

North Dakota Mathematics Content and Achievement Standards

Standard 1

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North Dakota Department of Public Instruction

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Standard 1: Number and Operation

Standard 1: Students understand and use basic and advanced concepts of number and number systems				
Benchmark Expectations	PROFICIENCY DESCRIPTOR			
	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
Kindergarten				
NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS				
K.1.1. Count to 20	Students count forward to 20 and backward from 10 with ease and with no errors.	Students count forward to 20 and backward from 10 with minimal difficulty and with no significant errors.	Students count forward to 20 and backward from 10 with difficulty or with a few significant errors.	Students count forward to 20 and backward from 10 with great difficulty or with many significant errors.
K.1.2. Count backward from 10 to 1	Students count up to 10 objects with ease.	Students count up to 10 objects with minimal difficulty.	Students count up to 10 objects with difficulty.	Students count up to 10 objects with great difficulty.
K.1.3. Demonstrate one-to-one correspondence by counting up to 10 objects				
K.1.4. Identify ordinal numbers to order objects, 1 st - 5 th	Students identify ordinal numbers to 5 th with ease and with no errors.	Students identify ordinal numbers 1 st to 5 th with minimal difficulty and with no significant errors.	Students identify ordinal numbers 1 st to 5 th with difficulty or with a few significant errors.	Students identify ordinal numbers 1 st to 5 th with great difficulty or with many significant errors.
K.1.5. Identify and write numerals to 10	Students identify and write numerals to 10 with ease and with no errors.	Students identify and write numerals to 10 with minimal difficulty and with no significant errors.	Students identify and write numerals to 10 with difficulty or with a few significant errors.	Students identify and write numerals to 10 with great difficulty or with many significant errors.
K.1.6. Determine the relationship between two sets with 10 or fewer objects; i.e., less than, greater than, or equal to	Students determine the relationship between sets of objects up to 10 with no errors.	Students determine the relationship between sets of objects up to 10 with no significant errors.	Students determine the relationship between sets of objects up to 10 with a few significant errors.	Students determine the relationship between sets of objects up to 10 with many significant errors.
K.1.7. Use concrete materials to represent wholes and halves	Students use concrete materials to represent wholes and halves with no errors.	Students use concrete materials to represent wholes and halves with no significant errors.	Students use concrete materials to represent wholes and halves with a few significant errors.	Students use concrete materials to represent wholes and halves with many significant errors.
OPERATIONS AND THEIR PROPERTIES				
<i>No expectations at this level</i>				

Standard 1: Students understand and use basic and advanced concepts of number and number systems

Benchmark Expectations	PROFICIENCY DESCRIPTOR			
	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
<p>COMPUTATIONAL FLUENCY AND ESTIMATION</p> <p><i>No expectations at this level</i></p>				
Grade 1				
NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS				
1.1.1. Count and order numbers to 100	Students count, order, identify, and write numbers to 100 with ease and with no errors.	Students count, order, identify, and write numbers to 100 with minimal difficulty and with no significant errors.	Students count, order, identify, and write numbers to 100 with difficulty or with a few significant errors.	Students count, order, identify, and write numbers to 100 with great difficulty or with many significant errors.
1.1.2. Identify and write numerals to 100				
1.1.3. Count backward from 20	Students count backward from 20 with ease and with no errors.	Students count backward from 20 with minimal difficulty and with no significant errors.	Students count backward from 20 with difficulty or with a few significant errors.	Students count backward from 20 with great difficulty or with many significant errors.
1.1.4. Count by 2's to 20, and 10's to 100	Students count by 2's to 20 and 10's to 100 with ease and with no errors.	Students count by 2's to 20 and 10's to 100 with minimal difficulty and with no significant errors.	Students count by 2's to 20 and 10's to 100 with difficulty or with a few significant errors.	Students count by 2's to 20 and 10's to 100 with great difficulty or with many significant errors.
1.1.5. Group objects by 2's, 5's, and 10's	Students group objects by 2's, 5's, and 10's with no errors.	Students group objects by 2's, 5's, and 10's with no significant errors.	Students group objects by 2's, 5's, or 10's with a few significant errors.	Students group objects by 2's, 5's, or 10's with many significant errors.
1.1.6. Identify position using ordinal numbers	Students identify position using ordinal numbers with no errors.	Students identify position using ordinal numbers with no significant errors.	Students identify position using ordinal numbers with a few significant errors.	Students identify position using ordinal numbers with many significant errors.
1.1.7. Connect number words and numerals to the quantities they represent (0 - 10)	Students connect number words and numerals to the quantities they represent with ease and with no errors.	Students connect number words and numerals to the quantities they represent with minimal difficulty and with no significant errors.	Students connect number words and numerals to the quantities they represent with difficulty or with a few significant errors.	Students connect number words and numerals to the quantities they represent with great difficulty or with many significant errors.

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	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
1.1.8. Represent and explain fractions (i.e., one half, one fourth) as part of a whole and part of a set using concrete materials/drawings	Students represent and explain fractions as part of a whole and part of a set using concrete materials/drawings with no errors.	Students represent and explain fractions as part of a whole and part of a set using concrete materials/drawings with no significant errors.	Students represent and explain fractions as part of a whole and part of a set using concrete materials/drawings with a few significant errors.	Students represent and explain fractions as part of a whole and part of a set using concrete materials/drawings with many significant errors.
1.1.9. Identify place value for ones and tens	Students identify place value for ones and tens with no errors.	Students identify place value for ones and tens with no significant errors.	Students identify place value for ones and tens with a few significant errors.	Students identify place value for ones and tens with many significant errors.
1.1.10. Compare two digit numbers using symbols; i.e., >, <, =	Students use symbols to compare two digit numbers with no errors.	Students use symbols to compare two digit numbers with no significant errors.	Students use symbols to compare two digit numbers with a few significant errors.	Students use symbols to compare two digit numbers with many significant errors.
1.1.11. Use grade-appropriate terms when communicating about addition and subtraction; i.e., sum, difference	Students use terms to communicate about addition and subtraction with no errors.	Students use terms to communicate about addition and subtraction with no significant errors.	Students use terms to communicate about addition and subtraction with a few significant errors.	Students use terms to communicate about addition and subtraction with many significant errors.
OPERATIONS AND THEIR PROPERTIES				
1.1.12. Use symbols to write addition and subtraction number sentences; i.e., +, -, =	Students use symbols to write addition and subtraction number sentences with no errors.	Students use symbols to write addition and subtraction number sentences with no significant errors.	Students use symbols to write addition and subtraction number sentences with a few significant errors.	Students use symbols to write addition and subtraction number sentences with many significant errors.
COMPUTATIONAL FLUENCY AND ESTIMATION				
1.1.13. Recall addition facts and subtraction facts (0-10)	Students recall addition and subtraction facts to 10 with ease.	Students recall addition and subtraction facts to 10 with minimal difficulty.	Students recall addition and subtraction facts to 10 with difficulty.	Students recall addition and subtraction facts to 10 with great difficulty.
1.1.14. Estimate the number of objects and check by counting	Students make and check estimates of quantity with no errors and with ease.	Students make and check estimates of quantity with no significant errors and with minimal difficulty.	Students make and check estimates of quantity with a few significant errors or with difficulty.	Students make and check estimates of quantity with many significant errors or with great difficulty.

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	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE				
Grade 2								
NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS								
2.1.1. Count and order numbers up to 1,000	Students count and order numbers up to 1,000 and count backward from 100 with ease and with no errors.	Students count and order numbers up to 1,000 and count backward from 100 with minimal difficulty and with no significant errors.	Students count and order numbers up to 1,000 and count backward from 100 with difficulty or with a few significant errors.	Students count and order numbers up to 1,000 and count backward from 100 with great difficulty or with many significant errors.				
2.1.2. Count backward from 100								
2.1.3. Count by 2's, 5's, and 10's					Students count by 2's, 5's, and 10's with ease and with no errors.	Students count by 2's, 5's, and 10's with minimal difficulty and with no significant errors.	Students count by 2's, 5's, and 10's with difficulty or with a few significant errors.	Students count by 2's, 5's, and 10's with great difficulty or with many significant errors.
2.1.4. Identify and write numerals to 1,000					Students identify and write numerals to 1,000 with ease and with no errors.	Students identify and write numerals up to 1,000 with minimal difficulty and with no significant errors.	Students identify and write numerals up to 1,000 with difficulty or with a few significant errors.	Students identify and write numerals up to 1,000 with great difficulty or with many significant errors.
2.1.5. Connect number words and numerals to the quantities they represent up to 100					Students connect number words and numerals to the quantities they represent with ease and with no errors.	Students connect number words and numerals to the quantities they represent with minimal difficulty and with no significant errors.	Students connect number words and numerals to the quantities they represent with difficulty or with a few significant errors.	Students connect number words and numerals to the quantities they represent with great difficulty or with many significant errors.
2.1.6. Demonstrate, identify, and explain the difference between odd and even numbers using concrete objects or drawings					Students identify odd and even numbers with no errors, and demonstrate and explain the difference, in great detail, using concrete objects or drawings.	Students identify odd and even numbers with no significant errors, and demonstrate and explain the difference, in adequate detail, using concrete objects or drawings.	Students identify odd and even numbers with a few significant errors, or demonstrate and explain the difference, in some detail, using concrete objects or drawings.	Students identify odd and even numbers with many significant errors, or demonstrate and explain the difference, in minimal detail, using concrete objects or drawings.
2.1.7. Identify place value concepts through the hundreds place					Students identify place value concepts through the hundreds place with no errors.	Students identify place value concepts through the hundreds place with no significant errors.	Students identify place value concepts through the hundreds place with a few significant errors.	Students identify place value concepts through the hundreds place with many significant errors.

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2.1.8. Use symbols (i.e., >, <, =) to compare whole numbers to 1,000	Students use symbols to compare whole numbers to 1,000 with no errors.	Students use symbols to compare whole numbers to 1,000 with no significant errors.	Students use symbols to compare whole numbers to 1,000 with a few significant errors.	Students use symbols to compare whole numbers to 1,000 with many significant errors.
2.1.9. Round numbers to tens and hundreds	Students round numbers to tens and hundreds with no errors.	Students round numbers to tens and hundreds with no significant errors.	Students round numbers to tens and hundreds with a few significant errors.	Students round numbers to tens and hundreds with many significant errors.
2.1.10. Use grade-appropriate terms when communicating about addition and subtraction; i.e., addend, sum, difference	Students use terms to communicate about addition and subtraction with no errors.	Students use terms to communicate about addition and subtraction with no significant errors.	Students use terms to communicate about addition and subtraction with a few significant errors.	Students use terms to communicate about addition and subtraction with many significant errors.
2.1.11. Represent and explain fractions (i.e., one half, one third, one fourth, one sixth and one eighth) as part of a whole and part of a set	Students represent and explain common fractions as part of a whole and part of a set with no errors.	Students represent and explain common fractions as part of a whole and part of a set with no significant errors.	Students represent and explain common fractions as part of a whole and part of a set with a few significant errors.	Students represent and explain common fractions as part of a whole and part of a set with many significant errors.
OPERATIONS AND THEIR PROPERTIES				
2.1.12. Select an operation to solve problems involving addition and subtraction of whole numbers	Students select an operation to solve problems involving addition and subtraction of whole numbers with no errors.	Students select an operation to solve problems involving addition and subtraction of whole numbers with no significant errors.	Students select an operation to solve problems involving addition and subtraction of whole numbers with few significant errors.	Students select an operation to solve problems involving addition and subtraction of whole numbers with many significant errors.
2.1.13. Demonstrate the inverse relationship between addition and subtraction; i.e., $3+4 = 7$, $7-4 = 3$	Students demonstrate the inverse relationship between addition and subtraction with no errors.	Students demonstrate the inverse relationship between addition and subtraction with no significant errors.	Students demonstrate the inverse relationship between addition and subtraction with a few significant errors.	Students demonstrate the inverse relationship between addition and subtraction with many significant errors.
2.1.14. Model multiplication using equal sets of objects	Students model multiplication using equal sets of objects with no errors.	Students model multiplication using equal sets of objects with no significant errors.	Students model multiplication using equal sets of objects with a few significant errors.	Students model multiplication using equal sets of objects with many significant errors.

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2.1.15. Add and subtract two-digit whole numbers between 0 and 100 without regrouping	Students add and subtract two-digit whole numbers between 0 and 100 with no errors.	Students add and subtract two-digit whole numbers between 0 and 100 with no significant errors.	Students add and subtract two-digit whole numbers between 0 and 100 with a few significant errors.	Students add and subtract two-digit whole numbers between 0 and 100 with many significant errors.
COMPUTATIONAL FLUENCY AND ESTIMATION				
2.1.16. Recall addition facts and subtraction facts (0-18)	Students recall addition facts and subtraction facts to 18 with ease.	Students recall addition facts and subtraction facts to 18 with minimal difficulty.	Students recall addition facts and subtraction facts to 18 with difficulty.	Students recall addition facts and subtraction facts to 18 with great difficulty.
2.1.17. Estimate whole number sums and differences	Students estimate whole number sums and differences with no errors.	Students estimate whole number sums and differences with no significant errors.	Students estimate whole number sums and differences with a few significant errors.	Students estimate whole number sums and differences with many significant errors.
Grade 3				
NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS				
3.1.1. Count and order numbers up to 10,000	Students count, order, read, write, and represent numbers up to 10,000 with ease and with no errors.	Students count, order, read, write, and represent numbers up to 10,000 with minimal difficulty and with no significant errors.	Students count, order, read, write, and represent numbers up to 10,000 with difficulty or with a few significant errors.	Students count, order, read, write, and represent numbers up to 10,000 with great difficulty or with many significant errors.
3.1.2. Read and write numerals to 10,000				
3.1.3. Represent numbers up to 10,000 in standard, expanded, and word form				
3.1.4. Identify the odd and even whole numbers from 0 to 10,000	Students identify odd and even numbers to 10,000 with no errors.	Students identify odd and even numbers to 10,000 with no significant errors.	Students identify odd and even numbers to 10,000 with a few significant errors.	Students identify odd and even numbers to 10,000 with many significant errors.
3.1.5. Identify place values from ten-thousands through the hundredths place	Students identify place values from ten-thousands through hundredths with no errors.	Students identify place values from ten-thousands through hundredths with no significant errors.	Students identify place values from ten-thousands through hundredths with a few significant errors.	Students identify place values from ten-thousands through hundredths with many significant errors.

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3.1.6. Use symbols to compare whole numbers from 0 to 10,000; i.e., $>$, $<$, $=$	Students use symbols to compare numbers to 10,000 with no errors.	Students use symbols to compare numbers to 10,000 with no significant errors.	Students use symbols to compare numbers to 10,000 with a few significant errors.	Students use symbols to compare numbers to 10,000 with many significant errors.
3.1.7. Use mathematical terms when communicating about computations; i.e., factor, product, divisor, dividend, quotient	Students use mathematical terms to communicate about computations with no errors.	Students use mathematical terms to communicate about computations with no significant errors.	Students use mathematical terms to communicate about computations with a few significant errors.	Students use mathematical terms to communicate about computations with many significant errors.
3.1.8. Round numbers to tens, hundreds, and thousands	Students round numbers to tens, hundreds, and thousands with no errors.	Students round numbers to tens, hundreds, and thousands with no significant errors.	Students round numbers to tens, hundreds, and thousands with a few significant errors.	Students round numbers to tens, hundreds, and thousands with many significant errors.
3.1.9. Represent fractions and mixed numbers using words, numerals, and physical models	Students represent fractions and mixed numbers using words, numerals, and physical models with no errors.	Students represent fractions and mixed numbers using words, numerals, and physical models with no significant errors.	Students represent fractions and mixed numbers using words, numerals, and physical models with a few significant errors.	Students represent fractions and mixed numbers using words, numerals, and physical models with many significant errors.
3.1.10. Model, represent, and explain the concept of multiplication; i.e., repeated addition, rectangular arrays, and skip counting	Students model, represent, and explain multiplication and division with no errors.	Students model, represent, and explain multiplication and division with no significant errors.	Students model, represent, and explain multiplication and division with a few significant errors.	Students model, represent, and explain multiplication and division with many significant errors.
3.1.11. Model, represent, and explain the concept of division; i.e., repeated subtraction, rectangular arrays, and equal sharing				
3.1.12. Use a variety of methods and tools for problem solving; e.g., computing, including mental math, paper and pencil, calculator, manipulatives	Students use an extensive variety of methods and tools for problem solving.	Students use a variety of methods and tools for problem solving.	Students use some different methods and tools for problem solving.	Students use a limited number of methods and tools for problem solving.
OPERATIONS AND THEIR PROPERTIES				
3.1.13. Add and subtract whole numbers between 0 and 10,000	Students add and subtract whole numbers to 10,000 with no errors.	Students add and subtract whole numbers to 10,000 with no significant errors.	Students add and subtract whole numbers to 10,000 with a few significant errors.	Students add and subtract whole numbers to 10,000 with many significant errors.

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Benchmark Expectations	PROFICIENCY DESCRIPTOR			
	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
3.1.14. Model and use the commutative and associative properties of addition and multiplication	Students model and use the commutative and associative properties of addition and multiplication with no errors.	Students model and use the commutative and associative properties of addition and multiplication with no significant errors.	Students model and use the commutative and associative properties of addition and multiplication with a few significant errors.	Students model and use the commutative and associative properties of addition and multiplication with many significant errors.
3.1.15. Apply the multiplication property of zero and one	Students apply the multiplication properties of zero and one with no errors.	Students apply the multiplication properties of zero and one with no significant errors.	Students apply the multiplication properties of zero and one with a few significant errors.	Students apply the multiplication properties of zero and one with many significant errors.
3.1.16. Multiply two- and three-digit numbers by a single-digit number	Students multiply two- and three-digit numbers by a single-digit number with no errors.	Students multiply two- and three-digit numbers by a single-digit number with no significant errors.	Students multiply two- and three-digit numbers by a single-digit number with a few significant errors.	Students multiply two- and three-digit numbers by a single-digit number with many significant errors.
3.1.17. Divide two- and three-digit numbers by single-digit number without remainders	Students divide two- and three-digit numbers by a single-digit number, without remainders, with no errors.	Students divide two- and three-digit numbers by a single-digit number, without remainders, with no significant errors.	Students divide two- and three-digit numbers by a single-digit number, without remainders, with a few significant errors.	Students divide two- and three-digit numbers by a single-digit number, without remainders, with many significant errors.
3.1.18. Demonstrate the inverse relationships between multiplication and division	Students demonstrate the inverse relationship between multiplication and division with no errors.	Students demonstrate the inverse relationship between multiplication and division with no significant errors.	Students demonstrate the inverse relationship between multiplication and division with a few significant errors.	Students demonstrate the inverse relationship between multiplication and division with many significant errors.
3.1.19. Add and subtract simple fractions with like denominators; e.g., $1/4 + 2/4 = 3/4$	Students add and subtract simple fractions with like denominators with no errors.	Students add and subtract simple fractions with like denominators with no significant errors.	Students add and subtract simple fractions with like denominators with a few significant errors.	Students add and subtract simple fractions with like denominators with many significant errors.
COMPUTATIONAL FLUENCY AND ESTIMATION				
3.1.20. Recall multiplication and division facts (0-10)	Students recall multiplication and division facts from 0 to 10 with ease.	Students recall multiplication and division facts from 0 to 10 with minimal difficulty.	Students recall multiplication and division facts from 0 to 10 with some difficulty.	Students recall multiplication and division facts from 0 to 10 with great difficulty.

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3.1.21. Estimate whole number products and quotients	Students estimate whole number products and quotients with no errors.	Students estimate whole number products and quotients with no significant errors.	Students estimate whole number products and quotients with a few significant errors.	Students estimate whole number products and quotients with many significant errors.
3.1.22. Use estimation to determine if solutions are reasonable	Students use estimation to determine if solutions are reasonable with no errors.	Students use estimation to determine if solutions are reasonable with no significant errors.	Students use estimation to determine if solutions are reasonable with a few significant errors.	Students use estimation to determine if solutions are reasonable with many significant errors.
Grade 4				
NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS				
4.1.1. Identify place value from hundred thousands through the hundredths place	Students identify place value from hundred thousands through the hundredths place with no errors.	Students identify place value from hundred thousands through the hundredths place with no significant errors.	Students identify place value from hundred thousands through the hundredths place with a few significant errors.	Students identify place value from hundred thousands through the hundredths place with many significant errors.
4.1.2. Order and compare using symbols; i.e., >, <, =, whole numbers (0 to 100,000) and decimals to hundredths	Students order and compare numbers from hundredths to 100,000 with no errors.	Students order and compare numbers from hundredths to 100,000 with no significant errors.	Students order and compare numbers from hundredths to 100,000 with a few significant errors.	Students order and compare numbers from hundredths to 100,000 with many significant errors.
4.1.3. Read and write numerals to 100,000	Students read and write numerals to 100,000 with no errors.	Students read and write numerals to 100,000 with no significant errors.	Students read and write numerals to 100,000 with a few significant errors.	Students read and write numerals to 100,000 with many significant errors.
4.1.4. Round whole numbers to the nearest tens, hundreds, thousands, ten thousands, and hundred thousands	Students round whole numbers to the nearest designated unit (tens through hundred thousands) with no errors.	Students round whole numbers to the nearest designated unit (tens through hundred thousands) with no significant errors.	Students round whole numbers up to the nearest designated unit (tens through hundred thousands) with a few significant errors.	Students round whole numbers up to the nearest designated unit (tens through hundred thousands) with many significant errors.

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Benchmark Expectations	PROFICIENCY DESCRIPTOR			
	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
4.1.5. Represent numbers up to hundred thousands in standard and expanded forms	Students represent numbers up to hundred thousands in standard and expanded forms with no errors.	Students represent numbers up to hundred thousands in standard and expanded forms with no significant errors.	Students represent numbers up to hundred thousands in standard and expanded forms with a few significant errors.	Students represent numbers up to hundred thousands in standard and expanded forms with many significant errors.
4.1.6. Write tenths and hundredths as decimals and fractions	Students write tenths and hundredths as decimals and fractions with no errors.	Students write tenths and hundredths as decimals and fractions with no significant errors.	Students write tenths and hundredths as decimals and fractions with a few significant errors.	Students write tenths and hundredths as decimals and fractions with many significant errors.
4.1.7. Compare equivalent decimals and fractions, e.g., $5/10 = .5$	Students compare equivalent decimals and fractions with no errors.	Students compare equivalent decimals and fractions with no significant errors.	Students compare equivalent decimals and fractions with a few significant errors.	Students compare equivalent decimals and fractions with many significant errors.
4.1.8. Use mathematical terms when communicating about computations involving fractions; i.e., numerator and denominator	Students use mathematical terms to communicate about computations involving fractions with no errors.	Students use mathematical terms to communicate about computations involving fractions with no significant errors.	Students use mathematical terms to communicate about computations involving fractions with a few significant errors.	Students use mathematical terms to communicate about computations involving fractions with many significant errors.
4.1.9. Explain the meaning of remainders in real-world situations	Students explain in great detail the meaning of remainders in real-world situations.	Students explain in adequate detail the meaning of remainders in real-world situations.	Students explain in some detail the meaning of remainders in real-world situations.	Students explain in minimal detail the meaning of remainders in real-world situations.
4.1.10. Determine what information is relevant for solving a problem	Students determine what information is relevant for solving a problem with no errors.	Students determine what information is relevant for solving a problem with no significant errors.	Students determine what information is relevant for solving a problem with a few significant errors.	Students determine what information is relevant for solving a problem with many significant errors.
4.1.11. Use a variety of strategies to solve problems; e.g., guess and check, work backwards, draw pictures, use objects	Students use an extensive variety of strategies to solve problems.	Students use many different strategies to solve problems.	Students use some different strategies to solve problems.	Students use a limited number of strategies to solve problems.

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OPERATIONS AND THEIR PROPERTIES				
4.1.12. Add and subtract whole numbers between 0 and 100,000	Students add and subtract whole numbers between 0 and 100,000 with no errors.	Students add and subtract whole numbers between 0 and 100,000 with no significant errors.	Students add and subtract whole numbers between 0 and 100,000 with a few significant errors.	Students add and subtract whole numbers between 0 and 100,000 with many significant errors.
4.1.13. Multiply multi-digit numbers by two-digit numbers	Students multiply multi-digit numbers by two-digit numbers and divide multi-digit numbers by single-digit numbers with no errors.	Students multiply multi-digit numbers by two-digit numbers and divide multi-digit numbers by single-digit numbers with no significant errors.	Students multiply multi-digit numbers by two-digit numbers and divide multi-digit numbers by single-digit numbers with a few significant errors.	Students multiply multi-digit numbers by two-digit numbers and divide multi-digit numbers by single-digit numbers with many significant errors.
4.1.14. Divide multi-digit numbers by a single-digit number	Students multiply multi-digit numbers by two-digit numbers and divide multi-digit numbers by single-digit numbers with no errors.	Students multiply multi-digit numbers by two-digit numbers and divide multi-digit numbers by single-digit numbers with no significant errors.	Students multiply multi-digit numbers by two-digit numbers and divide multi-digit numbers by single-digit numbers with a few significant errors.	Students multiply multi-digit numbers by two-digit numbers and divide multi-digit numbers by single-digit numbers with many significant errors.
4.1.15. Add and subtract fractions and mixed numbers with like denominators	Students add and subtract fractions and mixed numbers with like denominators with no errors.	Students add and subtract fractions and mixed numbers with like denominators with no significant errors.	Students add and subtract fractions and mixed numbers with like denominators with a few significant errors.	Students add and subtract fractions and mixed numbers with like denominators with many significant errors.
4.1.16. Add and subtract decimals	Students add and subtract decimals with no errors.	Students add and subtract decimals with no significant errors.	Students add and subtract decimals with a few significant errors.	Students add and subtract decimals with many significant errors.
4.1.17. Use the distributive property to simplify and perform computations	Students use the distributive property to simplify and perform computations with no errors.	Students use the distributive property to simplify and perform computations with no significant errors.	Students use the distributive property to simplify and perform computations with a few significant errors.	Students use the distributive property to simplify and perform computations with many significant errors.
COMPUTATIONAL FLUENCY AND ESTIMATION				
4.1.18. Determine when a rounded solution is appropriate	Students determine when a rounded solution is appropriate with no errors.	Students determine when a rounded solution is appropriate with no significant errors.	Students determine when a rounded solution is appropriate with a few significant errors.	Students determine when a rounded solution is appropriate with many significant errors.
4.1.19. Estimate computations of whole numbers, fractions, and decimals	Students estimate computations of whole numbers, fractions, and decimals with no errors.	Students estimate computations of whole numbers, fractions, and decimals with no significant errors.	Students estimate computations of whole numbers, fractions, and decimals with a few significant errors.	Students estimate computations of whole numbers, fractions, and decimals with many significant errors.

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Grade 5				
NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS				
5.1.1. Identify place value from the billions through the thousandths place	Students identify place value from billions to thousandths place with no errors.	Students identify place value from billions to thousandths place with no significant errors.	Students identify place value from billions to thousandths place with a few significant errors.	Students identify place value from billions to thousandths place with many significant errors.
5.1.2. Order and compare whole numbers using symbols	Students order and compare whole numbers using symbols with no errors.	Students order and compare whole numbers using symbols with no significant errors.	Students order and compare whole numbers using symbols with a few significant errors.	Students order and compare whole numbers using symbols with many significant errors.
5.1.3. Round whole numbers to the nearest million	Students round whole numbers to the nearest million with no errors.	Students round whole numbers to the nearest million with no significant errors.	Students round whole numbers to the nearest million with a few significant errors.	Students round whole numbers to the nearest million with many significant errors.
5.1.4. Read and represent numbers to 1,000,000 in standard, expanded, and short word form	Students read and represent numbers up to one million in standard, expanded, and short word form with no errors.	Students read and represent numbers up to one million in standard, expanded, and short word form with no significant errors.	Students read and represent numbers up to one million in standard, expanded, and short word form with a few significant errors.	Students read and represent numbers up to one million in standard, expanded, and short word form with many significant errors.
5.1.5. Place integers on a number line	Students place integers on a number line with no errors.	Students place integers on a number line with no significant errors.	Students place integers on a number line with a few significant errors.	Students place integers on a number line with many significant errors.
5.1.6. Use negative integers in real-world situations; e.g., thermometer reading, yardage in a football game	Students use negative integers in real-world situations with no errors.	Students use negative integers in real-world situations with no significant errors.	Students use negative integers in real-world situations with a few significant errors.	Students use negative integers in real-world situations with many significant errors.
5.1.7. Identify prime and composite numbers	Students identify prime and composite numbers with no errors.	Students identify prime and composite numbers with no significant errors.	Students identify prime and composite numbers with a few significant errors.	Students identify prime and composite numbers with many significant errors.

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Benchmark Expectations	PROFICIENCY DESCRIPTOR			
	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
5.1.8. Round, order, and compare, using symbols, fractions with like and unlike denominators	Students round, order, and compare fractions with like and unlike denominators with no errors.	Students round, order, and compare fractions with like and unlike denominators with no significant errors.	Students round, order, and compare fractions with like and unlike denominators with a few significant errors.	Students round, order, and compare fractions with like and unlike denominators with many significant errors.
5.1.9. Round, order, and compare, using symbols, decimals to the tenths, hundredths, and thousandths place	Students round, order, and compare decimals to the tenths, hundredths, and thousandths place with no errors.	Students round, order, and compare decimals to the tenths, hundredths, and thousandths place with no significant errors.	Students round, order, and compare decimals to the tenths, hundredths, and thousandths place with a few significant errors.	Students round, order, and compare decimals to the tenths, hundredths, and thousandths place with many significant errors.
5.1.10. Explain and demonstrate the concept of a percent	Students explain in great detail and demonstrate the concept of a percent with no errors.	Students explain in adequate detail and demonstrate the concept of a percent with no significant errors.	Students explain in some detail and/or demonstrate the concept of a percent with a few significant errors.	Students explain in minimal detail and/or demonstrate the concept of a percent with many significant errors.
5.1.11. Compare equivalent fractions, decimals, and percents, e.g., $75/100 = .75 = 75\%$	Students compare equivalent fractions, decimals, and percents with no errors.	Students compare equivalent fractions, decimals, and percents with no significant errors.	Students compare equivalent fractions, decimals, and percents with a few significant errors.	Students compare equivalent fractions, decimals with many significant errors.
5.1.12. Represent ratios and percents as parts of a whole using models and pictures	Students represent ratios and percents as parts of a whole with no errors.	Students represent ratios and percents as parts of a whole with no significant errors.	Students represent ratios and percents as parts of a whole with a few significant errors.	Students represent ratios and percents as parts of a whole with many significant errors.
5.1.13. Explain and demonstrate the relationship between exponential notation and repeated multiplication; e.g., $3^2 = 3 \times 3$	Students explain in great detail and demonstrate the relationship between exponential notation and repeated multiplication with no errors.	Students explain in adequate detail and demonstrate the relationship between exponential notation and repeated multiplication with no significant errors.	Students explain in some detail and/or demonstrate the relationship between exponential notation and repeated multiplication with a few significant errors.	Students explain in minimal detail and/or demonstrate the relationship between exponential notation and repeated multiplication with many significant errors.
OPERATIONS AND THEIR PROPERTIES				
5.1.14. Add and subtract whole numbers between 0 and 1,000,000	Students add and subtract whole numbers between 0 and 1,000,000 with no errors.	Students add and subtract whole numbers between 0 and 1,000,000 with no significant errors.	Students add and subtract whole numbers between 0 and 1,000,000 with a few significant errors.	Students add and subtract whole numbers between 0 and 1,000,000 with many significant errors.

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Benchmark Expectations	PROFICIENCY DESCRIPTOR			
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5.1.15. Use commutative, associative, and identity properties to solve problems	Students use commutative, associative, and identity properties with no errors.	Students use commutative, associative, and identity properties with no significant errors.	Students use commutative, associative, and identity properties with a few significant errors.	Students use commutative, associative, and identity properties with many significant errors.
5.1.16. Use divisibility rules for 2, 5, and 10	Students use divisibility rules for 2, 5, and 10 with no errors.	Students use divisibility rules for 2, 5, and 10 with no significant errors.	Students use divisibility rules for 2, 5, and 10 with a few significant errors.	Students use divisibility rules for 2, 5, and 10 with many significant errors.
5.1.17. Determine the prime factors for a number using a factor tree	Students determine the prime factors for a number using a factor tree with no errors.	Students determine the prime factors for a number using a factor tree with no significant errors.	Students determine the prime factors for a number using a factor tree with a few significant errors.	Students determine the prime factors for a number using a factor tree with many significant errors.
5.1.18. Determine least common multiple	Students determine the least common multiple and greatest common factor with no errors.	Students determine the least common multiple and greatest common factor with no significant errors.	Students determine the least common multiple and greatest common factor with a few significant errors.	Students determine the least common multiple and greatest common factor with many significant errors.
5.1.19. Determine greatest common factor				
5.1.20. Use order of operations to simplify numeric expressions	Students use the order of operations to simplify numeric expressions with no errors.	Students use the order of operations to simplify numeric expressions with no significant errors.	Students use the order of operations to simplify numeric expressions with a few significant errors.	Students use the order of operations to simplify numeric expressions with many significant errors.
5.1.21. Multiply multi-digit numbers by three-digit numbers	Students multiply multi-digit numbers by three-digit numbers and divide multi-digit numbers by two-digit numbers with or without remainders with no errors.	Students multiply multi-digit numbers by three-digit numbers and divide multi-digit numbers by two-digit numbers with or without remainders with no significant errors.	Students multiply multi-digit numbers by three-digit numbers and divide multi-digit numbers by two-digit numbers with or without remainders with a few significant errors.	Students multiply multi-digit numbers by three-digit numbers and divide multi-digit numbers by two-digit numbers with or without remainders with many significant errors.
5.1.22. Divide multi-digit numbers by two-digit numbers with or without remainders				
5.1.23. Add and subtract improper fractions and mixed numbers with unlike denominators	Students add and subtract improper fractions and mixed numbers with unlike denominators with no errors.	Students add and subtract improper fractions and mixed numbers with unlike denominators with no significant errors.	Students add and subtract improper fractions and mixed numbers with unlike denominators with a few significant errors.	Students add and subtract improper fractions and mixed numbers with unlike denominators with many significant errors.

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Benchmark Expectations	PROFICIENCY DESCRIPTOR			
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5.1.24. Add and subtract multi-digit decimals 5.1.25. Multiply and divide multi-digit decimals COMPUTATIONAL FLUENCY AND ESTIMATION <i>No new content at this level</i>	Students add, subtract, multiply, and divide multi-digit decimals with no errors.	Students add, subtract, multiply, and divide multi-digit decimals with no significant errors.	Students add, subtract, multiply, and divide multi-digit decimals with a few significant errors.	Students add, subtract, multiply, and divide multi-digit decimals with many significant errors.
Grade 6				
NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS				
6.1.1. Use a fraction to represent parts of a whole, division, or a ratio	Students use fractions to represent parts of a whole, division, or a ratio with no errors.	Students use fractions to represent parts of a whole, division, or a ratio with no significant errors.	Students use fractions to represent parts of a whole, division, or a ratio with a few significant errors.	Students use fractions to represent parts of a whole, division, or a ratio with many significant errors.
6.1.2. Explain and use whole number percents 1 to 100	Students explain in great detail and use whole number percents 1 to 100 with no errors.	Students explain in adequate detail and use whole number percents 1 to 100 with no significant errors.	Students explain in some detail and/or use whole number percents 1 to 100 with a few significant errors.	Students explain in minimal detail and/or use whole number percents 1 to 100 with many significant errors.
6.1.3. Find the equivalent forms among fractions, decimals, and whole number percents	Students find the equivalent forms among fractions, decimals, and whole number percents with no errors.	Students find the equivalent forms among fractions, decimals, and whole number percents with no significant errors.	Students find the equivalent forms among fractions, decimals, and whole number percents with a few significant errors.	Students find the equivalent forms among fractions, decimals, and whole number percents with many significant errors.
6.1.4. Compare and order fractions, decimals, mixed numbers and integers	Students compare and order fractions, decimals, mixed numbers, and integers with no errors.	Students compare and order fractions, decimals, mixed numbers, and integers with no significant errors.	Students compare and order fractions, decimals, mixed numbers, and integers with a few significant errors.	Students compare and order fractions, decimals, mixed numbers, and integers with many significant errors.
6.1.5. Generate a list of factors, prime factors, and multiples	Students generate a list of factors, prime factors, and multiples with no errors.	Students generate a list of factors, prime factors, and multiples with no significant errors.	Students generate a list of factors, prime factors, and multiples with a few significant errors.	Students generate a list of factors, prime factors, and multiples with many significant errors.

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6.1.6. Use rules to determine divisibility by 2, 3, 5, 6, 9, and 10	Students use rules to determine divisibility by 2, 3, 5, 6, 9, and 10 with no errors.	Students use rules to determine divisibility by 2, 3, 5, 6, 9, and 10 with no significant errors.	Students use rules to determine divisibility by 2, 3, 5, 6, 9, and 10 with a few significant errors.	Students use rules to determine divisibility by 2, 3, 5, 6, 9, and 10 with many significant errors.
OPERATIONS AND THEIR PROPERTIES				
6.1.7. Explain the effects of arithmetic operations on fractions and decimals	Students explain in great detail the effects of arithmetic operations on fractions and decimals.	Students explain in adequate detail the effects of arithmetic operations on fractions and decimals.	Students explain in some detail the effects of arithmetic operations on fractions and decimals.	Students explain in minimal detail the effects of arithmetic operations on fractions and decimals.
6.1.8. Identify the uses of the commutative and associative properties of addition and multiplication; e.g., grouping numbers to make addition or multiplication easier	Students identify the uses of the commutative and associative properties of addition and multiplication with no errors.	Students identify the uses of the commutative and associative properties of addition and multiplication with no significant errors.	Students identify the uses of the commutative and associative properties of addition and multiplication with a few significant errors.	Students identify the uses of the commutative and associative properties of addition and multiplication with many significant errors.
6.1.9. Use order of operations; i.e., multiplication, division, addition and subtraction, to simplify numeric expressions	Students use order of operations to simplify numeric expressions with no errors.	Students use order of operations to simplify numeric expressions with no significant errors.	Students use order of operations to simplify numeric expressions with a few significant errors.	Students use order of operations to simplify numeric expressions with many significant errors.
COMPUTATIONAL FLUENCY AND ESTIMATION				
6.1.10. Multiply and divide decimals	Students multiply and divide decimals with no errors.	Students multiply and divide decimals with no significant errors.	Students multiply and divide decimals with a few significant errors.	Students multiply and divide decimals with many significant errors.
6.1.11. Add, subtract, multiply, and divide fractions	Students add, subtract, multiply, and divide fractions with no errors.	Students add, subtract, multiply, and divide fractions with no significant errors.	Students add, subtract, multiply, and divide fractions with a few significant errors.	Students add, subtract, multiply, and divide fractions with many significant errors.
6.1.12. Express an exponent in standard form	Students express an exponent in standard form with no errors.	Students express an exponent in standard form with no significant errors.	Students express an exponent in standard form with a few significant errors.	Students express an exponent in standard form with many significant errors.

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6.1.13. Use problem solving strategies to solve and verify the results of problems	Students use problem solving strategies to solve and verify the results of problems with no errors.	Students use problem solving strategies to solve and verify the results of problems with no significant errors.	Students use problem solving strategies to solve and verify the results of problems with a few significant errors.	Students use problem solving strategies to solve and verify the results of problems with many significant errors.
6.1.14. Estimate the results of problems involving whole numbers, fractions, and decimals	Students estimate the results of problems involving whole numbers, fractions, and decimals with no errors.	Students estimate the results of problems involving whole numbers, fractions, and decimals with no significant errors.	Students estimate the results of problems involving whole numbers, fractions, and decimals with a few significant errors.	Students estimate the results of problems involving whole numbers, fractions, and decimals with many significant errors.
Grade 7				
NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS				
7.1.1. Use ratios and proportions to represent relationships	Students use ratios and proportions to represent relationships with no errors.	Students use ratios and proportions to represent relationships with no significant errors.	Students use ratios and proportions to represent relationships with a few significant errors.	Students use ratios and proportions to represent relationships with many significant errors.
7.1.2. Explain and use percents greater than 100	Students explain in great detail and use percents greater than 100 with no errors.	Students explain in adequate detail and use percents greater than 100 with no significant errors.	Students explain in some detail and/or use percents greater than 100 with a few significant errors.	Students explain in minimal detail and/or use percents greater than 100 with many significant errors.
7.1.3. Use prime factorization to determine the greatest common factor and least common multiple	Students use prime factorization to determine the greatest common factor and least common multiple with no errors.	Students use prime factorization to determine the greatest common factor and least common multiple with no significant errors.	Students use prime factorization to determine the greatest common factor and/or least common multiple with a few significant errors.	Students use prime factorization to determine the greatest common factor and/or least common multiple with many significant errors.
7.1.4. Use integers to represent and compare quantities	Students use integers to represent and compare quantities with no errors.	Students use integers to represent and compare quantities with no significant errors.	Students use integers to represent and compare quantities with a few significant errors.	Students use integers to represent and compare quantities with many significant errors.

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	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
OPERATIONS AND THEIR PROPERTIES				
7.1.5. Explain the effects of arithmetic operations on fractions, decimals, and integers	Students explain in great detail the effects of arithmetic operations on fractions, decimals, and integers.	Students explain in adequate detail the effects of arithmetic operations on fractions, decimals, and integers.	Students explain in some detail the effects of arithmetic operations on fractions, decimals, and integers.	Students explain in minimal detail the effects of arithmetic operations on fractions, decimals, and integers.
7.1.6. Use order of operations (i.e., parentheses and operations) to simplify numeric expressions	Students use order of operations to simplify numeric expressions with no errors.	Students use order of operations to simplify numeric expressions with no significant errors.	Students use order of operations to simplify numeric expressions with a few significant errors.	Students use order of operations to simplify numeric expressions with many significant errors.
COMPUTATIONAL FLUENCY AND ESTIMATION				
7.1.7. Add, subtract, multiply, and divide fractions and terminating decimals	Students add, subtract, multiply, and divide fractions and terminating decimals with no errors.	Students add, subtract, multiply, and divide fractions and terminating decimals with no significant errors.	Students add, subtract, multiply, and divide fractions and terminating decimals with a few significant errors.	Students add, subtract, multiply, and divide fractions and terminating decimals with many significant errors.
7.1.8. Solve real-world problems using integers, fractions, decimals, and percents	Students solve real-world problems using integers, fractions, decimals, and percents with no errors.	Students solve real-world problems using integers, fractions, decimals, and percents with no significant errors.	Students solve real-world problems using integers, fractions, decimals, and percents with a few significant errors.	Students solve real-world problems using integers, fractions, decimals, and percents with many significant errors.
7.1.9. Estimate the results of problems involving fractions, decimals, and percents	Students estimate the results of problems involving fractions, decimals, and percents with no errors.	Students estimate the results of problems involving fractions, decimals, and percents with no significant errors.	Students estimate the results of problems involving fractions, decimals, and percents with a few significant errors.	Students estimate the results of problems involving fractions, decimals, and percents with many significant errors.
7.1.10. Use proportions to solve problems	Students use proportions to solve problems with no errors.	Students use proportions to solve problems with no significant errors.	Students use proportions to solve problems with a few significant errors.	Students use proportions to solve problems with many significant errors.

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Grade 8				
NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS				
8.1.1. Identify subsets of the real number system; i.e., natural and whole numbers, integers, rational and irrational numbers	Students identify subsets of the real number system with no errors.	Students identify subsets of the real number system with no significant errors.	Students identify subsets of the real number system with a few significant errors.	Students identify subsets of the real number system with many significant errors.
8.1.2. Solve real-world problems involving ration, proportion, and percent	Students solve real-world problems involving ratio, proportion, and percent with no errors.	Students solve real-world problems involving ratio, proportion, and percent with no significant errors.	Students solve real-world problems involving ratio, proportion, and percent with a few significant errors.	Students solve real-world problems involving ratio, proportion, and percent with many significant errors.
8.1.3. Identify perfect squares 1 to 144 and approximate square roots	Students identify perfect squares 1 to 144 and approximate square roots with no errors.	Students identify perfect squares 1 to 144 and approximate square roots with no significant errors.	Students identify perfect squares 1 to 144 and approximate square roots with a few significant errors.	Students identify perfect squares 1 to 144 and approximate square roots with many significant errors.
8.1.4. Represent large and small numbers using scientific notation	Students represent large and small numbers using scientific notation with no errors.	Students represent large and small numbers using scientific notation with no significant errors.	Students represent large and small numbers using scientific notation with a few significant errors.	Students represent large and small numbers using scientific notation with many significant errors.
OPERATIONS AND THEIR PROPERTIES				
8.1.5. Apply operation properties to simplify computations and solve problems; i.e., commutative, associative, and distributive	Students apply operation properties to simplify computations and solve problems with no errors.	Students apply operation properties to simplify computations and solve problems with no significant errors.	Students apply operation properties to simplify computations and solve problems with a few significant errors.	Students apply operation properties to simplify computations and solve problems with many significant errors.
8.1.6. Apply the order of operations to simplify numeric expressions and solve problems	Students apply the order of operations to simplify numeric expressions and solve problems with no errors.	Students apply the order of operations to simplify numeric expressions and solve problems with no significant errors.	Students apply the order of operations to simplify numeric expressions and solve problems with a few significant errors.	Students apply the order of operations to simplify numeric expressions and solve problems with many significant errors.

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COMPUTATIONAL FLUENCY AND ESTIMATION				
8.1.7. Add, subtract, multiply, and divide integers	Students add, subtract, multiply, and divide integers with no errors.	Students add, subtract, multiply, and divide integers with no significant errors.	Students add, subtract, multiply, and divide integers with a few significant errors.	Students add, subtract, multiply, and divide integers with many significant errors.
8.1.8. Select and use a computational technique (e.g., mental calculation, paper-and-pencil, technology) to solve problems	Students select and use a computational technique to solve problems with no errors.	Students select and use a computational technique to solve problems with no significant errors.	Students select and use a computational technique to solve problems with a few significant errors.	Students select and use a computational technique to solve problems with many significant errors.
8.1.9. Determine when an estimate is sufficient and an exact answer is needed in problem situations	Students determine when an estimate is sufficient and an exact answer is needed in problem situations with no errors.	Students determine when an estimate is sufficient and an exact answer is needed in problem situations with no significant errors.	Students determine when an estimate is sufficient and an exact answer is needed in problem situations with a few significant errors.	Students determine when an estimate is sufficient and an exact answer is needed in problem situations with many significant errors.
Grades 9-10				
NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS				
9-10.1.1. Express numbers between one-billionth and one billion in fraction, decimal, and verbal form; express numbers of all magnitudes in scientific notation	<p>Students express numbers between one-billionth and one billion in fraction, decimal, and verbal form with no errors.</p> <p>Students express numbers of all magnitudes in scientific notation with no errors.</p>	<p>Students express numbers between one-billionth and one billion in fraction, decimal, and verbal form with no significant errors.</p> <p>Students express numbers of all magnitudes in scientific notation with no significant errors.</p>	<p>Students express numbers between one-billionth and one billion in fraction, decimal, and verbal form with a few significant errors.</p> <p>Students express numbers of all magnitudes in scientific notation with a few significant errors.</p>	<p>Students express numbers between one-billionth and one billion in fraction, decimal, and verbal form with many significant errors.</p> <p>Students express numbers of all magnitudes in scientific notation with many significant errors.</p>
9-10.1.2. Describe the hierarchal relationships (e.g., integers are rationals) among subsets of the real number system; i.e., reals, rationals, irrationals, integers, wholes, and naturals	Students describe with great detail the relationships between subsets of the real number system.	Students describe with adequate detail the relationships between subsets of the real number system.	Students describe with some detail the relationships between subsets of the real number system.	Students describe with minimal detail the relationships between subsets of the real number system.

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9-10.1.3. Identify the properties of the real number system; i.e., commutative, associative, distributive, closure, inverse, and identity properties	Students identify the properties of the real number system with no errors.	Students identify the properties of the real number system with no significant errors.	Students identify the properties of the real number system with a few significant errors.	Students identify the properties of the real number system with many significant errors.
9-10.1.4. Represent a set of data in a matrix	Students represent a set of data in a matrix with no errors.	Students represent a set of data in a matrix with no significant errors.	Students represent a set of data in a matrix with a few significant errors.	Students represent a set of data in a matrix with many significant errors.
OPERATIONS AND THEIR PROPERTIES				
9-10.1.5. Use the order of operations and properties of exponents to simplify an algebraic expression	Students use the order of operations and properties of exponents to simplify an algebraic expression with no errors.	Students use the order of operations and properties of exponents to simplify an algebraic expression with no significant errors.	Students use the order of operations and properties of exponents to simplify an algebraic expression with a few significant errors.	Students use the order of operations and properties of exponents to simplify an algebraic expression with many significant errors.
9-10.1.6. Analyze the effects of multiplication, division, raising to a power, and extracting a root on the magnitudes of quantities; e.g., when will the square root of a number be greater than the number itself, or what will happen to the magnitude of a number when you multiply it by a negative number?	Students analyze in great detail the effects of multiplication, division, raising to a power, and extracting a root on the magnitudes of quantities.	Students analyze with adequate detail the effects of multiplication, division, raising to a power, and extracting a root on the magnitudes of quantities.	Students analyze with some detail the effects of multiplication, division, raising to a power, and extracting a root on the magnitudes of quantities.	Students analyze with minimal detail the effects of multiplication, division, raising to a power, and extracting a root on the magnitudes of quantities.
9-10.1.7. Apply basic properties of exponents to simplify algebraic expressions; i.e., power of a product, power of a power, products and quotients of powers, zero and negative exponents	Students apply basic properties of exponents to simplify algebraic expressions with no errors.	Students apply basic properties of exponents to simplify algebraic expressions with no significant errors.	Students apply basic properties of exponents to simplify algebraic expressions with a few significant errors.	Students apply basic properties of exponents to simplify algebraic expressions with many significant errors.
COMPUTATIONAL FLUENCY AND ESTIMATION				
9-10.1.8. Apply estimation skills to predict realistic solutions to problems	Students apply estimation skills with ease to predict a realistic solution to a problem.	Students apply estimation skills with minimal difficulty to predict a realistic solution to a problem.	Students apply estimation skills with difficulty to predict a realistic solution to a problem.	Students apply estimation skills with great difficulty to predict a realistic solution to a problem.

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9-10.1.9. Select and use a computational technique (i.e., mental calculation, paper-and-pencil, or technology) to solve problems involving real numbers	Students select and use a computational technique with ease.	Students select and use a computational technique with minimal difficulty.	Students select and use a computational technique with difficulty.	Students select and use a computational technique with great difficulty.
9-10.1.10. Explain the reasonableness of a problem's solution and the process used to obtain it	Students explain in great detail the reasonableness of a problem's solution along with the process used to obtain it.	Students explain with adequate detail the reasonableness of a problem's solution along with the process used to obtain it.	Students explain with some detail the reasonableness of a problem's solution along with the process used to obtain it.	Students explain with minimal detail the reasonableness of a problem's solution along with the process used to obtain it.
9-10.1.11. Add, subtract, and perform scalar multiplication on matrices	Students add, subtract, and perform scalar multiplication on matrices with no errors.	Students add, subtract, and perform scalar multiplication on matrices with no significant errors.	Students add, subtract, and perform scalar multiplication on matrices with a few significant errors.	Students add, subtract, and perform scalar multiplication on matrices with many significant errors.
Grades 11-12				
NUMBERS, NUMBER RELATIONSHIPS, AND NUMBER SYSTEMS				
11-12.1.1. Translate between radical expressions and expressions involving rational exponents	Students translate between radical expressions and expressions involving rational exponents with no errors.	Students translate between radical expressions and expressions involving rational exponents with no significant errors.	Students translate between radical expressions and expressions involving rational exponents with a few significant errors.	Students translate between radical expressions and expressions involving rational exponents with many significant errors.
11-12.1.2. Describe the hierarchal relationships (e.g., explain why real numbers are complex) among subsets of the complex number system, i.e., complex, real, and imaginary	Students describe with great detail hierarchal relationships between subsets of the complex number system.	Students describe with adequate detail hierarchal relationships between subsets of the complex number system.	Students describe with some detail hierarchal relationships between subsets of the complex number system.	Students describe with minimal detail hierarchal relationships between subsets of the complex number system.
11-12.1.3. Use imaginary numbers to express square roots of negative numbers	Students use imaginary numbers to express square roots of negative numbers with no errors.	Students use imaginary numbers to express square roots of negative numbers with no significant errors.	Students use imaginary numbers to express square roots of negative numbers with a few significant errors.	Students use imaginary numbers to express square roots of negative numbers with many significant errors.

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<p>11-12.1.4. Justify the steps of an algebraic process using the properties of the real number system; e.g., write an algebraic proof</p> <p>OPERATIONS AND THEIR PROPERTIES</p>	Students justify the steps of an algebraic process in great detail, using the properties of the real number system.	Students justify the steps of an algebraic process in adequate detail, using the properties of the real number system.	Students justify the steps of an algebraic process in some detail, using the properties of the real number system.	Students justify the steps of an algebraic process in minimal detail, using the properties of the real number system.
<p>11-12.1.5. Determine which properties of the real number system hold for matrices; e.g., matrix multiplication is not commutative</p>	Students determine which properties of the real number system hold for matrices with no errors.	Students determine which properties of the real number system hold for matrices with no significant errors.	Students determine which properties of the real number system hold for matrices with a few significant errors.	Students determine which properties of the real number system hold for matrices with many significant errors.
<p>11-12.1.6. Apply basic properties of exponents and logarithms to rewrite algebraic expressions; i.e., power of a product, power of a power, products and quotients of powers, zero and negative exponents, and log of a product, quotient, or power</p> <p>COMPUTATIONAL FLUENCY AND ESTIMATION</p>	Students apply basic properties of exponents and logarithms to rewrite algebraic expressions with no errors.	Students apply basic properties of exponents and logarithms to rewrite algebraic expressions with no significant errors.	Students apply basic properties of exponents and logarithms to rewrite algebraic expressions with a few significant errors.	Students apply basic properties of exponents and logarithms with many significant errors.
<p>11-12.1.7. Add, subtract, and multiply complex numbers</p>	Students add, subtract, and multiply complex numbers with no errors.	Students add, subtract, and multiply complex numbers with no significant errors.	Students add, subtract, and multiply complex numbers with a few significant errors.	Students add, subtract, and multiply complex numbers with many significant errors.
<p>11-12.1.8. Multiply matrices containing no more than three rows or columns without the use of technology</p>	Students multiply matrices with no errors.	Students multiply matrices with no significant errors.	Students multiply matrices with a few significant errors.	Students multiply matrices with many significant errors.