Topic A:

Exponential Notation and Properties of Integer Exponents

8.EE.1

Focus Standard:	8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.
Instructional Days:	6	
Lesson 1:	Exponential Notation (S)[1]	
Lesson 2:	Multiplication and Division of Numbers in Exponential Form (S)	
Lesson 3:	Numbers in Exponential Form Raised to a Power (S)	
Lesson 4:	Numbers Raised to the Zeroth Power (E)	
Lesson 5:	Negative Exponents and the Laws of Exponents (S)	
Lesson 6:	Proofs of Laws of Exponents (S)	

In Topic A, students begin by learning the precise definition of exponential notation where the exponent is restricted to being a positive integer. In Lessons 2 and 3, students discern the structure of exponents by relating multiplication and division of expressions with the same base to combining like terms using the distributive property, and by relating multiplying three factors using the associative property to raising a power to a power.

Lesson 4 expands the definition of exponential notation to include what it means to raise a nonzero number to a zero power; students verify that the properties of exponents developed in Lessons 2 and 3 remain true. Properties of exponents are extended again in Lesson 5 when a positive integer, raised to a negative exponent, is defined. In Lesson 5, students accept the properties of exponents as true for all integer exponents and are shown the value of learning them, i.e., if the three properties of exponents are known, then facts about dividing numbers in exponential notation with the same base and raising fractions to a power are also known.

[1] Lesson Structure Key: **P**-Problem Set Lesson, **M**-Modeling Cycle Lesson, **E**-Exploration Lesson, **S**-Socratic Lesson

Topic A culminates in Lesson 6 when students work to prove the laws of exponents for all integer exponents. Throughout Topic A, students generate equivalent numerical expressions by applying properties of integer exponents, first with positive integer exponents, then with whole number exponents, and concluding with integer exponents in general.