Plan for Grade 8 Unit 7: Exponents and Scientific Notation

Relevant Unit(s) to review: Grade 6 Unit 6: Expressions and Exponents

Essential prior concepts to engage with this unit	• expressions that have positive whole-number exponents and whole-number, fraction, or variable bases
Brief narrative of approach	This unit remains largely intact, aligned to the learning goals for exponents and scientific notation. Although some review is incorporated into the unit, students may need additional support and review with exponent and exponent notation. Based on the Check Your Readiness assessment, consider incorporating concepts from Grade 6 Unit 6 for the first section of the unit.

Lessons to Add	Lessons to Remove or Modify
	1. Move to outside of class 8.7.16: culminating lesson incorporating work from the unit
Lessons added: 0	Lessons removed: 1

Modified Plan for Grade 8 Unit 7

Day	IM lesson	Notes
	assess	8.7 Check Your Readiness assessment. Note that the Check Your Readiness assessment includes item-by-item guidance to inform just-in-time adjustments to instruction within the lessons in 8.7
1	8.7.1	Create an expression that represents repeated multiplication, and explain (orally) how the structure of the expression helps compare quantities.
2	8.7.2	Generalize a process for multiplying exponential expressions with the same base.
3	8.7.3	Generalize a process for finding a power raised to a power, and justify (orally and in writing) that $(10^n)^m = 10^{n \cdot m}$
4	8.7.4	Generalize a process for dividing powers of 10, and justify (orally and in writing)
5	8.7.5	Describe (orally and in writing) how exponent rules extend to expressions involving negative exponents.
6	8.7.6	Generalize exponent rules for nonzero bases, including bases other than 10.
7	8.7.7	Use exponent rules to rewrite exponential equations involving negative exponents to have a single positive exponent, and explain (orally) the strategy.
8	8.7.8	Generalize a process for multiplying expressions with different bases having the same exponent.
9	8.7.9	Describe (orally and in writing) large and small numbers as multiples of powers of 10.
10	8.7.10	Compare large numbers using powers of 10, and explain (orally) the solution method.
11	8.7.11	Coordinate (orally and in writing) decimals and multiples of powers of 10 representing the same small number.
12	8.7.12	Determine what information is needed to answer a question about large numbers, and explain (orally) how that information would help solve the problem.

13	8.7.13	Identify (in writing) numbers written in scientific notation, and describe (orally) the features of an expression in scientific notation.
14	8.7.14	Generalize (orally and in writing) a process of multiplying and dividing numbers in scientific notation.
15	8.7.15	Generalize (orally and in writing) a process of adding and subtracting numbers in scientific notation and interpret results in context.
16	assess	8.7 End-of-Unit Assessment

Priority and Category List for Lessons

High priority (+), Medium priority (0), Low priority (-)

E: Explore, Play, and Discuss, D: Deep Dive, A: Synthesize and Apply

Lesson	Priority (+, 0, -)	Category (E, D, A)	Notes
8.7.1	+	E	Comprehend that repeated division by 2 is equivalent to repeated multiplication by one-half.
8.7.2	+	E	Generalize a process for multiplying exponential expressions with the same base.
8.7.3	+	D	Generalize a process for finding a power raised to a power.
8.7.4	+	D	Generalize a process for dividing powers of 10.
8.7.5	+	D	Describe (orally and in writing) how exponent rules extend to expressions involving negative exponents.
8.7.6	+	D	Generalize exponent rules for nonzero bases, including bases other than 10.
8.7.7	0	A	Use exponent rules to rewrite exponential equations involving negative exponents to have a single positive exponent, and explain (orally) the strategy.

8.7.8	0	D	Generalize a process for multiplying expressions with different bases having the same exponent.
8.7.9	+	E	Describe (orally and in writing) large and small numbers as multiples of powers of 10.
8.7.10	+	D	Compare large numbers using powers of 10, and explain (orally) the solution method.
8.7.11	+	D	Coordinate (orally and in writing) decimals and multiples of powers of 10 representing the same small number.
8.7.12	0	A	Determine what information is needed to answer a question about large numbers, and explain (orally) how that information would help solve the problem.
8.7.13	+	D	Identify (in writing) numbers written in scientific notation, and describe (orally) the features of an expression in scientific notation.
8.7.14	0	D	Generalize (orally and in writing) a process of multiplying and dividing numbers in scientific notation.
8.7.15	0	D	Generalize (orally and in writing) a process of adding and subtracting numbers in scientific notation and interpret results in context.
8.7.16	-	A	Use scientific notation to compare quantities in context, and describe (orally) how using scientific notation helps with making comparisons between very large and very small quantities.