

Math 30-3
Curriculum Package
February 2012



2012

Strand: Measurement

General Outcome: Develop spatial sense through direct and indirect measurement.

Specific Outcomes	Achievement Indicators – Measurable outcomes
<i>It is expected that students will:</i>	<i>The following set of indicators may be used to assess student achievement for each related specific learning outcome. Students who have fully met the specific learning outcomes are able to:</i>
Demonstrate an understanding of the limitations of measuring instruments, including: <ul style="list-style-type: none"> • precision • accuracy • uncertainty • tolerance • solve problems. [C, PS, R, T, V] [ICT: C6–4.4, C6–4.5] 	<ul style="list-style-type: none"> • Explain why, in a given context, a certain degree of precision is required. • Explain why, in a given context, a certain degree of accuracy is required. • Explain, using examples, the difference between precision and accuracy. • Compare the degree of accuracy of two given instruments used to measure the same attribute. • Relate the degree of accuracy to the uncertainty of a given measure. • Analyze precision and accuracy in a contextual problem. • Calculate maximum and minimum values, using a given degree of tolerance in context. • Describe, using examples, the limitations of measuring instruments used in a specific trade or industry; e.g., tape measure versus Vernier caliper. • Solve a problem that involves precision, accuracy or tolerance.

Strand: Geometry

General Outcome: Develop spatial sense.

Solve problems by using the sine law and cosine law, excluding the ambiguous case. [CN, PS, V]	<ul style="list-style-type: none"> • Identify and describe the use of the sine law and cosine law in construction, industrial, commercial and artistic applications. • Solve a problem, using the sine law or cosine law, when a diagram is given.
Solve problems that involve: <ul style="list-style-type: none"> • triangles • quadrilaterals • regular polygons. [C, CN, PS, V] 	<ul style="list-style-type: none"> • Describe and illustrate properties of triangles, including isosceles and equilateral. • Describe and illustrate properties of quadrilaterals in terms of angle measures, side lengths, diagonal lengths and angles of intersection. • Describe and illustrate properties of regular polygons. • Explain, using examples, why a given property does or does not apply to certain polygons. • Identify and explain an application of the properties of polygons in construction, industrial, commercial, domestic and artistic contexts. • Solve a contextual problem that involves the application of the properties of polygons.
Demonstrate an understanding of transformations on a 2-D shape or a 3-D object, including: <ul style="list-style-type: none"> • translations • rotations • reflections • dilations. [C, CN, R, T, V] [ICT: C6–3.4] 	<ul style="list-style-type: none"> • Identify a single transformation that was performed, given the original 2-D shape or 3-D object and its image. • Draw the image of a 2-D shape that results from a given single transformation. • Draw the image of a 2-D shape that results from a given combination of successive transformations. • Create, analyze and describe designs, using translations, rotations and reflections in all four quadrants of a coordinate grid. • Identify and describe applications of transformations in construction, industrial, commercial, domestic and artistic contexts. • Explain the relationship between reflections and lines or planes of symmetry. • Determine and explain whether a given image is a dilation of another given shape, using the concept of similarity. • Draw, with or without technology, a dilation image for a given 2-D shape or 3-D object, and explain how the original 2-D shape or 3-D object and its image are proportional. • Solve a contextual problem that involves transformations.

Strand: Number

General Outcome: Develop number sense and critical thinking skills.

Specific Outcomes	Achievement Indicators – Measurable outcomes
<i>It is expected that students will:</i>	<i>The following set of indicators may be used to assess student achievement for each related specific learning outcome. Students who have fully met the specific learning outcomes are able to:</i>
Analyze puzzles and games that involve logical reasoning, using problem-solving strategies. [C, CN, PS, R]	<ul style="list-style-type: none"> • Determine, explain and verify a strategy to solve a puzzle or to win a game; e.g., <ul style="list-style-type: none"> ○ guess and check ○ look for a pattern ○ make a systematic list ○ draw or model ○ eliminate possibilities ○ simplify the original problem ○ work backward ○ develop alternative approaches. • Identify and correct errors in a solution to a puzzle or in a strategy for winning a game. • Create a variation on a puzzle or a game, and describe a strategy for solving the puzzle or winning the game.
Solve problems that involve the acquisition of a vehicle by: <ul style="list-style-type: none"> • buying • leasing • leasing to buy. [C, CN, PS, R, T] 	<ul style="list-style-type: none"> • Describe and explain various options for buying, leasing and leasing to buy a vehicle. • Solve, with or without technology, problems that involve the purchase, lease or lease to purchase of a vehicle. • Justify a decision related to buying, leasing or leasing to buy a vehicle, based on factors such as personal finances, intended use, maintenance, warranties, mileage and insurance.
Critique the viability of small business options by considering: <ul style="list-style-type: none"> • expenses • sales • profit or loss. [C, CN, R] [ICT: F2–4.7] 	<ul style="list-style-type: none"> • Identify expenses in operating a small business, such as a hot dog stand. • Identify feasible small business options for a given community. • Generate options that might improve the profitability of a small business. • Determine the break-even point for a small business. • Explain factors, such as seasonal variations and hours of operation, that might impact the profitability of a small business.

Strand: Algebra

General Outcome: Develop algebraic reasoning.

Demonstrate an understanding of linear relations by: <ul style="list-style-type: none"> • recognizing patterns and trends • graphing • creating tables of values • writing equations • interpolating and extrapolating solving problems. [CN, PS, R, T, V] [ICT: C6–4.1, C6–4.3, C7–4.2] 	<ul style="list-style-type: none"> • Identify and describe the characteristics of a linear relation represented in a graph, table of values, number pattern or equation. • Sort a set of graphs, tables of values, number patterns and/or equations into linear and nonlinear relations. • Write an equation for a given context, including direct or partial variation. • Create a table of values for a given equation of a linear relation. • Sketch the graph for a given table of values. • Explain why the points should or should not be connected on the graph for a context. • Create, with or without technology, a graph to represent a data set, including scatterplots. • Describe the trends in the graph of a data set, including scatterplots. • Sort a set of scatterplots according to the trends represented (linear, nonlinear or no trend). • Solve a contextual problem that requires interpolation or extrapolation of information.
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Strand: Algebra

General Outcome: Develop algebraic reasoning.

Specific Outcomes	Achievement Indicators – Measurable outcomes
<i>It is expected that students will:</i>	<i>The following set of indicators may be used to assess student achievement for each related specific learning outcome. Students who have fully met the specific learning outcomes are able to:</i>
Continued from above...	<ul style="list-style-type: none"> • Relate slope and rate of change to linear relations. • Match given contexts with their corresponding graphs, and explain the reasoning. • Solve a contextual problem that involves the application of a formula for a linear relation.

Strand: Statistics

General Outcome: Develop statistical reasoning.

Solve problems that involve measures of central tendency, including: <ul style="list-style-type: none"> • mean • median • mode • weighted mean • trimmed mean. [C, CN, PS, R] 	<ul style="list-style-type: none"> • Explain, using examples, the advantages and disadvantages of each measure of central tendency. • Determine the mean, median and mode for a set of data. • Identify and correct errors in a calculation of a measure of central tendency. • Identify the outlier(s) in a set of data. • Explain the effect of outliers on mean, median and mode. • Calculate the trimmed mean for a set of data, and justify the removal of the outliers. • Explain, using examples such as course marks, why some data in a set would be given a greater weighting in determining the mean. • Calculate the mean of a set of numbers after allowing the data to have different weightings (weighted mean). • Explain, using examples from print and other media, how measures of central tendency and outliers are used to provide different interpretations of data. • Solve a contextual problem that involves measures of central tendency.
Analyze and describe percentiles. [C, CN, PS, R]	<ul style="list-style-type: none"> • Explain, using examples, percentile ranks in a context. • Explain decisions based on a given percentile rank. • Explain, using examples, the difference between percent and percentile rank. • Explain the relationship between median and percentile. • Solve a contextual problem that involves percentiles.

Strand: Probability

General Outcome: Develop critical thinking skills related to uncertainty.

Analyze and interpret problems that involve probability. [C, CN, PS, R]	<ul style="list-style-type: none"> • Describe and explain the applications of probability; e.g., medication, warranties, insurance, lotteries, weather prediction, 100-year flood, failure of a design, failure of a product, vehicle recalls, approximation of area. • Calculate the probability of an event based on a data set; e.g., determine the probability of a randomly chosen light bulb being defective. • Express a given probability as a fraction, decimal and percent and in a statement. • Explain the difference between odds and probability. • Determine the probability of an event, given the odds for or against. • Explain, using examples, how decisions may be based on a combination of theoretical probability calculations, experimental results and subjective judgments. • Solve a contextual problem that involves a given probability.
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