

Correlation of Alberta Program of Studies with Mathology Grade 4 (Number)

| Curriculum Expectations | Grade 4 Mathology.ca | Pearson Canada Grades 4-6 Mathematics Learning Progression |
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| General Outcome Develop number sense. | | |
| Specific Outcomes 1. Represent and describe whole numbers to 10 000, pictorially and symbolically. | Number Unit 1: Number Relationships and Place Value 1: Representing Numbers to 10 000 2: Composing and Decomposing Larger Numbers 6: Consolidation of Number Relationships and Place Value | Big Idea: Numbers are related in many ways. Decomposing and composing numbers to investigate equivalencies - Composes and decomposes whole numbers using standard and non-standard partitioning (e.g., 1000 is 10 hundreds or 100 tens). Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units. Unitizing quantities into base-ten units - Writes and reads whole numbers in multiple forms (e.g., 1358; one thousand three hundred fifty-eight; $1000 + 300 + 50 + 8$). - Understands that the value of a digit is ten times the value of the same digit one place to the right. |
| 2. Compare and order numbers to 10 000. | Number Unit 1: Number Relationships and Place Value 4: Comparing and Ordering Numbers 6: Consolidation of Number Relationships and Place Value | Big Idea: Numbers are related in many ways. Comparing and ordering quantities (multitude or magnitude) - Compares, orders, and locates whole numbers based on place-value understanding and records using $<$, $=$, $>$ symbols. |
| 3. Demonstrate an understanding of addition of numbers with answers to 10 000 and their corresponding subtractions (limited to 3- and 4-digit numerals) by: <ul style="list-style-type: none"> • using personal strategies for adding and subtracting • estimating sums and differences • solving problems involving addition and subtraction. | Number Unit 2: Fluency with Addition and Subtraction 7: Estimating Sums and Differences 8: Modelling Addition and Subtraction 9: Adding and Subtracting Larger Numbers 10: Using Mental Math to Add and Subtract | Big Idea: Quantities and numbers can be operated on to determine how many and how much. Investigating number and arithmetic properties - Recognizes and generates equivalent numerical expressions using commutative and associative properties. - Understands operation relationships (e.g., inverse relationship between multiplication/division, addition/subtraction). |

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| | <p>11: Creating and Solving Problems</p> <p>12: Consolidation of Fluency with Addition and Subtraction</p> | <p>- Understands the identity of operations (e.g., $5 + 0 = 5$; $7 \times 1 = 7$).</p> <p>Developing conceptual meaning of operations</p> <p>- Models and develops meaning for whole number computation to four digits.</p> <p>Developing fluency of operations</p> <p>- Estimates the result of whole number operations using contextually relevant strategies (e.g., How many buses are needed to take the Grade 8 classes to the museum?).</p> <p>- Solves whole number computation using efficient strategies (e.g., mental computation, algorithms, calculating cost of transactions and change owing, saving money to make a purchase).</p> |
| <p>4. Apply the properties of 0 and 1 for multiplication and the property of 1 for division.</p> | <p>Number Unit 5: Fluency with Multiplication and Division Facts</p> <p>24: Strategies for Multiplication</p> <p>27: Strategies for Division</p> <p>29: Consolidation of Fluency with Multiplication and Division Facts</p> | <p>Big Idea: Quantities and numbers can be operated on to determine how many and how much.</p> <p>Investigating number and arithmetic properties</p> <p>- Understands the identity of operations (e.g., $5 + 0 = 5$; $7 \times 1 = 7$).</p> |
| <p>5. Describe and apply mental mathematics strategies to determine basic multiplication facts to 9×9 and related division facts.</p> | <p>Number Unit 5: Fluency with Multiplication and Division Facts</p> <p>24: Strategies for Multiplication</p> <p>25: Solving Multiplication Problems</p> <p>26: Relating Multiplication and Division</p> <p>27: Strategies for Division</p> <p>29: Consolidation of Fluency with Multiplication and Division Facts</p> <p>Patterning Unit 1: Patterns and Relations</p> <p>4: Investigating Number Relationships</p> | <p>Big Idea: Quantities and numbers can be operated on to determine how many and how much.</p> <p>Investigating number and arithmetic properties</p> <p>- Recognizes and generates equivalent numerical expressions using commutative and associative properties.</p> <p>- Understands operational relationships (e.g., inverse relationship between multiplication/division, addition/subtraction).</p> <p>Developing fluency of operations</p> <p>- Fluently recalls multiplication and division facts to 100.</p> |

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| <p>6. Demonstrate an understanding of multiplication (2- or 3-digit by 1-digit) to solve problems by:</p> <ul style="list-style-type: none"> • using personal strategies for multiplication with and without concrete materials • using arrays to represent multiplication • connecting concrete representations to symbolic representations • estimating products • applying the distributive property. | <p>Number Unit 6: Multiplying and Dividing Larger Numbers</p> <p>30: Exploring Strategies for Multiplying 31: Estimating Products 35: Consolidation of Multiplying and Dividing Larger Numbers</p> | <p>Big Idea: Quantities and numbers can be operated on to determine how many and how much.</p> <p>Developing conceptual meaning of operations</p> <ul style="list-style-type: none"> - Models and develops meaning for whole number computation to four digits. <p>Developing fluency of operations</p> <ul style="list-style-type: none"> - Estimates the result of whole number operations using contextually relevant strategies (e.g., How many buses are needed to take the Grade 8 classes to the museum?). - Solves whole number computation using efficient strategies (e.g., mental computation, algorithms, calculating cost of transactions and change owing, saving money to make a purchase). |
| <p>7. Demonstrate an understanding of division (1-digit divisor and up to 2-digit dividend) to solve problems by:</p> <ul style="list-style-type: none"> • using personal strategies for dividing with and without concrete materials • estimating quotients • relating division to multiplication. | <p>Number Unit 5: Fluency with Multiplication and Division Facts</p> <p>27: Strategies for Division 29: Consolidation of Fluency with Multiplication and Division Facts</p> <p>Number Unit 6: Multiplying and Dividing Larger Numbers</p> <p>32: Exploring Strategies for Dividing 33: Estimating Quotients 34: Dividing with Remainders 35: Consolidation of Multiplying and Dividing Larger Numbers</p> | <p>Big Idea: Quantities and numbers can be operated on to determine how many and how much.</p> <p>Developing conceptual meaning of operations</p> <ul style="list-style-type: none"> - Models and develops meaning for whole number computation to four digits. <p>Developing fluency of operations</p> <ul style="list-style-type: none"> - Estimates the results of whole number operations using contextually relevant strategies (e.g., How many buses are needed to take the Grade 8 classes to the museum?). - Solves whole number computation using efficient strategies (e.g., mental computation, algorithms, calculating cost of transactions and change owing, saving money to make a purchase). |
| <p>8. Demonstrate an understanding of fractions less than or equal to one by using concrete, pictorial and symbolic representations to:</p> <ul style="list-style-type: none"> • name and record fractions for the parts of a whole or a set • compare and order fractions • model and explain that for different wholes, two identical fractions may not represent the same quantity • provide examples of where fractions are used. | <p>Number Unit 3: Fractions</p> <p>13: What Are Fractions? 14: Counting by Unit Fractions 15: Exploring Different Representations of Fractions 17: Exploring Equivalence in Fractions 18: Comparing and Ordering Fractions 19: Consolidation of Fractions</p> | <p>Big Idea: Numbers are related in many ways.</p> <p>Comparing and ordering quantities (multitude or magnitude)</p> <ul style="list-style-type: none"> - Compares, orders, and locates fractions with the same numerator or denominator using reasoning (e.g., $\frac{3}{5} > \frac{3}{6}$ because fifths are larger parts). <p>Estimating quantities and numbers</p> <ul style="list-style-type: none"> - Estimates the size and magnitude of fractions by comparing to benchmarks. |

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| | | <p>Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.</p> <p>Partitioning quantities to form fractions</p> <ul style="list-style-type: none"> - Partitions fractional parts into smaller fractional parts (e.g., partitions halves into thirds to create sixths). - Uses models to describe, name, and count forward and backward by unit fractions. <p>- Explains that two equivalent fractions represent the same part of a whole, but not necessarily equal quantities (e.g., $\frac{1}{2}$ of a set of 12 and $\frac{1}{2}$ of a set of 6 are equal fractions, but unequal quantities).</p> |
| <p>9. Represent and describe decimals (tenths and hundredths), concretely, pictorially and symbolically.</p> | <p>Number Unit 4: Decimals</p> <p>20: Exploring Tenths</p> <p>21: Exploring Hundredths</p> <p>23: Consolidation of Decimals</p> | <p>Big Idea: The set of real numbers is infinite.</p> <p>Extending whole number understanding to the set of real numbers</p> <ul style="list-style-type: none"> - Explores decimal fractions to tenths (e.g., 0.1, 0.5, 0.8) and hundredths (e.g., 0.42, 0.05, 0.90). <p>Big Idea: Numbers are related in many ways.</p> <p>Estimating quantities and numbers</p> <ul style="list-style-type: none"> - Estimates the location of decimals and fractions on a number line. <p>Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.</p> <p>Unitizing quantities into base-ten units</p> <ul style="list-style-type: none"> - Uses fractions with denominators of 10 to develop decimal fraction understanding and notation (e.g., five-tenths is $\frac{5}{10}$ or 0.5). - Counts forwards and backwards by decimal units (e.g., 0.1, 0.2, ... 0.9, 1.0). - Understands that the value of a digit is ten times the value of the same digit one place to the right. - Understands that the value of a digit is one-tenth the value of the same digit one place to the left. - Writes and reads decimal numbers in multiple forms (e.g., numerals, number names, expanded form). |

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| <p>10. Relate decimals to fractions and fractions to decimals (to hundredths).</p> | <p>Number Unit 4: Decimals 20: Exploring Tenths 21: Exploring Hundredths 23: Consolidation of Decimals</p> | <p>Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units. Unitizing quantities into base-ten units - Uses fractions with denominators of 10 to develop decimal fraction understanding and notation (e.g., five-tenths is $\frac{5}{10}$ or 0.5).</p> |
| <p>11. Demonstrate an understanding of addition and subtraction of decimals (limited to hundredths) by:</p> <ul style="list-style-type: none"> • using personal strategies to determine sums and differences • estimating sums and differences • using mental math strategies to solve problems. | <p>Number Unit 7: Operations with Fractions and Decimals 36: Estimating Sums and Differences with Decimals 37: Adding and Subtracting Decimals 38: Using Mental Math to Add and Subtract Decimals 39: Consolidation of Operations with Fractions and Decimals</p> | <p>Big Idea: Quantities and numbers can be operated on to determine how many and how much. Developing conceptual meaning of operations - Demonstrates an understanding of decimal number computation through modelling and flexible strategies. Developing fluency of operations - Estimates sums and differences of decimal numbers (e.g., calculating cost of transactions involving dollars and cents). - Solves decimal number computation using efficient strategies.</p> |

**Correlation of Alberta Program of Studies with Mathology Grade 4
 (Patterns and Relations: Patterns)**

| Curriculum Expectations | Grade 4 Mathology.ca | Pearson Canada Grades 4-6 Mathematics Learning Progression |
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| General Outcome Use patterns to describe the world and to solve problems. | | |
| Specific Outcomes 1. Identify and describe patterns found in tables and charts. | Patterning Unit 1: Patterns and Relations 2: Investigating Increasing and Decreasing Patterns 3: Representing Patterns 4: Investigating Number Relationships 6: Consolidation of Patterns and Relations | Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically. Representing patterns, relations, and functions - Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule. Generalizing and analyzing patterns, relations, and functions - Explains the rule for numeric patterns including the starting point and change (e.g., given: 16, 22, 28, 34, Start at 16 and add 6 each time). - Describes numeric and shape patterns using words and numbers. |
| 2. Translate among different representations of a pattern, such as a table, a chart or concrete materials. | Patterning Unit 1: Patterns and Relations 3: Representing Patterns 6: Consolidation of Patterns and Relations | Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically. Representing patterns, relations, and functions - Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule. - Uses multiple approaches to model situations involving repetition (i.e., repeating patterns) and change (i.e., increasing/decreasing patterns) (e.g., using objects, tables, graphs, symbols, loops and nested loops in coding). Generalizing and analyzing patterns, relations, and functions - Explains the rule for numeric patterns including the starting point and change (e.g., given: 16, 22, 28, 34, Start at 16 and add 6 each time). |

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| | | - Describes numeric and shape patterns using words and numbers. |
| 3. Represent, describe and extend patterns and relationships, using charts and tables, to solve problems. | Patterning Unit 1: Patterns and Relations 2: Investigating Increasing and Decreasing Patterns 3: Representing Patterns 6: Consolidation of Patterns and Relations | Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically. Representing patterns, relations, and functions - Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule. Generalizing and analyzing patterns, relations, and functions - Explains the rule for numeric patterns including the starting point and change (e.g., given: 16, 22, 28, 34, Start at 16 and add 6 each time). - Describes numeric and shape patterns using words and numbers. |
| 4. Identify and explain mathematical relationships, using charts and diagrams, to solve problems. | Pattern Unit 1: Patterns and Relations 4: Investigating Number Relationships 5: Sorting in Venn Diagrams and Carroll Diagrams 6: Consolidation of Patterns and Relations | Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically. Representing patterns, relations, and functions - Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule. Generalizing and analyzing patterns, relations, and functions - Explains the rule for numeric patterns including the starting point and change (e.g., given: 16, 22, 28, 34, Start at 16 and add 6 each time). - Describes numeric and shape patterns using words and numbers. |



Correlation of Alberta Program of Studies with Mathology Grade 4 (Patterns and Relations: Variables and Equations)

| Curriculum Expectations | Grade 4 Mathology.ca | Pearson Canada Grades 4-6 Mathematics Learning Progression |
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| General Outcome Represent algebraic expressions in multiple ways. | | |
| Specific Outcomes 5. Express a given problem as an equation in which a symbol is used to represent an unknown number. | Patterning Unit 2: Variables and Equations 7: Using Symbols 8: Solving Equations Concretely 9: Solving Addition and Subtraction Equations 11: Solving Multiplication and Division Equations 12: Using Equations to Solve Problems 13: Consolidation of Variables and Equations | Big Idea: Patterns and relations can be represented with symbols, equations, and expressions. Understanding equality and inequality, building on generalized properties of numbers and operations - Expresses a one-step mathematical problem as an equation using a symbol or letter to represent an unknown number (e.g., Sena had some tokens and used four. She has seven left: $\square - 4 = 7$). Using variables, algebraic expressions, and equations to represent mathematical relations - Understands an unknown quantity (i.e., variable) may be represented by a symbol or letter (e.g., $13 - \square = 8$; $4n = 12$). - Flexibly uses symbols and letters to represent unknown quantities in equations (e.g., knows that $4 + \square = 7$; $4 + x = 7$; and $4 + y = 7$ all represent the same equation with \square , x , and y representing the same value). - Interprets and writes algebraic expressions (e.g., $2n$ means two times a number; subtracting a number from 7 can be written as $7 - n$). - Understands a variable as a changing quantity (e.g., $5s$, where s can be any value). |

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| <p>6. Solve one-step equations involving a symbol to represent an unknown number.</p> | <p>Patterning Unit 2: Variables and Equations</p> <p>8: Solving Equations Concretely 9: Solving Addition and Subtraction Equations 11: Solving Multiplication and Division Equations 12: Using Equations to Solve Problems 13: Consolidation of Variables and Equations</p> | <p>Big Idea: Patterns and relations can be represented with symbols, equations, and expressions.</p> <p>Understanding equality and inequality, building on generalized properties of numbers and operations</p> <ul style="list-style-type: none"> - Determines an unknown number in simple one-step equations using different strategies (e.g., $n \times 3 = 12$; $13 - \square = 8$). - Uses arithmetic properties to investigate and transform one-step addition and multiplication equations (e.g., $5 + 4 = 9$ and $5 + a = 9$ have the same structure and can be rearranged in similar ways to maintain equality: $4 + 5 = 9$ and $a + 5 = 9$). - Uses arithmetic properties to investigate and transform one-step subtraction and division equations (e.g., $12 - 5 = 7$ and $12 - b = 7$ have the same structure and can be rearranged in similar ways to maintain equality: $12 - 7 = 5$ and $12 - 7 = b$). |
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Correlation of Alberta Program of Studies with Mathology Grade 4 (Shape and Space: Measurement)

| Curriculum Expectations | Grade 4 Mathology.ca | Pearson Canada Grades 4-6 Mathematics Learning Progression |
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| General Outcome Use direct and indirect measurement to solve problems. | | |
| Specific Outcomes 1. Read and record time, using digital and analog clocks, including 24-hour clocks. | Measurement Unit 3: Time 12: Exploring Time 13: Telling Time in One- and Five-Minute Intervals 14: Telling Time on a 24-Hour Clock 18: Consolidation of Time | Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons. Selecting and using units to estimate, measure, construct, and make comparisons - Reads and records time (i.e., digital and analogue) and calendar dates. Understanding relationships among measured units - Understands relationship among different measures of time (e.g., seconds, minutes, hours, days, decades). |
| 2. Read and record calendar dates in a variety of formats. | Measurement Unit 3: Time 17: Exploring Calendar Dates 18: Consolidation of Time | Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons. Selecting and using units to estimate, measure, construct, and make comparisons - Reads and records time (i.e., digital and analogue) and calendar dates. Understanding relationships among measured units - Understands relationship among different measures of time (e.g., seconds, minutes, hours, days, decades). |

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| <p>3. Demonstrate an understanding of area of regular and irregular 2-D shapes by:</p> <ul style="list-style-type: none"> • recognizing that area is measured in square units • selecting and justifying referents for the units cm^2 or m^2 • estimating area, using referents for cm^2 or m^2 • determining and recording area (cm^2 or m^2) • constructing different rectangles for a given area (cm^2 or m^2) in order to demonstrate that many different rectangles may have the same area. | <p>Measurement Unit 1: Length, Perimeter, and Area</p> <p>4: Estimating and Measuring Area in Square Metres</p> <p>5: Estimating and Measuring Area in Square Centimetres</p> <p>6: Exploring the Area of Rectangles</p> <p>7: Consolidation of Length, Perimeter, and Area</p> | <p>Big Idea: Many things in our world (e.g., objects, spaces, events) have attributes that can be measured and compared.</p> <p>Understanding attributes that can be measured, compared, and ordered</p> <p>- Understands area as an attribute of 2-D shapes that can be measured and compared.</p> <p>Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons. Selecting and using units to estimate, measure, construct, and make comparisons</p> <p>- Develops understanding of square units (e.g., square unit, square cm, square m) to measure area of 2-D shapes.</p> |
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Correlation of Alberta Program of Studies with Mathology Grade 4 (Shape and Space: 3-D Objects and 2-D Shapes)

| Curriculum Expectations | Grade 4 Mathology.ca | Pearson Canada Grades 4-6 Mathematics Learning Progression |
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| General Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them. | | |
| Specific Outcomes 4. Describe and construct right rectangular and right triangular prisms. | Geometry Unit 1A: 2-D Shapes and 3-D Solids 2: Identifying and Describing Prisms 3: Constructing Models of Prisms 5: Consolidation of 2-D Shapes and 3-D Solids | Big Ideas: 2-D shapes and 3-D solids can be analyzed and classified in different ways by their attributes. Investigating geometric attributes and properties of 2-D shapes and 3-D solids - Sorts, describes, constructs, and classifies 3-D objects based on edges, faces, vertices, and angles (e.g., prisms, pyramids). Investigating 2-D shapes, 3-D solids, and their attributes through composition and decomposition - Identifies and constructs nets for 3-D objects made from triangles and rectangles. |



Correlation of Alberta Program of Studies with Mathology Grade 4 (Shape and Space: Transformations)

| Curriculum Expectations | Grade 4 Mathology.ca | Pearson Canada Grades 4-6 Mathematics Learning Progression |
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| General Outcome Describe and analyze position and motion of objects and shapes. | | |
| Specific Outcomes 5. Demonstrate an understanding of congruency, concretely and pictorially. | Geometry Unit 1A: 2-D Shapes and 3-D Solids 1: Exploring Congruence 5: Consolidation of 2-D Shapes and 3-D Solids | Big Ideas: 2-D shapes and 3-D solids can be transformed in many ways and analyzed for change. Exploring 2-D shapes and 3-D solids by applying and visualizing transformations - Demonstrates an understanding of congruency (i.e., same side lengths and angles). |
| 6. Demonstrate an understanding of line symmetry by: <ul style="list-style-type: none"> • identifying symmetrical 2-D shapes • creating symmetrical 2-D shapes • drawing one or more lines of symmetry in a 2-D shape. | Geometry Unit 1A: 2-D Shapes and 3-D Solids 4: Understanding Line Symmetry 5: Consolidation of 2-D Shapes and 3-D Solids | Big Ideas: 2-D shapes and 3-D solids can be transformed in many ways and analyzed for change. Exploring symmetry to analyze 2-D shapes and 3-D solids - Draws and identifies lines of symmetry (i.e., vertical, horizontal, diagonal, oblique) in 2-D shapes and designs. |

Correlation of Alberta Program of Studies with Mathology Grade 4 (Statistics and Probability: Data Analysis)

| Curriculum Expectations | Grade 4 Mathology.ca | Pearson Canada Grades 4-6 Mathematics Learning Progression |
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| General Outcome Collect, display and analyze data to solve problems. | | |
| Specific Outcomes 1. Demonstrate an understanding of many-to-one correspondence. | Data Management Unit 1A: Data Management 1: Interpreting and Drawing Pictographs 2: Interpreting and Drawing Bar Graphs 3: Comparing Graphs 4: Consolidation of Data Management | Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness. Reading and interpreting data displays and analyzing variability - Reads and interprets data displays using many-to-one correspondence. |
| 2. Construct and interpret pictographs and bar graphs involving many-to-one correspondence to draw conclusions. | Data Management Unit 1A: Data Management 1: Interpreting and Drawing Pictographs 2: Interpreting and Drawing Bar Graphs 3: Comparing Graphs 4: Consolidation of Data Management | Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness. Creating graphical displays of collected data - Represents data graphically using many-to-one correspondence with appropriate scales and intervals (e.g., each symbol on pictograph represents 10 people). Reading and interpreting data displays and analyzing variability - Reads and interprets data displays using many-to-one correspondence. Drawing conclusions by making inferences and justifying decisions based on data collected. - Draws conclusions based on data presented. |