# Mathletics NWEA Common Core Number \& Operations 

## Skill Quests



RIT Score Band
May, 2022

# NWEA Common Core 

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May 2022
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## RIT Score Band 189-200

## 1 Number \& Operations in Base Ten

### 1.1 Use place value understanding and properties of operations to perform multidigit arithmetic

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 3.NBT.A. 1 Use place value understanding to round whole numbers to the nearest 10 or 100. | Rounding to the nearest 10 or 100 | Rounding numbers up to 1000 to the nearest 100 |
|  |  | Rounding numbers up to 1000 to the nearest 10 |
| 3.NBT.A. 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. | Add and subtract within 1000 | Add 2- and 3-digit numbers: number line |
|  |  | Add 2- and 3-digit numbers: jump strategy |
|  |  | Add two 2-digit numbers: base ten blocks |
|  |  | Add 2-and 3-digit numbers: expanded form |
|  |  | Add two 2-digit numbers: compensation |
|  |  | Subtract 2-digit from 3-digit: number line |
|  |  | Subtract 2-digit from 3-digit: jump strategy |
|  |  | Subtract two 2-digit numbers: base ten blocks |
|  |  | Subtract 2-digit from 3-digit: expanded form |
|  |  | Subtract two 2-digit numbers: compensation |
|  |  | Add and subtract up to 3digits: number line |
|  |  | Add and subtract up to 3digits: jump strategy |
|  |  | Add and subtract two 2-digits: place value blocks |
|  |  | Add and subtract up to 3digits: expanded form |
|  |  | Add and subtract two 2-digits: compensation |


| 3.NBT.A.3 Multiply one-digit whole <br> numbers by multiples of 10 in the <br> range $10-90$ using strategies based <br> on place value and properties of <br> operations. | Multiplying by a <br> multiple of 10 | Using place value to multiply <br> by multiples of 10 |
| :--- | :--- | :--- |
|  |  | Multiplying by a multiple of 10 |

## 2 Number \& Operations - Fractions

### 2.1 Develop understanding of fractions as numbers

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 3.NF.A. 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 $\mathrm{a} / \mathrm{b}$ as the quantity formed by a parts of size $1 / b$. | Introducing fractions | Introducing the numerator and denominator |
|  |  | Introducing eighths |
|  |  | Halves, quarters and eighths of objects or shapes |
|  |  | Halves, thirds or quarters of shapes: partitioning |
|  |  | Introducing sixths |
|  |  | Thirds and sixths of objects, shapes and sets |
| 3.NF.A.2.A 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. | Locating unit fractions on a number line | Locating unit fractions on a number line |
| 3.NF.A.2.B Represent a fraction $\mathrm{a} / \mathrm{b}$ 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 $\mathrm{a} / \mathrm{b}$ on the number line. | Locating fractions on a number line | Locating fractions on a number line |
| 3.NF.A.3.A Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. | Investigating equivalent fractions | Investigating equivalent fractions |
| 3.NF.A.3.B Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent. | Finding simple equivalent fractions | Recognize and generate simple equivalent fractions |
| 3.NF.A.3.C Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. | Whole numbers as fractions | Express and recognize whole numbers as fractions |


| 3.NF.A.3.D Compare two fractions <br> with the same numerator or the <br> same denominator by reasoning | Compare fractions | Comparing fractions: same <br> numerator or denominator |
| :--- | :--- | :--- |
| 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. |  |  |

## RIT Score Band 201-210

## 1 Number \& Operations in Base Ten

### 1.1 Generalize place value understanding for multi-digit whole numbers

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.NBT.A.1 Recognize that in a <br> multi-digit whole number, a digit in <br> one place represents ten times <br> what it represents in the place to its <br> right. | Generalizing place <br> value understanding | Generalizing place value <br> understanding |
| 4.NBT.A.2 Read and write multi- <br> digit whole numbers using base-ten <br> numerals, number names, and <br> expanded form. Compare two <br> multi-digit numbers based on <br> meanings of the digits in each <br> place, using >, =, and < symbols to <br> record the results of comparisons. | Reading and writing <br> multi-digit numbers | Reading and writing multi- <br> digit numbers |
| 4.NBT.A.3 Use place value <br> understanding to round multi-digit <br> whole numbers to any place. | Rounding 6-digit <br> numbers | numbers |
| nounding 6-digit numbers to |  |  |
| any place value |  |  |

### 1.2 Use place value understanding and properties of operations to perform multidigit arithmetic

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 4.NBT.B. 4 Fluently add and subtract multi-digit whole numbers using the standard algorithm. | Add/subtract multidigit numbers | Adding multi-digit numbers, no regrouping |
|  |  | Adding multi-digit numbers, regrouping |
|  |  | Subtracting multi-digit numbers, no regrouping |
|  |  | Subtracting multi-digit numbers, regrouping |
| 4.NBT.B. 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 | Multiplying numbers: place value | Multiply multi-digit numbers, expanded algorithm |
|  |  | Multiply 2-digit by 2-digit, expanded algorithm |
|  |  | Multiply multi-digit numbers using place value |
|  |  | Multiply multi-digit numbers, area model |


| equations, rectangular arrays, <br> and/or area models. |  | Multiply 2-digit by 2-digit, area <br> model |
| :--- | :--- | :--- |
| 4.NBT.B.6 Find whole-number |  |  |
| quotients and remainders with up |  |  |
| to four-digit dividends and one- | Dividing numbers: | place value |

## 2 Number \& Operations - Fractions

### 2.1 Extend understanding of fraction equivalence and ordering

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 4.NF.A. 1 Explain why a fraction a/b is equivalent to a fraction $(n \times a) /(n$ $\times$ b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. | Investigating fraction equivalence | Equivalent fractions with models |
|  |  | Equivalent fractions with multiplication |
| 4.NF.A. 2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1 / 2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, $=$, or <, and justify the conclusions. | Comparing fractions | Compare fractions using models |
|  |  | Compare fractions, different numerator/denominator |
|  |  | Compare fractions using common denominators |
|  |  |  |

### 2.2 Build fractions from unit fractions

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.NF.B.3.A Understand addition <br> and subtraction of fractions as <br> joining and separating parts <br> referring to the same whole. | Understand <br> adding/subtracting <br> fractions | Adding unit fractions, same <br> denominators: models |
|  | Adding fractions, same <br> denominator |  |
| Subtracting fractions, same <br> denominator |  |  |
| Adding and subtracting <br> fractions, same denominator |  |  |
| 4.NF.B.3.B Decompose a fraction <br> into a sum of fractions with the <br> same denominator in more than <br> one way, recording each <br> decomposition by an equation. <br> Justify decompositions, e.g., by <br> using a visual fraction model. | Decomposing fractions | Decomposing fractions |


| 4.NF.B.3.C Add and subtract mixed <br> numbers with like denominators. | Adding and subtracting <br> mixed numbers | Adding mixed numbers, same <br> denominator |
| :--- | :--- | :--- |
| Subtracting mixed numbers, <br> same denominator |  |  |
| 4.NF.B.3.D Solve word problems <br> involving addition and subtraction <br> of fractions referring to the same <br> whole and having like <br> denominators. | Word problems: <br> add/subtract fractions | Word problems: add/subtract <br> fractions |
| 4.NF.B.4.A Understand a fraction <br> a/b as a multiple of 1/b. | Fractions: multiples of <br> unit fractions | Fractions: multiples of unit <br> fractions |
| 4.NF.B.4.B Understand a multiple of <br> a/b as a multiple of $1 / b$, and use <br> this understanding to multiply a <br> fraction by a whole number. | Multiply fraction by <br> whole number, model | Multiply fractions by whole <br> numbers using models |
| 4.NF.B.4.C Solve word problems <br> involving multiplication of a fraction <br> by a whole number, e.g., by using <br> visual fraction models and <br> equations to represent the problem. | Word problems: <br> multiplying fractions | Word problems: multiply <br> fractions by whole numbers |

### 2.3 Understand decimal notation for fractions, and compare decimal fractions

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.NF.C.5 Express a fraction with <br> denominator 10 as an equivalent <br> fraction with denominator 100, and <br> use this technique to add two <br> fractions with respective <br> denominators 10 and 100. | Add fractions: <br> denominator of 10 and <br> 100 | Adding fractions with <br> denominators of 10 and 100 |
| 4.NF.C.6 Use decimal notation for <br> fractions with denominators 10 or <br> 100. | Representing fractions <br> as decimals | Introducing decimal notation |
|  |  | Introducing tenths |
| 4.NF.C.7 Compare two decimals to <br> hundredths by reasoning about <br> their size. Recognize that | Comparing decimals to <br> hundredths <br> comparisons are valid only when <br> the two decimals refer to the same <br> whole. Record the results of <br> comparisons with the symbols >, <br> or <, and justify the conclusions. |  |

## RIT Score Band 211-217

## 1 Number \& Operations in Base Ten

### 1.1 Understand the place value system

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 5.NBT.A. 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. | Understanding the place value system | Identifying the place value of a digit in a number |
|  |  | Understanding the place value system: powers of 10 |
| 5.NBT.A. 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. | Multiplying and dividing by powers of 10 | Multiplying decimals by powers of 10 |
|  |  | Dividing decimals by powers of 10 |
|  |  | Finding numbers before \& after using powers of 10 |
|  |  | Writing numbers using powers of 10 |
| 5.NBT.A.3.A Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. | Read and write decimals to thousandths | Reading and writing decimals to thousandths |
| 5.NBT.A.3.B Compare two decimals to thousandths based on meanings of the digits in each place, using >, $=$, and < symbols to record the results of comparisons. | Comparing decimals to thousandths | Comparing and ordering decimals to thousandths |
| 5.NBT.A. 4 Use place value understanding to round decimals to any place. | Rounding decimals | Rounding decimals |

### 1.2 Perform operations with multi-digit whole numbers and with decimals to hundredths

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 5.NBT.B.5 Fluently multiply multi- <br> digit whole numbers using the <br> standard algorithm. | Multiply multi-digit <br> numbers, algorithm | Multiplying multi-digit <br> numbers, algorithm |
| 5.NBT.B.6 Find whole-number <br> quotients of whole numbers with up | Dividing multi-digit <br> numbers | Using facts to divide 2-digit <br> multiples of 10 |


| to four-digit dividends and two- <br> digit divisors, using strategies <br> based on place value, the <br> properties of operations, and/or the <br> relationship between multiplication <br> and division. Ilustrate and explain <br> the calculation by using equations, <br> rectangular arrays, and/or area <br> models. | Multiplying and dividing 2- <br> digit multiples of 10 |
| :--- | :--- | :--- |
| Multiplication/division <br> problems: multiples of 10 |  |
| D.NBT.B.7 Add, subtract, multiply, <br> and divide decimals to hundredths, <br> aroducts subtracting partial <br> using concrete models or drawings <br> and strategies based on place <br> value, properties of operations, <br> and/or the relationship between <br> addition and subtraction; relate the <br> strategy to a written method and <br> explain the reasoning used. |  |
|  | Divide multi-digit numbers, <br> whole number remainder |
|  | Adding decimals to <br> hundredths, algorithm |
|  | Subtracting decimals using <br> mental strategies |
|  | Subtracting decimals to <br> hundredths, algorithm |
|  | Multiplying decimals and <br> whole numbers |
|  | Multiplying decimals to <br> hundredths, algorithm |
|  | Multiplying decimals using <br> mental strategies |
|  | Multiplicative relationships <br> with decimals |
|  |  <br> decimals, mental strategies |
|  | Dividing whole numbers and <br> decimals, algorithm |

## 2 Number \& Operations - Fractions

### 2.1 Use equivalent fractions as a strategy to add and subtract fractions

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 5.NF.A. 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. | Adding and subtracting fractions | Adding fractions and mixed numbers |
|  |  | Subtracting fractions and mixed numbers |
|  |  | Adding and subtracting fractions and mixed numbers |
|  |  | Adding fractions, proper and improper |
|  |  | Adding mixed numbers |
|  |  | Subtracting fractions, proper and improper |
|  |  | Subtracting mixed numbers |
| 5.NF.A. 2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. | Add/subtract fraction word problems | Solving word problems: fractions and mixed numbers |
|  |  | Solving fraction word problems |
|  |  |  |

### 2.2 Apply and extend previous understandings of multiplication and division

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 5.NF.B.3 Interpret a fraction as <br> division of the numerator by the <br> denominator (a/b $=$ a $\div$ b). Solve <br> word problems involving division of <br> whole numbers leading to answers <br> in the form of fractions or mixed <br> numbers, e.g., by using visual <br> fraction models or equations to <br> represent the problem. | Interpreting fractions <br> as division | Interpreting fractions as <br> division |
| 5.NF.B.4A Interpret the product <br> (a/b) $\times$ q as a parts of a partition of <br> q into b equal parts; equivalently, as <br> the result of a sequence of <br> operations a $\times$ q $\div$ b. | Understanding <br> multiplying fractions | Multiplying a fraction by a <br> whole number |
| 5.NF.B.4.B Find the area of a <br> rectangle with fractional side <br> lengths by tiling it with unit squares <br> of the appropriate unit fraction side <br> lengths, and show that the area is <br> the same as would be found by | Area of a rectangle, <br> fractional sides <br> multiplying the side lengths. | Find the area of a rectangle <br> with fractional sides |
| Multiply fractional side lengths to a <br> find areas of rectangles, and |  |  |
| represent fraction products as |  |  |
| rectangular areas. |  |  |


| 5.NF.B.6 Solve real world problems <br> involving multiplication of fractions <br> and mixed numbers. | Multiplying fractions <br> word problems | Word problems: multiply <br> fractions \& mixed numbers |
| :--- | :--- | :--- |
| 5.NF.B.7.A Interpret division of a <br> unit fraction by a non-zero whole <br> number, and compute such <br> quotients. | Dividing unit fractions <br> by whole numbers | Dividing unit fractions by <br> whole numbers, models |
|  | Dividing unit fractions by <br> whole numbers |  |
| 5.NF.B.7.B Interpret division of a <br> whole number by a unit fraction, <br> and compute such quotients. | Dividing whole <br> numbers by unit <br> fractions | Dividing whole numbers by <br> unit fractions, models |
|  | Dividing whole numbers by <br> unit fractions |  |
| 5.NF.B.7.C Solve real world <br> problems involving division of unit <br> fractions by non-zero whole <br> numbers and division of whole <br> numbers by unit fractions, e.g., by <br> using visual fraction models and <br> equations to represent the problem. | Dividing unit fractions <br> word problems | Word problems: divide unit <br> fractions/whole numbers |

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