Mathematics Curriculum Objectives

Number Knowledge

Objective	StudentSpeak Objective
Read any 3-digit whole number	Read any 3-digit whole number
Explain the meaning of digits in 2- or 3-digit whole numbers	To understand the meaning of 1s, 10s and 100s (2 and 3 digit numbers)
Order any set of three or more whole numbers (up to 99)	Can put 3 or more numbers in an order (up to 99)
Write/solve story problems involving 1/2, 1/4, 1/3, & 1/5	Write/solve story problems involving 1/2, 1/4, 1/3, & 1/5
Explain the meaning of the digits in any whole number	Explain the meaning of the digits in any whole number
Explain meaning of digits in numbers up to 3 decimal places	Explain the meaning of digits in numbers using tenths, hundredths, and thousandths (3 decimal places)
Order decimals and fractions up to and equivalent of 3 decimal places	Can order decimals using tenths, hundredths, and thousandths (3 decimal places)
Explain the meaning of negative numbers	Explain the meaning of negative numbers
Express a fraction as a decimal, & vice versa	Write a fraction as a decimal, and a decimal as a fraction
Express a decimal as a percentage, & vice versa	Write a decimal as a percentage, and a percentage as a decimal
Express quantities as fractions or percentages of a whole	Write a fraction as a percentage, and a percentage as a fraction
Count to at least 100	Count to at least 100
Demonstrate knowledge of the conventions for order of operations	Demonstrate knowledge of the conventions for order of operations
Knows doubles, halves and groupings of ten	Knows doubles, halves and groupings of ten
Classifies odd/even numbers	Classifies odd/even numbers
Say, read, write whole numbers and fractions	Say, read, write whole numbers and fractions

Objective	StudentSpeak Objective
Know tenths, tens, hundreds, thousands	Know tenths, tens, hundreds, thousands
Classify numbers as whole numbers and/or fractions (decimals)	Classify numbers as whole numbers and/or fractions (decimals)
Classify numbers by factors and multiples, including primes	Classify numbers by factors and multiples, including primes

Number Sense & Operations

Objective	StudentSpeak Objective
Represent sums of money with 2 or more combinations of notes & coins	Can make sums of money with two or more combinations of notes and coins
Explain the meaning & evaluate powers of whole numbers	Explain the meaning and powers of whole numbers
Give change for sums of money	Give change for sums of money
Write & solve whole number story problems using +, -, x, /	Use a story to solve problems using +, -, x, /
Write & solve story problems with combinations of +, -, x, /	Use a story to solve problems using a combination of +, -, x, /
Write & solve comparison problems	Write and solve comparison problems
Write and solve story problems using 1/2, 1/4, 1/3, 1/5	Write and solve story problems using 1/2, 1/4, 1/3, 1/5
Make sensible estimates & check reasonableness of answers	Make sensible estimates and check how reasonable the answer is
Operate with basic addition & subtraction facts	Work with basic addition and subtraction facts
Perform calculations of addition/subtraction	Make calculations using addition and subtraction
Demonstrate the ability to use the multiplication facts	Show the ability to use the multiplication facts
Make sensible estimates & check reasonableness of answers	Make sensible estimates and check how reasonable the answer is
Operate with basic multiplication facts	Work with basic multiplication facts

Write & solve whole number/decimal problems using +, -, x, /	Write and solve whole number and decimal problems using +, -, x, /
Solve problems using fractions of whole numbers or decimals	Solve problems using fractions of whole numbers or decimals
Explain satisfactory algorithms for +, -, x	Explain suitable equations for +, -, x
Demonstrate knowledge of conventions for order of operations	Know the rules for the order of operations
Find fractions equivalent to one given	Find an equivalent fraction
Make sensible estimates & check the reasonableness	Make sensible estimates and check how reasonable the answer is
Write & solve problems with decimal multiplication/division	Writing and solve problems by multiplying and dividing decimals
Find a given fraction or percentage of a quantity	Find a fraction or percentage of an amount
Use number stories (up to 9) about objects	Use number stories (up to 9) about objects
Solve problems involving positive and negative numbers	Solve problems involving positive and negative numbers
Express one quantity as a percentage of another	Express one quantity as a percentage of another
Solve fraction problems, using activities/models if needed	Solve fraction problems, using activities/models if needed
Increase/decrease quantities by given percent, incl mark up/discount/GST	Increase/decrease quantities by given percent, including mark-up/discount/GST
Share quantities in given ratios	Share quantities in give ratios
Solve practical problems using decimals/percentages	Solve practical problems using decimals/percentages
Calculate the values of square roots in approximate/exact forms	Calculate the values of square roots in approximate/exact forms
Make sensible estimates & check reasonableness of results	Make sensible estimates and check reasonableness of results
Devise a strategy to solve a whole number problem	Devise a strategy to solve a whole number problem

Devise a strategy to solve a fraction number problem	Devise a strategy to solve a fraction number problem
Perform basic operations on fractions/mixed numbers	Perform basic operations on fractions/mixed numbers
Estimate/calculate answers to problems making efficient use of calculator	Estimate/calculate answers to problems making efficient use of calculator
Convert standard form to ordinary form & vice versa	Convert standard form to ordinary form and ordinary form to standard
Understand the value of square roots in approximate/exact form	Understand the value of square roots in approximate/exact form
Identify & distinguish rational numbers	Identify and distinguish rational numbers
Identify/distinguish irrational numbers (from integers/whole/rational)	Identify/distinguish irrational numbers (from integers/whole/rational)
Round numbers sensibly	Round numbers sensibly
Discuss reasonableness/meaning of answers obtained in solving problem	Discuss reasonableness/meaning of answers obtained in solving problem
Write/solve problems with decimals needing choice of arithmetic operations	Write/solve problems with decimals needing choice of arithmetic operations
Solve simple problems involving exponents	Solve simple problems involving exponents
Find common factors and multiples	Find common factors and multiples
Solve problems involving factorials	Solve problems involving factorials

Algebra

Objective	StudentSpeak Objective
Use the mathematical symbols =, <, >	Use the mathematical symbols =, <, >
Continue sequential pattern & describe a rule	Continue the order of the pattern and write the rule
Use graphs to illustrate relationships	Use graphs to show the connections between two or more things
Describe rules for continuing number & spatial patterns	Describe rules for continuing patterns
Make up & use a rule to create a sequential	Use your own rule to make up a continuing pattern

Objective	StudentSpeak Objective
pattern	
State general rule for a set of similar practical problems	State a general rule for a set of similar problems
Use graphs to represent number, or informal, relations	Use graphs to represent number, or informal, relationships
Solve problems of the type (x+15=39)	Solve problems of the type (x + 15 = 39)
Find & express rules for any member of number sequence	Find and state rules for any part of the number sequence/s
Use a rule to make predictions	Use a rule to make predictions
Sketch & interpret whole number graphs of simple situations	Sketch and explain the meaning of graphs of simple situations (whole numbers)
Find & justify a word formula for given practical situations	Find and explain a word formula in practical situations
Solve simple linear equations such as (2x+4=16)	Solve simple linear equations such as (2x + 4 = 16)
Combine like terms in algebraic expressions	Combine like terms in algebraic expressions
Factorise & expand algebraic expressions	Factorise and expand algebraic expressions
Simplify algebraic fractions	Simplify algebraic fractions
Use equations to represent practical situations	Use equations to represent practical situations
Evaluate linear expressions by substitution	Evaluate linear expressions by substitution
Model and solve linear equations	Solve linear equations
Make a pattern & give rule for general term in words/symbols	Make a pattern and give rule for general term in words/symbols
Generate a pattern from a rule	Generate a pattern from a rule
Sketch & interpret graphs which represent everyday situations	Sketch and interpret graphs which represent everyday situations
Graph linear rule, interpret slope/intercepts using integer co-ordinates	Graph linear rule, interpret slope/intercepts using integer co-ordinates
Interpret/use information about rates shown	Interpret/use information about rates shown in a

Objective	StudentSpeak Objective
in a variety of ways	variety of ways
Substitute values into formulae	Substitute values into formulae
Model and solve linear, simultaneous & simple quadratic equations	Form/solve linear, simultaneous and simple quadratic equations
Generate linear/quadratic patterns & find/justify the rule	Generate linear/quadratic patterns and find/justify the rule
Interpret/use information about rates shown in variety of ways	Interpret/use information about rates shown in variety of ways
Generate a pattern from a rule	Generate a pattern from a rule
Form & interpret a graph	Form and interpret a graph
Explain the relationship between the gradient of graph & rate of change	Explain the relationship between the gradient of graph and rate of change
Design & use a 2-dimensional scale to represent data	Design and use a two-dimensional scale to represent data
Graph linear/quadratic/exponential functions & simple circle/hyperbola	Graph linear/quadratic/exponential functions and simple circle/hyperbola
Manipulate simple expressions	Manipulate simple expressions
Form & solve simple linear inequations	Form and solve simple linear inequations

Measurement

Objective	StudentSpeak Objective
Measure length/mass/capacity using appropriate metric units	Measure length/mass/capacity using appropriate metric units
Read & know units of time (minute/hour/day/week/month/year)	Read and know units of time (minute/hour/day/week/month/year)
Reasonably estimate length/mass/area/volume/temperature	Reasonably estimate length/mass/area/volume/temperature
Measure using a range of units & scales	Measure using a range of unit and scales
Read & interpret everyday statements involving time	Read and explain everyday time problems

Objective	StudentSpeak Objective
Show analogue time as digital time & vice versa	Show analogue (clock with hands) time as digital time and vice versa
Measure by reading scales to nearest gradation	Read scales and measure to the nearest gradation
Read & construct a variety of scales, timetables, & charts	Read and create a variety of scales, timetables, and charts
Perform calculations with time, including 24-hour clock	Make calculations with time, including 24-hour clock
Identify/know about quarter and half turns	Identify and know about quarter and half turns
Know about simple angles (90, 180, 30, 45, 60)	Know about simple angles (30, 45, 60, 90,180)
Know about/measure angles that are simple fractions of 360 e.g., 45,90,180	Know about and measure angles (30, 45, 60, 90,180, 360)
Identify/know about clockwise & anticlockwise turns	Identify and know about clockwise and anticlockwise turns
Know perimeters, areas, and volumes of simple shapes	Can find perimeters, areas and volumes of simple shapes
Make quarter and half turns	Make quarter and half turns
Use protractor to measure angles to nearest gradation	Use a protractor to measure angles to the nearest gradation
Make clockwise and anticlockwise turns	Make clockwise and anticlockwise turns
Know about perimeter/area/volume of shapes & limits of answer	Know about perimeter/area/volume of shapes and limits of answer
Design & use models to solve measuring problems in practical contexts	Design and use models to solve measuring problems in practical contexts
Show knowledge/skills to plan/implement/evaluate practical measuring tasks	Show knowledge/skills to plan/implement/evaluate practical measuring tasks
Know how to find volumes of cuboids from measurements of length	Know how to find volumes of cuboids from measurement of length
Know about volume of common shapes &	Know about volume of common shapes and limits of

Objective	StudentSpeak Objective
limits of answer	answer
Calculate volumes of cuboids from measurements of length	Calculate volumes of cuboids from measurements of length
Find perimeters/areas of common shapes, and limits of answer	Find perimeters/areas of common shapes, and limits of answer
Find volumes of common shapes & limits of answer	Find volumes of common shapes and limits of answer
Calculate/measure circle/rectangle/triangle perimeter & rectangle area	Calculate/measure circle/rectangle/triangle perimeter and rectangle area

Shape

Objective	StudentSpeak Objective
Make, name, & describe shapes/objects in own/geometric language	Make, name, and describe shapes/objects in own/geometric language
Describe features of 2-D & 3-D objects in geometric language	Describe the features of 2D and 3D objects using the language of geometry
Make, name, & describe shapes/objects in own/geometric language	Make, name, and describe shapes/objects in own/geometric language
Design & make containers to specified requirements	Design and make containers to specified requirements
Model & describe 3-D objects shown in diagrams or pictures	Model and describe 3-D objects shown in diagrams or pictures
Draw pictures of simple 3-dimensional objects	Draw pictures of simple three-dimensional objects
Construct triangles & circles with drawing instruments	Construct triangles and circles with drawing instruments
Design net & make simple polyhedra to specified dimensions	Design net and make simple polyhedra to specified dimensions
Make a model of solid object from top, front, side, back views	Make a model of solid object (like a cube) from top, front, side back views
Draw diagrams of solid objects made from cubes	Draw diagrams of solid objects made from cubes

Objective	StudentSpeak Objective
Investigate angle properties of triangles & polygons	Investigate angle properties of triangles and polygons
Use the polygon symmetry/angle properties to solve practical problems	Use the polygon symmetry/angle properties to solve practical problems
Constructions (rt angle/parallel/perp lines/circle/median/mediator etc)	Constructions (right angle/parallel/perp lines /circle/median/mediator etc.)
Make isometric drawings of 3-D objects built out of blocks	Make isometric drawings of three-dimension objects built out of blocks
Draw & interpret 2-D representations of 3-D objects	Draw and interpret two-dimension representations of three-dimension objects
Know angle properties of parallel lines & explain reasoning involved	Know angle properties of parallel lines and explain reasoning involved
Know the symmetry & angle properties of polygons	Know the symmetry and angle properties of polygons
Know angle between tangent/radius & angle-in-semicircle properties	Know angle between tangent/radius and angle-in-semicircle properties
Know how to find rt-angled triangle lengths (scale drwg/Pythag/trig ratio)	Know how to find right-angled triangle lengths (scale drawing/Pythagoras/trigonometry/sine-cos rules
Knowledge of angles in practical triangle problems (trig & sine/cos rules)	Knowledge of angles in practical triangle problems (trigonometry and sine/cos rules)
Identify angle properties in rt-angle triangles within 3-D objects/drawings	Identify angle properties in right-angle triangles within three-dimensional objects/drawings
Explore & describe a locus formed in a practical situation	Explore and describe a locus formed in a practical situation
Knowledge of triangle lengths (scale drwg/Pythag/trig/sine-cos rules)	Knowledge of triangle lengths (scale drawing/Pythagoras/trigonometry/sine-cos rules)
Know length properties in rt-angled triangles within 3-D objects/drawings	Know length properties in right-angled triangles within three-dimensional objects/drawings
Use angle properties of parallel lines & explain the reasoning involved	Use angle properties of parallel lines and explain the reasoning involved
Use angle between tangent/radius & angle-in-semicircle properties	Use angle between tangent/radius and angle-in-semicircle properties

Objective	StudentSpeak Objective
Find length in right-angle triangle (scale drawing/Pythagoras/trig ratio)	Find length in right-angle triangle (scale drawing/Pythagoras/trigonometry ratio)
Find angles in practical triangle problems using trig ratio & sine/cos rules	Find angles in practical triangle problems using trigonometry ratio and sine/cos rules
Find triangle lengths (scale drwg/Pythag/trig/sine-cos rules)	Find triangle lengths (scale drawing/Pythagoras/trigonometry/sine-cos rules)
Define plane shapes/prisms/pyramids/cones/spheres by spatial features	Define plane shapes/prisms/pyramids/cones/spheres by spatial features
Use angle properties of intersecting lines and explain reasoning involved	Use angle properties of intersecting lines & explain reasoning involved

Position & Orientation

Objective	StudentSpeak Objective
Describe/interpret position with direction/distance language	Describe and explain the position using direction and distance language
Draw & interpret simple scale maps	Draw and explain simple scale maps
Specify location using bearings or grid references	Identify location using bearing or grid references
Describe patterns of reflection, rotation, & translation	Describe patterns of reflection, rotation, and translation
Describe the reflection or rotational symmetry of an object	Explain the reflection or rotational symmetry of an object
Make & describe patterns with translation/rotation/reflection	Make and explain patterns with translation/rotation/reflection
Use or make patterns using reflection, rotation, & translation	Use or make patterns using reflection, rotation, and translation
Design/make pattern using translation, reflection, rotation	Design and make pattern using translation, reflection, rotation
Enlarge, on grid paper, simple shapes to a specified scale	Enlarge, on grid paper, simple shapes to a particular scale
Apply the symmetries of regular polygons	Apply the symmetries of regular polygons

Objective	StudentSpeak Objective
Use the reflection or rotational symmetry of an object	Use the reflection or rotational symmetry of an object
Enlarge/reduce 2-D shapes & identify invariant properties	Enlarge and reduce 2-D shapes and identify constant properties
Solve practical problems which can be modelled using vectors	Solve practical problems which can be modelled using vectors
Identify & use invariant properties under transformations	Identify and use invariant properties under transformations
Use & interpret vectors which describe translations	Use and interpret vectors which describe translations
Apply the relationship between scale factors for length, area, & volume	Apply the relationship between scale factors for length, area, and volume
Explain the effect of negative scale factors for enlargement	Explain the effect of negative scale factors for enlargement
Describe effect of 2/more transformations (reflection/rotation/translation)	Describe effect of 2 or more transformations (reflection/rotation/translation)
Recognise 2 similar shapes, know about scale factor & length	Recognise two similar shapes, know about scale factor and length
Recognise 2 similar shapes, find scale factor & use to find length	Recognise two similar shapes, find scale factor and use to find length
Create/use rectangular/rotational coord systems to specify location/paths	Create/use rectangular/rotational coord systems to specify location/paths
Interpret location/direction using bearing and grid references	Interpret location/direction using bearing and grid references
Construct and describe simple loci	Construct and describe simple loci
Interpret points/lines on coord plane, incl scale/compass with maps	Interpret points/lines on coord plane, incl scale/compass with maps
Solve/model areas contained by two or more loci	Solve/model areas contained by two or more loci

Probability

Objective	StudentSpeak Objective

Objective	StudentSpeak Objective
Assign numerical probability values to events using simple fractions	Assign numerical probability values to simple events
Use possible outcomes to assign probabilities	Use possible outcomes to assign probabilities
Compare related events & order on a scale of likelihood	Compare related events and order on a scale of likelihood
Plan investigation of probability assertions in a situation	Plan investigation of probability assertions in a situation
Use systematic approach to count a set of possible outcomes	Use systematic approach to count a set of possible outcomes
Predict likelihood of outcomes based on set of observations	Predict likelihood of outcomes based on set of observations
Collect appropriate probability data	Collect appropriate probability data
Estimate relative frequencies of events & mark on a scale	Estimate relative frequencies of events and mark on a scale
Find all possible outcomes for a sequence of events e.g., using tree diagrams	Find all possible outcomes using tree diagrams
Determine probabilities of events based on long-run relative frequency	Determine probabilities of events based on long-run relative frequency
Predict/test/explain results of simple probability experiment	Predict/test/explain results of simple probability experiment
Determine theoretical probabilities of outcomes (eg roll die, draw card)	Determine theoretical probabilities of outcomes (e.g., roll die, draw card)
Find the probability of a given sequence of events, using tree diagrams	Find the probability of a given sequence of events, using tree diagrams
Find theoretical probabilities of exclusive & independent events	Find theoretical probabilities of exclusive and independent events
Use probability trees to calculate conditional probabilities	Use probability trees to calculate conditional probabilities
Find probability/outcomes for multivariate data from social contexts	Find probability/outcomes for multivariate data from social contexts

Statistics

Objective	StudentSpeak Objective
Describe situation represented by statistical data displays	Describe situation represented by statistical data displays
Design & use a simple scale to measure qualitative data	Design and use a simple scale to measure qualitative data
Collect & display data using pictograms, tally or bar charts	Collect and display data using pictograms, tally or bar charts
Describe the features of own data displays	Describe the features of your own data displays (like graph)
Make statements about data shown in a statistical display	Make statements about data shown in a statistical display
Plan statistical investigation of assertion in a situation	Plan statistical investigation of assertion in a situation
Collect & display numeric data in various graphs	Collect and display numeric data in various graphs
Use own language to describe distinctive features of data	Use own language to describe distinctive features of data
Make sensible statements about a statistical investigation	Make sensible statements about a statistical investigation
Plan statistical investigation of issue or experiment	Plan statistical investigation of issue or experiment
Collect appropriate statistical data	Collect appropriate statistical data
Choose & construct data displays to show significant features	Choose and construct data displays to show significant features
Collect & display time-series data	Collect and display time-series data
Report distinctive features of data displays	Report distinctive features of data displays
Evaluate others' interpretations of data displays	Evaluate others' interpretations of data displays
Make statements/recommendations based on statistical results	Make statements/recommendations based on statistical results
Plan/conduct stats investigation with diff types	Plan/conduct statistic investigation with different

Objective	StudentSpeak Objective
of data/variation over time	types of data/variation over time
Consider/identify variables to study & select/justify samples to collect	Consider/identify variables to study and select/justify samples to collect
Find/validate data measures (eg mean/median/range etc) from approp displays	Find/validate data measures (e.g., mean/median/range etc) from appropriate displays
Collect/display comparative samples in appropriate displays	Collect/display comparative samples in appropriate displays
Discuss discrete/continuous numeric data shown in quality displays	Discuss discrete/continuous numeric data shown in quality displays
Use data displays/measures to compare data associated with diff categories	Use data displays/measures to compare data associated with different categories
Report on time-related variation as result of statistical investigation	Report on time-related variation as result of statistical investigation
Report possible sources of error/limitations of investigation	Report possible sources of error/limitations of investigation
Design statistical qns involving possible relationships between variables	Design statistical questions involving possible relationships between variables
Formulate questions about time variation in continuous processes	Formulate questions about time variation in continuous processes
Collect/concisely report sig features of bivariate data incl scatter graphs	Collect/concisely report signature features of bivariate data including scatter graphs
Make/justify statements about relationships from stats investigation	Make/justify statements about relationships from statistical investigation
Identify long/short-term features in time-series data	Identify long/short-term features in time-series data
Identify data collection methodology	Identify data collection methodology
Suggest improvements in the investigation where inferences inconclusive	Suggest improvements in the investigation where inferences inconclusive