## Essential Element, Linkage Levels, and Mini-Map
### Math: Grade 7

**M.EE.7.NS.2.c-d**

<table>
<thead>
<tr>
<th>Grade-Level Standard</th>
<th>DLM Essential Element</th>
<th>Linkage Levels</th>
</tr>
</thead>
</table>
| **M.7.NS.2.c** Apply properties of operations as strategies to multiply and divide rational numbers; **M.7.NS.2.d** Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats | **M.EE.7.NS.2.c-d** Express a fraction with a denominator of 10 as a decimal | **Initial Precursor**  
- Recognize separateness  
- Recognize set  
**Distal Precursor**  
- Recognize whole on a set model  
**Proximal Precursor**  
- Recognize tenths in a set model  
- Recognize one tenth in a set model  
**Target**  
- Explain the decimal point  
- Represent a fraction with a denominator of 10 as a decimal  
**Successor**  
- Explain place value for tenths  
- Compare two decimals to tenths using symbols |

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

**Initial Precursor:** Expressing a fraction as a decimal requires a student to be able to recognize that two or more sets or groups of items exist. Work on this skill using a variety of sets. Help students recognize when items are grouped together into a set or separated out. 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 set of 9 is part of 10).

![Initial Precursor Diagram](image1)

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

**Distal Precursor:** As students work toward greater understanding of sets, educators will provide students with many set models (see below) of fractions using the same unit fraction, either halves, thirds, fourths, or tenths. Students will work on identifying the whole.

![Distal Precursor Diagram](image2)

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.7.NS.2.c-d Express a fraction with a denominator of 10 as a decimal
<table>
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<tbody>
<tr>
<td><strong>M.7.RP.1</strong> Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units; <strong>M.7.RP.2</strong> Recognize and represent proportional relationships between quantities; <strong>M.7.RP.3</strong> Use proportional relationships to solve multistep ratio and percent problems</td>
<td><strong>M.EE.7.RP.1-3</strong> Use a ratio to model or describe a relationship</td>
<td><strong>Initial Precursor</strong>&lt;br&gt;• Recognize subset&lt;br&gt;• Recognize set&lt;br&gt;• Recognize separateness&lt;br&gt;<strong>Distal Precursor</strong>&lt;br&gt;• Recognize fraction&lt;br&gt;• Explain unit fraction&lt;br&gt;• Partition any shape into equal parts&lt;br&gt;<strong>Proximal Precursor</strong>&lt;br&gt;• Explain ratio&lt;br&gt;• Recognize many to 1 ratio&lt;br&gt;<strong>Target</strong>&lt;br&gt;• Recognize many to many ratio&lt;br&gt;• Represent many to many ratio&lt;br&gt;<strong>Successor</strong>&lt;br&gt;• Explain rates as ratios</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>How is the Initial Precursor related to the Target?</th>
<th>How is the Distal Precursor related to the Target?</th>
</tr>
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<tbody>
<tr>
<td><strong>Initial Precursor</strong>: In order to understand ratios, students need to gain experience with creating sets. Educators can provide students with 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. Then, separate the objects again based on another characteristic.</td>
<td><strong>Distal Precursor</strong>: As students become more adept at tracking discrete objects, they begin working on one-to-one distribution of objects to person, objects to objects, and objects to available space (e.g., giving each person in the group a pencil; given four counters, they would line up four more counters in front of or on top of the first set; given three chairs at a table, the students would place a cup on the table for each available chair). As students’ understanding of one-to-one distribution develops, provide students many opportunities to recognize equivalence in sets with same items and then sets with differing items. As students work on all these skills and concepts, continue to draw their attention to parts and wholes.</td>
</tr>
</tbody>
</table>

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>
<tr>
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<td>T</td>
<td>Target</td>
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<tr>
<td>SP</td>
<td>Supporting</td>
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<tr>
<td>S</td>
<td>Successor</td>
</tr>
<tr>
<td>UN</td>
<td>Untested</td>
</tr>
</tbody>
</table>
M.EE.7.RP.1-3 Use a ratio to model or describe a relationship
## Essential Element, Linkage Levels, and Mini-Map
### Math: Grade 7
#### M.EE.7.NS.3

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</table>
| **M.7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers | **M.EE.7.NS.3** Compare quantities represented as decimals in real world examples to tenths | **Initial Precursor**  
- Recognize separateness  
- Recognize set  
- Recognize subset  
**Distal Precursor**  
- Recognize one tenth in a set model  
- Recognize tenths in a set model  
**Proximal Precursor**  
- Represent a decimal to tenths as a fraction  
**Target**  
- Compare two decimals to tenths using symbols  
**Successor**  
- Compare two decimals to hundredths using symbols |

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

**Initial Precursor:** Adding fractions requires a student to be able to recognize that two or more sets or groups of items exist. Work on this skill using a variety of sets. Help students recognize when items are grouped together into a set or separated out. Educators present a set, 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?

**Distal Precursor:** As students begin to understand labeling, counting small sets, and recognizing wholes and parts of objects and sets, use set models to provide a wide variety of sets of 10 to model tenths (e.g., individual shapes to match the fraction: “I have 10 cubes in my bag, 1/10 of them are blue”).

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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:*

- **IP** Initial Precursor
- **SP** Supporting
- **DP** Distal Precursor
- **S** Successor
- **PP** Proximal Precursor
- **UN** Untested
- **T** Target
**M.EE.7.NS.3** Compare quantities represented as decimals in real world problems to tenths
<table>
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</table>
| M.7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram | M.EE.7.NS.1 Add fractions with like denominators (halves, thirds, fourths, and tenths) with sums less than or equal to one | Initial Precursor  
- Recognize separateness  
- Recognize subset  
Distal Precursor  
- Recognize parts of a given whole or a unit  
Proximal Precursor  
- Explain the concept of addition and subtraction of fractions  
- Decompose a fraction into a sum of unit fractions with the same denominator  
Target  
- Add fractions with common denominators  
Successor  
- Add or subtract fractions with denominators of 10 and 100 |

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<tr>
<td><strong>Initial Precursor:</strong> Adding fractions requires a student to be able to recognize that two or more sets or groups of items exist. Work on this skill using a variety of sets. Help students recognize when items are grouped together into a set or separated out. As educators present a set, 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).</td>
<td><strong>Distal Precursor:</strong> As students begin to understand labeling, counting small sets, and recognizing wholes and parts of objects and sets, use a variety of tools (e.g., ten-frames, egg cartons, a collection of items in a category [clothes: shoes, socks, pants], your hands) to label and count the sets, and label and count the subsets.</td>
</tr>
</tbody>
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</table>
M.EE.7.NS.1 Add fractions with like denominators (halves, thirds, fourths, and tenths) with sum less than or equal to one
### ESSENTIAL ELEMENT, LINKAGE LEVELS, AND MINI-MAP

**MATH: GRADE 7**  
**M.EE.7.NS.2.A**

<table>
<thead>
<tr>
<th>Grade-Level Standard</th>
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</thead>
</table>
| **M.7.NS.2.a** Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts | **M.EE.7.NS.2.a** Solve multiplication problems with products to 100 | **Initial Precursor**  
- Recognize separateness  
- Recognize set  
**Distal Precursor**  
- Solve repeated addition problems  
- Represent repeated addition with an equation  
- Explain repeated addition  
**Proximal Precursor**  
- Demonstrate the concept of multiplication  
**Target**  
- Multiply by 1, 2, 3, 4, 5, 6, 7, 8, 9, and/or 10  
**Successor**  
- Divide by 1, 2, 3, 4, 5, 6, 7, 8, 9, and/or 10  
- Apply the relationship between multiplication and division |

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<tr>
<td><strong>Initial Precursor:</strong> Solving multiplication problems requires a student to be able to recognize that two or more sets or groups of items exist. Work on this skill using a variety of sets. Help students recognize when items are grouped together into a set or separated out. 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).</td>
<td><strong>Distal Precursor:</strong> As students’ understanding of labeling and counting sets develops, they will begin working on adding items to a set and combining sets to create a new set. Additionally, students will work on developing an understanding of equal shares by actively participating in one-to-one distribution of objects to person, objects to objects, and objects to available space (e.g., giving each person in the group two pencils; given four counters, they would line up four more counters in front of or on top of the first set; given three chairs at a table, the student would place a cup on the table for each available chair). As students learn to work with sets and connect their understanding of equal shares to sets, educators will provide students experience with combining multiple sets (e.g., 3 sets with 4 counters each) and represent the problem (e.g., $4 + 4 + 4 = ?$). Students will also learn to represent the problem using a pencil or their communication system (e.g., the student is shown 4 equal sets each with 2 counters. The student counts the first set and writes a 2 or indicates 2, then writes or indicates the plus sign. The student repeats for all 4 sets and then indicates the equal sign and solves the problem.).</td>
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</tbody>
</table>

M.EE.7.NS.2.a  Copyright © 2020 University of Kansas Center for Research. All rights reserved.  2 of 3
M.EE.7.NS.2.a Solve multiplication problems with products to 100
## Basic Objectives

- Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If \( p \) and \( q \) are integers, then 
  \[
  -(p/q) = (-p)/q = p/(-q).
  \]
- Interpret quotients of rational numbers by describing real-world contexts.

## DLM Essential Element

- M.EE.7.NS.2.b
- Solve division problems with divisors up to five and also with a divisor of 10 without remainders.

## Linkage Levels

### Initial Precursor
- Recognize subset
- Recognize set
- Recognize separateness

### Distal Precursor
- Solve repeated subtraction problems
- Represent repeated subtraction with an equation
- Explain repeated subtraction

### Proximal Precursor
- Demonstrate the concept of division

### Target
- Divide by 1, 2, 3, 4, 5, and/or 10

### Successor
- Explain the relationship between multiplication and division

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

**Initial Precursor:** 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., music I like/music I don't like; red fidgets/black fidgets). 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., color, length). Activities that require students to engage actively with the items will foster understanding of set, subsets, and separateness.

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

**Distal Precursor:** As students’ understanding of labeling and counting sets develops, they will begin working on adding and taking away items from a set. Educators provide opportunities for students to work on developing an understanding of equal shares by actively participating in one-to-one distribution of objects to person, objects to objects, and objects to available space (e.g., giving each person in the group two pencils; given four counters they would line up, then four more counters in front of or on top of the first set; given three chairs at a table, the student would place a cup on the table for each available chair) and taking equal shares away (subtracting) from each person, object, or space. Educators will provide opportunities for students to connect their understanding of subtraction (starting with the whole and taking away a part) to repeated subtraction. For example, if the educator has 12 balls, and each team gets 4 balls, how many teams will there be? By subtracting 4 from the whole, we made 3 equal sets so there are 3 teams.

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

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**M.EE.7.NS.2.b** Solve division problems with divisors up to five and also with a divisor of 10 without remainders.
## Essential Element, Linkage Levels, and Mini-Map

**Math: Grade 7**  
**M.EE.7.G.1**

<table>
<thead>
<tr>
<th>Grade-Level Standard</th>
<th>DLM Essential Element</th>
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</tr>
</thead>
</table>
| M.7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale | M.EE.7.G.1 Match two similar geometric shapes that are proportional in size and in the same orientation | Initial Precursor  
- Attend  
- Notice what is new  

Distal Precursor  
- Recognize same  
- Recognize different  

Proximal Precursor  
- Match the same two-dimensional shape with same size and same orientation  
- Match the same three-dimensional shapes with same size and same orientation  

Target  
- Match the same two-dimensional shape with different sizes and same orientation  
- Match the same three-dimensional shapes with different size and same orientation  

Successor  
- Match the same two-dimensional shapes with different size and different orientation  
- Match the same three-dimensional shapes with different size and different orientation  

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<tr>
<td><strong>Initial Precursor:</strong> In order to match two- and three-dimensional shapes, students must first begin by learning to attend to people and objects when they are present. In the context of this Essential Element, educators should work on attending while interacting with shapes. As students' attention to people, objects, and shapes increases, the educator draws the students' attention to new objects or stimuli, labels them (e.g., “these are two red cubes and two blue cubes,” or “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.</td>
<td><strong>Distal Precursor:</strong> At this level, educators will encourage students to begin placing like objects together, drawing attention to the characteristics that make an item the same or different and using the core vocabulary to demonstrate the words same and different.</td>
</tr>
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</table>
M.EE.7.G.1 Match two similar geometric shapes that are proportional in size and in the same orientation.
# Essential Element, Linkage Levels, and Mini-Map

**Math: Grade 7**  
**M.EE.7.G.2**

<table>
<thead>
<tr>
<th>Grade-Level Standard</th>
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</tr>
</thead>
</table>
| **M.7.G.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle | **M.EE.7.G.2** Recognize geometric shapes with given conditions | **Initial Precursor**  
- Recognize same  
- Recognize different  
**Distal Precursor**  
- Recognize squares  
- Recognize circles  
- Recognize triangles  
- Recognize rectangles  
- Recognize cubes  
- Recognize cones  
- Recognize cylinders  
- Recognize spheres  
**Proximal Precursor**  
- Describe attributes of shapes  
**Target**  
- Recognize shapes with specified attributes  
**Successor**  
- Classify shapes with specified attributes |

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<tr>
<td><strong>Initial Precursor:</strong> Being able to recognize shapes given certain conditions 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.</td>
<td></td>
</tr>
<tr>
<td><strong>NOTE:</strong> 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).</td>
<td></td>
</tr>
<tr>
<td><strong>Distal Precursor:</strong> Now that students have experience identifying shapes as “same” and “different,” provide instruction that focuses on the attribute of a given shape and making comparisons with other shapes. Educators should take care to use the names of the shapes while defining and describing the attributes. While students do not need to say the shape names, they do need to learn what makes a shape a shape (e.g., a square has four equal straight sides, a triangle has three straight sides, and a cone is an object that narrows from a circular base to a point).</td>
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- **S** Successor
- **PP** Proximal Precursor
- **UN** Untested
- **T** Target
M.EE.7.G.2 Recognize geometric shapes with given conditions.
## ESSENTIAL ELEMENT, LINKAGE LEVELS, AND MINI-MAP
### MATH: GRADE 7
#### M.EE.7.G.5

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</table>
| M.7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure | M.EE.7.G.5 Recognize angles that are acute, obtuse, and right | Initial Precursor  
• Recognize attribute values  
Distal Precursor  
• Recognize line  
• Recognize point  
• Recognize ray  
Proximal Precursor  
• Recognize angle  
Target  
• Recognize obtuse angles  
• Recognize acute angles  
• Recognize right angles  
Successor  
• Compare angles to a right angle |

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

**Initial Precursor:** In order to recognize angles, students begin by learning to notice what is new. The educator draws the students’ attention to new objects or stimuli, labels them (e.g., “this is a circle, and it does not have any sides,” “this is a rectangle, and it has four sides”) and the student observes, feels, or otherwise interacts with the shapes. 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:** At this level, educators provide students with specific vocabulary (line, point, and ray). These are all denoted by certain characteristics (a line has arrows on both ends; a point is a dot on a graph, a line, a line segment, or a number line; a ray is a line that has a well-defined starting point). Educators should take care to use the names “line,” “point,” and “ray” while defining and describing the attributes. While students do not need to say the names, they do need to learn their meaning. Educators should teach these attributes within the context of working with shapes, graphs, parallel lines, perpendicular lines, etc.

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.7.G.5 Recognize angles that are acute, obtuse, and right.
<table>
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<tr>
<th>Grade-Level Standard</th>
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</table>
| **M.7.G.4** Know the formulas for the area and circumference of a circle, and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle | **M.EE.7.G.4** Determine the perimeter of a rectangle by adding the measures of the sides | **Initial Precursor**  
- Recognize attribute values  
**Distal Precursor**  
- Describe measurable attributes  
- Recognize measurable attributes  
**Proximal Precursor**  
- Explain length  
- Explain perimeter  
**Target**  
- Calculate the perimeter of a rectangle by counting unit lengths on a grid  
- Calculate perimeter by adding all the side lengths  
**Successor**  
- Use coordinates to calculate perimeters of polygons |

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<tr>
<td><strong>Initial Precursor:</strong> In order to calculate perimeter, 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 long cubes and short cubes,” or “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.</td>
<td><strong>Distal Precursor:</strong> As students develop their attention to objects and notice the difference between objects, they will begin working on recognizing and describing measurable attributes. Students need lots of experience making direct comparisons between objects. Educators should use the comparison words (e.g., big/small, tall/short, longer/shorter). While students do not need to say them, they do need to learn their meaning.</td>
</tr>
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M.EE.7.G.4 Determine the perimeter of a rectangle by adding the measures of the sides.
# ESSENTIAL ELEMENT, LINKAGE LEVELS, AND MINI-MAP
## MATH: GRADE 7
### M.EE.7.SP.3

<table>
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</table>
| M.7.SP.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability | M.EE.7.SP.3 Compare two sets of data within a single data display such as picture graph, line plot, or bar graph | **Initial Precursor**  
- Classify  
- Order objects  
**Distal Precursor**  
- Recognize the structure of a bar graph  
- Recognize the structure of a line plot (dot plot)  
- Recognize the structure of a picture graph  
**Proximal Precursor**  
- Recognize peaks in data distribution  
- Recognize symmetric distribution  
- Recognize outliers  
- Recognize variability in a data set  
**Target**  
- Use visual overlap of two sets of data to compare variability of two populations  
- Compare differences in shape of 2 or more sets of data  
**Successor**  
- Draw inferences by comparing two data sets |

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<td><strong>Initial Precursor:</strong> In order to compare data, students begin by learning to recognize 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 graph or line plot and encourage students to actively participate in its creation.</td>
<td><strong>Distal Precursor:</strong> Students actively participate in the creation of graphs and line plots by placing representations, x's, or dots for each response to the research question.</td>
</tr>
</tbody>
</table>

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M.EE.7.SP.3 Compare two sets of data within a single data display such as picture graph, line plot, or bar graph.
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| **M.7.SP.5** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event; | **M.EE.7.SP.5-7** Describe the probability of events occurring as possible or impossible | **Initial Precursor**  
- Recognize attribute values |
| **M.7.SP.6** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability; |  
| **M.7.SP.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy | **Distal Precursor**  
- Classify  
- Recognize outcomes of an event |
| **M.7.SP.8** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability; | **Proximal Precursor**  
- Classify  
- Recognize outcomes of an event |
| **Target**  
- Classify events as possible or impossible | **Successor**  
- Recognize probability as the likelihood of an event |
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<tr>
<td><strong>Initial Precursor:</strong> In order to describe the probability of an event, students begin by learning about attributes, numbers, and measurement. Educators draw student attention to new objects or stimuli, label and describe them (e.g., “this is a circle; it won’t have sides,” “this egg carton has 12 spaces; it is likely that 12 eggs will fit into those spaces,” “this book is a small book, and it’s impossible for it to get bigger”) and students observe, feel, or otherwise interact with the objects.</td>
<td><strong>Distal Precursor:</strong> Proportional understanding is key when working toward describing probabilities. Educators provide many opportunities for students to classify (group) items based on their size (e.g., compare two or more items and determine which is larger or smaller), amount (e.g., numbers larger or smaller than a given number), and distance between numbers (e.g., skip counting by 2, 5, or 10).</td>
</tr>
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| T  | Target           |    |           

Use a number line or counters to model how you got your answer.  
2, 4, 6, ?
M.EE.7.SP.5-7 Describe the probability of events occurring as possible or impossible.
## ESSENTIAL ELEMENT, LINKAGE LEVELS, AND MINI-MAP

**MATH: GRADE 7**

**M.EE.7.EE.1**

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| M.7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients | M.EE.7.EE.1 Use the properties of operations as strategies to demonstrate that expressions are equivalent | Initial Precursor  
  - Partition sets  
  - Combine sets  

Distal Precursor  
  - Model associativity of multiplication  
  - Model additive commutativity  
  - Model associativity of addition  
  - Model multiplicative commutativity  

Proximal Precursor  
  - Apply the associative property of multiplication  
  - Apply commutative property of addition  
  - Apply associative property of addition  
  - Apply the commutative property of multiplication  

**Target**  
  - Use properties of operations to generate equivalent expressions involving subtraction  
  - Use properties of operations to generate equivalent expressions involving addition  

**Successor**  
  - Use equivalent expressions in real-world context

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

**Initial Precursor:** In order to use properties of operations, students begin by counting small units, recognizing that two or more sets or groups of items exist. Work on this skill using a variety of sets. Help students recognize when items are grouped together into a set or separated out. 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. The general goal is to explore how the set changes when items are separated out (partitioned) or combined.

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

**Distal Precursor:** As students continue developing their understanding of how sets change, educators can use manipulatives to create sets that model the associative and associative properties of addition and multiplication.

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M.EE.7.EE.1 Use the properties of operations as strategies to demonstrate that expressions are equivalent.
**Grade-Level Standard** | **DLM Essential Element** | **Linkage Levels**
--- | --- | ---
M.7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05." | M.EE.7.EE.2 Identify an arithmetic sequence of whole numbers with a whole number common difference | **Initial Precursor**
- Classify
- Contrast objects
- Order objects

**Distal Precursor**
- Recognize symbolic patterns
- Recognize sequence

**Proximal Precursor**
- Recognize growing patterns
- Recognize shrinking patterns

**Target**
- Recognize arithmetic sequences

**Successor**
- Recognize the recursive rule for arithmetic sequences

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How is the Initial Precursor related to the Target?

**Initial Precursor:** In order to identify arithmetic sequences, students begin by learning to recognize what is the same and different between familiar items, such as color, shape, quantity, size, texture, and pattern. Educators should take care to use attribute words (e.g., circle/square, more/less/same, rough/smooth, red, green, red, green) while defining and demonstrating their meaning. While students do not need to say these words, they do need to learn the meanings. Educators will also provide activities in which students work on grouping two or more items in the same set based on an attribute and ordering the items by size or shape.

How is the Distal Precursor related to the Target?

**Distal Precursor:** As students develop their understanding of attributes and work toward arithmetic sequences, educators provide interactive lessons around patterns using attributes like shape, size, and color. At this level, students are also expected to recognize symbolic (letter and number) patterns. This also requires that students recognize numerals in order (i.e., 1, 2, 3...). Educators should take care to use number names while defining and demonstrating symbolic sequences. While students do not need to say these words, they do need to learn the meanings and the sequence.

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M.EE.7.EE.2 Identify an arithmetic sequence of whole numbers with a whole number common difference.