# Essential Element, Linkage Levels, and Mini-Map

## Math: Grade 3

### M.EE.3.NBT.2

<table>
<thead>
<tr>
<th>Grade-Level Standard</th>
<th>DLM Essential Element</th>
<th>Linkage Levels</th>
</tr>
</thead>
</table>
| M.3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction | M.EE.3.NBT.2 Demonstrate understanding of place value to tens | **Initial Precursor**  
- Recognize separateness  
- Recognize set  
**Distal Precursor**  
- Explain ten as a composition of ten ones  
**Proximal Precursor**  
- Recognize multiple tens and something  
- Compose numbers based on tens  
**Target**  
- Explain place value for ones and tens  
**Successor**  
- Explain the relationship between rounding and place value  
- Explain place value for hundreds |

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

**Initial Precursor**: Understanding place value starts with students working on early counting skills. Educators demonstrate and provide explicit lessons on the conceptual and procedural knowledge of number names, number sequence, one-to-one correspondence, cardinality, abstraction principle, and order irrelevance principle all within a context of counting concrete, pictorial, and numeral representations. Educators will support students by counting anything and everything, helping them to notice when things are grouped together and when they are separate.

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

**Distal Precursor**: At this level, students are provided lessons on recognizing equivalence in sets with same items and then with different items. Educators will also have students compare sets and make basic ordinal judgments (e.g., a set has more and fewer disks than the comparison set) using models (e.g., ten-frame, number line, arrays, etc.) of ten as the benchmark for which these comparisons are made.

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A diagram showing the relationship of nodes in the mini-map appears below.

*Key to map codes in upper right corner of node boxes:*

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
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M.EE.3.NBT.2- Demonstrate understanding of place value to tens
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| M.3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations | M.EE.3.NBT.3 Count by tens using models such as objects, base ten blocks, or money | Initial Precursor  
  • Recognize before  
  • Recognize after  

Distal Precursor  
  • Explain number sequence pattern  

Proximal Precursor  
  • Rote count to 30  
  • Count to 30  

Target  
  • Skip count by 10s  

Successor  
  • Skip count by 10s starting at a multiple of 10  
  • Count with dimes  
  • Count with 10 dollar bills  
  • Explain repeated addition  

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<tr>
<td><strong>Initial Precursor:</strong> In order to fully understand the number sequence and skip counting, students begin by counting objects in a one-to-one fashion. Then, students use small collections to make comparisons (e.g., 3 items is more than 2 items because you have to count further). Once students can count at least 3 items, educators begin introducing the positional words before and after. A powerful way to teach these concepts is to incorporate them into daily routines. For example, lining classmates up to go somewhere, lining up familiar items, following a schedule, and using the words “before” and “after” to describe the relative location of the people, objects, and events. During math, educators will describe the location and the characteristic of the item being discussed (e.g., the square comes before the circle; number 2 is after number 1; in this pattern, blue is before red).</td>
<td><strong>Distal Precursor:</strong> Students will continue to build their familiarity with the counting sequence enabling them to have number-before and number-after knowledge (e.g., when asked &quot;What comes after 5?&quot; the student is able to indicate 6 without having to count up from 1; however, they still may use the count sequence to get a running start: 4, 5, 6). Educators provide students with many opportunities to make close comparisons utilizing models (e.g., ten-frame, number line, sets) so they have a visual or tactual way to compare small collections (e.g., Which is more? 7 or 8; 3 or 4; 9 or 10). The models help students see that two is one more than one, and three is one more than two. This will help them build the concept that each number in the count sequence is one more than the previous number.</td>
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- DP Distal Precursor
- PP Proximal Precursor
- SP Supporting
- S Successor
- UN Untested
- T Target
M.EE.3.NBT.3 Count by tens using models such as objects, base ten blocks, or money.
## M.EE.3.NF.1-3

### Grade-Level Standard

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</table>
| **M.3.NF.1** Understand a fraction \( \frac{1}{b} \) as the quantity formed by \( 1 \) part when a whole is partitioned into \( b \) equal parts; understand a fraction \( \frac{a}{b} \) as the quantity formed by \( a \) parts of size \( \frac{1}{b} \); | **M.EE.3.NF.1-3** Differentiate a fractional part from a whole | **Initial Precursor**  
- Recognize some | **Distal Precursor**  
- Recognize separateness  
- Recognize wholeness | **Proximal Precursor**  
- Partition shapes | **Target**  
- Recognize parts of a given whole or a unit  
- Explain unit fraction | **Successor**  
- Recognize fraction  
- Recognize whole on an area model  
- Recognize one half on an area model |
<p>| <strong>M.3.NF.2</strong> Understand a fraction as a number on the number line; represent fractions on a number line diagram; |  |  |  |  |  |  |</p>
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<td><strong>Initial Precursor:</strong> Understanding fractions requires students to first recognize an amount of something. Before students begin to recognize items separately, they recognize sets visually or tactually as a whole (i.e., there is something there). Provide students with meaningful experiences and descriptions of items they can touch, hear, smell, and see. Help students make sense of the items by demonstrating the symbolic word, sign, or symbol (e.g., Here are/is some cubes, some pencils, some dirt). Look for fun and interesting opportunities across the day to use the word some within a natural context.</td>
<td><strong>Distal Precursor:</strong> When working toward an understanding of fractions, students need exposure to a wide variety of items that can be put together and taken apart (e.g., linking cubes, magnetic tiles, puzzles). Encourage students to interact with the objects. Educators should take care to use the words whole and part to describe them. While students do not need to say these words, they do need to learn the meanings. At the same time, students will be working on counting skills. The models used to teach counting (e.g., five-frame, ten-frame, sets, number line) can be used to support the concepts of whole and part.</td>
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M.EE.3.NF.1-3 Differentiate a fractional part from a whole.
E**SSENTIAL ELEMENT, LINKAGE LEVELS, AND MINI-MAP**

**MATH: GRADE 3**

**M.EE.3.OA.4**

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<tr>
<td>M.3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ ÷ 3$, $6 \times 6 = ?$</td>
<td>M.EE.3.OA.4 Solve addition and subtraction problems when result is unknown, limited to operands and results within 20</td>
<td><strong>Initial Precursor</strong>&lt;br&gt;• Recognize separateness&lt;br&gt;• Recognize set</td>
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<tr>
<td><strong>Initial Precursor:</strong> Understanding how to add and subtract requires a student to be able to recognize a set or group of items (also see M.3.OA.1-2). Students need many opportunities to experience quantities and numerals in context across the school day. Educators provide lessons using a variety of sets to model early counting. 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.</td>
<td><strong>Distal Precursor:</strong> As students begin to understand labeling and counting small sets, educators will highlight the differences between sets on the basis of overall area or discrete number using the words more, less, and same. Provide students with multiple opportunities to count and compare a wide variety of sets with an increasing number of items, label the set (e.g., eight ball, 12 bears, 15 blocks), and move items in and out of the sets, labeling and counting them again (e.g., &quot;You just said this set has 11 cubes; if I take two cubes, how many will you have?&quot;). NOTE: Educator can work on the Distal Precursor level using the sets of numbers that students working at the Target level are adding and subtracting.</td>
</tr>
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M.EE.3.OA.4 Solve addition and subtraction problems when result is unknown, limited to operands and results within 20.
# Essential Element, Linkage Levels, and Mini-Map

## Math: Grade 3

### M.EE.3.G.2

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| **M.3.G.2** Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as \( \frac{1}{4} \) of the area of the shape | **M.EE.3.G.2** Recognize that shapes can be partitioned into equal areas | **Initial Precursor**  
- Recognize unit  
- Recognize wholeness  
- Recognize parts of a given whole or a unit  

**Distal Precursor**  
- Partition shapes  

**Proximal Precursor**  
- Model equal part  
- Partition circle into 2 equal parts  
- Partition circle into 3 equal parts  
- Partition circle into 4 equal parts  
- Partition a rectangle into rows and columns  
- Partition rectangle into 2 equal parts  
- Partition rectangle into 3 equal parts  
- Partition rectangle into 4 equal parts  

**Target**  
- Partition any shape into equal parts  

**Successor**  
- Recognize one tenth on an area model  
- Recognize one third on an area model  
- Recognize one half on an area model  
- Recognize one fourth on an area model  

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<td><strong>Initial Precursor:</strong> Being able to partition shapes requires a student to recognize a unit and recognize when basic objects are in whole and part forms. Work on this understanding by giving students an opportunity to observe, feel, or otherwise interact with objects and shapes in their whole and part forms. The general goal is to explore the differences between whole units or objects and parts of units or objects. As students explore shapes, label them and describe them as whole or part.</td>
<td><strong>Distal Precursor:</strong> As students begin to recognize whole objects or shapes and parts of objects or shapes, they can move toward building and taking apart shapes. NOTE: Educators can work on the Distal Precursor skills using everyday objects and/or using the shapes that students working at the Target level are partitioning into equal parts.</td>
</tr>
</tbody>
</table>

NOTE: Educators can work on the Initial Precursor skills using everyday objects and/or using the shapes that students working at the Target level are partitioning into equal parts.

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M.EE.3.G.2 Recognize that shapes can be partitioned into equal areas.
# Essential Element, Linkage Levels, and Mini-Map

## Math: Grade 3

**M.EE.3.MD.1**

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<tbody>
<tr>
<td>M.3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line</td>
<td>M.EE.3.MD.1 Tell time to the hour on a digital clock</td>
<td><strong>Initial Precursor</strong>&lt;br&gt;• Attend&lt;br&gt;• Recognize different&lt;br&gt;<strong>Distal Precursor</strong>&lt;br&gt;• Recognize measurable attributes&lt;br&gt;<strong>Proximal Precursor</strong>&lt;br&gt;• Recognize the hour on a digital clock&lt;br&gt;• Recognize the minute on a digital clock&lt;br&gt;<strong>Target</strong>&lt;br&gt;• Tell time to the hour&lt;br&gt;<strong>Successor</strong>&lt;br&gt;• Tell time to the half hour&lt;br&gt;• Tell time to the quarter hour</td>
</tr>
</tbody>
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<tr>
<td><strong>Initial Precursor</strong>: 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.</td>
<td><strong>Distal Precursor</strong>: 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.</td>
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M.EE.3.MD.1 Tell time to the hour on a digital clock.
## Essential Element, Linkage Levels, and Mini-Map

### Math: Grade 3

**M.EE.3.MD.4**

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| **M.3.MD.4** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters | **M.EE.3.MD.4** Measure length of objects using standard tools, such as rulers, yardsticks, and meter sticks | **Initial Precursor**  
- Recognize attribute values  
**Distal Precursor**  
- Make direct comparison of 2 lengths  
**Proximal Precursor**  
- Demonstrate iteration of length unit  
- Measure length using informal units  
**Target**  
- Use an appropriate tool to measure length using inches  
- Use an appropriate tool to measure length using feet  
**Successor**  
- Compare lengths of 2 or more objects using standard tools |

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<td><strong>Initial Precursor:</strong> In working toward learning to use tools to measure the 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, describes it, and the student observes, feels, or otherwise interacts with it.</td>
<td><strong>Distal Precursor:</strong> As students are engaging with objects, educators will continue to label and describe them, but they will also begin to incorporate lessons that have students directly compare lengths of two objects by matching one item against another (e.g., placing them side by side). This implies that they can distinguish length from other attributes such as color or shape. As students make direct comparisons, educators should demonstrate the describing words associated with length (e.g., short/long, length) and encourage students to begin using the words.</td>
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M.EE.3.MD.4 Measure length of objects using standard tools, such as rulers, yardsticks, and meter sticks.
### Essential Element, Linkage Levels, and Mini-Map

#### Math: Grade 3

**M.EE.3.MD.3**

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| M.3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using pictures presented in scaled bar graphs | M.EE.3.MD.3 Use picture or bar graph data to answer questions about data | Initial Precursor
- Recognize attribute values
- Arrange objects in pairs

**Distal Precursor**
- Classify
- Order objects

**Proximal Precursor**
- Recognize the structure of a bar graph
- Recognize the structure of a picture graph

**Target**
- Use bar graphs to read the data
- Use picture graphs to read the data

**Successor**
- Use graphs to read between the data

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

**Initial Precursor:** In order to be able to understand data on a graph, students begin by learning to notice the attributes of an object. The educator draws the students’ attention to new objects or stimuli, labels them, describes them, and the student observes, feels, or otherwise interacts with them. Educators encourage students to begin placing like objects together.

### 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 items in the same set based on their attributes (e.g., two tigers, bumpy ball and bumpy gravel, red spoons).

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M.EE.3.MD.3 Use picture or bar graph data to answer questions about data
### Grade-Level Standard | DLM Essential Element | Linkage Levels
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**M.3.OA.1** Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as $5 \times 7$; **M.3.OA.2** Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each | **M.EE.3.OA.1-2** Use repeated addition to find the total number of objects and determine the sum | **Initial Precursor**  - Recognize subset  - Recognize set  - Recognize separateness  **Distal Precursor**  - Demonstrate the concept of addition  - Combine sets  - Combine  **Proximal Precursor**  - Represent repeated addition with an equation  - Represent repeated addition with a model  **Target**  - Solve repeated addition problems  **Successor**  - Demonstrate the concept of multiplication
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<td><strong>Initial Precursor:</strong> In order to use repeated addition to solve problems, students must first 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 and 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 “one of these things is not like the other”; highlighting one characteristic in a group of similar items [e.g., color] by which the items will be grouped; incorporating creating sets into everyday activities [e.g., during clean up time students place items into one of two bins based on a designated characteristic]).</td>
<td><strong>Distal Precursor:</strong> 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. The following are examples of models.</td>
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M.EE.3.OA.1-2 Use repeated addition to find the total number of objects and determine the sum.
# Essential Element, Linkage Levels, and Mini-Map

## Math: Grade 3

### M.EE.3.OA.8

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| M.3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding | M.EE.3.OA.8 Solve one-step real world problems using addition or subtraction within 20 | Initial Precursor  
- Combine sets  
- Partition sets  
Distal Precursor  
- Demonstrate the concept of addition  
- Demonstrate the concept of subtraction  
Proximal Precursor  
- Determine the unknown in an addition equation  
- Determine the unknown in a subtraction equation  
Target  
- Solve subtraction word problems within 100  
- Solve addition word problems within 100  
Successor  
- Solve 2-step addition and subtraction word problems |

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

**Initial Precursor:** The knowledge needed to solve addition and subtraction word problems links back to an understanding of how to create sets (see M.3.OA.1-2), but it also requires learning to manipulate sets (i.e., combining and separating or partitioning). Provide students many opportunities to take a set of objects (e.g., tiles, linking cubes, buttons) and separate them based on a given characteristic (e.g., shape, color, size) into two distinct sets, separate them again based on another characteristic. Guide students to notice how the set size changes each time you combine or partition the sets.

![Diagram showing the relationship of nodes in the mini-map](image)

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

**Distal Precursor:** As students gain an understanding of how to group and manipulate items into sets, educators will begin to help students connect their knowledge of sets and counting to addition and subtraction. Educators will provide multiple experiences using the various addition and subtraction problem types (e.g., joining, separating, part-part-whole, and comparison problems). Here are a few examples.

![Diagram showing part-part-whole problem](image)

A diagram showing the relationship of nodes in the mini-map appears below.

**Key to map codes in upper right corner of node boxes:**

- **IP**  Initial Precursor
- **SP**  Supporting
- **DP**  Distal Precursor
- **S**  Successor
- **PP**  Proximal Precursor
- **UN**  Untested
- **T**  Target
M.EE.3.OA.8 Solve one-step real world problems using addition or subtraction within 20.
### Essential Element, Linkage Levels, and Mini-Map

**Math: Grade 3**

**M.EE.3.OA.9**

<table>
<thead>
<tr>
<th>Grade-Level Standard</th>
<th>DLM Essential Element</th>
<th>Linkage Levels</th>
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| M.3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends | M.EE.3.OA.9 Identify arithmetic patterns | **Initial Precursor**
- Recognize same
- Recognize different

| Distal Precursor | Order objects
- Classify
- Contrast objects

| Proximal Precursor | Recognize patterns

| Target | Recognize repeating patterns
- Recognize symbolic patterns
- Recognize growing patterns

| Successor | Extend a symbolic pattern by applying the rule
- Recognize the pattern rule in a growing pattern

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

**Initial Precursor:** Recognizing patterns is an important building block to many mathematical concepts and skills such as skip counting, repeated addition, and multiplication. In order to build toward arithmetic patterns, students need to engage in activities that compare at least two items. Calling attention to both how they are the same and how they are different. This type of instruction should include but may not be limited to quantities, shapes, and attributes across the school day so students have many opportunities to experience same and different.

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

**Distal Precursor:** Building on same and different, educators can use some of the other mathematical concepts like working with sets or recognizing a whole and parts to help students identify same and different. For instance, students may create a set and then create a second set that has the same amount. Then, they can change one of the sets to make it different. As students are learning to create and identify sets that are same and different, educators can draw student attention to the various attributes of an object to teach students to order, classify, and contrast the objects. These understandings will then lead to students having the attentional skills to begin recognizing patterns.

A diagram showing the relationship of nodes in the mini-map appears below.

**Key to map codes in upper right corner of node boxes:**

- **IP** Initial Precursor
- **SP** Supporting
- **DP** Distal Precursor
- **S** Successor
- **PP** Proximal Precursor
- **UN** Untested
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M.EE.3.OA.9 Identify arithmetic patterns.