NM-MSSA MATH 2020-2021
PRACTICE TEST ANSWER KEY
Grade 4

Item Number	Key	Standards
1	A	4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
2	C	4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
3	D	4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), …*
4	A	4.OA.B.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.
5	D	4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction $(n × a)/(n × b)$ 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.
6	B	4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.
7		4.NBT.B.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.
8	C	4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
9	A	4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.[1] [1] See Glossary, Table 2.

Item Number	Key	Standards
10	A	4.MD.A.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.
11	C	4.MD.B.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. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*
12	B	4.NBT.A.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.
13	D	4.OA.B.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.
14		4.OA.A.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.
15	D	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, e.g., by using a visual fraction model.
16	D	4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.[1] [1] See Glossary, Table 2.
17	B	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 equations, rectangular arrays, and/or area models.

Item Number	Key	Standards
18	C	**4.OA.C.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. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*
19	A	**4.G.A.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.
20	D	**4.NF.C.7** Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
21	C	**4.G.A.1** 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.
22	B	**4.NF.B.3** Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. **4.NF.B.3.D** Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
23	C	**4.NBT.A.1** Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division*.
24	D,E	**4.G.A.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.
25		**4.MD.A.1** Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), …*
26	B	**4.MD.A.3** Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

Item Number	Key	Standards
27	A	**4.OA.A.2** Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.[1] [1] See Glossary, Table 2.
28	D	**4.NF.B.3** Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. **4.NF.B.3.D** Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
29	B	**4.OA.C.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. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*
30	A	**4.NF.C.7** Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
31	A,D	**4.NBT.A.3** Use place value understanding to round multi-digit whole numbers to any place.
32		**4.NF.B.3** Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. **4.NF.B.3.D** Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
33	C	**4.MD.B.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. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*
34	A	**4.NBT.A.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.
35	C	**4.NF.B.3** Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. **4.NF.B.3.C** Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

Item Number	Key	Standards
36	B	4.G.A.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.
37	B	4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

#7

Concepts and Procedures Scoring Rubric

Score	Description
2	Student earns 2 points.
1	Student earns 1 point.
0	Student earns 0 points.
Blank	No response.

Concepts and Procedures Training Notes:

Part a.	1 point	for correct answer, **2,400**
Part b.	1 point	for correct answer, **475**

Mathematical Practices Scoring Rubric

Score	Description
1	Student earns 1 point.
0	Student earns 0 points.
Blank	No response.

Mathematical Practices Training Notes:

1 point   for using models to develop designs, predict outcomes, describe phenomena, solve problems, and explain causes and effects (student explains how to use the area model in part (b) to find the given quotient)

Rubric Block: Author, Scorer, Test-constructor, Tutor
Exemplary Response:

a. 2,400

b. The quotient is equal to $400 + n + 5$. The value of n is equal to $420 \div 6 = 70$. So the quotient of $2,850 \div 6$ is equal to $400 + 70 + 5 = 475$.

#14

Concepts and Procedures Rubric

Score	Description
4	The student earns 4 points.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response.

Concepts and Procedures Training Notes:

Part a   2 points   for correct answer, **226 slices of pizza**, with correct equation, $s = 113 \times 2$, or equivalent

     OR

     1 point   for correct answer with incorrect or no equation

          or

          for correct equation with incorrect or no answer

Part b   2 points   for correct answer, **29 pizzas**, with correct equation, $p = 226 \div 8$, or equivalent

     OR

     1 point   for correct answer with incorrect or no equation

          or

          for correct equation with incorrect or no answer

Mathematical Practices Rubric

Score	Description
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response.

Training Notes:

1 point   for making sense of problems (ignores extraneous information)

1 point   for ensuring the solution makes sense (considers how the remainder means an extra pizza will need to be ordered)

Exemplary Response:

a. 226 slices of pizza, $s = 113 \times 2$; $s = 226$

b. 29 pizzas, $p = 226 \div 8$, $p = 28$ R2, If the school ordered 28 pizzas, they would have 224 slices of pizza. The school needs 226 slices of pizza. So, the remainder tells me to add 1 more pizza to the order.

#25

Concepts and Procedures Scoring Rubric

Score	Description
2	Student earns 2 points.
1	Student earns 1 point.
0	Student earns 0 points.
Blank	No response.

Concepts and Procedures Training Notes:

Part b   2 points   for correct answer, **500,000 centimeters**, with sufficient explanation or work shown to convert from kilometers to centimeters

OR

1 point   for correct answer with insufficient or no work or explanation

or

for appropriate conversion strategy with incorrect or no answer

Rubric Block: Author, Scorer, Test-constructor, Tutor
Mathematical Practices Scoring Rubric

Score	Description
1	Student earns 1 point.
0	Student earns 0 points.
Blank	No response.

Mathematical Practices Training Notes:

1 point   for analyzing the problem to ensure the proper units are specified in the solution (student explains that an incorrect conversion factor was used to change kilometers to centimeters in part (a))

Rubric Block: Author, Scorer, Test-constructor, Tutor
Exemplary Response:

a. Keenan's statement uses the wrong conversion from kilometers to centimeters. He may have confused kilometers with meters since 1 meter is 100 centimeters.

b. 1 kilometer is 1,000 meters, so 5 kilometers is $5 \times 1{,}000 = 5{,}000$ meters.

1 meter is 100 centimeters, so 5,000 meters is $5{,}000 \times 100 = 500{,}000$ centimeters.

#32

Concepts and Procedures Scoring Rubric:

Score	Description
4	The student earns 4 points.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response

Training Notes:

Part a 2 points for correct answer, $\dfrac{36}{100}$ **or equivalent**, with strategy that shows understanding of adding fractions that refer to same whole and have like denominators

OR

1 point for correct answer with insufficient or no work or explanation

OR

for strategy that shows understanding of adding fractions that refer to same whole and have like denominators with incorrect or no answer

Part b 1 point for correct answer, $\dfrac{78}{100}$ **or equivalent**

Part c 1 point for correct answer, **blueberry and lemon**

Mathematical Practices Scoring Rubric:

Score	Description
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response

Training Notes:

1 point for making use of structure (shows understanding of adding or subtracting fractions to justify the fraction in part (b))

1 point for using mathematical properties (decomposes 28 into 16 and 12 to justify the answer in part (c))

Rubric Block: Author, Proctor, Scorer, Test-constructor, Tutor

Exemplary Response:

a. $\dfrac{36}{100}$; 16 out of 100 or $\dfrac{16}{100}$ were blueberry, 20 out of 100 or $\dfrac{20}{100}$ were strawberry; $\dfrac{16}{100} + \dfrac{20}{100} = \dfrac{36}{100}$

b. $\dfrac{78}{100}$; 100 pies were sold, $\dfrac{22}{100}$ were apple, $100 - 22 = 78$, so $\dfrac{78}{100}$ were not apple

c. Blueberry and lemon; the two fractions that represent each flavor as a fraction of the total number of pies sold have to add up to $\dfrac{28}{100}$. This means that the number of pies sold for the two flavors must add up to 28. Of the numbers given, only two numbers add up to 28: 16 and 12. Therefore, the fraction represents blueberry and lemon pies sold.