

## ESSENTIAL ELEMENT, LINKAGE LEVELS, AND MINI-MAP

### MATH: GRADE 7

### M.EE.7.NS.2.C-D

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.NS.2.c</b> Apply properties of operations as strategies to multiply and divide rational numbers; <b>M.7.NS.2.d</b> 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	<b>M.EE.7.NS.2.c-d</b> Express a fraction with a denominator of 10 as a decimal	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Recognize separateness</li> <li>Recognize set</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize whole on a set model</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize tenths in a set model</li> <li>Recognize one tenth in a set model</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Explain the decimal point</li> <li>Represent a fraction with a denominator of 10 as a decimal</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Explain place value for tenths</li> <li>Compare two decimals to tenths using symbols</li> </ul>

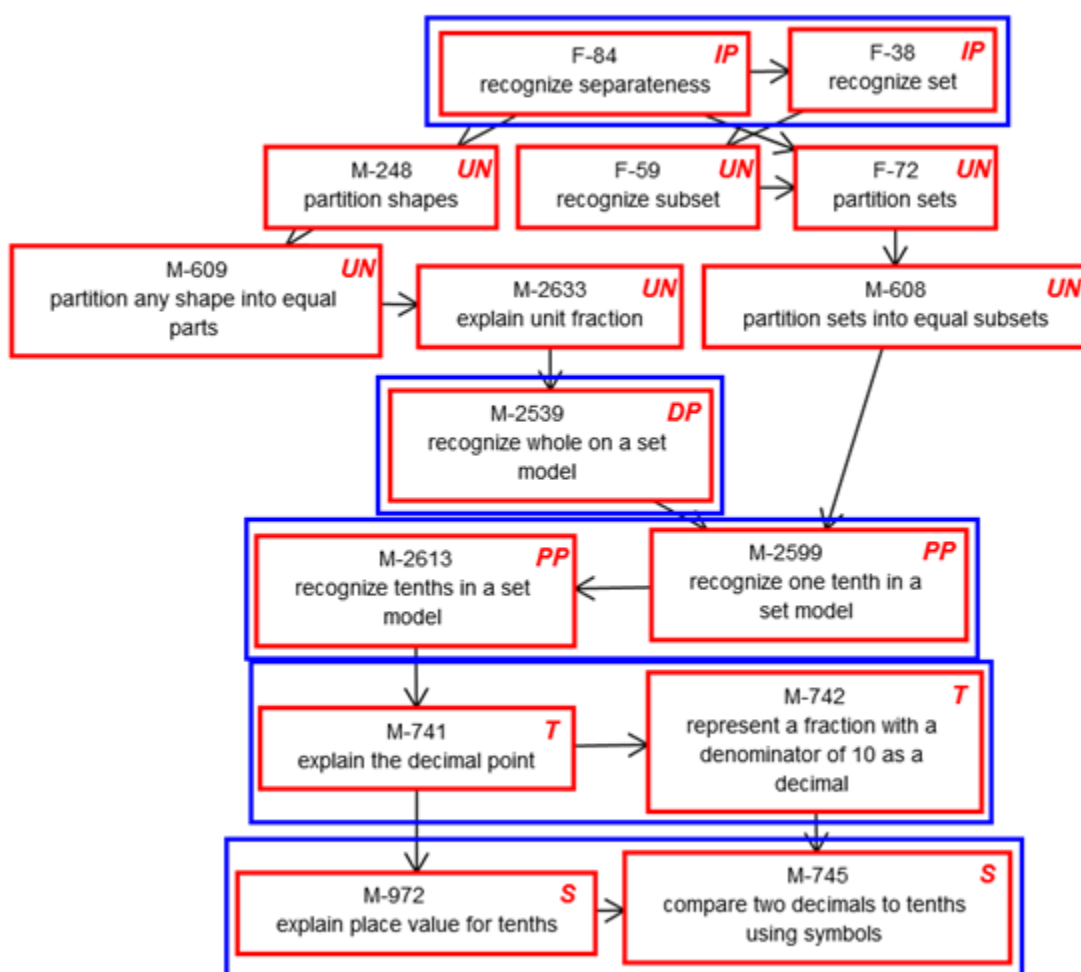
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A diagram showing the relationship of nodes in the mini-map appears below.

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

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**M.EE.7.NS.2.c-d** Express a fraction with a denominator of 10 as a decimal



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### MATH: GRADE 7

### M.EE.7.RP.1-3

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.RP.1</b> Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.; <b>M.7.RP.2</b> Recognize and represent proportional relationships between quantities; <b>M.7.RP.3</b> Use proportional relationships to solve multistep ratio and percent problems	<b>M.EE.7.RP.1-3</b> Use a ratio to model or describe a relationship	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Recognize subset</li> <li>Recognize set</li> <li>Recognize separateness</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize fraction</li> <li>Explain unit fraction</li> <li>Partition any shape into equal parts</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Explain ratio</li> <li>Recognize many to 1 ratio</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Recognize many to many ratio</li> <li>Represent many to many ratio</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Explain rates as ratios</li> </ul>

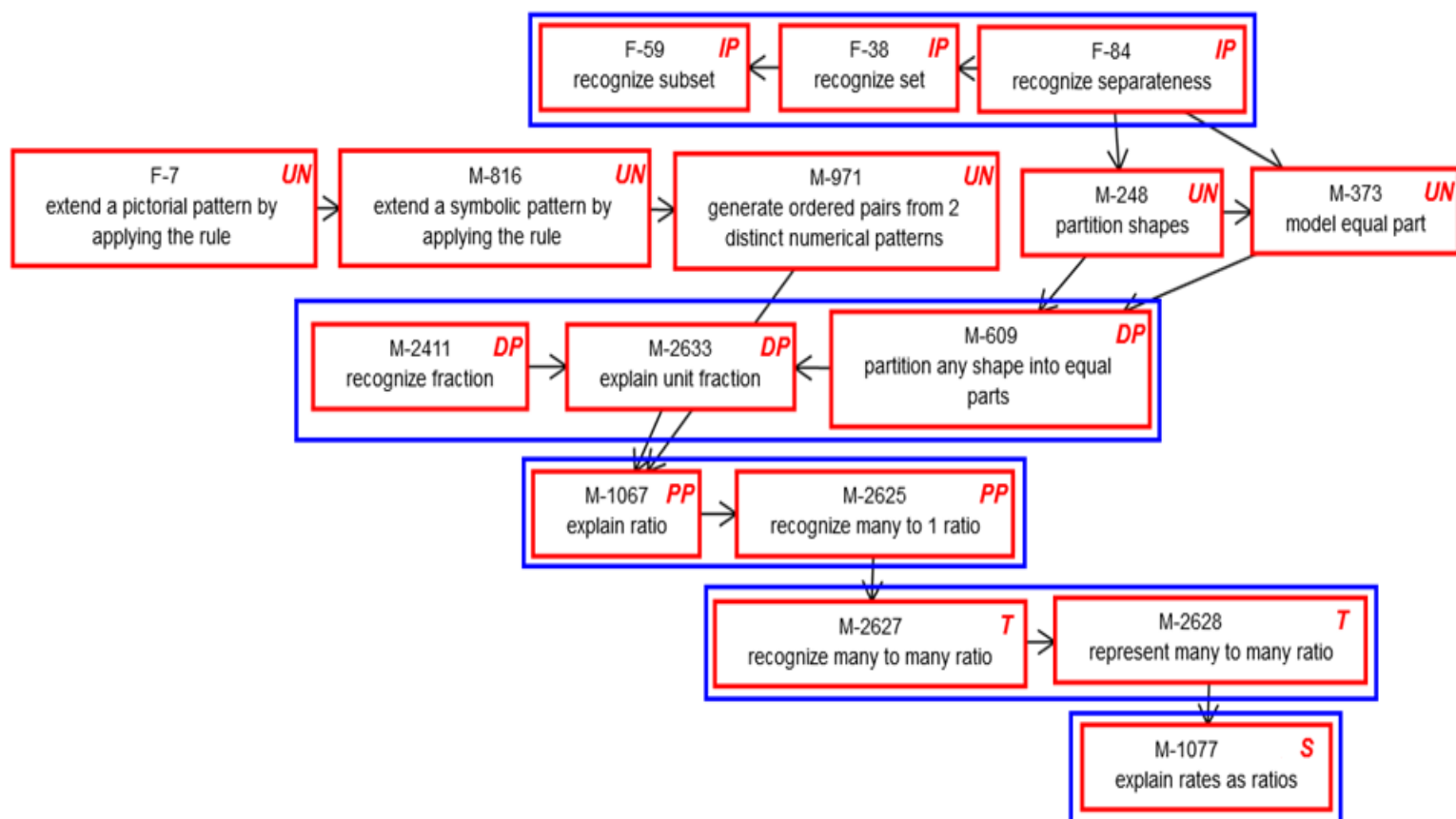
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**M.EE.7.RP.1-3** Use a ratio to model or describe a relationship



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### MATH: GRADE 7

### M.EE.7.NS.3

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.NS.3</b> Solve real-world and mathematical problems involving the four operations with rational numbers	<b>M.EE.7.NS.3</b> Compare quantities represented as decimals in real world examples to tenths	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Recognize separateness</li> <li>Recognize set</li> <li>Recognize subset</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize one tenth in a set model</li> <li>Recognize tenths in a set model</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Represent a decimal to tenths as a fraction</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Compare two decimals to tenths using symbols</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Compare two decimals to hundredths using symbols</li> </ul>

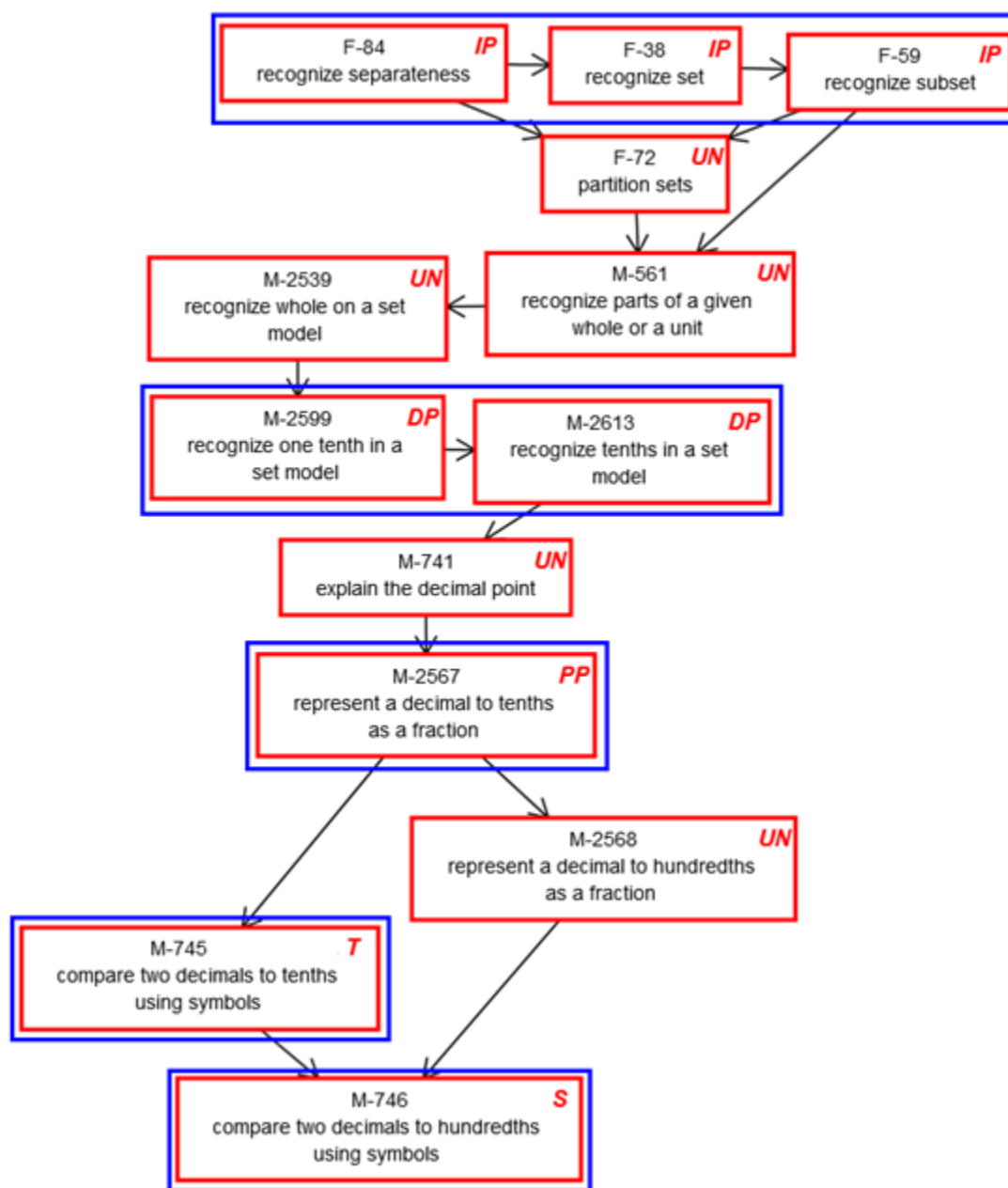
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**M.EE.7.NS.3** Compare quantities represented as decimals in real world problems to tenths



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### MATH: GRADE 7

#### M.EE.7.NS.1

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.NS.1</b> 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	<b>M.EE.7.NS.1</b> Add fractions with like denominators (halves, thirds, fourths, and tenths) with sums less than or equal to one	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Recognize separateness</li> <li>Recognize subset</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize parts of a given whole or a unit</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Explain the concept of addition and subtraction of fractions</li> <li>Decompose a fraction into a sum of unit fractions with the same denominator</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Add fractions with common denominators</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Add or subtract fractions with denominators of 10 and 100</li> </ul>

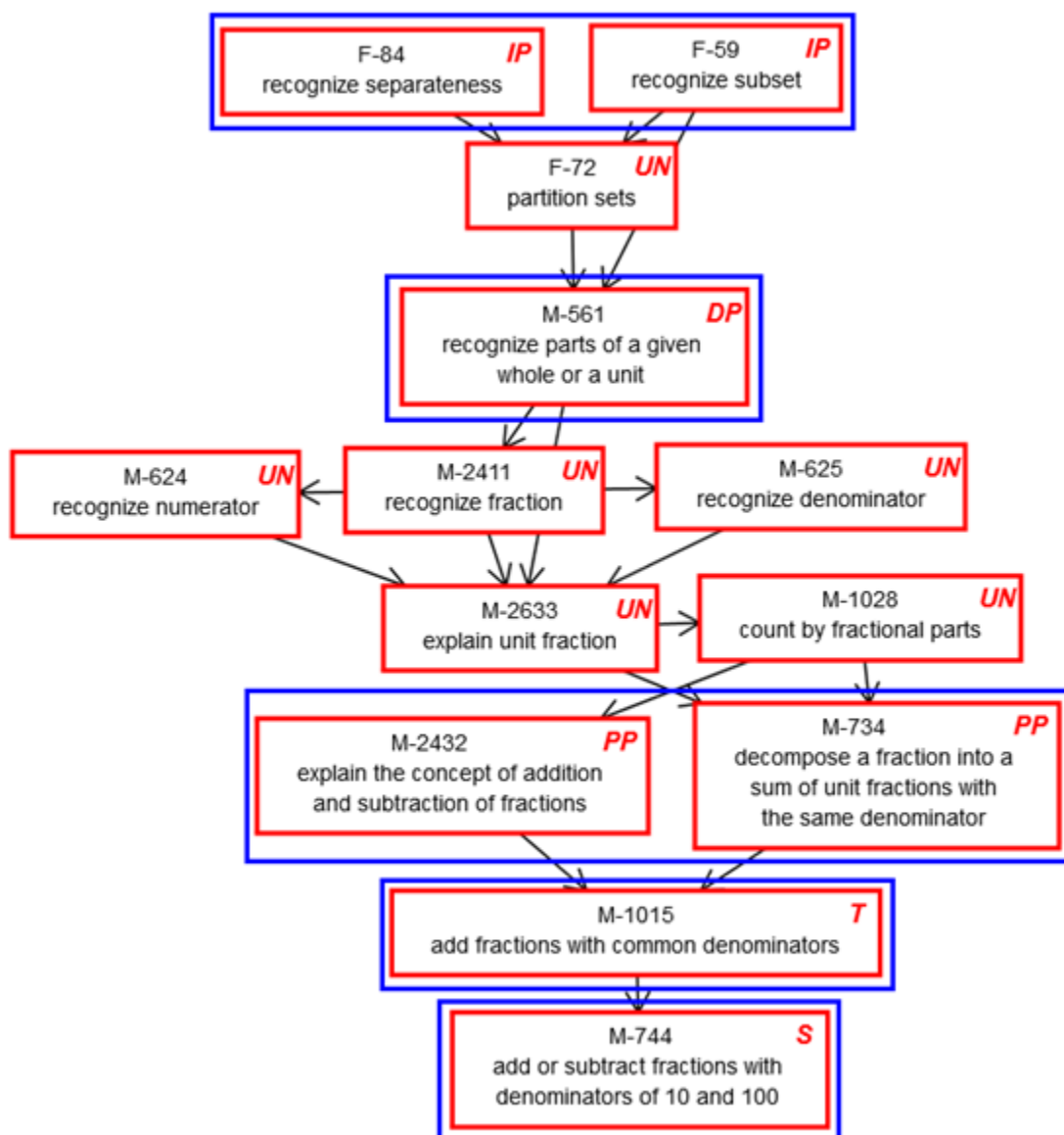
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**M.EE.7.NS.1** Add fractions with like denominators (halves, thirds, fourths, and tenths) with sum less than or equal to one





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### MATH: GRADE 7

### M.EE.7.NS.2.A

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.NS.2.a</b> 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	<b>M.EE.7.NS.2.a</b> Solve multiplication problems with products to 100	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Recognize separateness</li> <li>Recognize set</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Solve repeated addition problems</li> <li>Represent repeated addition with an equation</li> <li>Explain repeated addition</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Demonstrate the concept of multiplication</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Multiply by 1, 2, 3, 4, 5, 6, 7, 8, 9, and/or 10</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Divide by 1, 2, 3, 4, 5, 6, 7, 8, 9, and/or 10</li> <li>Apply the relationship between multiplication and division</li> </ul>

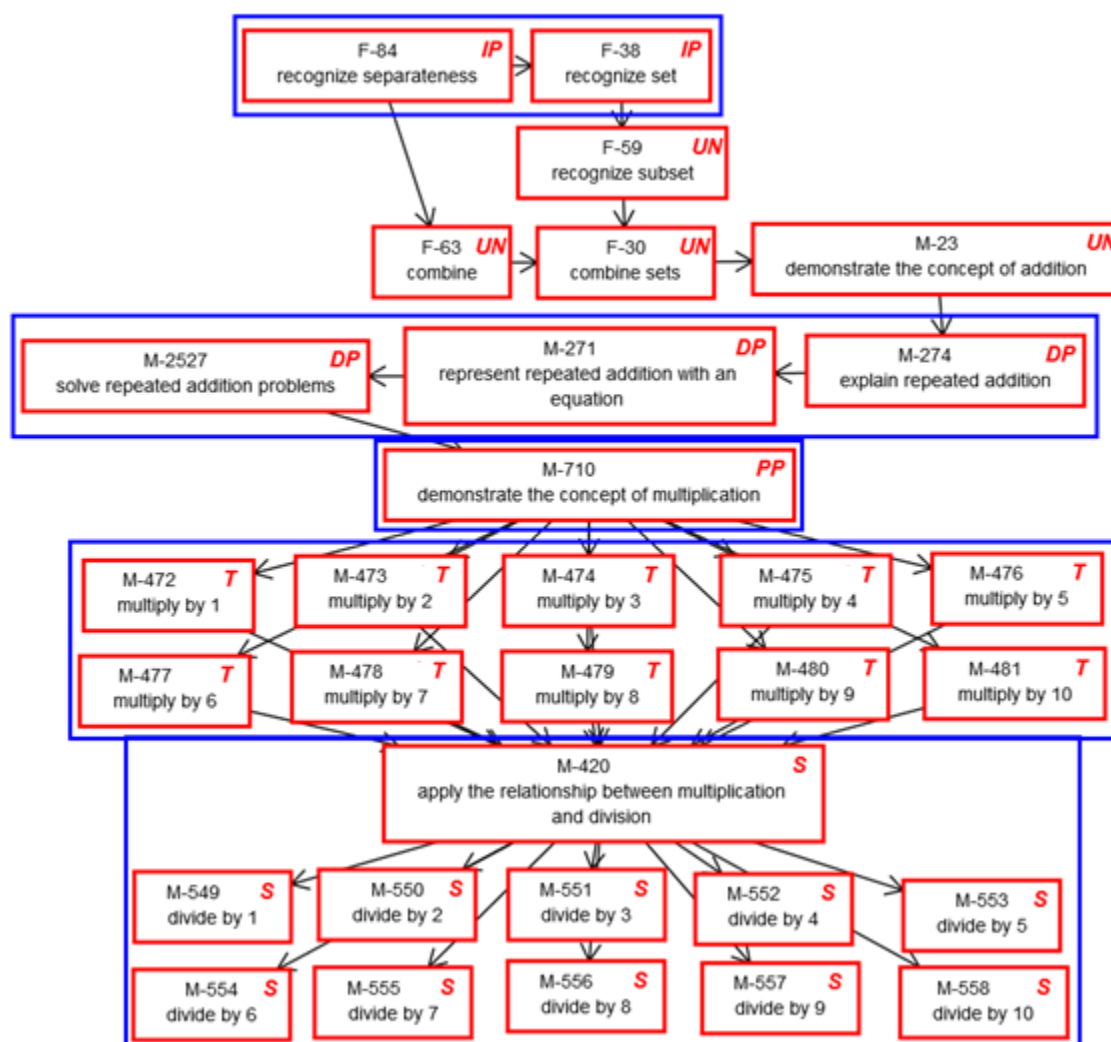
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**M.EE.7.NS.2.a** Solve multiplication problems with products to 100



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### MATH: GRADE 7

### M.EE.7.NS.2.B

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.NS.2.b</b> 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	<b>M.EE.7.NS.2.b</b> Solve division problems with divisors up to five and also with a divisor of 10 without remainders	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Recognize subset</li> <li>Recognize set</li> <li>Recognize separateness</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Solve repeated subtraction problems</li> <li>Represent repeated subtraction with an equation</li> <li>Explain repeated subtraction</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Demonstrate the concept of division</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Divide by 1, 2, 3, 4, 5, and/or 10</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Explain the relationship between multiplication and division</li> </ul>

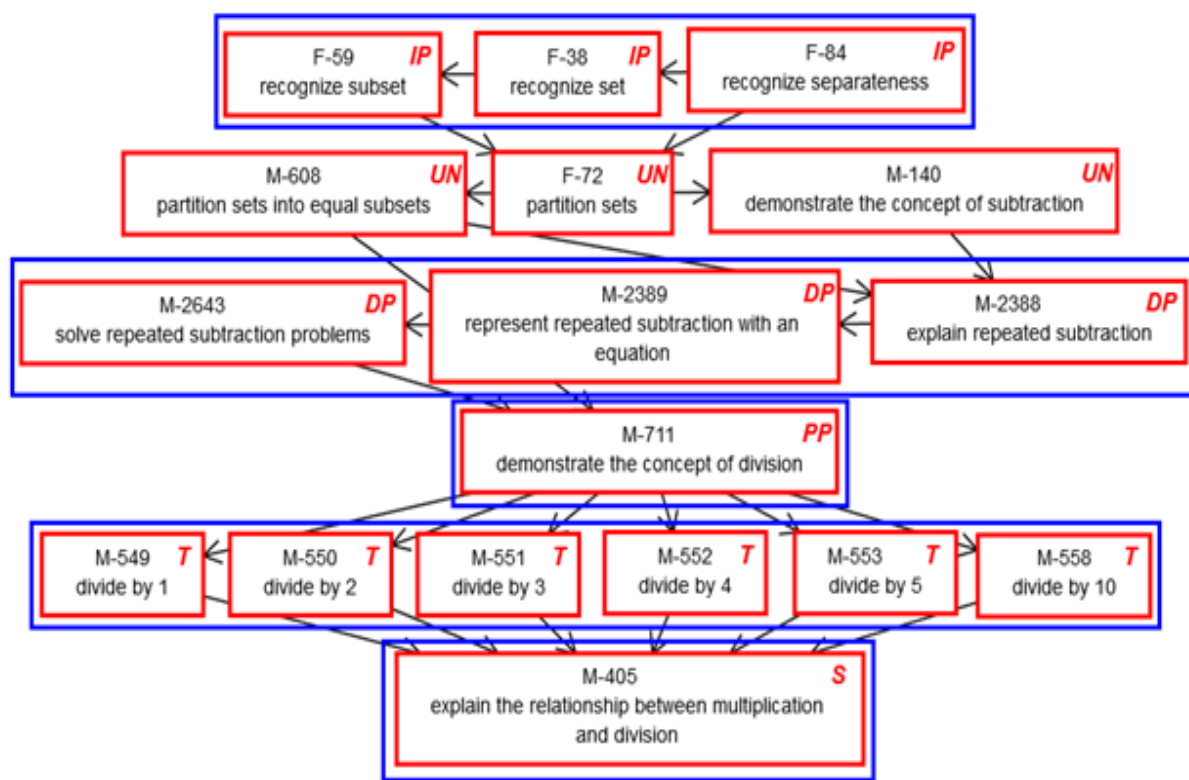
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**M.EE.7.NS.2.b** Solve division problems with divisors up to five and also with a divisor of 10 without remainders



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### MATH: GRADE 7

### M.EE.7.G.1

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.G.1</b> 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	<b>M.EE.7.G.1</b> Match two similar geometric shapes that are proportional in size and in the same orientation	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Attend</li> <li>Notice what is new</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize same</li> <li>Recognize different</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Match the same two-dimensional shape with same size and same orientation</li> <li>Match the same three-dimensional shapes with same size and same orientation</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Match the same two-dimensional shape with different sizes and same orientation</li> <li>Match the same three-dimensional shapes with different size and same orientation</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Match the same two-dimensional shapes with different size and different orientation</li> <li>Match the same three-dimensional shapes with different size and different orientation</li> </ul>

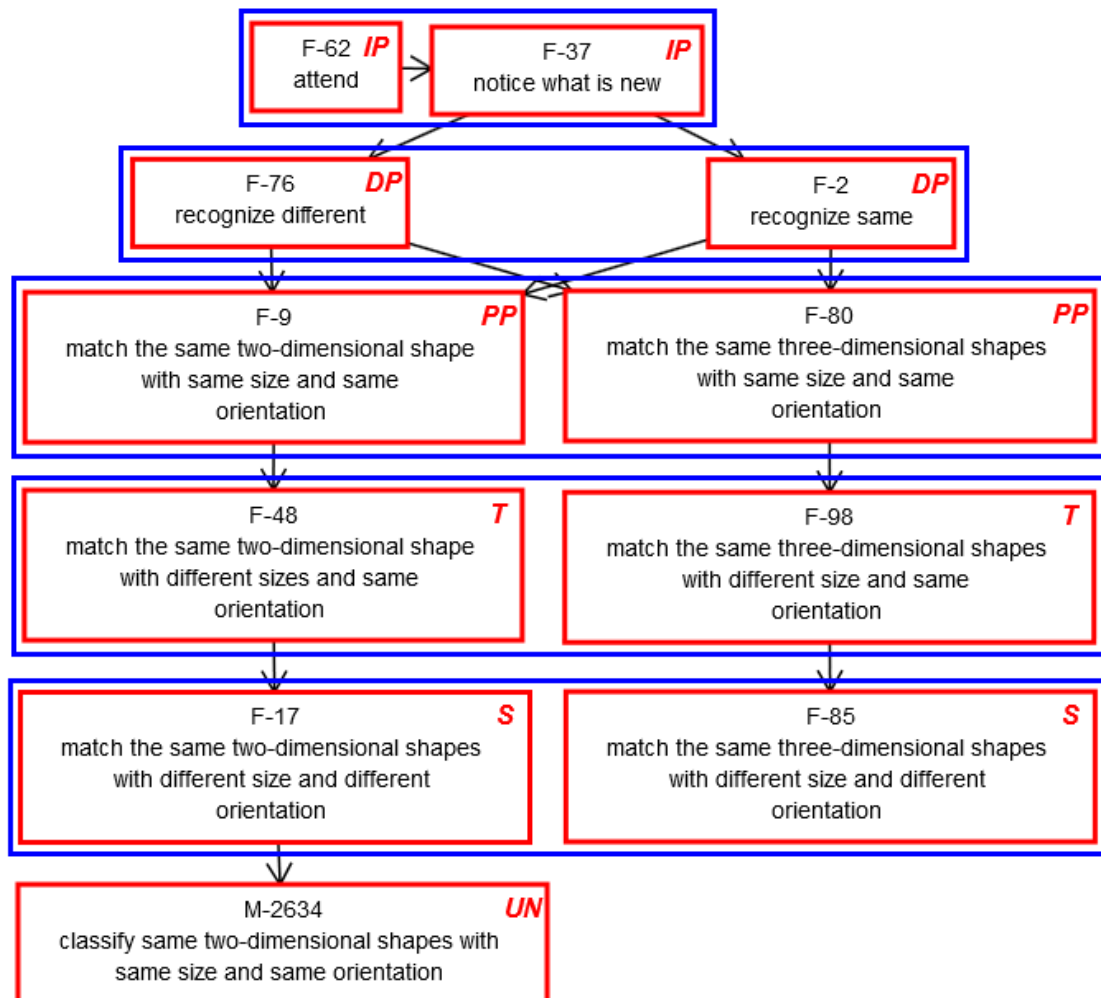
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**M.EE.7.G.1** Match two similar geometric shapes that are proportional in size and in the same orientation



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### MATH: GRADE 7

### M.EE.7.G.2

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.G.2</b> 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	<b>M.EE.7.G.2</b> Recognize geometric shapes with given conditions	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Recognize same</li> <li>Recognize different</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize squares</li> <li>Recognize circles</li> <li>Recognize triangles</li> <li>Recognize rectangles</li> <li>Recognize cubes</li> <li>Recognize cones</li> <li>Recognize cylinders</li> <li>Recognize spheres</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Describe attributes of shapes</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Recognize shapes with specified attributes</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Classify shapes with specified attributes</li> </ul>

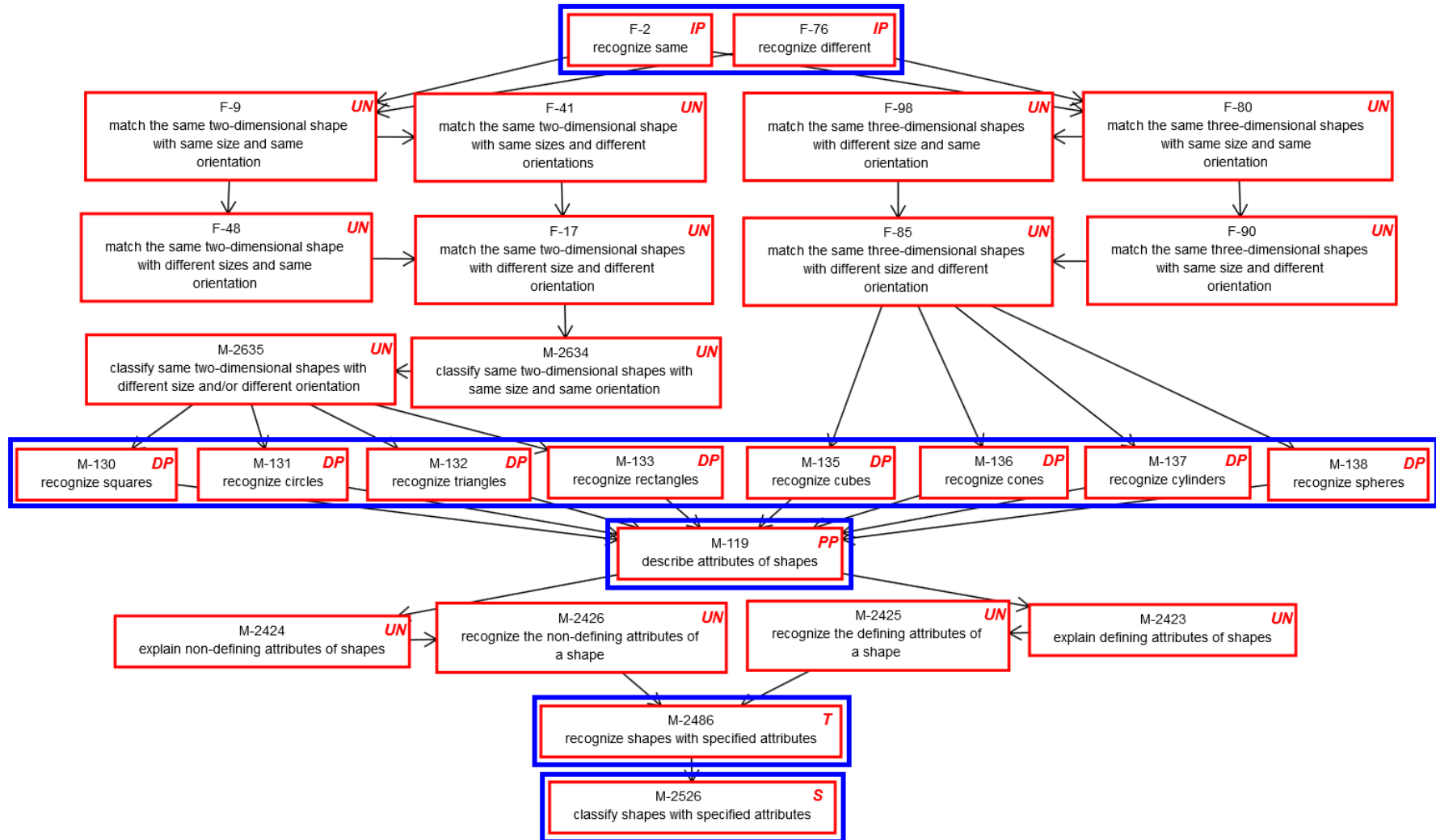
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## M.EE.7.G.2 Recognize geometric shapes with given conditions





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### MATH: GRADE 7

### M.EE.7.G.5

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.G.5</b> 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	<b>M.EE.7.G.5</b> Recognize angles that are acute, obtuse, and right	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Recognize attribute values</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize line</li> <li>Recognize point</li> <li>Recognize ray</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize angle</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Recognize obtuse angles</li> <li>Recognize acute angles</li> <li>Recognize right angles</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Compare angles to a right angle</li> </ul>

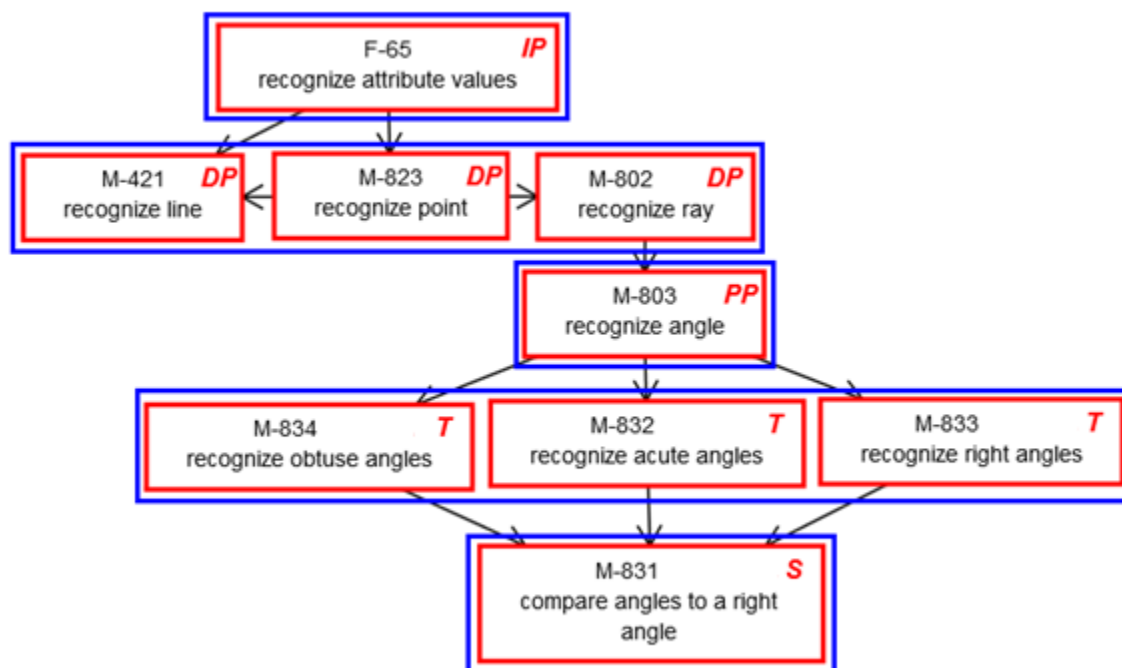
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**M.EE.7.G.5** Recognize angles that are acute, obtuse, and right



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### MATH: GRADE 7

### M.EE.7.G.4

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.G.4</b> 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	<b>M.EE.7.G.4</b> Determine the perimeter of a rectangle by adding the measures of the sides	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Recognize attribute values</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Describe measurable attributes</li> <li>Recognize measurable attributes</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Explain length</li> <li>Explain perimeter</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Calculate the perimeter of a rectangle by counting unit lengths on a grid</li> <li>Calculate perimeter by adding all the side lengths</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Use coordinates to calculate perimeters of polygons</li> </ul>

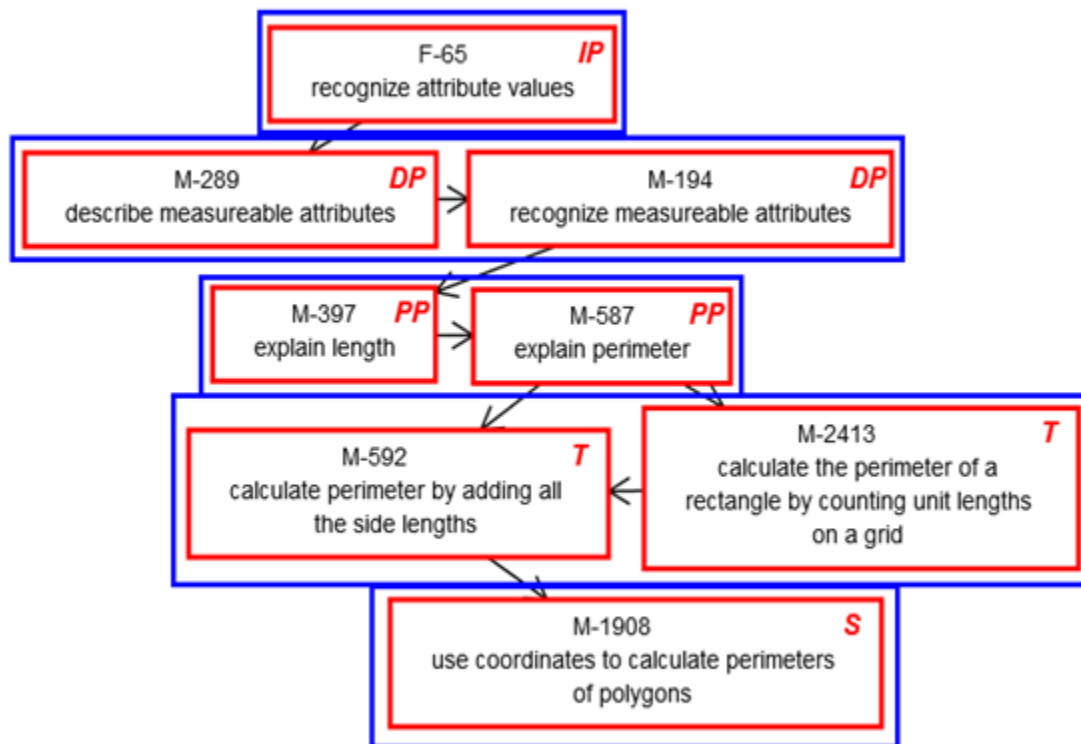
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**M.EE.7.G.4** Determine the perimeter of a rectangle by adding the measures of the sides



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### MATH: GRADE 7

### M.EE.7.SP.3

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.SP.3</b> 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	<b>M.EE.7.SP.3</b> Compare two sets of data within a single data display such as picture graph, line plot, or bar graph	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Classify</li> <li>Order objects</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize the structure of a bar graph</li> <li>Recognize the structure of a line plot (dot plot)</li> <li>Recognize the structure of a picture graph</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize peaks in data distribution</li> <li>Recognize symmetric distribution</li> <li>Recognize outliers</li> <li>Recognize variability in a data set</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Use visual overlap of two sets of data to compare variability of two populations</li> <li>Compare differences in shape of 2 or more sets of data</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Draw inferences by comparing two data sets</li> </ul>

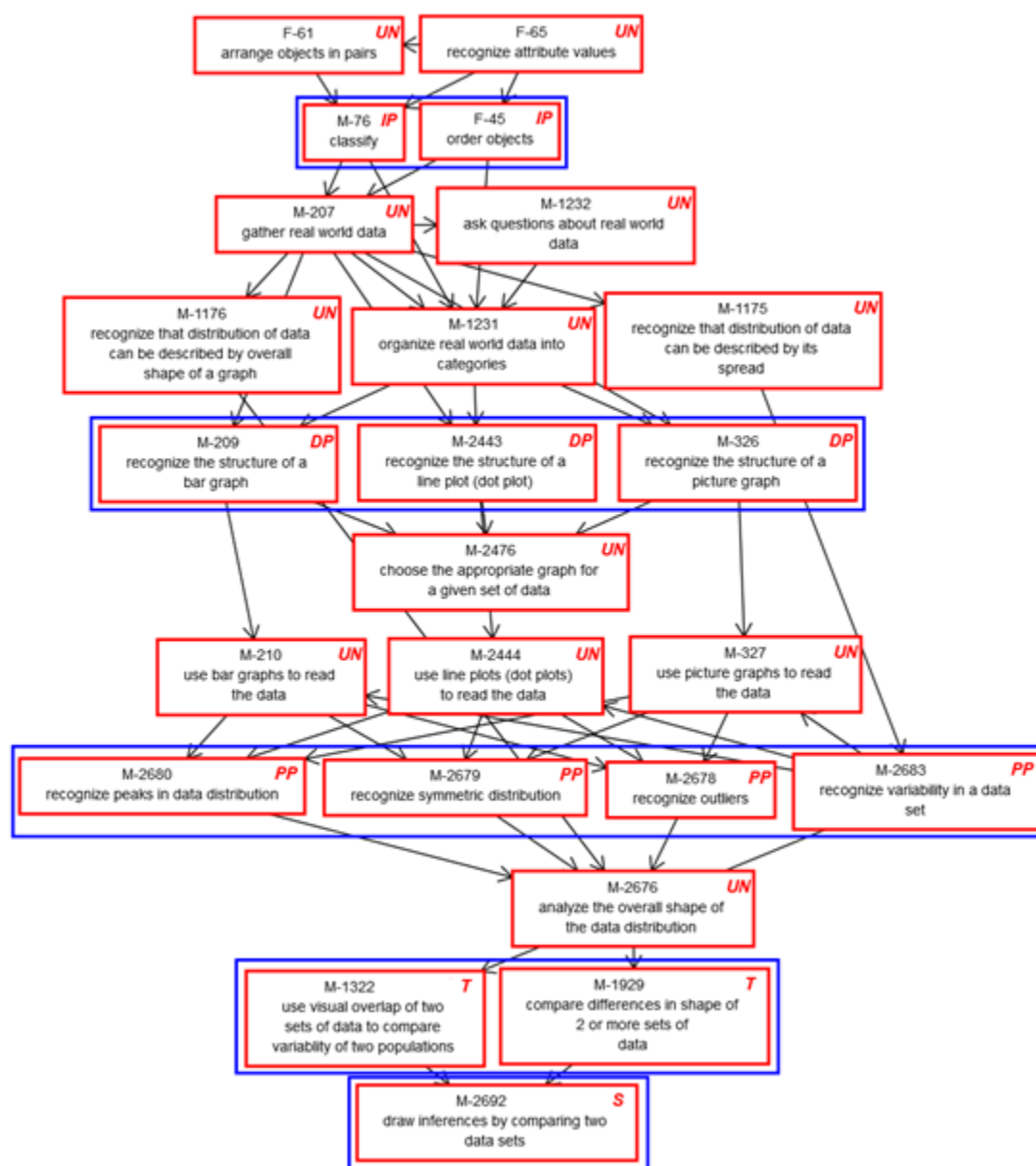
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**M.EE.7.SP.3** Compare two sets of data within a single data display such as picture graph, line plot, or bar graph



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### MATH: GRADE 7

### M.EE.7.SP.5-7

Grade-Level Standard	DLM Essential Element	Linkage Levels
<p><b>M.7.SP.5</b> 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; <b>M.7.SP.6</b> 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; <b>M.7.SP.7</b> 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</p>	<p><b>M.EE.7.SP.5-7</b> Describe the probability of events occurring as possible or impossible</p>	<p><b>Initial Precursor:</b></p> <ul style="list-style-type: none"> <li>Recognize attribute values</li> </ul> <p><b>Distal Precursor:</b></p> <ul style="list-style-type: none"> <li>Classify</li> </ul> <p><b>Proximal Precursor:</b></p> <ul style="list-style-type: none"> <li>Recognize outcomes of an event</li> </ul> <p><b>Target:</b></p> <ul style="list-style-type: none"> <li>Classify events as possible or impossible</li> </ul> <p><b>Successor:</b></p> <ul style="list-style-type: none"> <li>Recognize probability as the likelihood of an event</li> </ul>

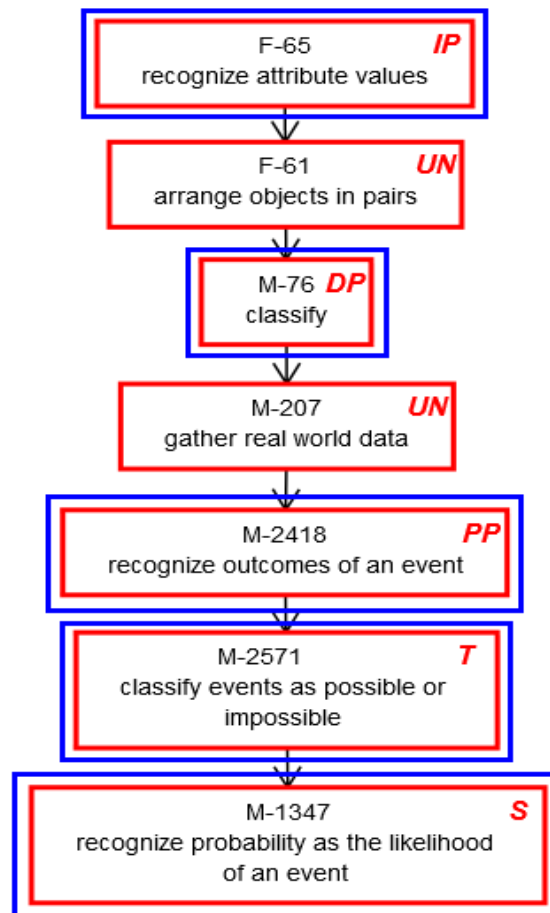
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**M.EE.7.SP.5-7** Describe the probability of events occurring as possible or impossible





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### MATH: GRADE 7

#### M.EE.7.EE.1

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.EE.1</b> Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients	<b>M.EE.7.EE.1</b> Use the properties of operations as strategies to demonstrate that expressions are equivalent	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>• Partition sets</li> <li>• Combine sets</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>• Model associativity of multiplication</li> <li>• Model additive commutativity</li> <li>• Model associativity of addition</li> <li>• Model multiplicative commutativity</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>• Apply the associative property of multiplication</li> <li>• Apply commutative property of addition</li> <li>• Apply associative property of addition</li> <li>• Apply the commutative property of multiplication</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>• Use properties of operations to generate equivalent expressions involving subtraction</li> <li>• Use properties of operations to generate equivalent expressions involving addition</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>• Use equivalent expressions in real-world context</li> </ul>

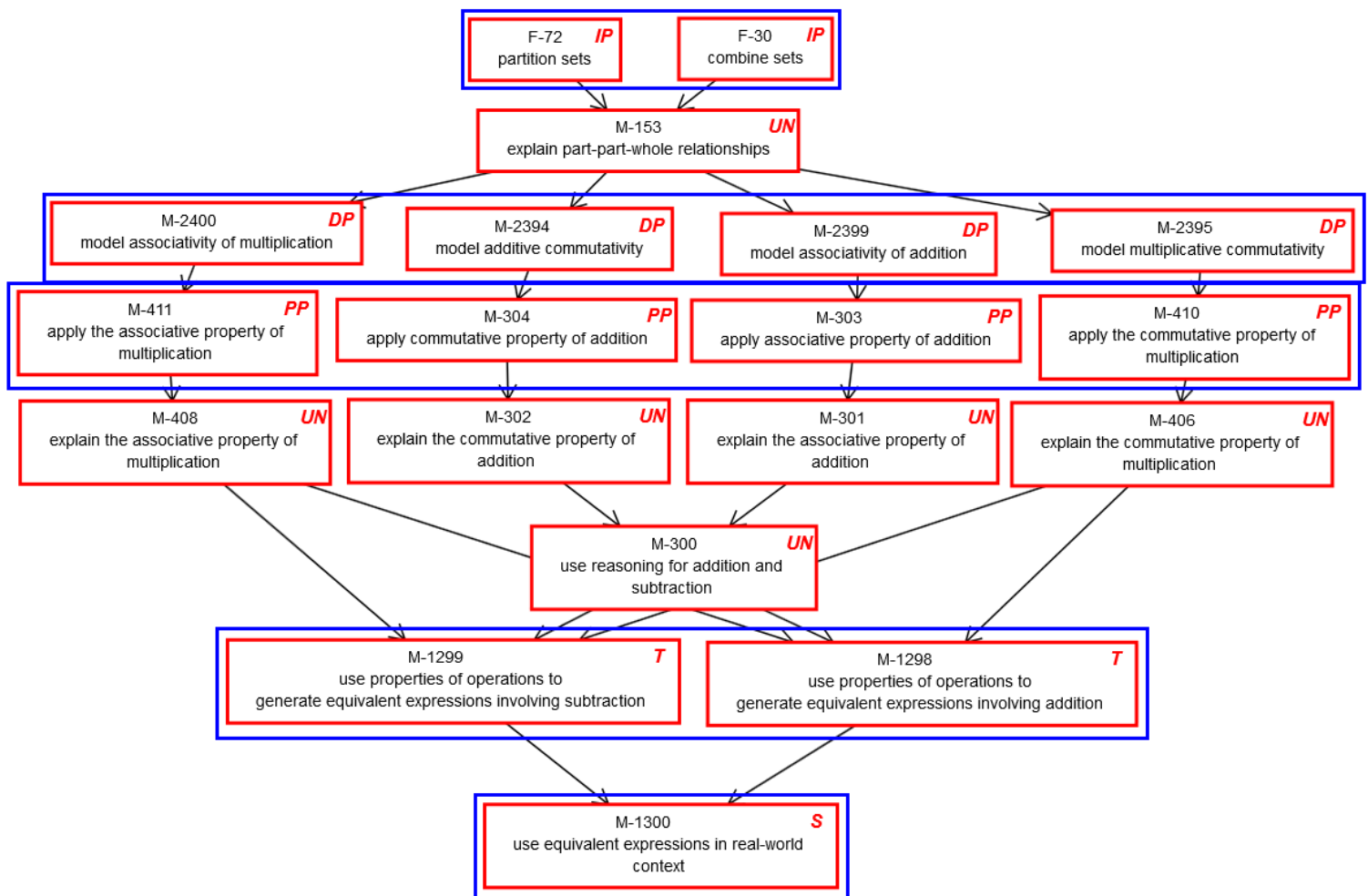
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A diagram showing the relationship of nodes in the mini-map appears below.

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.EE.1** Use the properties of operations as strategies to demonstrate that expressions are equivalent



## ESSENTIAL ELEMENT, LINKAGE LEVELS, AND MINI-MAP

### MATH: GRADE 7

### M.EE.7.EE.2

Grade-Level Standard	DLM Essential Element	Linkage Levels
<b>M.7.EE.2</b> 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."	<b>M.EE.7.EE.2</b> Identify an arithmetic sequence of whole numbers with a whole number common difference	<b>Initial Precursor:</b> <ul style="list-style-type: none"> <li>Classify</li> <li>Contrast objects</li> <li>Order objects</li> </ul> <b>Distal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize symbolic patterns</li> <li>Recognize sequence</li> </ul> <b>Proximal Precursor:</b> <ul style="list-style-type: none"> <li>Recognize growing patterns</li> <li>Recognize shrinking patterns</li> </ul> <b>Target:</b> <ul style="list-style-type: none"> <li>Recognize arithmetic sequences</li> </ul> <b>Successor:</b> <ul style="list-style-type: none"> <li>Recognize the recursive rule for arithmetic sequences</li> </ul>

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

