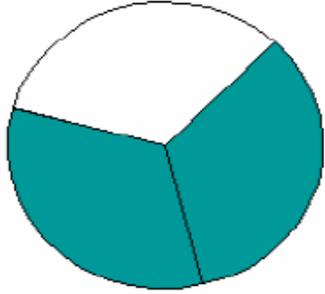


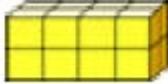
Grade Span Expectations (AAGSEs) Rhode Island Alternate Assessment

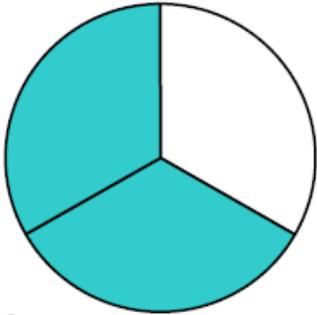
Mathematics Resource Materials *Definitions and Examples for Grades K-12*

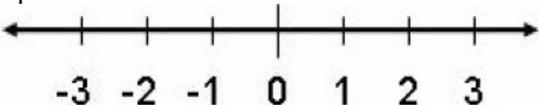
- ◆ Numbers and Operations: pp. 2-6
- ◆ Geometry and Measurement: pp. 7-12
- ◆ Data, Statistics, and Probability: pp. 13-15
- ◆ Functions and Algebra: pp. 16-19
- ◆ References: pp. 20-21

Numbers and Operations

Glossary Term	Definition
Additive identity	If zero is added to any number the results (sum) is the original number for any number a , $a + 0 = a$ (e. g., $6 + 0 = 6$).
Area model	<p>An area model is a continuous region used to show part to whole relationships. Example:</p> <div style="text-align: center;">  </div> <p>The <i>area model</i> shows $\frac{2}{3}$ of the whole shaded.</p>
Associative property for addition	When adding three (or more) numbers, it does not matter whether the first pair or the last pair is added first (e.g., $(3 + 5) + 2 = 3 + (5 + 2)$).
Cardinality	<p>After completion of counting, understanding that the last count word in a set indicates the amount of the set. Example:</p> <div style="text-align: center;">  </div> <p>Count 1, 2, 3, 4</p> <p>The <i>cardinality</i> of this set is 4.</p>
Commutative property of addition	The order of adding two numbers does not affect their sum (e.g., $3 + 5 = 5 + 3$).
Composition of numbers (composing)	A whole number can be composed by adding two or more numbers (e.g., $3 + 5 = 8$; $6 + 2 = 8$; $2 + 2 + 4 = 8$).

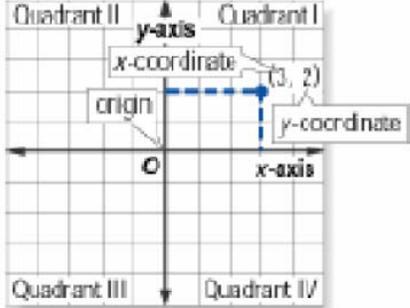
Glossary Term	Definition
Concrete materials	<p>Any of various objects designed to be moved or arranged by hand as a means of developing motor skills or understanding abstractions (e.g., concrete manipulative materials, cubes).</p> <p>Example:</p> 
Congruent	See Geometry and Measure
Counting-on and counting-down or up strategies	<p><i>Counting-on strategies:</i> Counting two parts of a whole starting with the first part and “counting on” to the next part. (e.g., start at 12 and count on 3).</p> <p><i>Counting-down strategies:</i> Counting back from a target number (e.g., start with 12 and count back by 3).</p>
Decimal	<ul style="list-style-type: none"> • Decimal system – a number system based on 10. • Decimal point – a point between a whole number and a decimal fraction. • Decimal fraction – a fraction written as a decimal. <p style="text-align: center;">Example: $\frac{1}{4}$</p> <p style="text-align: center;">decimal fraction = 0.25</p>
Decomposition of numbers (decomposing)	Demonstrating understanding of whole numbers using decomposition means that a whole number can be decomposed into multiple addends (e.g., $8 = 3 + 5$; $8 = 6 + 2$; $8 = 2 + 2 + 4$).

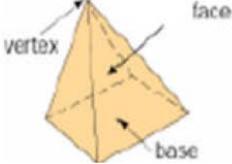
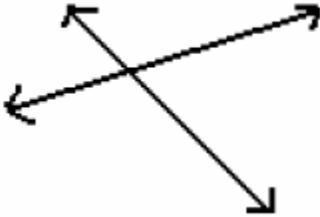
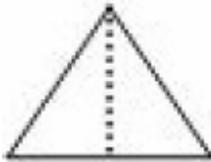
Glossary Term	Definition
Direct model	Modeling the actions in an addition or subtraction situation step by step using manipulatives or drawing pictures. (e.g., drawing pictures of 12 pencils and then crossing out 4 to represent a story problem of 12 pencils subtract 4 pencils).
Discrete (set) model	Finite or countable models in a set. <div style="text-align: center;">  </div> This is a discrete model because there are four triangles counted in the set.
Expanded notation	In expanded notation a number is represented by the sum of the values of each digit in the number. Example: $367 = 300 + 60 + 7$
Field properties	Communicative and associative of addition and multiplication; additive identity; and multiplicative identity
Fraction	A number in the form of a $\frac{a}{b}$ where a is called the numerator and b is called the denominator. (The denominator cannot be 0.) One use for fractions is to name part of a whole or part of a collection. Example: <div style="text-align: center;">  </div> $\frac{2}{3}$ 2 is the numerator and 3 is the denominator. a b 2 3

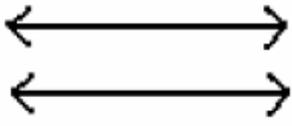
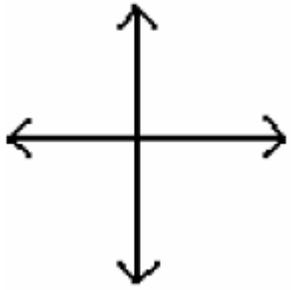
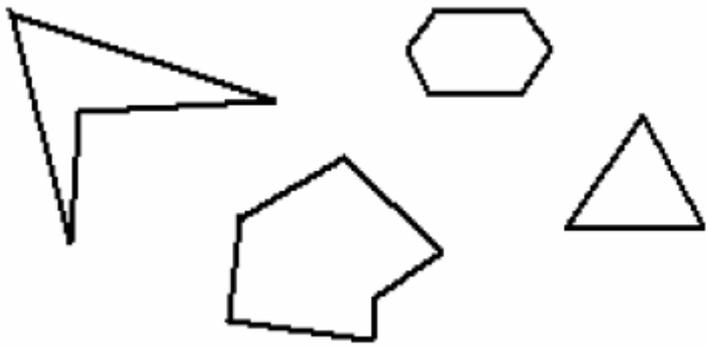
Glossary Term	Definition
Fractional Parts	A number where the numerator is greater than 0 and less than the denominator and the number of parts in the whole is equal to the denominator, e.g., $\frac{1}{2}$.
Hypothesis	A tentative theory used to guide an investigation.
Larger number principle	The later a number word appears in the counting sequence, the larger the collection it represents (e.g., a collection of 33 is larger than 27 because 33 appears after 27 in the counting sequence).
Number conservation	<p>Recognize equivalent collections of items despite appearances (e.g., use different age appropriate items for comparison of quantity). Example:</p>  <p>Using <i>number conservation</i>, the group of bears and group of ladybugs are equivalent.</p>
Number line	<p>A number line is a line where every real number corresponds to a unique point on the line. Thus, if two numbers correspond to the same point on the line the numbers are equivalent.</p> 
Ordinal number	Numbers that show place or position (first, second third...to tenth, e.g., identifies first person in line.
Percent	<p>Percent is a term meaning per hundred and denoted with a % symbol.</p> <p>Example:</p> $9\% = \frac{9}{100} = 0.09$

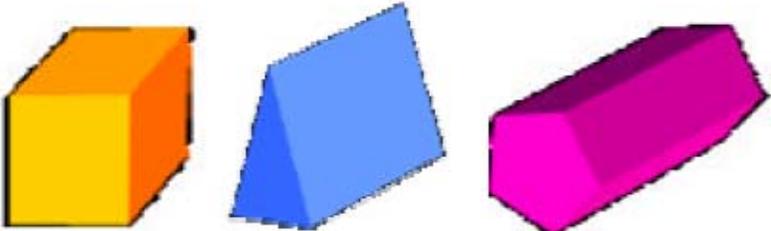
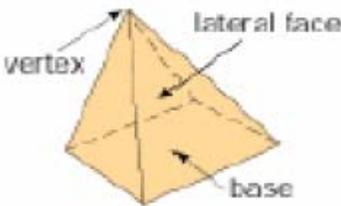
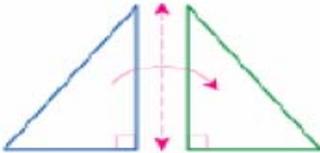
Glossary Term	Definition
Product	Answer to a multiplication item
Quotient	Answer to a division item
Rational number	<p>A real number that can be written as:</p> <ul style="list-style-type: none"> ○ a ratio of two integers (fraction), excluding zero as a denominator, ○ a repeating or terminating decimal, or ○ an integer. <p>Example: negative and positive numbers zero repeating or terminating decimals fractions</p>
Semi-concrete representation	Any of various visual representations designed to solve problems (e.g., pictorial representations, hundreds' chart, number line).
Unitizing	<p>Standard grouping of a specified number (ones, tens) used to represent quantities.</p> <p>Example:</p> <div style="text-align: center;">  </div> <p>Unitizing means that we call this base ten block “one ten”. This “one ten” is also equal to “ten ones”.</p>
Whole number	A counting number from one to infinity plus zero.

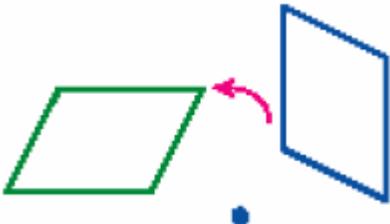
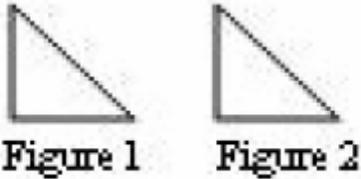
Geometry and Measurement

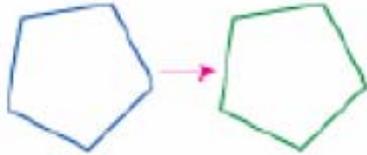
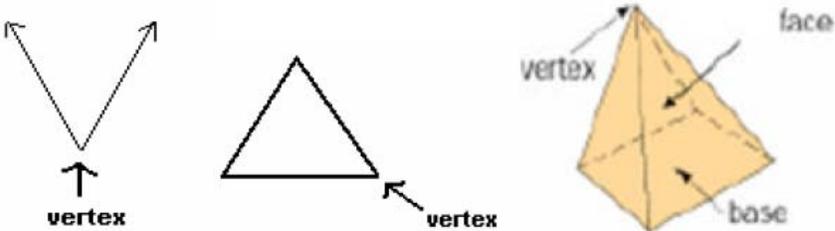
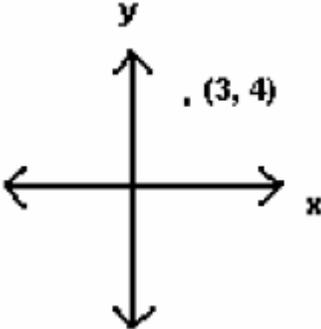
Glossary Term	Definition
Array	<p>An arrangement in rows and columns.</p> <p>Example:</p> 
Base	The faces on the top and bottom of a three-dimensional figure.
Circle	A set of points equidistant from a given point.
Concrete shape	Any of various shapes designed to be moved or arranged by hand as a means of developing motor skills or understanding abstractions. (e.g., pattern blocks)
Congruent figures	<p>Figures that have the same shape and same size.</p> <p>Example:</p>  <p>These two shapes are congruent figures.</p>
Coordinate labels	<p>Coordinates are written as order pairs to give the exact location of a point, object on a grid, Cartesian plane or map.</p> <p>Example:</p>  <p>The coordinate labels of this Cartesian plane are (3, 2).</p>
Coordinate reference system	A system that uses coordinates to establish position.

Glossary Term	Definition
Decomposition of shapes	To take apart or to take apart into separate components (e.g., taking apart 2-D shapes to make new shapes).
Face	Flat sides (surface) found on a three-dimensional figure. Example: 
Faces of a prism	The flat sides (surfaces) that make up a prism.
Flip	A geometric transformation, to turn over (a mirrored image). Example:  <p style="text-align: center;">Figure 1 Figure 2</p> Figure 2 represents the <i>flip</i> of Figure 1.
Geoblocks	Three-dimensional blocks used to explain geometry concepts.
Intersecting lines	Lines that meet or cross.  <p style="text-align: center;">These are <i>intersecting</i> lines.</p>
Line symmetry	Figures that match exactly when folded in half have line symmetry. Example:  <p style="text-align: center;">The dotted line denotes the <i>line symmetry</i> of this triangle.</p>

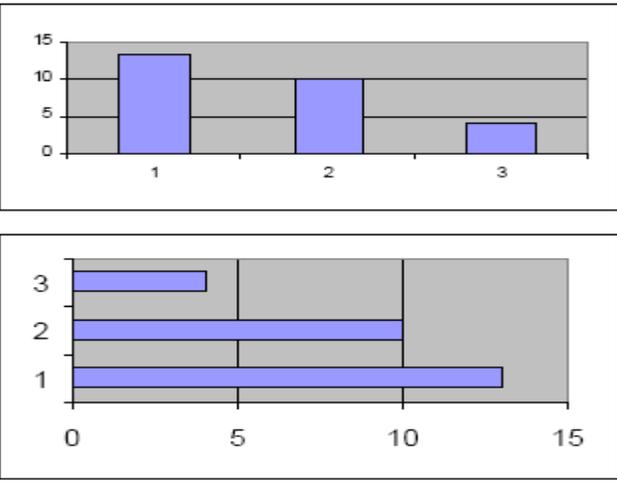
Glossary Term	Definition
Orientation	A relative position in which a shape or object is presented.
Parallel lines	<p>Lines that never meet or cross each other, no matter how far extended.</p> <p>Example:</p> <div data-bbox="922 394 1214 520" style="text-align: center;">  </div> <p>These are <i>parallel</i> lines.</p>
Perpendicular lines	<p>Lines that meet to form right angles.</p> <div data-bbox="922 657 1214 947" style="text-align: center;">  </div> <p>These are <i>perpendicular</i> lines.</p>
Polygon	<p>A closed figure on a flat surface that is made up of line segments joined end to end. The line segments of a <i>polygon</i> may not cross.</p> <p>Examples:</p> <div data-bbox="711 1150 1417 1497" style="text-align: center;">  </div>

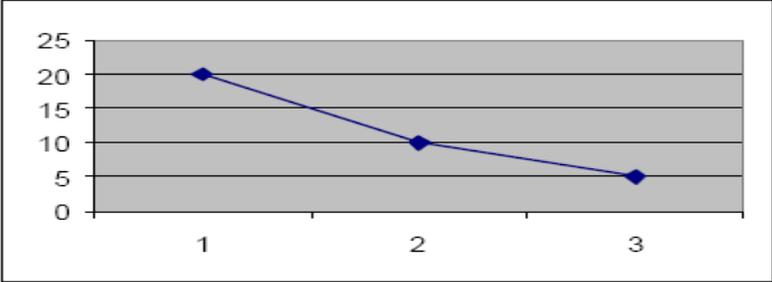
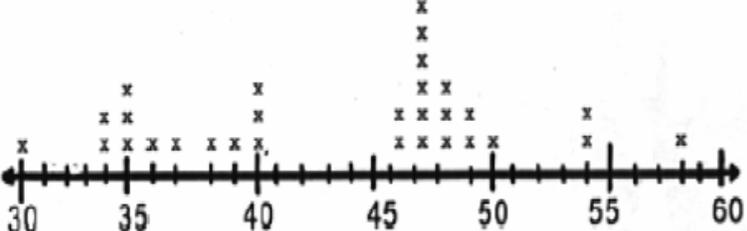
Glossary Term	Definition
<p>Polyhedron</p>	<p>A geometric solid whose surfaces, or faces, are all formed by polygons. Examples:</p> 
<p>Prism</p>	<p>A solid, three-dimensional shape with two identical, parallel bases on which all other faces are parallelograms. Prisms get their names from their bases. (e.g., if a prism has bases that are triangles it is called a <i>triangular prism</i>). Example:</p>  <p>This is a <i>triangular prism</i>.</p>
<p>Pyramid</p>	<p>A solid that has one base that is a polygon. All of the other sides, or faces, are triangles that come together at a point called the <i>vertex</i> or <i>apex</i>. Pyramids get their name from their bases (e.g., if a pyramid has a base that is a hexagon it is called a <i>hexagonal pyramid</i>). Example:</p>  <p>This is a <i>rectangular pyramid</i>.</p>
<p>Quick image</p>	<p>A brief image shown of a shape or object (e.g., draw a triangle after a “quick image” of a triangle is shown).</p>
<p>Reflection (flip)</p>	<p>A transformation in which a figure is flipped over a line. Example:</p> 

Glossary Term	Definition
Rotation	<p>A transformation in which a figure is turned around a fixed point. Example:</p> 
Semi-concrete shape	<p>Any of various pictorial representations designed to solve problems (e.g., paper pattern blocks).</p>
Similar shapes	<p>Two figures are similar if they have exactly the same shape, their angles are equal in size and sides of one figure are in proportion to the sides of the other. Example:</p>  <p>These two shapes are <i>similar</i>.</p>
Slide	<p>To move an object or item in any direction without rotating it. Example:</p>  <p>Figure 2 is called a <i>slide</i> from Figure 1.</p>
Standard units	<p>Units that are categorized as being part of the customary (inch, feet, yard etc.) and/or metric (millimeter, centimeter, meter etc.) systems.</p>
Transitivity	<p>The principle of transitivity allows for the logical deduction that if <i>object A</i> is the same length as <i>object B</i> and <i>object B</i> is the same length as <i>object C</i>, then <i>objects A and C</i> are the same length.</p>

Glossary Term	Definition
<p>Translation</p>	<p>A transformation in which a figure is slid in any direction. Example:</p> 
<p>Turn</p>	<p>To rotate around a point.</p>
<p>Unit iteration</p>	<p>The repetition of a single unit for a measurement (e.g., someone wishing to measure the length of a field with only a meter stick would need to use <i>unit iteration</i> by placing the stick end to end with no gaps to find the length).</p>
<p>Vertex</p>	<p>The point where the rays of an angle or the sides of a polygon or the edges of a polyhedron meet. Examples:</p> 
<p>X and Y axis</p>	<p>An X-axis is a horizontal reference from which we can uniquely define a point. A Y-axis is a vertical reference from which we can uniquely define a point. Example:</p>  <p>The 3 is on the horizontal <i>x-axis</i> and the 4 is on the vertical <i>y-axis</i>.</p>

Data, Statistics and Probability

Glossary Term	Definition						
Attributes	<p>A characteristic (e.g., sorting by color; <i>sorting game</i>).</p> <p>Example:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Shape</th> <th style="text-align: center;">Attributes</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">big, shaded circle</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">small, not shaded triangle</td> </tr> </tbody> </table>	Shape	Attributes		big, shaded circle		small, not shaded triangle
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	big, shaded circle						
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Bar graph	<p>A graph that uses horizontal or vertical bars to represent numbers in the data.</p> <p>Example:</p> <div style="text-align: center;">  </div>						
Certain	<p>An event that will always happen (e.g., drop a rock in water, and it will sink).</p>						

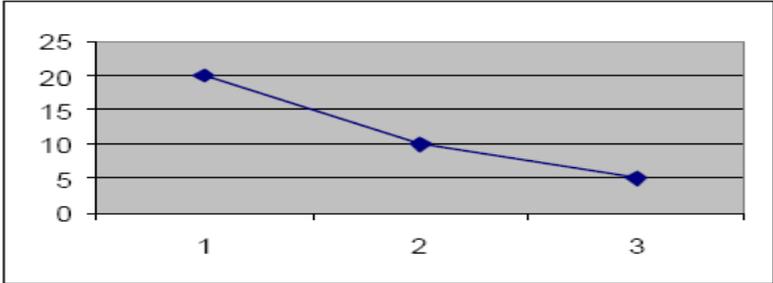
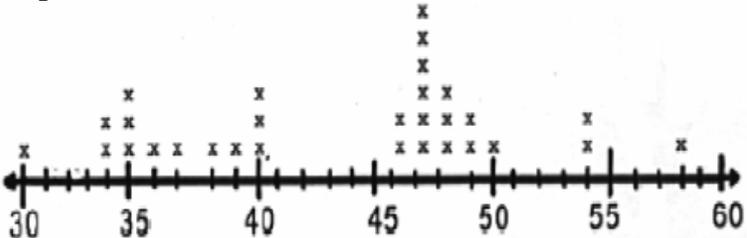
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Line graph	<p>A graph that uses line segments to connect data points which represent data. Line graphs are often used to show how something has changed over a period of time.</p> <p>Example:</p>  <table border="1" data-bbox="623 667 1395 949"> <caption>Data for Line Graph Example</caption> <thead> <tr> <th>x-axis value</th> <th>y-axis value</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20</td> </tr> <tr> <td>2</td> <td>10</td> </tr> <tr> <td>3</td> <td>5</td> </tr> </tbody> </table>	x-axis value	y-axis value	1	20	2	10	3	5																																
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Glossary Term	Definition
Mode	Number in a set that occurs most often
Not likely/unlikely	Something that will probably not happen.
Possible	An event that has a chance of happening.
Sample space	Set of all outcomes possible outcomes for an experiment (e.g., 1, 2, 3, 4, 5, 6 are the sample space for rolling a single die.)
Table	Mathematical information organized in columns and rows.
Tree diagram	A strategy used for identifying combinations or as a general counting technique for solving problems.
Unlikely	Not apt to produce a desired outcome.

Functions and Algebra

Glossary Term	Definition
Constant rate of a pattern	A pattern that continues with a fixed value (e.g., $\Delta \Delta\Delta \Delta\Delta\Delta \Delta\Delta\Delta\Delta$, each successive element grows by one triangle).
Core unit of a repeating pattern	The shortest string of elements that repeats (e.g., x, o, x, o, x, the xo is the core unit of this pattern).
Concrete representation	Any of various objects designed to be moved or arranged by hand as a means of developing motor skills or understanding abstractions (e.g., blue-red cubes; making “trains” or “towers” with two colors of snap cubes).
Element to a pattern	Each member in a pattern (e.g., given the first five elements in a pattern the student can tell what the seventh element will be).
Equality	A statement, usually an equation, that one thing equals another.
Equation	A mathematical sentence where the left side of the equals sign has the same value as the right side. (e.g., $6 + 4 = 10$)
Equivalence representation	Representations that are equal.
Expression	A mathematical combination made from mathematical symbols (e.g., one side of an equation is also an expression, $6 + 4$).
Extend a pattern	To continue and lengthen a pattern.
Geometric elements	Elements of a pattern that are geometric.
Number sentence	A mathematical sentence written in numerals and mathematical symbols (e.g., $2 \times 5 = 10$).
Numeric element	Elements of a pattern that are numbers.
Open sentence	A mathematical statement with one or more variables (e.g., $2 + ? = 7$).
Pattern (Repeating)	A pattern with a cyclic structure (e.g., (A, B) pattern (blue-red, blue-red) or (A, B, C) pattern (blue-red-green, blue-red-green)).
Pattern (Growing)	Patterns that involve a progression from step to step. Example: $\begin{array}{cccc} ? & ?? & ??? & ??? \\ \textit{Step 1} & \textit{Step 2} & \textit{Step 3} & \textit{Step 4} \end{array}$ This pattern is <i>growing</i> by one in each step.

Glossary Term	Definition
Pattern (Numeric)	A pattern arranged according to rule using numbers (e.g., counting by ones, twos, etc.).
Pattern (Geometric)	A pattern arranged according to rule using geometric shapes. Example: ? ? ? ? ? ?
Qualitative term	A characteristic of something (e.g., identifying something as taller, colder, darker or heavier with a general observation).
Quantitative term	A measurement of something (e.g., identifying how much taller, colder or heavier by measuring or weighing.).
Semi-concrete Representation	Any of various visual representations designed to solve problems (e.g., 100's chart, repeating pattern on paper).
Successive element	A member of a set/pattern following one after the other without any interruptions (e.g., Δ $\Delta\Delta$ $\Delta\Delta\Delta$ $\Delta\Delta\Delta\Delta$, each successive element grows by one triangle).

Glossary Term	Definition
Equally likely	Events (such as the outcomes of an experiment) that have the same chance of occurring (e.g., a spinner that is divided into three equal parts has an <i>equally likely</i> chance of land on any of the three parts).
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References for the Rhode Island Alternate Assessment Grade Span Expectations (AAGSEs) in Mathematics Resource Materials

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