Dynamic Learning Maps Mathematics Initial and Distal Precursors 5th Grade

This English Language Arts resource provides teachers with enhanced descriptions of the Initial and Distal precursors for the most frequently used Essential Elements.

By providing a clear connection between the IP or DP linkage level and the Target linkage level, teachers can better tailor classroom instruction for each student. Additionally, links to instructional information for each Essential Element and familiar texts in ELA, make these handy classroom resources.

M.EE.5.NF.1

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

Link to Minimap:

http://www.dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.NF.1.pdf

Target |

Recognize halves in a set model.
Recognize fourths in a set model.
Recognize halves on an area model.
Recognize fourths on an area model.

Proximal Precursor	Distal Precursor:	Initial Precursor:
Recognize one half in a set model. Recognize one fourth in a set model. Recognize one half on an area model. Recognize one fourth on an area model.	Partition sets into equal subsets. Partition any shape into equal parts.	Recognize some. Recognize separateness.

How is the Initial Precursor related to the target?

Initial Precursor: 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. Begin working on the quantifier “some” as students are developing an understanding of the quantities 1-4 using the students' communication system to demonstrate the use of the word “some”.

How is the Distal Precursor related to the target?

Distal Precursor: 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.

M.EE.5.NF.2

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).

Link to Minimap:

http://dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.NF.2.pdf

Target |

Recognize thirds on an area model.
Recognize tenths on an area model.

Proximal Precursor	Distal Precursor:	Initial Precursor:
Recognize one third on an area model. Recognize one tenth on an area model.	Partition any shape into equal parts.	Recognize some. Recognize separateness.

How is the Initial Precursor related to the target?

Initial Precursor: 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. Begin working on the quantifier “some” as students are developing an understanding of the quantities 1-4, using the students' communication system to demonstrate the use of the word “some”.

How is the Distal Precursor related to the target?

Distal Precursor: 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.

M.EE.5.NBT.1

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

Link to Minimap:

http://www.dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.NBT.1.pdf

Target | Compare 2 quantities up to 100 using models.

Proximal Precursor	Distal Precursor:	Initial Precursor:
Compare 2 quantities up to 10 using models.	Count all objects in a set or subset. Recognize same number of. Recognize different number of. Recognize more number of. Recognize fewer number of.	Recognize separateness. Recognize set.

How is the Initial Precursor related to the target?

Initial Precursor: 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?

Distal Precursor: 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.

M.EE.5.NBT.3

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

Link to Minimap:

http://dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.NBT.3.pdf

Target | Compare 2 numerals up to 100 using symbols (=,<,>).

Proximal Precursor	Distal Precursor:	Initial Precursor:
Compare 2 numerals up to 10 using symbols (=,<,>).	Compare 2 quantities up to 10 using models.	Recognize separateness. Recognize set.

How is the Initial Precursor related to the target?

Initial Precursor: 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 encourage students to use numerals to label and count the separate sets.

How is the Distal Precursor related to the target?

Distal Precursor: 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.

M.EE.5.NBT.4

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

Link to Minimap:

http://dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.NBT.4.pdf

Target | Round whole numbers 0-100 to the nearest ten.

Proximal Precursor	Distal Precursor:	Initial Precursor:
Explain place value for ones and tens. Explain the relationship between rounding and place value.	Recognize ten and something. Recognize multiple tens and something. Decompose numbers based on tens. Explain ten as a composition of ten ones. Recognize a unit.	Use perceptual subitizing.

How is the Initial Precursor related to the target?

Initial Precursor: 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?

Distal Precursor: 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, etc.). Teen numbers are an important part of understanding this concept.

M.EE.5.NBT.5

M.EE.5.NBT.5 Multiply whole numbers up to 5x5.

Link to Minimap:

http://dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.NBT.5.pdf

Target |

Multiply by 1.
Multiply by 2.
Multiply by 3.
Multiply by 4.
Multiply by 5.

Proximal Precursor	Distal Precursor:	Initial Precursor:
Demonstrate the concept of multiplication.	Explain repeated addition. Represent repeated addition with an equation. Solve repeated addition problems.	Recognize separateness. Recognize set. Recognize subset.

How is the Initial Precursor related to the target?

Initial Precursor: 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?

Distal Precursor: 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 (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.

M.EE.5.NBT.6-7

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

Link to Minimap:

http://dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.NBT.6-7.pdf

Target | Partition sets into equal subsets.

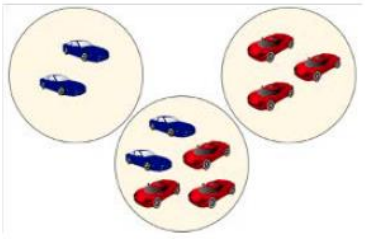
Proximal Precursor	Distal Precursor:	Initial Precursor:
Partition sets.	Model equal set. Recognize equal. Recognize same number of.	Recognize separateness. Recognize set. Recognize subset.

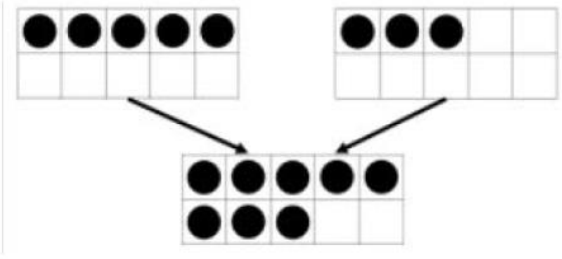
How is the Initial Precursor related to the target?

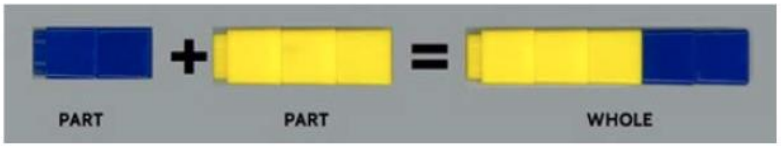
Initial Precursor: In order to understand the division, students must learn to organize items into groups/sets based on a common characteristic such as size, color, shape, or texture. Students learn how to sort items by separating a group of items into two groups (e.g., vehicles and animals). As students 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?

Distal Precursor: 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.







M.EE.5.G.1-4

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

Link to Minimap:

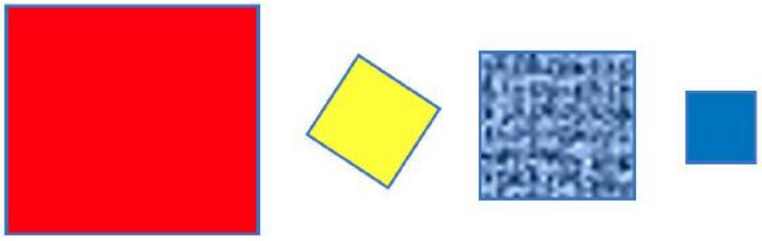
http://www.dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.G.1-4.pdf

Target | Analyze shapes to identify common attributes.

Proximal Precursor	Distal Precursor:	Initial Precursor:
Describe attributes of shape.	Classify same two-dimensional shapes with same size and same orientation. Classify same two-dimensional shapes with different size and/or different orientation.	Recognize same. Recognize different.

How is the Initial Precursor related to the target?

Initial Precursor: 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., multiple squares in different colors, sizes, and orientations) 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?

Distal Precursor: 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.

M.EE.5.MD.1.a

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

Link to Minimap:

http://www.dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.MD.1.a.pdf

Target | Tell time to the quarter hour.
Tell time to the half hour.

Proximal Precursor	Distal Precursor:	Initial Precursor:
Recognize the hour hand. Tell time to the half hour. Recognize the hour on a digital clock. Recognize the minute hand. Recognize the minute on a digital clock.	Recognize measurable attributes.	Attend. Recognize different.

How is the Initial Precursor related to the target?

Initial Precursor: 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?

Distal Precursor: 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.

M.EE.5.MD.1.b

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

Link to Minimap:

http://dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.MD.1.b.pdf

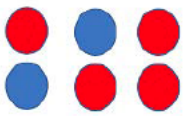
Target | Use an appropriate tool for measuring length using inches.
Use an appropriate tool for measuring length using feet.
Use an appropriate tool for measuring mass in pounds.
Use an appropriate tool for measuring mass in ounces.

Proximal Precursor	Distal Precursor:	Initial Precursor:
Make direct comparison of 2 lengths. Order more than 2 lengths by direct comparison. Order more than 2 masses by direct comparison. Make direct comparison of 2 masses.	Recognize measurable attributes.	Recognize attribute values.

How is the Initial Precursor related to the target?

Initial Precursor: 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).

One Attribute

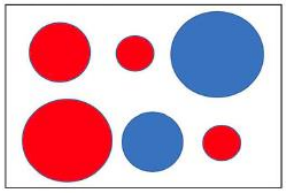


How is the Distal Precursor related to the target?

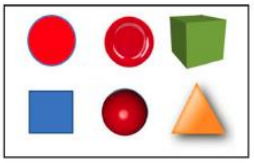
Distal Precursor: As students' attention to objects develops, educators present a wide variety of attribute materials that can be sorted and classified in different ways (e.g., leaves, seashells, hair color, long/short, size, short/tall, shape, thickness, solids/stripes). Students will work on sorting 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

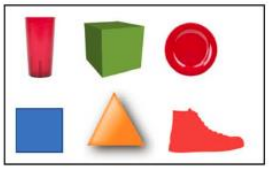
Red Within



Red Within



Red Across



M.EE.5.MD.1.c

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

Link to Minimap:

http://dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.MD.1.c.pdf

Target

State the value of a nickel related to a dime.
State the value of a nickel related to a quarter.
State the value of a penny related to a nickel.
State the value of a penny related to a dime.
State the value of a penny related to a quarter.

Proximal Precursor	Distal Precursor:	Initial Precursor:
State the value of a penny. State the value of a nickel. State the value of a dime. State the value of a quarter. Recognize penny. Recognize nickel. Recognize dime. Recognize quarter.	Recognize money.	Recognize attribute values.

How is the Initial Precursor related to the target?

Initial Precursor: 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?

Distal Precursor: 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.

M.EE.5.MD.2

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

Link to Minimap:

http://www.dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.MD.2.pdf

Target |

Represent data using bar graph.
Represent data using picture graph.
Represent data using line plot (dot plot).
Use graphs to read between the data.

Proximal Precursor	Distal Precursor:	Initial Precursor:
Use bar graphs to read the data. Use picture graphs to read the data. Use line plots (dot plots) to read the data.	Classify. Order objects.	Arrange objects in pairs. Recognize attribute values.

How is the Initial Precursor related to the target?

Initial Precursor: 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?

Distal Precursor: 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.

M.EE.5.OA.3

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

Link to Minimap:

http://www.dynamiclearningmaps.org/sites/default/files/documents/Math_EEs/M.EE.5.OA.3.pdf

Target | Extend a symbolic pattern by applying the rule.

Proximal Precursor	Distal Precursor:	Initial Precursor:
Recognize repeating patterns. Recognize the core unit in a repeated pattern. Recognize the pattern rule in a growing pattern. Recognize growing patterns. Recognize symbolic patterns. Recognize shrinking patterns. Recognize the pattern rule in a shrinking pattern.	Recognize patterns.	Order objects. Classify. Contrast objects.

How is the Initial Precursor related to the target?

Initial Precursor: 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?

Distal Precursor: 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.