume in modeling situations. |
| G.MG.3 | **(9/10)** Apply geometric methods to solve design problems. | NO CHANGES. | G.MG.3 | Apply geometric methods to solve design problems. |
| N.RN.1 | **(9/10)** Know and apply the properties of integer exponents to generate equivalent numerical and algebraic expressions. | **Moved up from 8th grade 8.EE.1.**<br><br>NO CHANGES. | 8.EE.1 | Know and apply the properties of integer exponents to generate equivalent numerical expressions. |
| N.RN.2 | **(11)** Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. | NO CHANGES | N.RN.1 | Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. |
| N.RN.3 | **(11)** Rewrite expressions involving radicals and rational exponents using the properties of exponents. | NO CHANGES. | N.RN.2 | Rewrite expressions involving radicals and rational exponents using the properties of exponents. |
| | | **Removed because it was a redundant content.** | N.RN.3 | Explain why the sum or product of two rational numbers are rational; that the sum of a rational number and an irrational number is irrational; and that the product of a |

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| | | | | nonzero rational number and an irrational number is irrational. |
| N.Q.1 | **(all)** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. | NO CHANGES. | N.Q.1 | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. |
| N.Q.2 | **(all)** Define appropriate quantities for the purpose of descriptive modeling. | NO CHANGES. | N.Q.2 | Define appropriate quantities for the purpose of descriptive modeling. |
| N.Q.3 | **(all)** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. | NO CHANGES. | N.Q.3 | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. |
| N.CN.1 | **(11)** Know there is a complex number *i* such that $i^2 = -1$, and every complex number has the form $a + bi$ with *a* and *b* real. | NO CHANGES. | N.CN.1 | Know there is a complex number i such that $i^2 = -1$, and every complex number has the form a + bi with a and b real. |
| N.CN.2 | **(11)** Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. | NO CHANGES. | N.CN.2 | Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. |
| N.CN.3 | **(11)** Find the conjugate of a complex number. | **Standard N.CN.3 was broken into two standards N.CN.3 and N.CN.4**<br><br>NO CHANGES. | N.CN.3 | (+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers. |
| N.CN.4 | **(+)** Use conjugates to find moduli and quotients of complex numbers. | **Standard N.CN.3 was broken into two standards N.CN.3 and N.CN.4**<br><br>NO CHANGES | N.CN.3 | (+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers. |
| N.CN.5 | **(+)** Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number. | NO CHANGES. | N.CN.4 | (+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number. |
| N.CN.6 | **(+)** Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. | NO CHANGES. | N.CN.5 | (+) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. |

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| N.CN.7 | **(+)** Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints. | NO CHANGES | N.CN.6 | (+) Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints. |
| N.CN.8 | **(11)** Solve quadratic equations with real coefficients that have complex solutions. | NO CHANGES. | N.CN.7 | Solve quadratic equations with real coefficients that have complex solutions. |
| N.CN.9 | **(+)** Extend polynomial identities to the complex numbers. | NO CHANGES. | N.CN.8 | (+) Extend polynomial identities to the complex numbers. |
| N.CN.10 | **(+)** Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials. | NO CHANGES. | N.CN.9 | (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials. |
| N.VM.1 | **(+)** Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes $(e.g., v, \|v\|, \|\|v\|\|, \mathbf{v})$. | NO CHANGES. | N.VM.1 | (+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, \|v\|, \|\|v\|\|, **v**). |
| N.VM.2 | **(+)** Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point. | NO CHANGES | N.VM.2 | (+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point. |
| N.VN.3 | **(+)** Solve problems involving velocity and other quantities that can be represented by vectors. | NO CHANGES | N.VM.3 | (+) Solve problems involving velocity and other quantities that can be represented by vectors. |
| N.VM.4 | **(+)** Add and subtract vectors. | NO CHANGES. | N.VM.4 | (+) Add and subtract vectors. |
| N.VM.4A | **(+)** Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes. | NO CHANGES. | N.VM.4a | Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes. |
| N.VM.4B | **(+)** Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum. | NO CHANGES. | N.VM.4b | Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum. |
| N.VM.4C | **(+)** Understand vector subtraction $\mathbf{v} - \mathbf{w}$ as $\mathbf{v} + (-\mathbf{w})$, where $-\mathbf{w}$ is the additive inverse of $\mathbf{w}$, with the same magnitude as $\mathbf{w}$ and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise. | NO CHANGES. | N.VM.4c | Understand vector subtraction $\mathbf{v} - \mathbf{w}$ as $\mathbf{v} + (-\mathbf{w})$, where $-\mathbf{w}$ is the additive inverse of $\mathbf{w}$, with the same magnitude as $\mathbf{w}$ and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise. |

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| N.VM.5 | **(+)** Multiply a vector by a scalar. | NO CHANGES | N.VM.5 | (+) Multiply a vector by a scalar. |
| N.VM.5A | **(+)** Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise. | NO CHANGES | N.VM.5a | Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise. |
| N.VM.5B | **(+)** Compute the magnitude of a scalar multiple *cv* using $\|\|cv\|\| = \|c\|v$. Compute the direction of *cv* knowing that when $\|c\|v \neq 0$, the direction of *cv* is either along *v* (for $c > 0$) or against *v* (for $c < 0$). | NO CHANGES | N.VM.5b | Compute the magnitude of a scalar multiple cv using \|\|cv\|\| = \|c\|v. Compute the direction of cv knowing that when \|c\|v ≠ 0, the direction of cv is either along v (for c > 0) or against v (for c < 0). |
| N.VM.6 | **(11)** Use matrices to represent and manipulate data. | NO CHANGES | N.VM.6 | (+) Use matrices to represent and manipulate data. |
| N.VM.7 | **(11)** Multiply matrices by scalars to produce new matrices. | NO CHANGES | N.VM.7 | (+) Multiply matrices by scalars to produce new matrices. |
| N.VM.8 | **(11)** Add, subtract, and multiply matrices of appropriate dimensions; **find determinants of $2 \times 2$ matrices**. | "Find determinants of $2 \times 2$ matrices" was added. | N.VM.8 | (+) Add, subtract, and multiply matrices of appropriate dimensions. |
| N.VM.9 | **(+)** Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties. | NO CHANGES | N.VM.9 | (+) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties. |
| N.VM.10 | **(+)** Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse. | NO CHANGES | N.VM.10 | (+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse. |
| N.VM.11 | **(+)** Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors. | NO CHANGES | N.VM.11 | (+) Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors. |
| N.VM.12 | **(+)** Work with $2 \times 2$ matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area. | NO CHANGES | N.VM.12 | (+) Work with 2 X 2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area. |
| | | **Removed because content is covered in 6.SP.4 and S.ID.2** | S.ID.1 | Represent data with plots on the real number line (dot plots, histograms, and box plots). |

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| S.ID.1 | **(9/10)** Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. | NO CHANGES. | S.ID.2 | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. |
| S.ID.2 | **(9/10)** Interpret differences in shape, center, and spread in the context of the data sets **using dot plots, histograms, and box plots**, accounting for possible effects of extreme data points (outliers). | "Using dot plots, histograms, and box plots" was added. | S.ID.3 | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). |
| S.ID.3 | **(+)** Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. | NO CHANGES. | S.ID.4 | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| S.ID.4 | **(9/10)** Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. | NO CHANGES | S.ID.5 | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |
| S.ID.5 | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. | NO CHANGES | S.ID.6 | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. |
| S.ID.5a | **(9/10)** Use a given linear function to solve problems in the context of data. | **Standard S.ID.6a was broken into three standards: S.ID.5a, S.ID.5b, and S.ID.5d.**<br><br>"Fitted to data" was removed. | S.ID.6a | Fit a function to the data; use functions **fitted to data** to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. |
| S.ID.5b | **(9/10)** Fit a linear function to data and use it to solve problems in the context of the data. | Standard S.ID.6a was broken into three standards: S.ID.5a, S.ID.5b, and S.ID.5d.<br><br>Linear functions were separated from quadratic and exponential.<br><br>Quadratic and exponential became + standards. | S.ID.6a | Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. |
| S.ID.5c | **(+)** Assess the fit of a function by plotting and analyzing residuals. | "Informally" was removed. | S.ID.6b | **Informally** assess the fit of a function by plotting and analyzing residuals. |

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| | | **Removed because it is in S.ID.5b** | S.ID.6c | Fit a linear function for a scatter plot that suggests a linear association. |
| S.ID.5d | **(+)** Fit quadratic and exponential functions to the data. Use functions fitted to data to solve problems in the context of the data. | **Standard S.ID.6a was broken into three standards: S.ID.5a, S.ID.5b, and S.ID.5d.**<br><br>Linear functions were separated from quadratic and exponential.<br><br>Quadratic and exponential became + standards. | S.ID.6a | Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. |
| S.ID.6 | **(9/10)** Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. | NO CHANGES | S.ID.7 | Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. |
| S.ID.7 | **(11)** Compute (using technology) and interpret the correlation coefficient of a linear fit. | NO CHANGES | S.ID.8 | Compute (using technology) and interpret the correlation coefficient of a linear fit. |
| S.ID.8 | **(11)** Distinguish between correlation and causation. | NO CHANGES | S.ID.9 | Distinguish between correlation and causation. |
| S.IC.1 | **(+)** Understand statistics as a process for making inferences to be made about population parameters based on a random sample from that population. | Became a + standard.<br><br>NO CHANGES | S.IC.1 | Understand statistics as a process for making inferences to be made about population parameters based on a random sample from that population. |
| S.IC.2 | **(+)** Decide if a specified model is consistent with results from a given data-generating process. | Became a + standard.<br><br>NO CHANGES | S.IC.2 | Decide if a specified model is consistent with results from a given data-generating process. |
| S.IC.3 | **(+)** Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. | Became a + standard.<br><br>NO CHANGES | S.IC.3 | Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. |
| S.IC.4 | **(+)** Use data from a sample survey to estimate a population mean or proportion; develop a margin of error. | "through the use of simulation models for random sampling" was removed from standard and changed to an example for how to develop a margin of error. | S.IC.4 | Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling. |

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| S.IC.5 | **(+)** Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. | Became a + standard.<br><br>NO CHANGES | S.IC.5 | Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. |
| S.IC.6 | **(+)** Evaluate reports based on data. | Became a + standard.<br><br>NO CHANGES | S.IC.6 | Evaluate reports based on data. |
| S.CP.1 | **(+)** Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not"). | Became a + standard.<br><br>NO CHANGES | S.CP.1 | Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not"). |
| S.CP.2 | **(+)** Understand that two events *A* and *B* are independent if the probability of *A* and *B* occurring together is the product of their probabilities, and use this characterization to determine if they are independent. | Became a + standard.<br><br>NO CHANGES | S.CP.2 | Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. |
| S.CP.3 | **(+)** Understand the conditional probability of *A* given *B* as $\frac{P(A \text{ and } B)}{P(B)}$, and interpret independence of *A* and *B* as saying that the conditional probability of *A* given *B* is the same as the probability of *A*, and the conditional probability of *B* given *A* is the same as the probability of *B*. | Became a + standard.<br><br>NO CHANGES | S.CP.3 | Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B. |
| S.CP.4 | **(+)** Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. | Became a + standard.<br><br>NO CHANGES | S.CP.4 | Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two- way table as a sample space to decide if events are independent and to approximate conditional probabilities |
| S.CP.5 | **(+)** Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. | Became a + standard.<br><br>NO CHANGES | S.CP.5 | Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. |
| S.CP.6 | **(+)** Find the conditional probability of *A* given *B* as the fraction of *B*'s outcomes that also belong to *A*, and interpret the answer in terms of the model. | Became a + standard.<br><br>NO CHANGES | S.CP.6 | Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model. |

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| S.CP.7 | **(+)** Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model. | Became a + standard.<br><br>NO CHANGES | S.CP.7 | Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model. |
| S.CP.8 | **(+)** Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B\|A) = P(B)P(A\|B)$, and interpret the answer in terms of the model. | Became a + standard.<br><br>NO CHANGES | S.CP.8 | (+) Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B\|A) = P(B)P(A\|B), and interpret the answer in terms of the model. |
| S.CP.9 | **(+)** Use permutations and combinations to compute probabilities of compound events and solve problems. | Became a + standard.<br><br>NO CHANGES | S.CP.9 | (+) Use permutations and combinations to compute probabilities of compound events and solve problems. |
| S.MD.1 | **(+)** Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions. | NO CHANGES. | S.MD.1 | (+) Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions. |
| S.MD.2 | **(+)** Calculate the expected value of a random variable; interpret it as the mean of the probability distribution. | NO CHANGES. | S.MD.2 | (+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution. |
| S.MD.3 | **(+)** Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. | NO CHANGES. | S.MD.3 | (+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. |
| S.MD.4 | **(+)** Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. | NO CHANGES. | S.MD.4 | (+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. |
| S.MD.5 | **(+)** Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values. | NO CHANGES. | S.MD.5a | (+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values. |
| S.MD.5a | **(+)** Find the expected payoff for a game of chance. | NO CHANGES. | S.MD.5a | (+) Find the expected payoff for a game of chance. |
| S.MD.5b | **(+)** Evaluate and compare strategies on the basis of expected values. | NO CHANGES. | S.MD.5b | (+) Evaluate and compare strategies on the basis of expected values. |
| S.MD.6 | **(+)** Use probabilities to make fair decisions. | NO CHANGES. | S.MD.6 | (+) Use probabilities to make fair decisions. |
| S.MD.7 | **(+)** Analyze decisions and strategies using probability concepts. | NO CHANGES. | S.MD.7 | (+) Analyze decisions and strategies using probability concepts. |