Grade: 4 **Subject:** Mathematics	**Unit 5: Multi-Digit Multiplication**
Big Idea/Rationale:	• This unit reviews and builds upon the concepts of arrays, single-digit multiplication, place value, and area that the students discovered earlier. The activities help students gain a conceptual understanding of multi-digit multiplication. They are expected to apply this knowledge to numeric calculations and real-world problem solving situations, including multiplication combinations and comparisons.
Enduring Understanding (Mastery Objective):	Students will understand that: • For a given set of numbers, there are relationships that are always true called properties, and these are the rules that govern arithmetic and algebra. • Breaking apart calculations into simpler ones is the idea used in all algorithms for rational numbers. This directly correlates with the Associative Property which states that the way in which factors are grouped does not affect the product. • Answers to problems should always be checked for reasonableness and this can be done through estimation. • Context is critical when using estimation. • There is more than one algorithm to solve a problem.
Essential Questions (Instructional Objective):	• What patterns can we use to help remember multiplication? • What happens when you multiply two numbers and switch the order of the factors? • How can the Distributive Property and knowledge of basic facts be used to find other products and facts? • What patterns can you see when you multiply 1-digit numbers by multiples of 10? • How do you know your answer is reasonable? • What are some strategies to find the product of two numbers?
Content (Subject Matter & Learning Objectives):	• Understand area models of multiplication for ones and tens. • Understand patterns of multiplication with ones, tens, and hundreds. Represent one-digit by two digit multiplication, using area models. • Use estimation and multiplication with tens to check products and solve real-world problems. • Relate the area model of multiplication to numeric methods of multiplication. • Compare and analyze methods of multiplication. • Draw area models to represent the product of a one-digit number and a three digit-number. • Use numeric methods to multiply a one-digit by a three-digit number. • Multiply one-digit numbers by three-digit numbers. • Use the Shortcut Method, (the Standard Multiplication Algorithm).

	• Estimate products of one-digit and three-digit numbers. • Determine what information is needed to solve a word problem. • Solve multi-step word problems. • Represent two-digit by two-digit multiplication, using area models. • Use different methods of two-digit by two-digit multiplication. • Explore the Shortcut Method for two-digit by two-digit multiplication. • Compare numerical methods of two-digit by two digit multiplication. • Estimate products of two-digit numbers. • Practice two-digit by two-digit multiplication. • Use an area model to represent multiplication of hundreds. • Explore and use different methods to multiply hundreds. • Use an area model to represent multiplication with thousands. • Use several methods to multiply thousands. • Solve a variety of problems, using mathematical concepts and skills. • Use the mathematical process of problem solving, connections, reasoning and proof, communication, and representation. • Solve a variety of problems using mathematical concepts and skills.
Standards	• **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. • **4.NBT.B.5:** Multiply a whole number of up to four digits by a one-digit whole number, and multiply 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. • **Mathematical Practices**
Materials and Resources	• Math Expressions, Student Journals, Manipulatives, Math themed literature, BrainPop, IXL Mathematics