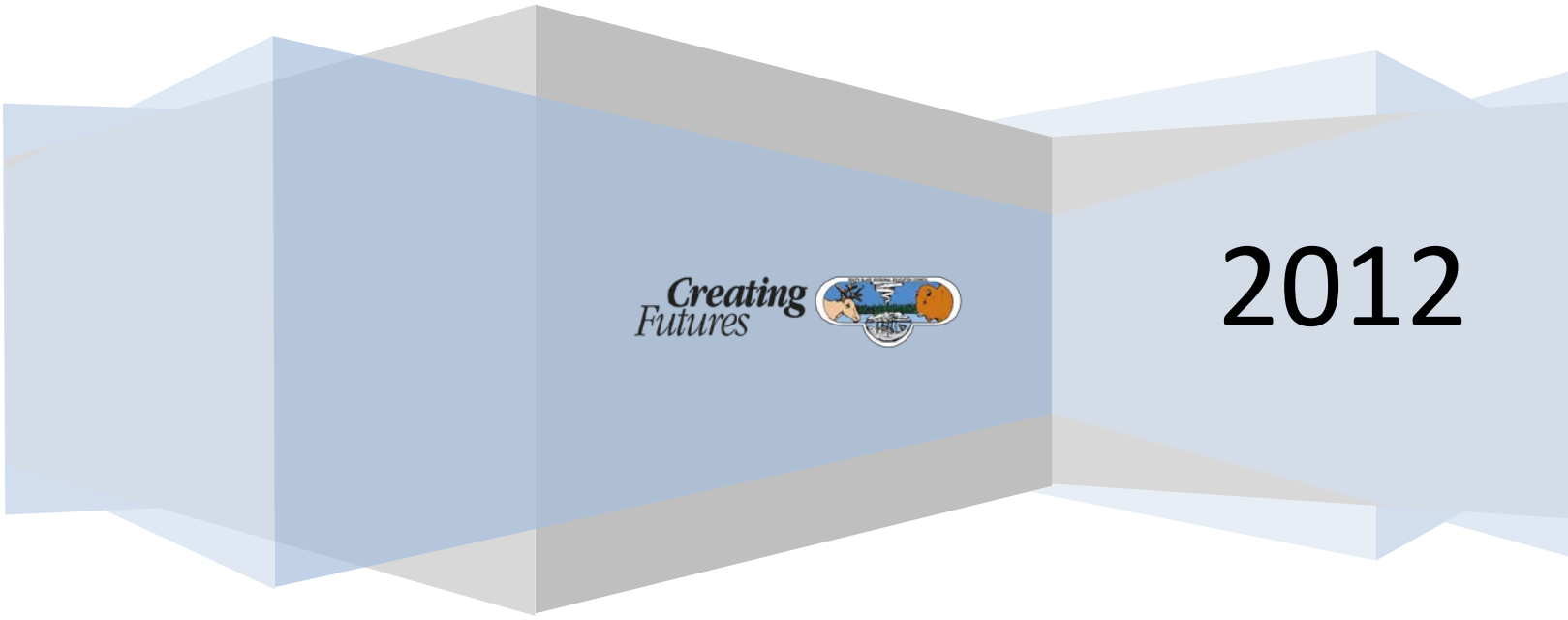
South Slave Divisional Education Council

MATH GRADE 9

CURRICULUM PACKAGE

June 2012



2012

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Dene Kede

Dene Kede, the culture-based curriculum of the NWT, serves as the heart of the NWT Curriculum. Dene Kede was developed under the guidance of Dene elders and shares, through its teachings, the knowledge, skills, and values of the Dene. These cultural understandings serve as the underpinnings for all learning in all content areas and it is expected that the teachings and knowledge contained within Dene Kede shall be woven into all lessons. In this manner our students will become more capable, more successful and better able to *walk in two worlds.*

Passage to Manhood

Outcomes	Achievement Indicators – Measurable outcomes
It is expected that students will:	*The following set of indicators is used to assess student achievement for each related specific learning outcome. Students who have fully met the specific learning outcomes are able to:*
Major Cultural Understanding: In the past, puberty for boys signified an important change.	
Discuss and understand that in the past, puberty for boys signified an important change.	• Puberty was marked with a change in the voice of a boy. • In times past, the Dene believed that young boys and girls gained spiritual power, as they became adolescents. • Passage into puberty began a period of intense training for young boys, in preparation for manhood.
Major Cultural Understanding: After puberty, boys began an intensive training for manhood.	
Describe ways after puberty, that boys began training for manhood.	• Training began when boys were very young but during adolescence it became very intensive and the expectations grew considerably. • The boys began to accompany the adult men on hunts. With the "first kill" of a young man Elders would tear at his clothing to celebrate the emergence of a provider and to remind him that there were those with whom he should share his catch. If the first kill was a large one, the whole community celebrated and the meat would be distributed to the Elders. • They learned to make and repair tools, they learned about time, direction and weather as it related to travelling. • They learned how to work with a leader in large hunts, cooperating to ensure success. • They were made to go off on hunting trips alone as a test of their knowledge and skills and mental stamina and courage. • When the young man proved capable and self-sufficient on the land, he was recognized as a man and allowed to marry
Major Cultural Understanding: Some tribes trained their boys in a separate camp during their passage.	
Describe and record how some tribes trained their boys in camps during their passage.	• The boys were put through a period of training away from others. • They were given rigorous challenges such as sleeping by sitting upright, or working without a break right after waking. • These challenges were meant to condition their bodies and to develop mental stamina.
Major Cultural Understanding: Some tribes engaged their young men in dream quests.	
Discuss what a Dream Quest might have been like for a young man	• Stories of dream quests were told to the young people from the time they were young so that they could look forward to the time that they would begin their own quests. • Even today, puberty signifies an important change in boys. • Dream quests were sacred spiritual experiences where the young men would receive dreams or visions, which communicated their medicine powers • Young men were encouraged to stay in the bush, away from others in order to enable dreams. • There were times that dreams did not come at all to boys, and other times when boys became old men before the dreams would come to them. There were powers, which existed only in the people who showed courage and concern
Major Cultural Understanding: As in the past, boys today can use the time of their passage to prepare themselves for manhood	
Discuss ways in which young man prepare today for manhood and record responses	• By knowing that the changes in their bodies signify the ability to father a child • By recognizing the spiritual possibilities within themselves and treating themselves with respect • By accepting and seeking the guidance of Elders and other men

Passage to Manhood

Outcomes	Achievement Indicators – Measurable outcomes
It is expected that students will:	*The following set of indicators is used to assess student achievement for each related specific learning outcome. Students who have fully met the specific learning outcomes are able to:*
Major Cultural Understanding: Attitudes related to self development as a man	
Describe the most effective ways for men to develop to be active members of their families and communities	• Willingness to learn from the words of Elders • Willingness to reflect on one's decisions and behaviors • Willingness to accept and begin learning the roles and responsibilities of men in their families and their community
Major Cultural Understanding: Skills related to self development as a man	
Identify what skills would be important for a young man to know as he moved into adulthood	• Recognizing changes in one's body and the implications of these Caring for one's body • Personal goal setting • Seeking Elders for guidance • Seeking opportunities to learn the skills required for manhood
Major Cultural Understanding: Skills related to being a man in one's family and community	
Distinguish what it means to be a member of your current family; what does it mean to be a member of your community	• As determined by family and community

Spirit of the Land

Major Cultural Understanding: Dene spirituality is attached to the land.	
Cite and write stories about your Dene Spirituality	• Dene oral stories tell about when the world was new. • The Creator made the land and the animals fist and then made the people. • The Creator gave medicine powers to all people who lived good lives to use to help others to survive. These medicine powers were spirit powers from nature. • Spiritual brothers were sent to the earth to bring laws to the land and to people. These laws were meant to help the Dene so that we could live with the animal creatures and with each other more peacefully. • Messages have been left in the form of landmarks throughout our land to remind us of the sacredness of the land and the Dene laws which are to guide our lives.
Major Cultural Understanding: Dene prophets have seen the past and the future and have relayed messages about how to deal with the changes that are happening to the Dene.	
List examples of the ways in which the Dene prophets have seen the past and the future and have relayed messages about how to deal with the changes that are happening to the Dene. Describe how this knowledge is important in today's changing society	• The prophets are people who have received messages for the Dene people from the Creator. • The prophets have communicated that changes will put great pressures upon Dene. • Dene prophets have seen the past and the future and have relayed messages about how to deal with the changes that are happening to the Dene
Major Cultural Understanding: When missions and churches first arrived they tried to discourage the practice of Dene spirituality.	
Recall ways in which the missions and churches tried to discourage the practice of Dene spirituality.	• Each community has its own stories of how their Dene spirituality was discouraged. • Despite the pressures to abandon Dene spirituality, many of the beliefs have persisted and are accepted into many churches.
Major Cultural Understanding: Today, Dene people continue their spiritual ties to the land.	
Give examples of how the Dene people continue their spiritual ties to the land.	• Belief that without the land, life is not possible. • Belief that the land must be honoured and protected to ensure that it continues to sustain the people. • Belief that in honouring the land, the Creator is being honoured. • Belief in the ways of respect for the land: • Belief that medicine powers have diminished but exist in the form of talents among people.

Spirit of the Land

Outcomes	Achievement Indicators – Measurable outcomes
It is expected that students will:	*The following set of indicators is used to assess student achievement for each related specific learning outcome. Students who have fully met the specific learning outcomes are able to:*
(Continued)	• Belief that the Elders still living who have led spiritual lives have the most to teach about the spirit of the land. • Much of the spiritual knowledge of the Dene is passed from mentor to specially chosen students.
Major Cultural Understanding: Skills related to recognizing the spirit of the land	
Identify skills you will need to recognize the spirit of the land	• Honouring the spirit of the land in Dene ways • Seeking Elders for teachings and guidance
Major Cultural Understanding: Attitudes related to recognizing the spirit of the land	
Identify attitudes you will need to relate to the spirit of the land	• Willingness to reflect on one's feelings about the land • Willingness to show respect to the spirit of the land • Willingness to learn about the spirit of the land

Developing out Talents

Major Cultural Understanding: People are born with talents and these are sacred.	
Give examples of how people are born with special talents in your community	• Talents are gifts that come to individuals from the Creator. • Everyone is born with a talent but it must be discovered and developed. • A person's talents can be discovered when the person is very young.
Major Cultural Understanding: A person's talent must be discovered.	
Discuss ways students can identify personal talents and talents of those around them	• Things come easily to those with talent. • People in one's family may know the talents of the family members. • Elders are often able to see talents in the young. If the young are able to take the advice of Elders, they can discover the talents in themselves. • In the past young people were advised by Elders in their dream quests as they searched for their spiritual powers. • Elders with finely developed talents and wisdom were mentors for the young who showed talents in their areas
Major Cultural Understanding: An Individual should share their talent.	
Identify why and ways that people in your community should share their talents.	• Special talents and abilities are provided to individuals by the Creator in order for them to be shared. • Talents were meant by the Creator to help people survive and to live a better life. • Talents that are not shared are left unused (can't be shy or lazy). You receive back what you give away or share in the way of talents. • Individuals should not use talents for self-gain. One should not expect payment for the sharing of a talent. • Gifts should be offered in exchange for the sharing of talent in order to enable the person to maintain his or her talent.
Major Cultural Understanding: A person with talent is humble.	
Discuss why it is important that a person with talent remain humble.	• A person with talent must not boast of it or ridicule others who do not have it. • A person with talent does not speak of his talent. It is left to others to recognize and speak of the talent.
Major Cultural Understanding: Dene talents come in many forms.	
Discuss and identify the people in your community with talents.	• Some talents are closer to the Creator than other talents. • The Dene believe that certain activities are more spiritual in nature than others and when people have talents in these activities they are gifted with medicine powers and are considered very important people to the culture. Examples are midwifery, drumming and dancing. • Talents today come in other forms that are useful to our lives: talents such as being a good truck driver, being a good teacher or being a good mechanic.

Spirit of the Land

Outcomes	Achievement Indicators – Measurable outcomes
It is expected that students will:	*The following set of indicators is used to assess student achievement for each related specific learning outcome. Students who have fully met the specific learning outcomes are able to:*
(Continued)	• Some people are gifted with many talents. These people are encouraged to search for the one talent that they feel comfortable or easy with - that will be the one that was meant for them
Major Cultural Understanding: Attitudes related to the development of one's talent	
Identify ways in which you can develop and strengthen your own talents and share those talents with those around you	• Reflect on work habits relating to one's talent • Try new experiences and take opportunities to learn • Continually learn and develop skills to honour the talent • Spend time in the company of elders who can help in assessing one's strengths • Remain humble • Share one's talents with others • Seek an elder(s) for mentorship in the area of one's talent.
Major Cultural Understanding: Development of Dene Skills	
Continue personal development of Dene skills	• Developing Dene skills at increasing levels of complexity • Increasing individualization and creativity in work

Winter Camp

Major Cultural Understanding: Dene knowledge about winter weather and land conditions is important to successful and safe winter land use.

Describe the winter weather and land conditions and identify why it is important to understand conditions	• Use various weather indicators o Ice conditions, behaviors on lakes and rivers and o Implications for land use o Wind conditions and implications for land use o Snow variations and implications for land use o Temperature and implications for land use
Major Cultural Understanding: Dene knowledge of the winter hunting/fishing/ trapping area is important to successful and safe winter land use.	
Identify what knowledge about winter weather and land conditions is important to successful and safe winter land use.	• Locate trap line locations on a map • Locate geographical features, landmarks and spiritual sites o Potentially dangerous areas in winter o Historical land use information o Use of area in other seasons o Other resources in the area accessed by the Dene
Major Cultural Understanding: Dene knowledge about fur bearing animals is important for successful winter trapping.	
Identify what Dene knowledge about fur bearing animals is important for successful winter trapping.	• Fur bearing animals found in area • Life cycles, habitat and habits of fur bearing animals • Where and how best to set traps based on knowledge of their habits

Self Government

Major Cultural Understanding: In contrast to the accepted Canadian perspective of political change in the Northwest Territories, the Dene have their own perspective which is the basis for their struggle for Self Government

Compare and contrast the Canadian perspective of political change in the Northwest Territories, Identify the Dene perspective which is the basis for their struggle for Self Government	• The northern territory is considered hinterland: remote lands owned primarily for the purpose of exploiting of its resources. • The aboriginal people are considered just one of many ethnic groups making up the mosaic that is Canada. Settlers who have moved to the North have as much right to the land and how it is controlled as the First Nations people. • Treaties in the past were acknowledgments on the part of the Dene that they were extinguishing their aboriginal or First People's rights. • The Canadian constitution can only recognize and give powers to provinces. • To encourage political growth, the NWT is being prepared for provincial status.

Self Government

Outcomes	Achievement Indicators – Measurable outcomes
It is expected that students will:	*The following set of indicators is used to assess student achievement for each related specific learning outcome. Students who have fully met the specific learning outcomes are able to:*
Major Cultural Understanding: The Dene has a tradition-based model of self-government.	
Identify and describe the Dene tradition-based model of self-government.	• Unity and cooperation within the group is valued. o Consensus style decision making: o Participants who spoke were only those who had earned the right to speak. Young people were seldom involved in decision making group. o When one spoke, one's words carried weight because one had earned the right to speak. The leader would take into consideration everything said and would suggest solutions or courses of action based on agreement of the whole group. o Once courses of action were agreed upon, there was no continuing disagreement or subversive activity. o Once the course of action was agreed upon, absolute adherence was expected. o Elders have the life experience and wisdom to know what is important in a leader. o Leadership requires support. o Leader had helpers to administer his leadership o The purpose of leadership and government was to ensure the survival of the group.
Major Cultural Understanding: The Dene are seeking Self Government as a way to control aspects of their lives that are most closely related to their survival as a people.	
Give examples of how the Dene are seeking Self Government as a way to control aspects of their lives that are most closely related to their survival as a people.	• By seeking political rights based on their status as a "nation" • By seeking a style of the political leadership based on Elder's council and consensus • By seeking to control the management and monitoring of land and water use: • By seeking to control economic development: • By seeking to control the social institutions:
Major Cultural Understanding: Successful Self Government will require Dene awareness and participation.	
Describe why it is important that Self Government requires Dene awareness and participation.	• Individual awareness of all the issues that have bearing on Dene lives • Active participation in discussions of issues and in decision-making
Major Cultural Understanding: Attitudes related to understanding Dene self-government.	
Identify what aattitudes are important to relate to understanding Dene self-government.	• Willingness to learn from the Dene their perspective on self-government
Major Cultural Understanding: Attitudes related to visualizing oneself in the future.	
Describe what attitudes are important for Dene to relate to visualizing oneself in the future	• Willingness to reflect on one's future and set goals for participation in Dene Self-Government

MATH GRADE 9

Strand: Number

General Outcome: Develop number sense.

Outcomes	Achievement indicators – measurable outcomes
It is expected that students will:	**Achievement Indicators** *The following set of indicators **may** be used to determine whether students have met the corresponding specific outcome.*
1. Demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents by: • representing repeated multiplication using powers • using patterns to show that a power with an exponent of zero is equal to one • solving problems involving powers. [c, cn, PS, R]	• Demonstrate the differences between the exponent and the base by building models of a given power, such as 23 and 32. • Explain, using repeated multiplication, the difference between two given powers in which the exponent and base are interchanged, e.g., 103 and 310. • Express a given power as a repeated multiplication. • Express a given repeated multiplication as a power. • Explain the role of parentheses in powers by evaluating a given set of powers, e.g., $(-2)^4$,(-2^4) and -2^4. • Demonstrate, using patterns, that a^0 is equal to 1 for a given value of a ($a \neq 0$). • Evaluate powers with integral bases (excluding base 0) and whole number exponents
2. Demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole number exponents. [C, CN, PS, R, T]	• Explain, using examples, the exponent laws of powers with integral bases (excluding base 0) and whole number exponents: o $(a^m)(a^n) = a^{m+n}$ o $a^m \div a^n = a^{m-n}$,$m > n$ o $(a^m)^n = a^{mn}$ o $(ab)^m = a^m b^m$ • Evaluate a given expression by applying the exponent laws. • Determine the sum of two given powers, e.g., $5^2 + 5^3$, and record the process. • Determine the difference of two given powers, e.g., $4^3 - 4^2$, and record the process. • Identify the error(s) in a given simplification of an expression involving powers.
3. Demonstrate an understanding of rational numbers by: • comparing and ordering rational numbers • solving problems that involve arithmetic operations on rational numbers. [C, CN, PS, R, T, V]	• Order a given set of rational numbers, in fraction and decimal form, by placing them on a number line, e.g., $\frac{3}{5}$, - 0.666 … , 0.5, - $\frac{5}{8}$. • Identify a rational number that is between two given rational numbers. • Solve a given problem involving operations on rational numbers in fraction form and decimal form.
4. Explain and apply the order of operations, including exponents, with and without technology. [PS, T]	• Solve a given problem by applying the order of operations without the use of technology. • Solve a given problem by applying the order of operations with the use of technology. • Identify the error in applying the order of operations in a given incorrect solution.
5. Determine the square root of positive rational numbers that are perfect squares. [C, CN, PS, R, T]	• Determine whether or not a given rational number is a square number and explain the reasoning. • Determine the square root of a given positive rational number that is a perfect square. • Identify the error made in a given calculation of a square root, e.g., Is 3.2 the square root of 6.4? • Determine a positive rational number given the square root of that positive rational number.

MATH GRADE 9

Strand: Number

General Outcome: Develop number sense.

Outcomes	Achievement indicators – measurable outcomes
It is expected that students will:	**Achievement Indicators** *The following set of indicators **may** be used to determine whether students have met the corresponding specific outcome.*
6. Determine an approximate square root of positive rational numbers that are non-perfect squares. [C, CN, PS, R, T]	• Estimate the square root of a given rational number that is not a perfect square using the roots of perfect squares as benchmarks. • Determine an approximate square root of a given rational number that is not a perfect square using technology, e.g., calculator, computer. • Explain why the square root of a given rational number as shown on a calculator may be an approximation. • Identify a number with a square root that is between two given numbers.
Strand: Patterns and Relations (Patterns) **General Outcome:** Use patterns to describe the world and solve problems.	
1. Generalize a pattern arising from a problem-solving context using linear equations and verify by substitution. [C, CN, PS, R, V]	• Write an expression representing a given pictorial, oral or written pattern. • Write a linear equation to represent a given context. • Describe a context for a given linear equation. • Solve, using a linear equation, a given problem that involves pictorial, oral and written linear patterns. • Write a linear equation representing the pattern in a given table of values and verify the equation by substituting values from the table.
2. Graph linear relations, analyze the graph and interpolate or extrapolate to solve problems. [C, CN, PS, R, T, V]	• Describe the pattern found in a given graph. • Graph a given linear relation, including horizontal and vertical lines. • Match given equations of linear relations with their corresponding graphs. • Extend a given graph (extrapolate) to determine the value of an unknown element. • Interpolate the approximate value of one variable on a given graph given the value of the other variable. • Extrapolate the approximate value of one variable from a given graph given the value of the other variable. • Solve a given problem by graphing a linear relation and analyzing the graph.
Strand Patterns and Relations (Variables and Equations) **General Outcome:** Represent algebraic expressions in multiple ways.	
3. Model and solve problems using linear equations of the form: • $ax = b$ • $\frac{x}{a} = b$, $a \neq 0$ • $ax + b = c$ • $\frac{x}{a} + b = c$, $a \neq 0$ • $ax = b + cx$ • $a(x + b) = c$ • $ax + b = cx + d$ • $a(bx + c) = d(ex + f)$ • $\frac{a}{x} = b$, $x \neq 0$ where a, b, c, d, e and f are rational numbers. [C, CN, PS, V]	• Model the solution of a given linear equation using concrete or pictorial representations, and record the process. • Determine, by substitution, whether a given rational number is a solution to a given linear equation. • Solve a given linear equation symbolically. • Identify and correct an error in a given incorrect solution of a linear equation. • Represent a given problem using a linear equation. • Solve a given problem using a linear equation and record the process.

MATH GRADE 9

Strand Patterns and Relations (Variables and Equations)

General Outcome: Represent algebraic expressions in multiple ways.

Outcomes	Achievement indicators – measurable outcomes
It is expected that students will:	**Achievement Indicators** *The following set of indicators **may** be used to determine whether students have met the corresponding specific outcome.*
4. Explain and illustrate strategies to solve single variable linear inequalities with rational coefficients within a problem-solving context. [C, CN, PS, R, V]	• Translate a given problem into a single variable linear inequality using the symbols ≥, >,< or ≤. • Determine if a given rational number is a possible solution of a given linear inequality. • Generalize and apply a rule for adding or subtracting a positive or negative number to determine the solution of a given inequality. • Generalize and apply a rule for multiplying or dividing by a positive or negative number to determine the solution of a given inequality. • Solve a given linear inequality algebraically and explain the process orally or in written form. • Compare and explain the process for solving a given linear equation to the process for solving a given linear inequality. • Graph the solution of a given linear inequality on a number line. • Compare and explain the solution of a given linear equation to the solution of a given linear inequality. • Verify the solution of a given linear inequality using substitution for multiple elements in the solution. • Solve a given problem involving a single variable linear inequality and graph the solution.
5. Demonstrate an understanding of polynomials (limited to polynomials of degree less than or equal to 2). [C, CN, R, V]	• Create a concrete model or a pictorial representation for a given polynomial expression. • Write the expression for a given model of a polynomial. • Identify the variables, degree, number of terms and coefficients, including the constant term, of a given simplified polynomial expression. • Describe a situation for a given first degree polynomial expression. • Match equivalent polynomial expressions given in simplified form, e.g., $4x - 3x^2 + 2$ is equivalent to $-3x^2 + 4x + 2$.
6. Model, record and explain the operations of addition and subtraction of polynomial expressions, concretely, pictorially and symbolically (limited to polynomials of degree less than or equal to 2).[C, CN, PS, R, V]	• Model addition of two given polynomial expressions concretely or pictorially and record the process symbolically. • Model subtraction of two given polynomial expressions concretely or pictorially and record the process symbolically. • Apply a personal strategy for addition and subtraction of given polynomial expressions, and record the process symbolically. • Identify equivalent polynomial expressions from a given set of polynomial expressions, including pictorial and symbolic representations. • Identify the error(s) in a given simplification of a given polynomial expression.
7. Model, record and explain the operations of multiplication and division of polynomial expressions (limited to polynomials of degree less than or equal to 2) by monomials, concretely, pictorially and symbolically. [C, CN, R, V]	• Model multiplication of a given polynomial expression by a given monomial concretely or pictorially and record the process symbolically. • Model division of a given polynomial expressions by a given monomial concretely or pictorially and record the process symbolically. • Apply a personal strategy for multiplication and division of a given polynomial expression by a given monomial. • Provide examples of equivalent polynomial expressions. • Identify the error(s) in a given simplification of a given polynomial expression.

MATH GRADE 9

Strand: Shape and Space (Measurement)

General Outcome**:** Use direct or indirect measurement to solve problems.

Outcomes	Achievement indicators – measurable outcomes
It is expected that students will:	**Achievement Indicators** *The following set of indicators **may** be used to determine whether students have met the corresponding specific outcome.*
1. Solve problems and justify the solution strategy using circle properties including: • the perpendicular from the centre of a circle to a chord bisects the chord • the measure of the central angle is equal to twice the measure of the inscribed angle subtended by the same arc • the inscribed angles subtended by the same arc are congruent • a tangent to a circle is perpendicular to the radius at the point of tangency. [C, CN, PS, R, T, V]	• Provide an example that illustrates: o the perpendicular from the centre of a circle to a chord bisects the chord o the measure of the central angle is equal to twice the measure of the inscribed angle subtended by the same arc o the inscribed angles subtended by the same arc are congruent o a tangent to a circle is perpendicular to the radius at the point of tangency. • Solve a given problem involving application of one or more of the circle properties. • Determine the measure of a given angle inscribed in a semicircle using the circle properties. • Explain the relationship among the centre of a circle, a chord and the perpendicular bisector of the chord.
Strand: Shape and Space (3-D Objects and 2-D Shapes) **General Outcome:** Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.	
2. Determine the surface area of composite 3-D objects to solve problems. [C, CN, PS, R, V]	• Determine the area of overlap in a given concrete composite 3-D object, and explain its effect on determining the surface area (limited to right cylinders, right rectangular prisms and right triangular prisms). • Determine the surface area of a given concrete composite 3-D object (limited to right cylinders, right rectangular prisms and right triangular prisms). • Solve a given problem involving surface area.
3. Demonstrate an understanding of similarity of polygons. [C, CN, PS, R, V]	• Determine if the polygons in a given pre-sorted set are similar and explain the reasoning. • Draw a polygon similar to a given polygon and explain why the two are similar. • Solve a given problem using the properties of similar polygons.
4. Draw and interpret scale diagrams of 2-D shapes.[CN, R, T, V]	• Identify an example in print and electronic media, e.g., newspapers, the Internet, of a scale diagram and interpret the scale factor. • Draw a diagram to scale that represents an enlargement or reduction of a given 2-D shape. • Determine the scale factor for a given diagram drawn to scale. • Determine if a given diagram is proportional to the original 2-D shape and, if it is, state the scale factor. • Solve a given problem that involves a scale diagram by apply the properties of similar triangles.
5. Demonstrate an understanding of line and rotation symmetry. [C, CN, PS, V]	• Classify a given set of 2-D shapes or designs according to the number of lines of symmetry. • Complete a 2-D shape or design given one half of the shape or design and a line of symmetry. • Determine if a given 2-D shape or design has rotation symmetry about the point at the centre of the shape or design and, if it does, state the order and angle of rotation. • Rotate a given 2-D shape about a vertex and draw the resulting image. • Identify a line of symmetry or the order and angle of rotation symmetry in a given tessellation.

Strand: Shape and Space (3-D Objects and 2-D Shapes)

General Outcome: Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.

Outcomes	Achievement indicators – measurable outcomes
It is expected that students will:	**Achievement Indicators** *The following set of indicators **may** be used to determine whether students have met the corresponding specific outcome.*
(Continued) 5.	• Identify the type of symmetry that arises from a given transformation on the Cartesian plane. • Complete, concretely or pictorially, a given transformation of a 2-D shape on a Cartesian plane, record the coordinates and describe the type of symmetry that results. • Identify and describe the types of symmetry created in a given piece of artwork. • Determine whether or not two given 2-D shapes on the Cartesian plane are related by either rotation or line symmetry. • Draw, on a Cartesian plane, the translation image of a given shape using a given translation rule, such as R2, U3 or □ □, □□□, label each vertex and its corresponding ordered pair and describe why the translation does not result in line or rotation symmetry. • Create or provide a piece of artwork that demonstrates line and rotation symmetry, and identify the line(s) of symmetry and the order and angle of rotation.
Strand: Statistics and Probability (Data Analysis) **General Outcome:** Collect, display and analyze data to solve problems.	
1. Describe the effect of: • bias • use of language • ethics • cost • time and timing • privacy • cultural sensitivity on the collection of data. [C, CN, R, T]	• Analyze a given case study of data collection, and identify potential problems related to bias, use of language, ethics, cost, time and timing, privacy or cultural sensitivity. • Provide examples to illustrate how bias, use of language, ethics, cost, time and timing, privacy or cultural sensitivity may influence the data.
2. Select and defend the choice of using either a population or a sample of a population to answer a question. [C, CN, PS, R]	• Identify whether a given situation represents the use of a sample or a population. • Provide an example of a situation in which a population may be used to answer a question and justify the choice. • Provide an example of a question where a limitation precludes the use of a population and describe the limitation, e.g., too costly, not enough time, limited resources. • Identify and critique a given example in which a generalization from a sample of a population may or may not be valid for the population.

Strand: Statistics and Probability (Data Analysis)

General Outcome: Collect, display and analyze data to solve problems.

Outcomes	Achievement indicators – measurable outcomes
It is expected that students will:	**Achievement Indicators** *The following set of indicators **may** be used to determine whether students have met the corresponding specific outcome.*
3. Develop and implement a project plan for the collection, display and analysis of data by: • formulating a question for investigation • choosing a data collection method that includes social considerations • selecting a population or a sample • collecting the data • displaying the collected data in an appropriate manner • drawing conclusions to answer the question. [C, PS, R, T, V]	• Create a rubric to assess a project that includes the assessment of: o a question for investigation o the choice of a data collection method that includes social considerations o the selection of a population or a sample and justifying the choice o the display of the collected data o the conclusions to answer the question. • Develop a project plan that describes: o a question for investigation o the method of data collection that includes social considerations o the method for selecting a population or a sample o the method to be used for collection of the data o the methods for analysis and display of the data. • Complete the project according to the plan, draw conclusions and communicate findings to an audience. • Self-assess the completed project by apply the rubric.
Strand: Statistics and Probability (Chance and Uncertainty) **General Outcome**: Collect, display and analyze data to solve problems.	
4. Demonstrate an understanding of the role of probability in society. [C, CN, R, T]	• Provide an example from print and electronic media, e.g., newspapers, the Internet, where probability is used. • Identify the assumptions associated with a given probability and explain the limitations of each assumption. • Explain how a single probability can be used to support opposing positions. • Explain, using examples, how decisions based on probability may be a combination of theoretical probability, experimental probability and subjective judgment.

AAT MATH GRADE 9
TEST BLUEPRINT

Multiple Choice (MC) and Numerical Response (NR)			
Item Type	**Number of Items**	**Number of Marks**	**Percentage of Test**
MC	40	40	80%
NR	10	10	20%
TOTAL	50	50	100%

Content Domain of Test	
Strand	**Percentage of Items on Test**
Number	25 – 35%
Patterns and Relations	30 - 40%
Shape and Space	15– 25%
Statistics and Probability	10 – 20%

Cognitive Domain of Test	
Complexity Level	**Percentage of Items on Test**
Low	30 – 40%
Moderate	40 – 50%
High	15 – 25%