

Mini-Map for M.EE.8.EE.1

Subject: Mathematics Expressions and Equations (EE) Grade: 8

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.8.EE.1 Identify the meaning of an exponent (limited to	M.8.EE.1 Know and apply the properties of integer exponents
exponents of 2 and 3).	to generate equivalent numerical expressions.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Combine two or more	Communicate	Demonstrate	Recognize exponents	Explain that when
sets of objects to create	understanding that in	multiplication by	[i.e., "b", in expressions	multiplying two base
a new set. Combine two	repeated addition	combining multiple sets	<i>a^b</i> , where " <i>b</i> " indicates	numbers raised to the
or more parts (e.g.,	problems, a single	containing the same	the number of times	same power, the
toys, shapes) to form a	numerical value is	number of objects.	the base number (" <i>a</i> ")	problem equals the
new whole.	added repeatedly (e.g.,	Communicate	is to be multiplied (e.g.,	product of the base
Demonstrate an	6 + 6 + 6) and that one	understanding that the	$2^3 = 2 \times 2 \times 2$].	numbers with the same
understanding of	way to add a number a	number of sets times		exponent, and that
addition by combining	given number of times	the number of objects		when multiplying (or
the objects of two or	is by using skip-counting	in each set equals the		dividing) two base
more sets.	as a strategy (e.g., 6 + 6	total number of objects.		numbers raised to
	+ 6 can be added as 6,	Communicate		different powers, the
	12, 18). Use models,	understanding that in		problem equals the
	such as mathematical	multiplication, one		product (or quotient) of
	equations (e.g., 5 + 5 +	factor represents the		the base numbers
	5 = 15), sets of	number of elements in		raised to the sum (or
	manipulatives, or	a group, the second		difference) of the
	number line diagrams	factor represents the		exponents. Solve for
	to represent a repeated	number of groups, and		when a nonzero
	addition problem.	the product is the		number is raised to the

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
		number obtained by		0 power, where the
		multiplying two factors.		answer is always one.

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target? Recognizing exponents requires a student to be able to recognize that two or more sets or groups of items exist. Educators can work on this skill using a variety of sets. Help students recognize when items are grouped together into a set and when they are separated out. The educator presents a set, labels it (e.g., two balls, one marker, three CDs), counts the items, labels it again, and encourages students to use numbers to label and count the separate sets. Then, combine the sets, give it a new label, and count the set.

How is the Distal Precursor related to the Target? As students' understanding of labeling and counting sets develops, they will begin working on adding items to a set and combining sets to create a new set. Additionally, students will work on developing an understanding of equal shares by actively participating in one-to-one distribution of objects to person, objects to objects, and objects to available space (e.g., giving each person in the group a pencil; given four counters, they would line up four more counters in front of or on top of the first set; given three chairs at a table, the student would place a cup on the table for each available chair). As students learn to work with sets and connect their understanding of equal shares to sets, educators can provide students experience with combining multiple sets (e.g., 3 sets with 4 counters each) and represent the problem (e.g., 4 + 4 + 4 = ?). Students will also learn to represent the problem using a pencil or their communication system (e.g., the student is shown 4 equal sets each with 2 counters. The student counts the first set and writes a 2 or indicates 2, then writes or indicates the plus sign. The student repeats for all 4 sets and then indicates the equal sign and solves the problem.).

Instructional Resources

Released Testlets				
See the Guide to Practice Activities and Released Testlets.				
Using Untested (UN) Nodes				
See the document Using Mini-Maps to Plan Instruction.				

Link to Text-Only Map



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