



## Mini-Map for M.EE.HS.N.RN.1

Subject: Mathematics

Number and Quantity—The Real Number System (N.RN)

Grade: 11

### Learning Outcome

DLM Essential Element	Grade-Level Standard
<b>M.EE.HS.N.RN.1</b> Determine the value of a quantity that is squared or cubed.	<b>M.N.RN.1</b> Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.

### Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Combine two or more sets of objects to create a new set. Combine two or more parts (e.g., toys, shapes) to form a new whole. Demonstrate an understanding of addition by combining the objects of two or more sets.	Communicate understanding that in repeated addition problems, a single numerical value is added repeatedly (e.g., $6 + 6 + 6$ ) and that one way to add a number a given number of times is by using skip-counting as a strategy (e.g., $6 + 6 + 6$ can be added as 6, 12, 18). Represent repeated addition problems using an equation showing the	Demonstrate multiplication by combining multiple sets containing the same number of objects. Communicate understanding that the number of sets times the number of objects in each set equals the total number of objects. Communicate understanding that in multiplication, one factor represents the number of elements in	Determine the value of a whole number exponent expression (e.g., $4^2 = 16$ ).	Communicate understanding that a perfect square is the product of two equal factors (e.g., $6 \times 6$ ) and that a perfect cube is the product of three equal factors (e.g., $7 \times 7 \times 7$ ).

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
	addition of the same numeral the required number of times, and find the correct sum using an addition strategy (e.g., $5 + 5 + 5 = 15$ ).	a group, the second factor represents the number of groups, and the product is the number obtained by multiplying two factors.		

## Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

### *How is the Initial Precursor related to the Target?*

Determining the value of a quantity that is squared or cubed requires a student to count small amounts, recognizing that two or more sets or groups of items exist. Work on this skill using a variety of sets. Help students recognize when items are grouped together into a set or 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. The general goal is to explore how the set changes when items are combined.

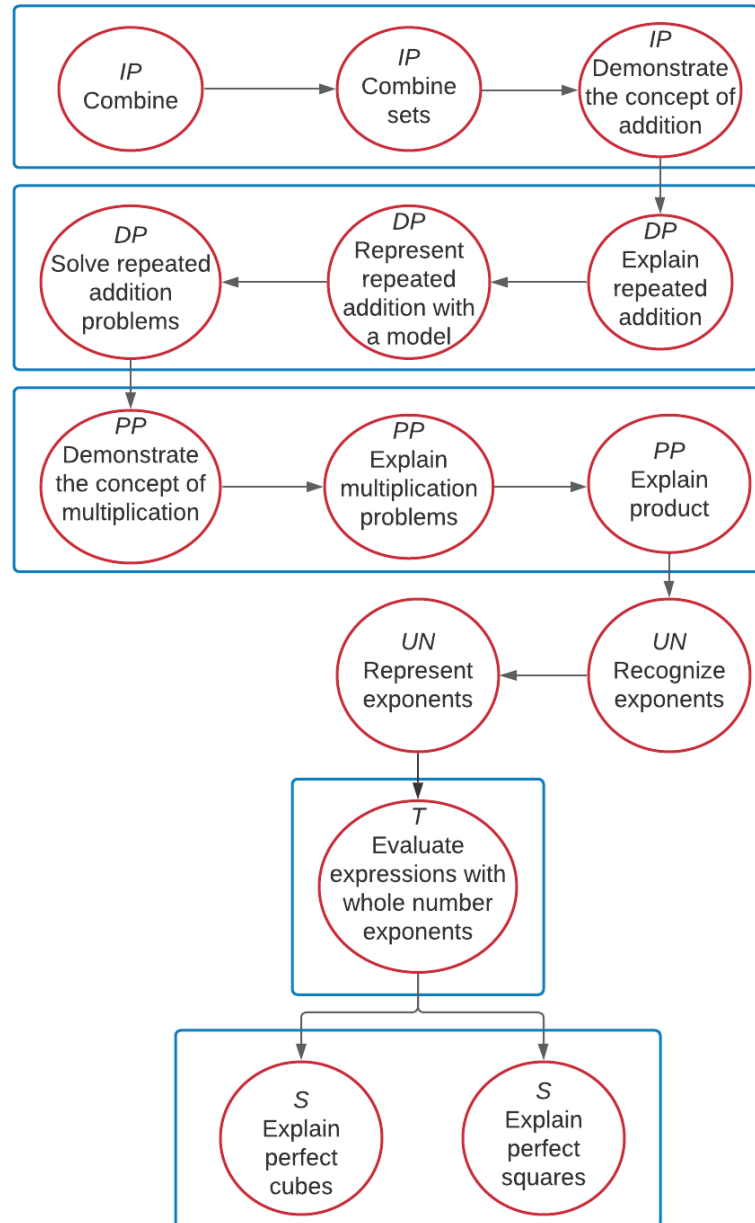
### *How is the Distal Precursor related to the Target?*

As students gain an understanding of how to group items into sets, educators will begin to help students connect their knowledge of sets with their knowledge of counting and addition. Educators will provide multiple experiences counting sets and combining sets using multiple models. As student understanding progresses, educators provide experience with multiple small sets, and students will use repeated addition to find the total. They can check their work by counting the individual items in each group. Educators should take care to use words like “some,” “all,” “put,” and “add” while defining and demonstrating their meaning. While students do not need to say these words, they do need to learn the meanings.

## Instructional Resources

<b>Released Testlets</b>
See the <a href="#">Guide to Practice Activities and Released Testlets</a> .
<b>Using Untested (UN) Nodes</b>
See the document <a href="#">Using Mini-Maps to Plan Instruction</a> .

**M.EE.HS.N.RN.1** Determine the value of a quantity that is squared or cubed.



Map Key	
<b>IP</b>	Initial Precursor
<b>DP</b>	Distal Precursor
<b>PP</b>	Proximal Precursor
<b>T</b>	Target
<b>S</b>	Successor
<b>UN</b>	Untested
<b>Boxes</b> indicate tested nodes	