Mini-Map for M.EE.5.NF.1

Subject: Mathematics
Number and Operations—Fractions (NF)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.NF.1 Identify models of halves (1/2, 2/2) and fourths (1/4, 2/4, 3/4, 4/4).	**M.5.NF.1** Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Communicate generic understanding of "some" as a certain amount or a number of people or things.	Divide familiar shapes, such as circles, squares, and/or rectangles, into two or more equal parts. Divide a set with up to 10 objects into two or more equal subsets.	Identify the area model that represents one half or one fourth of a familiar shape or object. Identify the set model that represents one half or one fourth of a set of objects.	Identify the area model that is divided into halves or fourths. Identify the set model that is divided into halves or fourths.	Identify the area model that represents a given specified proper fraction (e.g., 1/2, 1/3, 1/4, 1/7). Identify the set model that represents a given specified proper fraction (e.g., 1/2, 1/3, 1/4, 1/7).

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

In order to understand fractions, students start with learning to recognize two or more sets or groups of items. Work on this skill using a variety of sets with 1-4 items. Help students recognize when items are grouped together into a set or separated out. The educator presents a set, labels it, and then counts the items (e.g., two balls, 1, 2) and encourages students to use numbers to label and count the separate sets. As students are developing an understanding of the quantities 1-4, begin working on the quanitifier "some" by using the students' communication system to demonstrate the use of the word "some".

How is the Distal Precursor related to the Target?

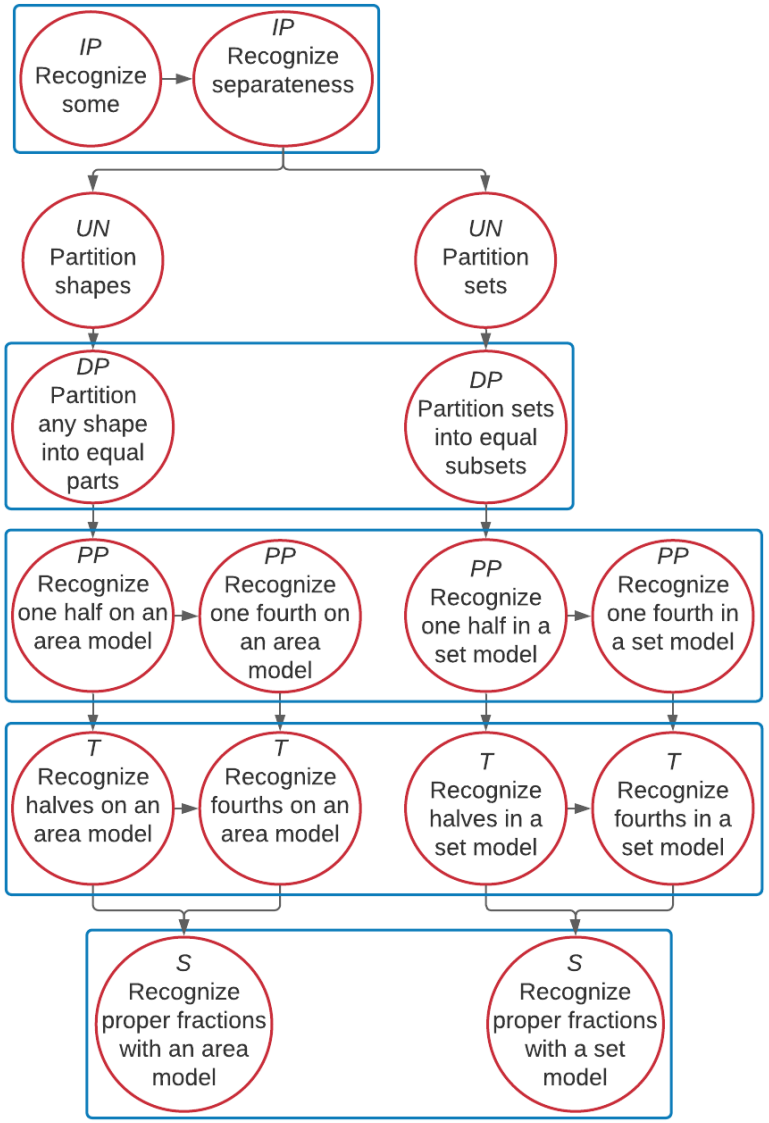
As students begin to understand labeling and counting small sets (1-4), they begin to use the number sequence and become more adept at tracking individual objects. At this level, instruction should focus on one-to-one correspondence and authentic social encounters like distributing objects (e.g., passing out classroom materials, one per person) to people and aligning objects or people to available spaces (e.g., one note for parents in each backpack). These skills are the beginning of partitioning sets into equal subsets.

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

M.EE.5.NF.1 Identify models of halves (1/2, 2/2) and fourths (1/4, 2/4, 3/4, 4/4).



Map Key	
IP	Initial Precursor
DP	Distal Precursor
PP	Proximal Precursor
T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Mini-Map for M.EE.5.NF.2

Subject: Mathematics
Number and Operations—Fractions (NF)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.NF.2 Identify models of thirds (1/3, 2/3, 3/3) and tenths (1/10, 2/10, 3/10, 4/10, 5/10, 6/10, 7/10, 8/10, 9/10, 10/10).	**M.5.NF.2** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Communicate generic understanding of "some" as a certain amount or a number of people or things.	Divide familiar shapes, such as circles, squares, and/or rectangles, into two or more equal parts.	Recognize an area model representing the fractions one third or one tenth when presented with three different area models.	Recognize the area model that is divided into thirds or tenths when presented with three different area models.	Recognize the area model that represents a specified proper fraction.

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

In order to understand fractions students start with learning to recognize two or more sets or groups of items. Work on this skill using a variety of sets with 1-4 items. Help students recognize when items are grouped together into a set or separated out. As educators present a set, label it, and then count the items (e.g., two balls, 1, 2) and encourage students to use numbers to label and count the separate sets. As students are developing an understanding of the quantities 1-4, begin working on the quanitifier "some" by using the students' communication system to demonstrate the use of the word "some".

How is the Distal Precursor related to the Target?

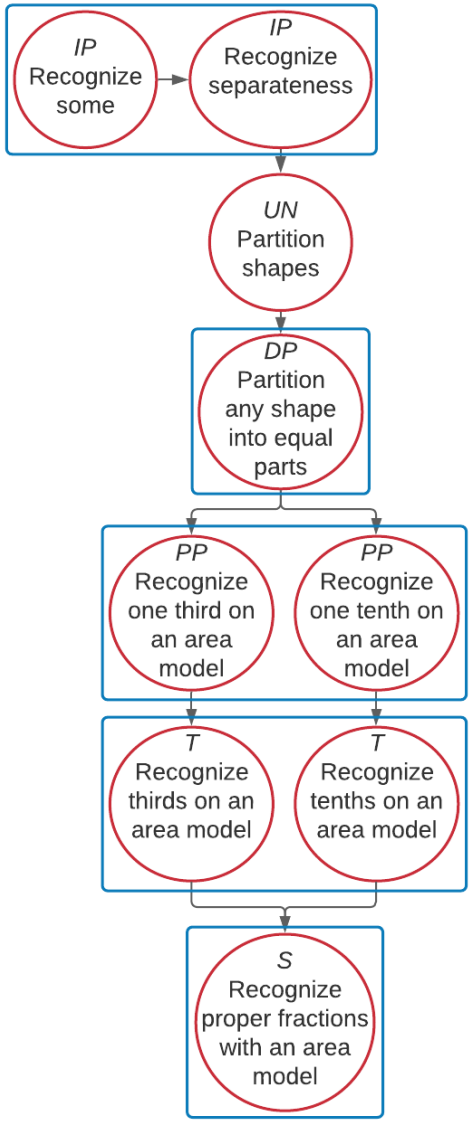
As students begin to understand labeling and counting small sets (1-4), they begin to use the number sequence and become more adept at tracking individual objects. At this level, instruction should focus on one-to-one correspondence and authentic social encounters like distributing objects (e.g., passing out classroom materials, one per person) to people and aligning objects to available spaces (e.g., one note for parents in each backpack). These skills are the beginning of partitioning sets into equal parts.

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

M.EE.5.NF.2 Identify models of thirds (1/3, 2/3, 3/3) and tenths (1/10, 2/10, 3/10, 4/10, 5/10, 6/10, 7/10, 8/10, 9/10, 10/10).



Map Key	
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DP	Distal Precursor
PP	Proximal Precursor
T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Mini-Map for M.EE.5.NBT.1

Subject: Mathematics
Number and Operations in Base Ten (NBT)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.NBT.1 Compare numbers up to 99 using base ten models.	**M.5.NBT.1** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Communicate understanding of set by recognizing a group of objects sharing an attribute.	Count all objects in a set to communicate the total number of objects in that set. Identify sets having the same number of objects. Identify a set containing a different number of objects than the other two sets. Recognize a set containing more or fewer objects than the other set.	Use models such as concrete manipulatives, diagrams, pictures, or technology to compare two sets of objects up to 10, and communicate that the number of objects in one set is greater than, less than, or equal to the number of objects in the other set.	Use models such as concrete manipulatives, diagrams, pictures, or technology to compare two sets of objects up to 100, and communicate that the number of objects in one set is greater than, less than, or equal to the number of objects in the other set.	Compare two numbers up to 100 using the symbols >, <, and = to show that one number is greater than, less than, or equal to the other number. Order three or more two-digit numerals from greatest to least or least to greatest.

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

Comparing numbers requires a student to be able to recognize two or more sets or groups of items. Work on this skill using a variety of sets. To 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 bear, three blocks), counts the items, labels it again, and encourages students to use numbers to label and count the separate sets.

NOTE: Educators can work on the Initial Precursor level using the sets of numbers that students working at the Target level are working on, but when using the larger sets, help students notice the difference in overall area when sets are larger or smaller.

How is the Distal Precursor related to the Target?

As students begin to understand labeling and counting small sets (1-4), they begin to use the number sequence and become more adept at tracking individual objects, recognizing same, different, more, and less on the basis of overall area or discrete number. Work on this skill using a variety of sets, labeling and counting the sets, moving items in and out of the sets, and labeling and counting the sets again. Draw the students' attention to the change that occurs when items are moved in and out of a set.

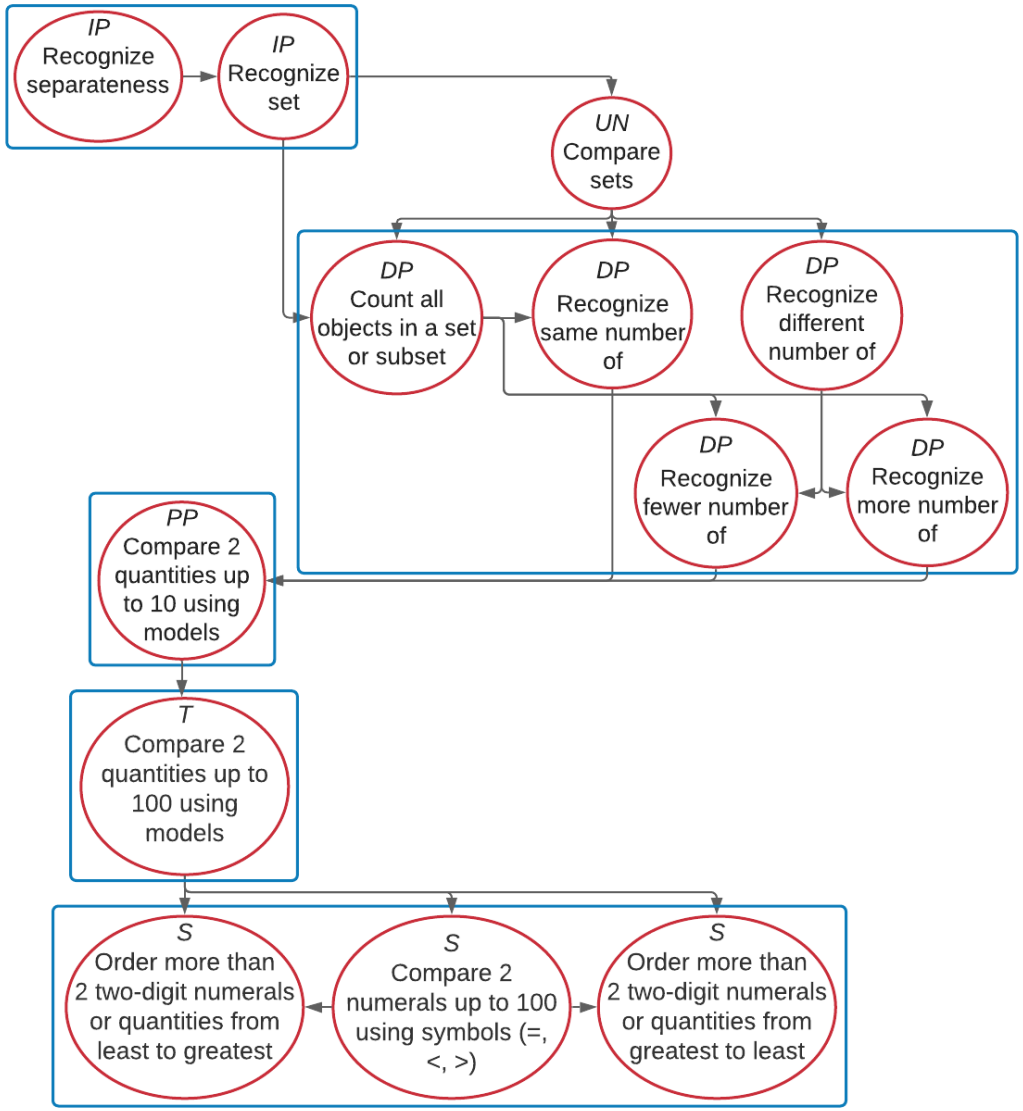
NOTE: When working on the Distal Precursor level, students will count and compare smaller sets using both overall area and discrete number, but when using the larger sets that students working at the Target level are working on, they will compare using overall area rather than discrete number.

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

M.EE.5.NBT.1 Compare numbers up to 99 using base ten models.



Map Key	
IP	Initial Precursor
DP	Distal Precursor
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T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Mini-Map for M.EE.5.NBT.3

Subject: Mathematics
Number and Operations in Base Ten (NBT)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.NBT.3 Compare whole numbers up to 100 using symbols (<, >, =).	**M.5.NBT.3** Read, write, and compare decimals to thousandths.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Communicate understanding of set by recognizing a group of objects sharing an attribute.	Use models such as concrete manipulatives, diagrams, pictures, or technology to compare two sets of objects up to 10, and communicate that the number of objects in one set is greater than, less than, or equal to the number of objects in the other set.	Compare two numbers up to 10 using the symbols >, <, and = to show that one number is greater than, less than, or equal to the other number.	Compare two numbers up to 100 using the symbols >, <, and = to show that one number is greater than, less than, or equal to the other number.	Compare two numbers up to 1,000 using the symbols >, <, and = to show that one number is greater than, less than, or equal to the other number. Order three or more two-digit numerals from greatest to least or least to greatest.

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

In order to compare numbers (e.g., <, >, =) students need many opportunities to experience quantities and numerals in context across the school day. Educators provide lessons using a variety of sets. Teach students to recognize when items are grouped together into a set or separated out. The educator presents a set, labels it (e.g., two balls, one bear, three blocks), counts the items, labels it again, and encourages students to use numerals to label and count the separate sets.

How is the Distal Precursor related to the Target?

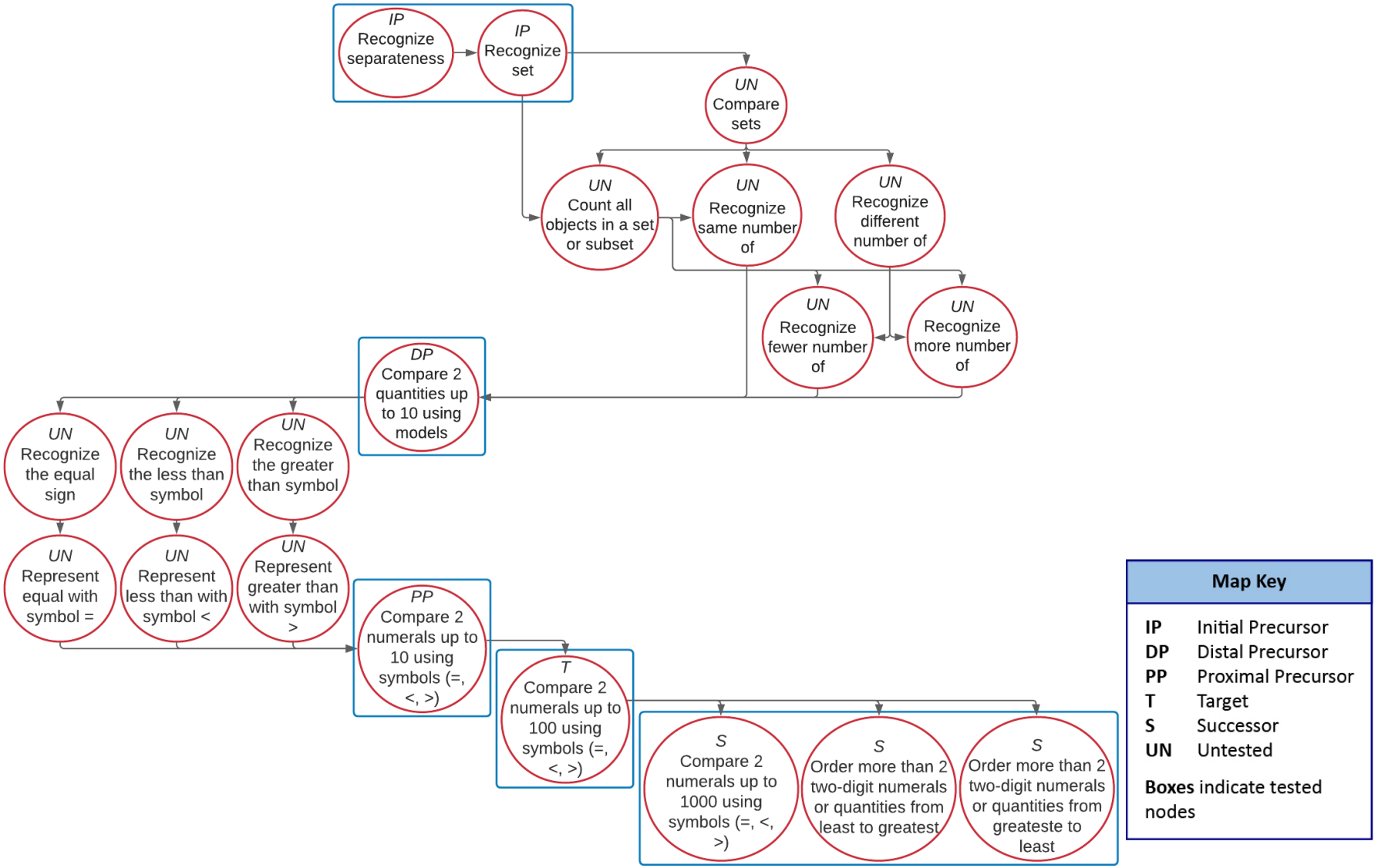
As students gain experience with creating simple sets, counting in context, and developing one-to-one correspondence, educators will introduce comparisons through terms such as same/different, more/less, 1 more/1 less. Continue to count anything and everything across the school day and help students compare amounts.

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

M.EE.5.NBT.3 Compare whole numbers up to 100 using symbols (<, >, =).



Mini-Map for M.EE.5.NBT.4

Subject: Mathematics
Number and Operations in Base Ten (NBT)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.NBT.4 Round two-digit whole numbers to the nearest 10 from 0-90.	**M.5.NBT.4** Use place value understanding to round decimals to any place.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Without counting each object, recognize the number of objects in a set (up to four).	Recognize a unit as a group of countable objects. Recognize ten as a group of 10 individual objects or 1 ten. Recognize a group of 10-19 objects as 1 ten and a group of remaining ones and a group of 20 or more objects as multiple sets of 10 and a group of remaining ones. Decompose or represent a given number in terms of tens and ones (e.g., 43 = 4 tens and 3 ones).	Communicate understanding that the digit in the tens place is formed by grouping objects by tens and the digit in the ones place is composed of individual objects. Communicate understanding of how to round numbers to the nearest ten using place-value: the tens place is rounded up if the digit in the ones place equals 5 or more (e.g., 45 is rounded to 50) and is rounded down otherwise (e.g., 32 is rounded down to 30).	Round numbers 0-100 to the nearest ten by using a rounding strategy (e.g., number line, place value).	Round numbers 100 and beyond to the nearest hundred by using a rounding strategy (e.g., number line, place value).

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

To round numbers, students start by knowing number names, the count sequence, one-to-one correspondence and working on understanding cardinality or number. These procedures and concepts develop through many experiences in early counting. Perceptual subitizing happens when the student is able to name the amount (1-3 items) without actually counting them. For example, when an educator asks the student to get their shoes and asks, "How many shoes do you have?" The student would reply, "two" without using the count sequence of one, two. This only happens when students have been given many experiences counting small numbers with many different contexts and materials.

NOTE: Students who are blind will learn to use tactile enumeration for 1-3 items.

How is the Distal Precursor related to the Target?

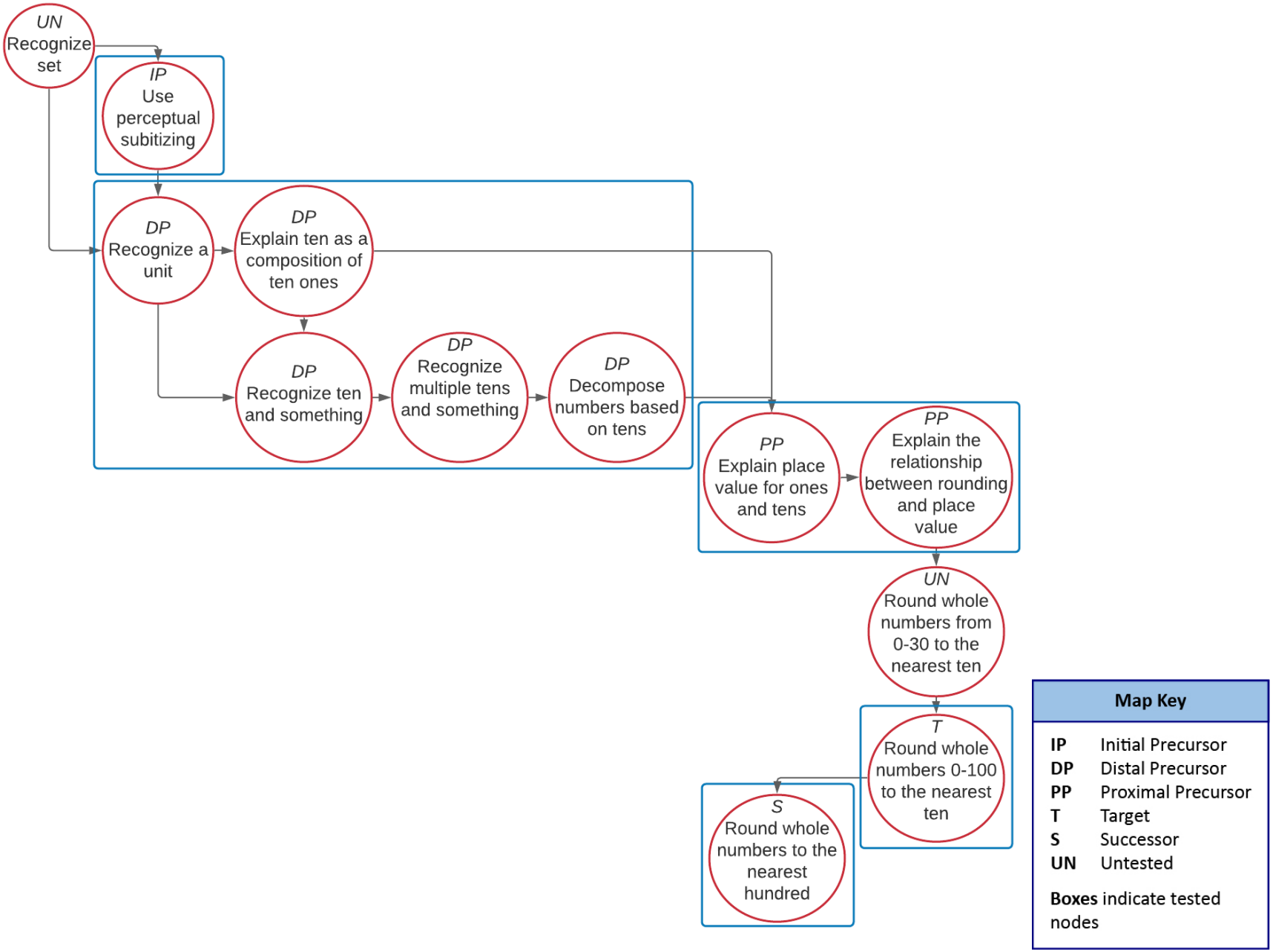
As students continue to gain experience in early counting (1-10 items), educators will introduce the concept that 10 can be grouped into one unit. Educators will use models that help students perceive a group of 10 and some more (e.g., bundles, ten-frames, number line, arrays). Teen numbers are an important part of understanding this concept.

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

M.EE.5.NBT.4 Round two-digit whole numbers to the nearest 10 from 0-90.



Mini-Map for M.EE.5.NBT.5

Subject: Mathematics
Number and Operations in Base Ten (NBT)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.NBT.5 Multiply whole numbers up to 5 × 5.	**M.5.NBT.5** Fluently multiply multi-digit whole numbers using the standard algorithm.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Communicate understanding of set by recognizing a group of objects sharing an attribute. Communicate understanding of a subset by recognizing a subset as a set or group of objects within a larger set that share an attribute.	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 12, 18). Represent repeated addition problems using an equation showing the addition of 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.	Multiply numbers up to 12 by factors 1 to 5, using manipulatives or repeated addition (e.g., multiply 3 x 5 by adding 5 + 5 + 5 = 15).	Communicate understanding of multiplication as the number of groups times the number of objects in each group (with the understanding that each group contains an equal number of objects) and that the total number of objects (i.e., the product) can then be divided by the number of groups to equal the number of objects in each group, and vice versa.

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
	same numeral the required number of times, and find the correct sum using an addition strategy (e.g., 5 + 5 + 5 = 15).			

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

In order to understand multiplication, students must learn to organize items into groups/sets based on a common characteristic such as size, color, shape, texture, or flavor. Students learn how to sort items by separating a group of items into two groups (e.g., vehicles and animals). As students gain comfort sorting items into sets, they are encouraged to use their language to convey their thought process by identifying and naming the characteristic that determines the set (e.g., wheels, legs). Activities that require students to engage actively with the items will foster the students' understanding of set, subsets, and separateness (e.g., the game "concentration" where the cards highlight one characteristic in a group of similar cards [e.g., shape]; incorporating creating sets into everyday activities [e.g., during independent reading, the teacher gives a student a pile of books and asks them to create two sets, then helps the student determine the criteria they want to use to sort them, such as books I want to read/books I don't want to read; bugs/dogs; sports/gaming]).

How is the Distal Precursor related to the Target?

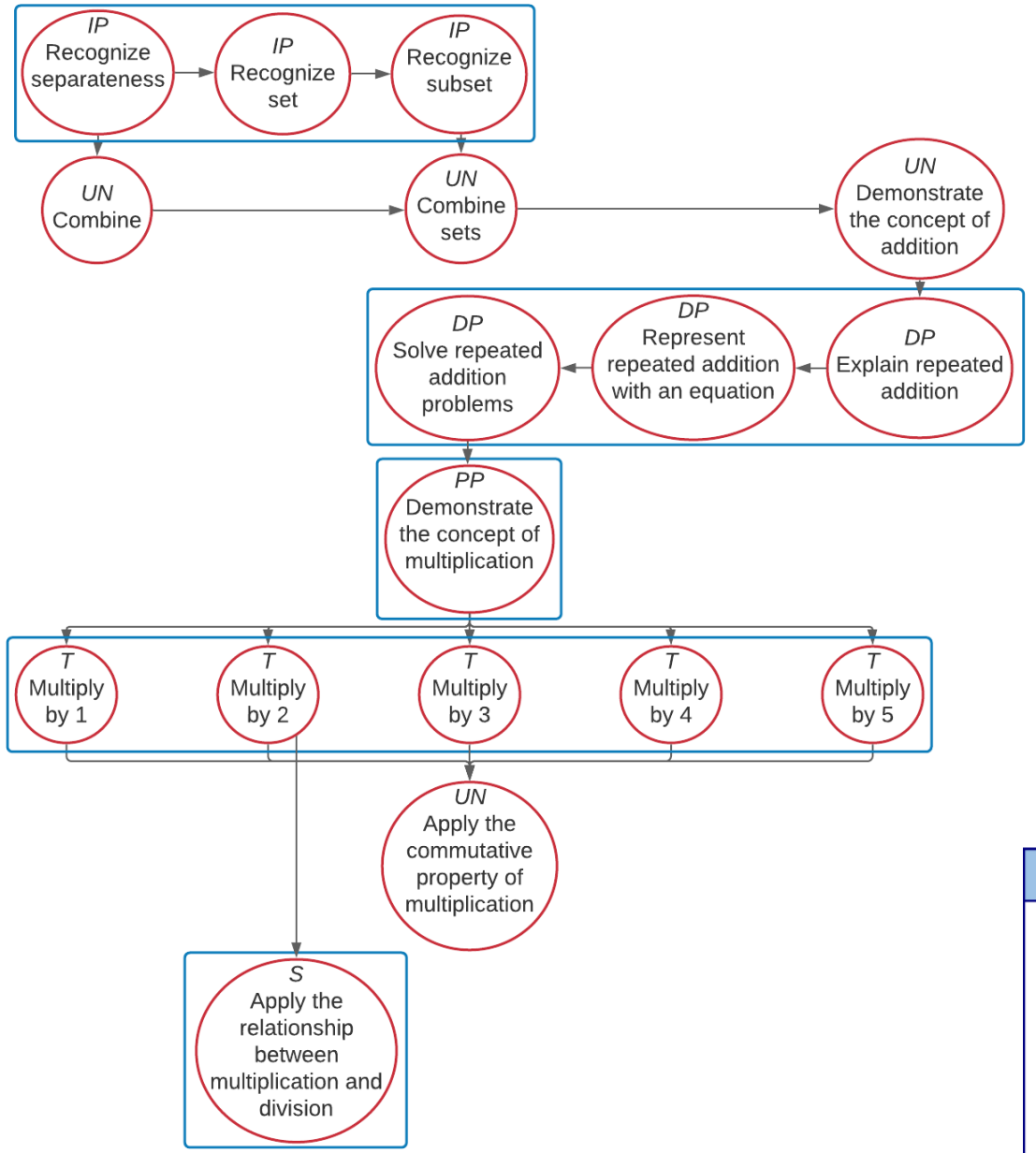
As students gain an understanding of how to group items into sets, educators will begin to help students connect their knowledge of sets with their knowledge of counting and addition. Educators will provide multiple experiences counting sets and combining sets using multiple models. As student understanding progresses, educators will provide experience with multiple (3-4) 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

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

M.EE.5.NBT.5 Multiply whole numbers up to 5 × 5.



Map Key	
IP	Initial Precursor
DP	Distal Precursor
PP	Proximal Precursor
T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Mini-Map for M.EE.5.NBT.6-7

Subject: Mathematics
Number and Operations in Base Ten (NBT)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.NBT.6-7 Illustrate the concept of division using fair and equal shares.	**M.5.NBT.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **M.5.NBT.7** Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Communicate understanding of set by recognizing a group of objects sharing an attribute. Communicate understanding of a subset by recognizing a	Recognize two sets that contain the same number of objects, and name those sets as "equal" sets. Communicate understanding that "same amount" means "equal." Create a set that contains the same number of objects as the given set.	Divide a set of 12 or fewer objects into two or more distinct subsets. (These subsets may or may not contain an equal number of objects.)	Divide a set containing 10 or fewer objects into equal subsets (e.g., divide a set consisting of 10 counters into two subsets with 5 counters each).	Communicate understanding of division as total number of objects (i.e., dividend) divided by number of groups (i.e., divisor) equals number of objects in each group (i.e., quotient) (e.g., 20/5 = 4). Understand that division is similar to repeated subtraction,

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
subset as a set or group of objects within a larger set that share an attribute.				where a single number (i.e., divisor) is subtracted repeatedly from a given number (i.e., dividend) and the quotient equals the number of times the number is subtracted (e.g., 20/5 = 20 - 5 - 5 - 5 - 5 = 0; thus, the quotient = 4).

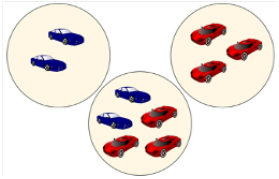
Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

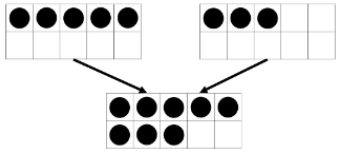
How is the Initial Precursor related to the Target?

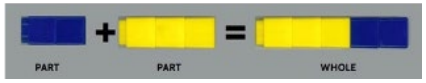
In order to understand division, students must learn to organize items into groups/sets based on a common characteristic such as size, color, shape, or texture. Students learn how to sort items by separating a group of items into two groups (e.g., vehicles and animals). As students gain comfort sorting items into sets, they are encouraged to use their language to convey their thought process by identifying and naming the characteristic that determines the set (e.g., wheels, legs). Activities that require students to engage actively with the items will foster the students' understanding of set, subsets, and separateness (e.g., the game "concentration" where the cards highlight one characteristic in a group of similar items [e.g., color] by which the items are grouped; incorporating creating sets into everyday activities [e.g., during independent reading, the teacher gives a student a pile of books and asks them to create two sets, helping the student determine the criteria they want to use to sort them, such as books I want to read/books I don't want to read; bugs/dogs; sports/gaming]).

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. Educators will provide multiple experiences counting sets and combining sets using multiple models (see below for examples). Educators also need to introduce the concept of equal sets using the students' background knowledge of same and different.





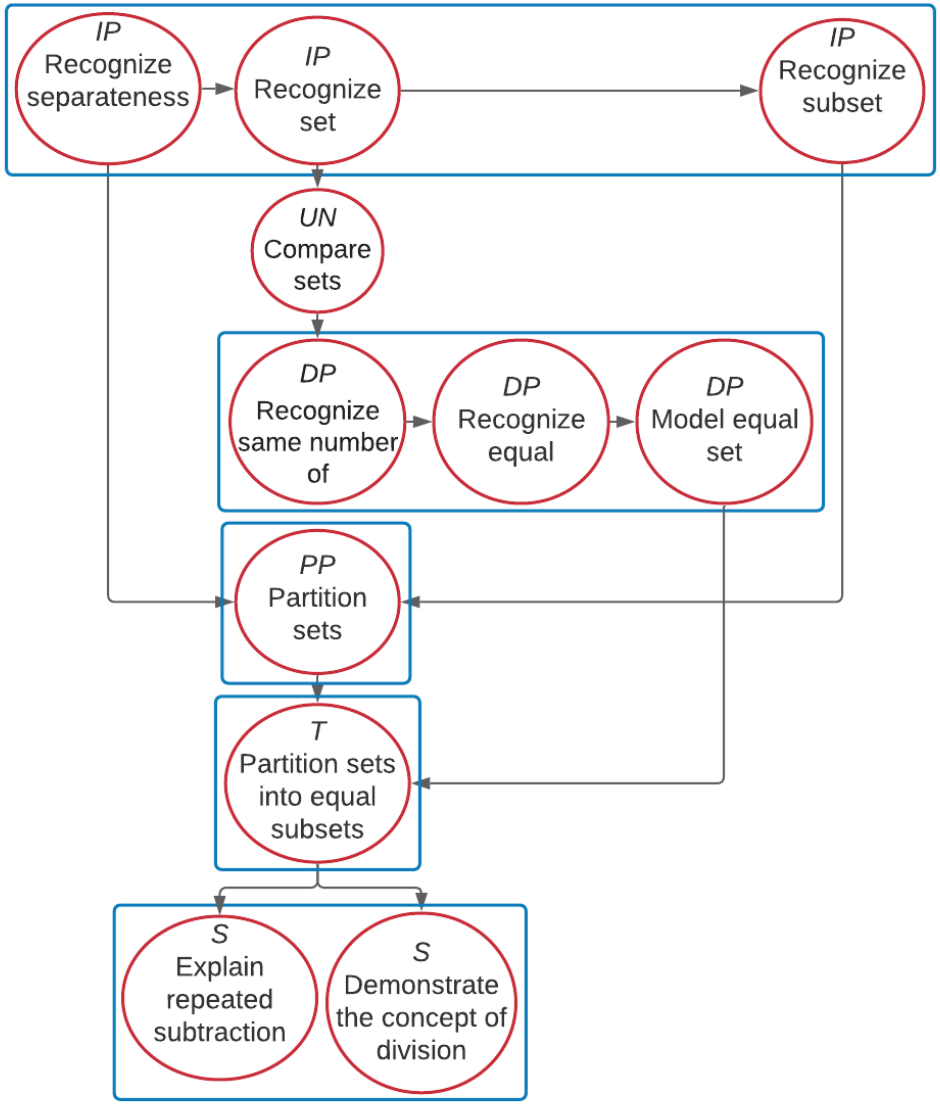


Instructional Resources

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

M.EE.5.NBT.6-7 Illustrate the concept of division using fair and equal shares.



Map Key	
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T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Mini-Map for M.EE.5.G.1-4

Subject: Mathematics
Geometry (G)
Grade: 5

Learning Outcome

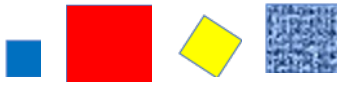
DLM Essential Element	Grade-Level Standard
M.EE.5.G.1-4 Sort two-dimensional figures and identify the attributes (angles, number of sides, corners, color) they have in common.	**M.5.G.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate). **M.5.G.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. **M.5.G.3** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. **M.5.G.4** Classify two-dimensional figures in a hierarchy based on properties.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Recognize "same" as the object that shares all of the same attributes as other objects in a group. Recognize "different" as the object that shares some or none of the attributes as other objects in a group.	Group together two-dimensional shapes that are the same size and have the same orientation. Group together two-dimensional shapes that are different sizes and/or have different orientations.	Communicate attribute values of a shape, such as the number of sides or number of corners (e.g., a square has four sides).	Compare different shapes and communicate common attributes shared by them (e.g., a square and a rectangle have four sides).	Compare different shapes and identify similarities and differences between their attributes (e.g., a square and a rectangle have four sides, but a rectangle has two pairs of congruent sides and a square has four congruent sides).

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

Being able to analyze shapes requires a student to recognize when basic objects and shapes are the same or different. Work on this understanding by providing students with a shape and naming it (e.g., this is a square ). Then provide multiple examples of the same shape so students can make comparisons (e.g., ) focusing student attention on the characteristics that make this a particular shape (e.g., a square has 4 sides that are the same size). As students explore shapes, label them and describe them as “same” or “different”.

NOTE: When presenting the same shape for comparison, do use shapes with different colors, textures, sizes, and orientation so that students understand the attribute that makes it that shape (e.g., 4 sides that are the same size).

How is the Distal Precursor related to the Target?

As students develop an understanding of same and different shapes, provide opportunities for students to classify or group the same shapes based on the shape size (e.g., this is a big square, this is a little square). As students progress with identifying the size of shapes, the educator can begin to introduce different orientations of the shape.

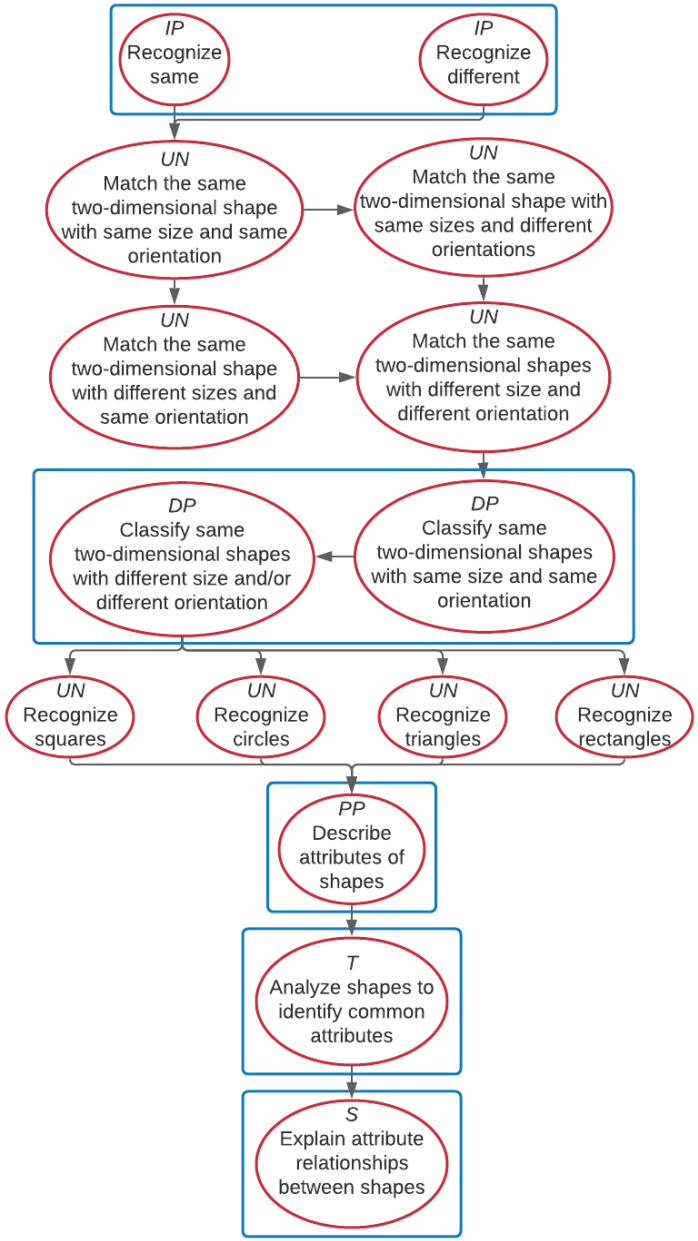
NOTE: As new attributes (e.g., size and orientation) are introduced, be sure to support the student in remembering that the attribute doesn't change the name of the shape.

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

M.EE.5.G.1-4 Sort two-dimensional figures and identify the attributes (angles, number of sides, corners, color) they have in common.



Map Key	
IP	Initial Precursor
DP	Distal Precursor
PP	Proximal Precursor
T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Mini-Map for M.EE.5.MD.3

Subject: Mathematics
Measurement and Data (MD)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.MD.3 Identify common three-dimensional shapes.	**M.5.MD.3** Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Notice or pay attention to a new stimulus (e.g., object, task, sound) introduced in the environment. (Students may use the methods of eye gaze, pointing, etc., to show they have noticed the new stimuli.)	Recognize "same" as the object that shares all of the same attributes as other objects in a group. Recognize "different" as the object that shares some or none of the attributes as other objects in a group.	Match two three-dimensional shapes (e.g., spheres, rectangular prisms, cubes, pyramids) that are the same size and have either the same or different orientation. Match two three-dimensional shapes (e.g., spheres, rectangular prisms, cubes, pyramids) that are different sizes and have either the same or different orientation.	Recognize three-dimensional shapes such as spheres, cones, cubes, and cylinders.	Communicate different attribute values (e.g., number of sides, number of angles, orientation, size) of spheres, cylinders, cubes, and cones. Describe objects in the real world using attributes of three-dimensional shapes (e.g., describing a door as rectangular, a roll of paper towels as a cylinder).

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

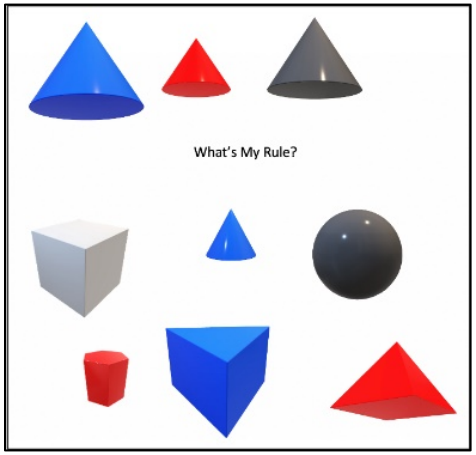
How is the Initial Precursor related to the Target?

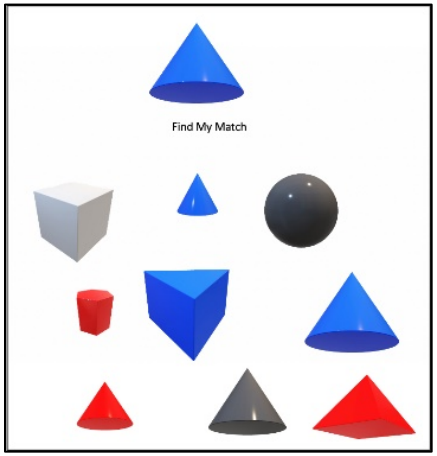
In order to identify three-dimensional shapes, students must first begin by learning to notice what is new. In the context of this EE, educators should work on attending while interacting with real objects that have definable shapes (e.g., cylindar, cube, cone). As students' attention to the objects increases, the educator draws the students' attention to the object and labels them (e.g., “This is a cube, it has 6 sides" or "this is a cone it has a round bottom and a pointy top"), and the student observes, feels, or otherwise interacts with it. Educators encourage students to begin placing like objects together, drawing attention to the characteristics that make an item the same or different.

How is the Distal Precursor related to the Target?

Now that students have experience with three-dimensional shapes and objects they need to begin learning about how they are the “same” and “different.” Provide instruction that focuses on creating sets that are grouped together in meaningful ways. Students do not have to label the shapes, but they do need to be able to match and identify items in a group based on the rule or attribute. For this Essential Element, it is important to use three-dimensional objects to create sets. These types of activities support students in understanding what attributes to pay attention to and what attributes to ignore based on the goal of the activity.

NOTE: Notice these activities are not just about sorting. The student is comparing an item or group of items to multiple items and learning what attribute he/she should focus on. This should be done with real objects to begin with rather than pictures on a worksheet or folder activity. "Find my match" is an easier activity than "What's my rule" so if students are really struggling to find the rule provide more experiences with finding the match.



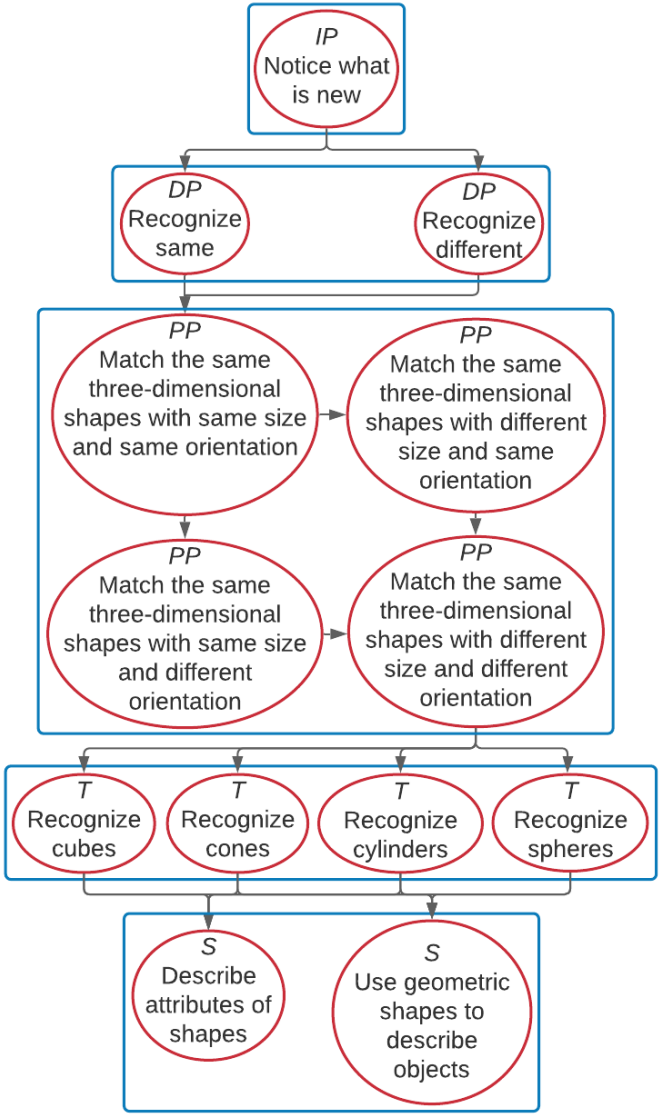


Instructional Resources

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

M.EE.5.MD.3 Identify common three-dimensional shapes.



Map Key	
IP	Initial Precursor
DP	Distal Precursor
PP	Proximal Precursor
T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Mini-Map for M.EE.5.MD.4-5

Subject: Mathematics
Measurement and Data (MD)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.MD.4-5 Determine the volume of a rectangular prism by counting units of measure (unit cubes).	**M.5.MD.4** Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft, and improvised units. **M.5.MD.5** Relate volume to the operations of multiplication and addition, and solve real-world and mathematical problems involving volume.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Communicate understanding of "separateness" by recognizing objects that are not joined together. Recognize enclosure as an enclosed space that lies within a boundary that distinguishes it from the space that lies outside the boundary.	Communicate understanding that volume is the space enclosed by a three-dimensional shape or an object. Communicate understanding that a unit cube is a cube with edge lengths of 1 unit and a volume of 1 cubic unit.	Communicate understanding that the volume of a solid figure can be determined by filling the figure with unit cubes and that the volume can be calculated by counting the number of unit cubes.	Calculate the volume of a rectangular prism by packing a box with unit cubes and counting them.	Solve word problems involving the volume of a rectangular prism by determining the volume of the prism. (The volume of a rectangular prism should be determined by packing the prism with unit cubes.)

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

Calculating volume using unit cubes requires a student to be able to recognize that the items are seperate from one another and can be grouped together. Work on this skill using a variety of sets. Help students recognize when items are grouped together into a set or separated out. Create these sets so that they are physically grouped together (e.g., enclosure; two or more boxes, two or more paper circles, two or more strings that can enclose the set). As educators present a set, they label it (e.g., two balls, one marker, three CDs), count the items, label it again, and encourage students to use numerals to label and count the separate sets. Use tools like the ten-frame to point out whole and parts (e.g., a row of 5 dots and a row of 4 dots are parts or subsets of 9).

How is the Distal Precursor related to the Target?

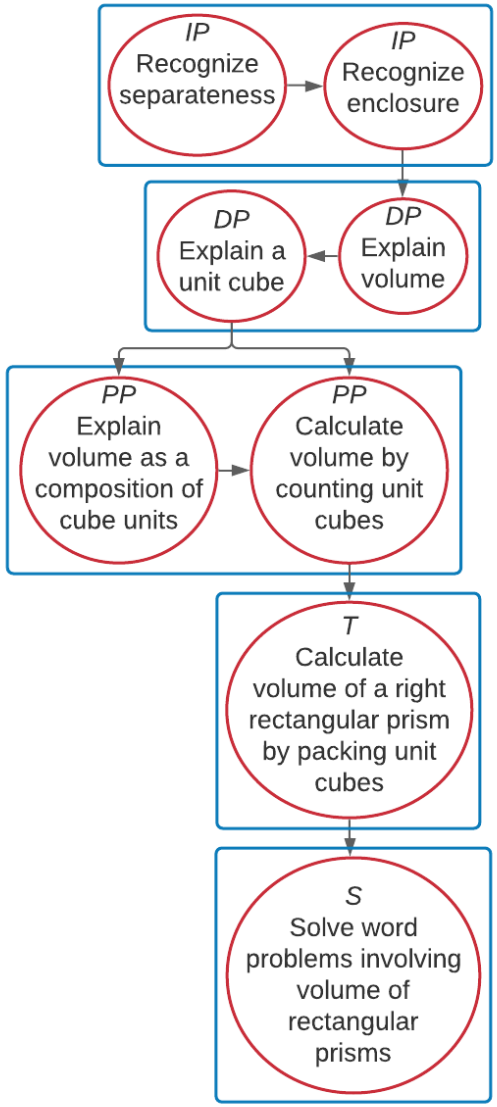
Once students begin to understand that items can be grouped together and counted (even if their counting is not yet accurate), educators can begin supporting students in understanding that many attributes can be measured even when using the same object (e.g., length, width, volume). For these students working at the Distal Precursor linkage level, educators provide many experiences with filling containers with different materials and helping students notice which materials fill all of the container and which leave gaps. When students start noticing the difference educators can begin introducing "fair" comparisons (e.g., when it's hard to tell which will hold more we can use a tool [unit cube] to help us). Students need multiple experiences measuring different attributes (e.g., Which container is taller? Wider? Which holds the most?) and comparing the unit of measure (e.g., unit cube, inches, number of paperclips). As students fill rectangular containers with unit cubes, educators teach the rule of no gaps or overlaps and support students in learning to count accurately.

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

M.EE.5.MD.4-5 Determine the volume of a rectangular prism by counting units of measure (unit cubes).



Map Key	
IP	Initial Precursor
DP	Distal Precursor
PP	Proximal Precursor
T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Mini-Map for M.EE.5.MD.1.a

Subject: Mathematics
Measurement and Data (MD)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.MD.1.a Tell time using an analog or digital clock to the half or quarter hour.	**M.5.MD.1.a** Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Show interest in and focused attention to a task, object, or any environment stimulus. Recognize "different" as the object that shares some or none of the attributes as other objects in a group.	Recognize attributes or characteristics of an object that are measurable (e.g., length, weight, time).	Identify the hour and minute hands on an analog clock, with the understanding that each number on the clock represents a specific hour (e.g., when the hour hand is at 6, it represents 6 o'clock). Recognize hours and minutes on a digital clock, such that the numeral on the left side of the colon represents hours and the numeral on the right side of the colon represents minutes.	Tell time to the nearest half hour (e.g., 4:30, 7:30) or quarter hour (e.g., 3:15, 6:45, 9:15) using both an analog and digital clock.	Communicate understanding (e.g., write, draw) of how hours and minutes are represented on analog and digital clocks to represent time in the standard format (e.g., 5:35).

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

In order to understand the passage of time and ultimately to tell time and understand its relevance, students begin by learning to focus their attention and recognize when things in their environment change or are different. In the context of learning to tell time, educators can help students attend to what is happening and contrast it with what will happen next or what happened in the past. They can draw students' attention to changes and help them notice new and different things in the environment, especially when those new and different things are associated with the passage of time.

How is the Distal Precursor related to the Target?

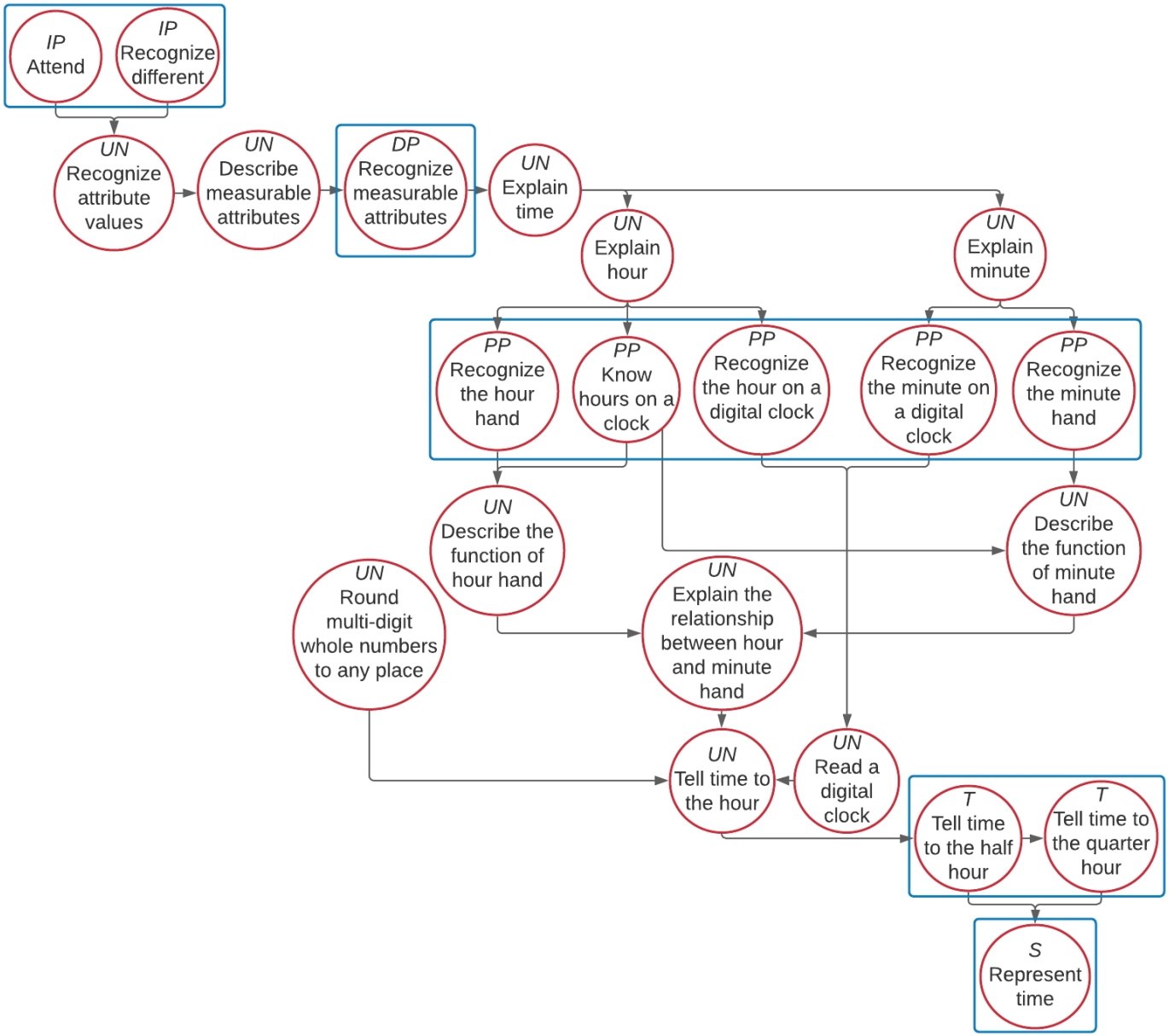
In the context of an Essential Element addressing the ability to tell time, recognizing measurable attributes refers to attributes that begin to mark time. For example, students recognize attributes such as the beginning and ending of an activity; things that are accomplished first then next; and specific time concepts such as day, night, today, tomorrow, and yesterday.

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

M.EE.5.MD.1.a Tell time using an analog or digital clock to the half or quarter hour.



Map Key	
IP	Initial Precursor
DP	Distal Precursor
PP	Proximal Precursor
T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Mini-Map for M.EE.5.MD.1.b

Subject: Mathematics
Measurement and Data (MD)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.MD.1.b Use standard units to measure weight and length of objects.	**M.5.MD.1.b** Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems.

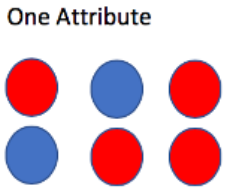
Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Recognize attributes or characteristics of an object, such as color, orientation, length, width, and weight.	Recognize attributes or characteristics of an object that are measurable (e.g., length, weight, time).	Directly compare lengths of two or more objects and order these objects from shortest to longest, or vice versa. Directly compare masses of two or more objects and order these objects from the heaviest to the lightest, or vice versa.	Communicate understanding of using an appropriate tool to measure the length and mass of an object. Measure the length of an object in inches or feet and the mass of an object in pounds or ounces.	Estimate the length of an object in inches or feet. Estimate the mass of an object in ounces or pounds.

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

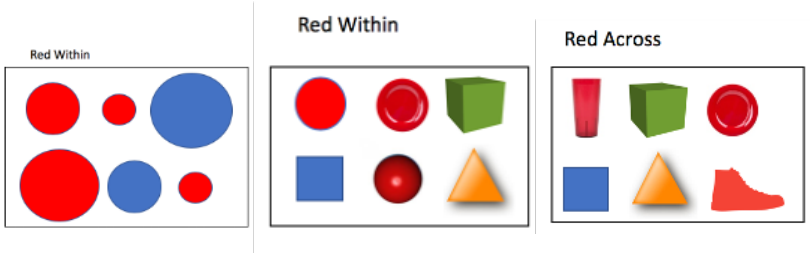
How is the Initial Precursor related to the Target?

In working toward learning to use standard units to measure for weight and length of objects, students begin by learning to notice the attributes of an object. The educator draws the students' attention to an object or stimulus, labels it, and describes it, and the student observes, feels, or otherwise interacts with it. At this level, students are working on a single attribute within a set (e.g., these fit the category [shape, color, size], these do not).



How is the Distal Precursor related to the Target?

As students' attention to objects develops, educators present a wide variety of attribute materials that can be sorted and classified in different ways (e.g., leaves, seashells, hair color, long/short, size, short/tall, shape, thickness, solids/stripes). Students will work on sorting the materials based on a given rule (e.g., attribute) and with the educator's support, they will begin to create and communicate their own rules for sorting the materials. Additionally, educators should provide opportunities for students to make comparisons within and across materials. Below is an example within and across. Attribute: the color red.

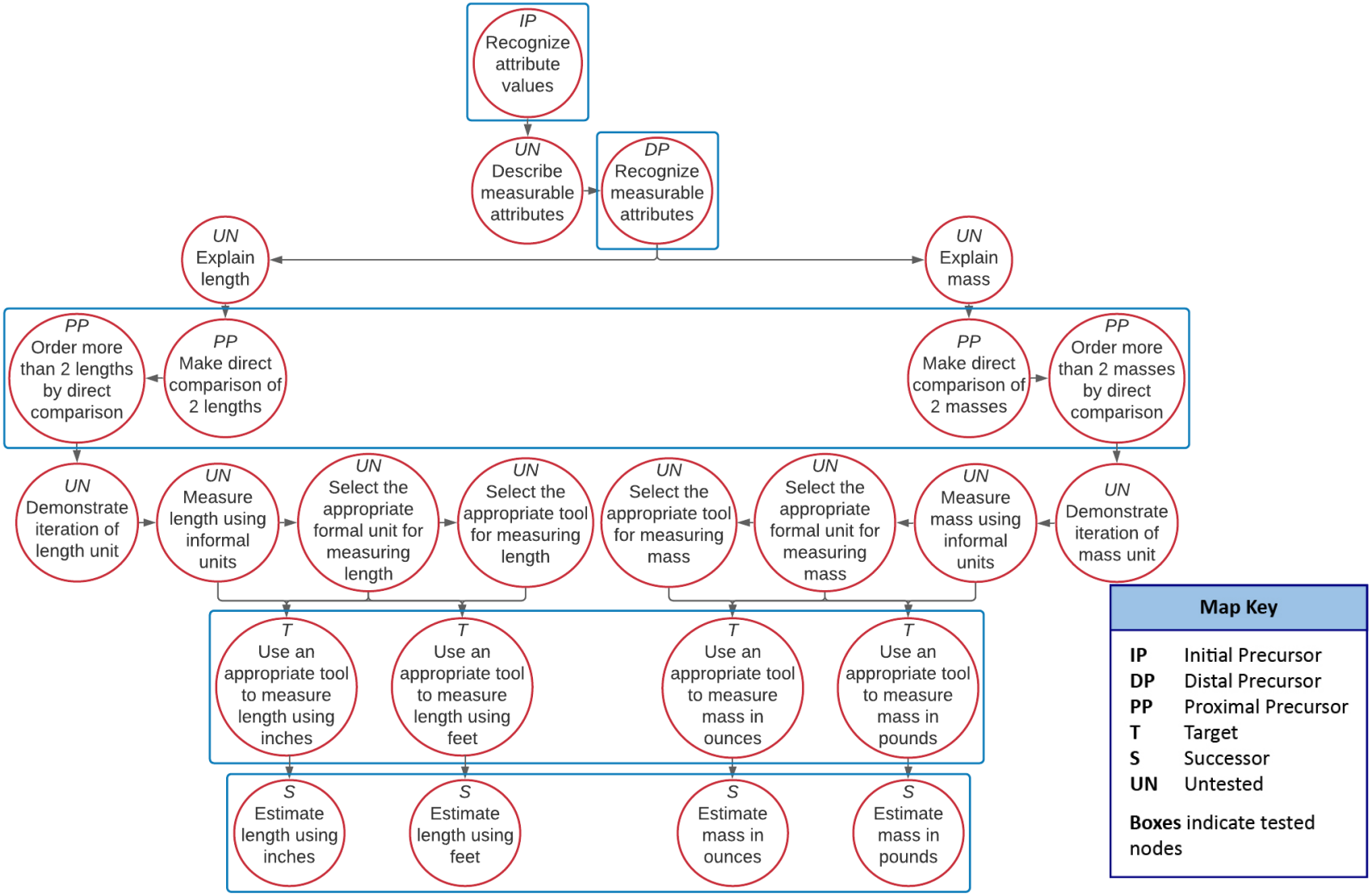


Instructional Resources

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

M.EE.5.MD.1.b Use standard units to measure weight and length of objects.



Mini-Map for M.EE.5.MD.1.c

Subject: Mathematics
Measurement and Data (MD)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.MD.1.c Indicate relative value of collections of coins.	**M.5.MD.1.c** Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Recognize an object with a specific attribute value (e.g., an object with four sides).	Recognize coins and/or dollar bills as money, and recognize that they have value when compared to a piece of paper.	Identify pennies, dimes, nickels, and quarters when shown different coins. Communicate that a penny is worth 1 cent, a nickel is worth 5 cents, a dime is worth 10 cents, and a quarter is worth 25 cents.	Communicate that a number of coins of a lesser value can be worth the same as one coin of a greater value (e.g., five pennies have the same value as a nickel, 10 pennies have the same value as a dime, two nickels have the same value as one dime, 25 pennies have the same value as one quarter, and five nickels have the same value as one quarter).	Find the total value of a set containing different types of coins (e.g., add the values of a nickel and a quarter).

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

In working toward learning to determine the value of coins, students begin by experiencing coins in three ways. First, the educator draws the students' attention to the various coins, labeling and describing them, and letting students observe, feel, or otherwise interact with them. At the same time, students need to experience money in context (e.g., cafeteria, school store, community outing) and experience the exchange of money for a product or service. Additionally, educators will provide students with early counting activities, which can include pennies.

How is the Distal Precursor related to the Target?

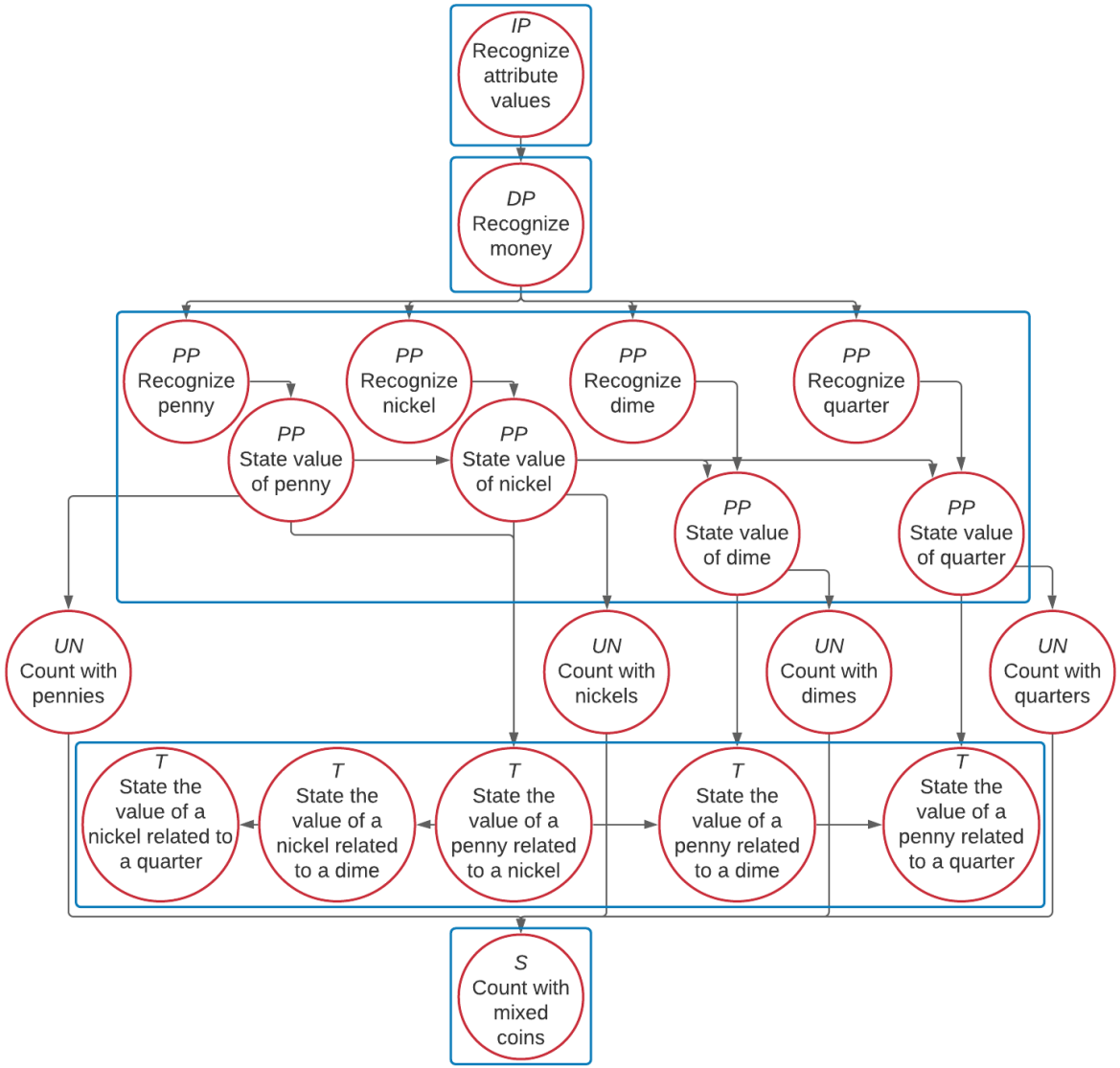
As students learn to recognize coins from other objects, educators will provide experiences for students to learn the names and value of the coins. This can be done by continuing to provide many opportunities and experiences of using money in context and making connections to their knowledge of counting.

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

M.EE.5.MD.1.c Indicate relative value of collections of coins.



Map Key	
IP	Initial Precursor
DP	Distal Precursor
PP	Proximal Precursor
T	Target
S	Successor
UN	Untested

Boxes indicate tested nodes

Mini-Map for M.EE.5.MD.2

Subject: Mathematics
Measurement and Data (MD)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.MD.2 Represent and interpret data on a picture graph, line plot, or bar graph.	**M.5.MD.2** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Form a pair by putting together two different objects (e.g., a toy truck and a toy car). Recognize attribute values of an object (e.g., a square has four sides).	Group together objects by attribute values such as shape or size (e.g., group together a square, a rectangle, and a rhombus, as they all have four sides). Order objects by following a specific rule (e.g., arrange three objects with different sizes from the smallest to largest).	Use bar, picture, or line graphs to answer explicit questions for which the obvious answer is on the graph (e.g., on a bar graph representing favorite ice cream of students in a class, identify and communicate the number of students who like chocolate-flavor ice cream).	Represent data using bar graphs, picture graphs, and line plots. Interpret or integrate information on these types of graphs to answer questions (e.g., on the bar graph representing students' favorite ice cream, how many more students like strawberry than chocolate ice cream?).	Draw inferences or make predictions by interpreting information presented on a bar graph, picture graph, or line plot (e.g., on the bar graph representing the number of pizzas required for a certain number of people, predict the number of pizzas needed for 20 people).

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

In order to be able to understand data on a graph, students begin learning to notice what is new. The educator draws the students' attention to new objects or stimuli, labels them (e.g., “these are two red cubes and two blue cubes”, “you have two fidgets; one is big and one is small but they are both fidgets”), and the student observes, feels, or otherwise interacts with it. Educators encourage students to begin placing like objects together, drawing attention to the characteristics that make an item the same or different.

How is the Distal Precursor related to the Target?

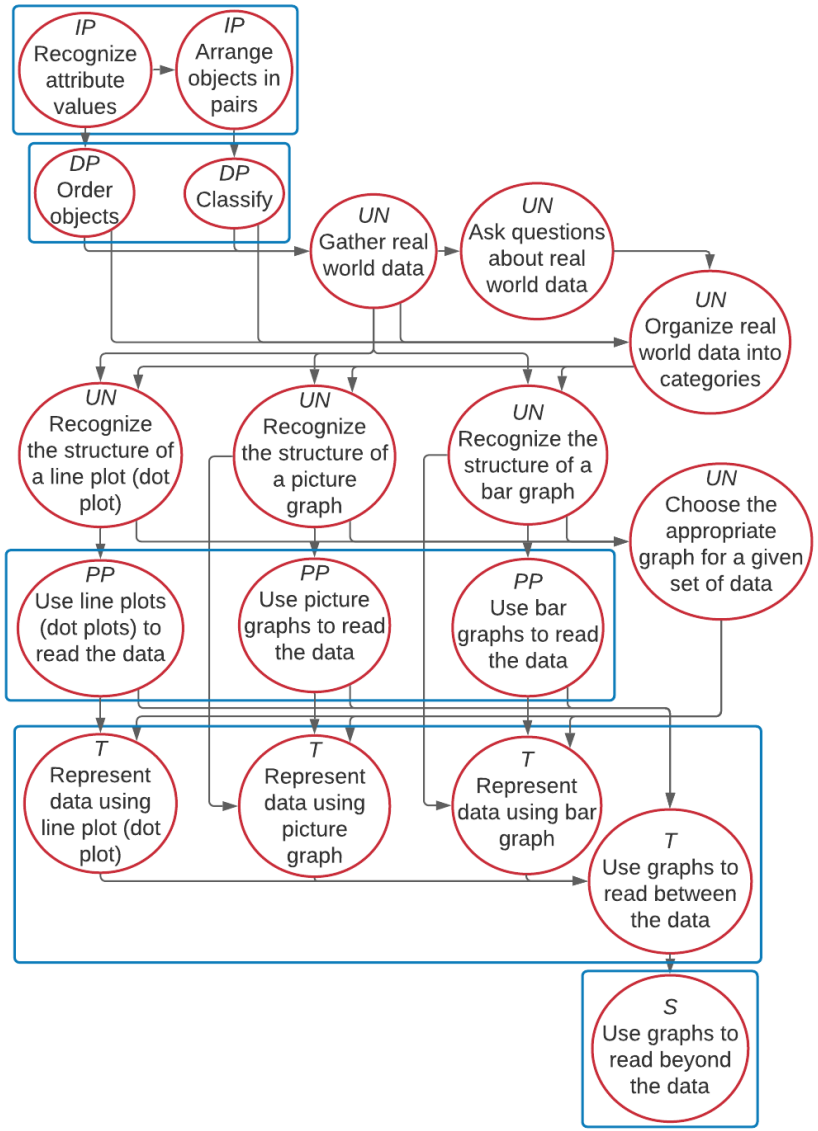
As the students’ attention to objects increases, educators will begin to draw the students' attention to what is the same and different between familiar items: color, shape, quantity (1-4), size, texture, and pattern. Educators should take care to use attribute words while defining and demonstrating their meaning. While students do not need to say these words, they do need to learn the meanings. Students will also begin to group two or more items in the same set based on an attribute (e.g., two tigers, bumpy balls and bumpy gravel, red spoons). As the students group two or more items, the educator will demonstrate the representation in a bar or picture graph and encourage students to actively participate in the creation of the graph.

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

M.EE.5.MD.2 Represent and interpret data on a picture graph, line plot, or bar graph.



Map Key	
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S	Successor
UN	Untested

Boxes indicate tested nodes

Mini-Map for M.EE.5.OA.3

Subject: Mathematics
Operations and Algebraic Thinking (OA)
Grade: 5

Learning Outcome

DLM Essential Element	Grade-Level Standard
M.EE.5.OA.3 Identify and extend numerical patterns.	**M.5.OA.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

Linkage Level Descriptions

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
Group together objects by attribute values such as shape or size (e.g., group together a square, a rectangle, and a rhombus, as they all have four sides). Contrast or distinguish objects based on attributes such as shape, size, texture, and numerical pattern. Order objects by following a specific rule (e.g., arrange three objects with different sizes from the smallest to largest).	Recognize patterns (or cycles) that exist in nature (e.g., seasons occur in a pattern, day and night occur in a pattern) or in everyday life (e.g., music, P.E., and art classes occur in a pattern in school).	Recognize a repeating pattern as a pattern that has a core unit repeated over and over (e.g., 1, 1, 2, 1, 1, 2...). Determine the core unit in a pattern that repeats over and over again. Recognize a growing pattern as a pattern that increases (e.g., 3, 6, 9, 12...) and a shrinking pattern as a pattern that decreases (e.g., 12, 10, 8...). Identify the pattern rule in growing and shrinking patterns by	Communicate the next term in a repeating, growing, and shrinking pattern, consisting of numerals or letters, by recognizing the core unit or the pattern rule and applying it to the pattern (e.g., the pattern rule in the pattern 3, 6, 9, 12... is "add 3," so the next term in the pattern is 12 + 3 equals 15).	Predict an element in a repeating, growing, and shrinking pattern by analyzing a given pattern, determining its core unit or the pattern rule, and applying it beyond just the next term (e.g., the pattern rule in the pattern 3, 6, 9, 12... is "add 3," so the sixth term in the pattern equals 18).

Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
		determining how each step in a pattern differs from the preceding step.		

Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

How is the Initial Precursor related to the Target?

In order to understand and work with patterns, students begin by learning to notice what is new. The educator draws the students' attention to new objects or stimuli, labels them (e.g., “these are two red cubes and two blue cubes,” “you have two fidgets; one is big and one is small but they are both fidgets”) and the student observes, feels, or otherwise interacts with them. Educators encourage students to begin placing like objects together, drawing attention to the characteristics that make an item the same or different.

How is the Distal Precursor related to the Target?

As students develop their awareness of attributes and putting like objects together, educators will draw the students' attention to patterns in words, symbols, numbers, images, routines, and the environment, allowing the student to observe, feel, or otherwise interact with the patterns.

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

M.EE.5.OA.3 Identify and extend numerical patterns.