WHAKATANE INTERMEDIATE SCHOOL

MATHEMATICS CURRICULUM

Planning

Considering all points

- NZ Curriculum – All strands
- Data gathering and analysis
- School targets
- School and individual needs
- Target students
- Maths standards
- Whanau/community
- Ethnic and cultural diversity
- Resources
- Integration
- Critical thinking
- Key competencies

Action

Expectations

- Assessment/analysis
- Target learners
- 4 hours of maths per week
- group teaching
- consistent delivery of structured lesson
- meaningful contexts
- collaboration
- talking about learning
- practice
- learning styles
- key competencies
- feedback/feed forward
- critical thinking/discussion
- digital learning experiences
- home learning
-

Outcomes

What learners will have achieved

- By the end of year 7 students will be achieving at early level 4 of the NZ Curriculum (Beginning)
- By the end of year 8 students will be achieving at level 4 of the NZ curriculum (Middle)
- Be self directed learners
- Talk about and describe strategies used
- Collaborate effectively to solve problems
- Have a positive attitude towards mathematics
- Successfully sit standardised tests (PAT)
- Meet the national standard - year 7 or year 8
- Discuss next steps in maths and how they are going to get there

WHAKATANE INTERMEDIATE SCHOOL

MATHEMATICS CURRICULUM

LEVEL 3	LEVEL 4	LEVEL 5
NUMBER AND ALGEBRA **Number strategies** • use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages **Number knowledge** • know basic multiplication and division facts • know counting sequences for whole numbers • know how many tenths, tens, hundreds, and thousands are in whole numbers • know fractions and percentages in everyday use **Equations and expressions** • record and interpret additive and simple multiplicative strategies, using words, diagrams, and symbols, with an understanding of equality **Patterns and relationships** • generalise the properties of addition and subtraction with whole numbers • connect members of sequential patterns with their ordinal position and use tables, graphs, and diagrams to find relationships between successive elements of number and spatial patterns. **GEOMETRY AND MEASUREMENT** **Measurement** • Use linear scales and whole numbers of metric units for length, area, volume and capacity, weight (mass), angle, temperature, and time. • Find areas of rectangles and volumes of cuboids by applying multiplication. **Shape** • Classify plane shapes and prisms by their spatial features. • Represent objects with drawings and models. **Position and orientation** • Use a co-ordinate system or the language of direction and distance to specify locations and describe paths. **Transformation** • Describe the transformations (reflection, rotation, translation, or enlargement) that have mapped one object onto another. **STATISTICS** **Statistical Investigation** • Conduct investigations using the statistical enquiry cycle: o Gathering, sorting, and displaying multivariate category and whole-number data and simple time-series data to answer questions;	**NUMBER AND ALGEBRA** **Number strategies and knowledge** • Use a range of multiplicative strategies when operating n whole numbers • Understand addition and subtraction of fractions, decimals, and integers • Find fractions, decimals, and percentages of amounts expressed as whole numbers, simple fractions and decimals • Apply simple linear proportions, including ordering fractions • Know the equivalent decimal and percentage and percentage forms for everyday fractions • Know the relative size and place value structure of positive and negative integers and decimals to three places **Equations and expressions** • Form and solve simple liner equations **Patterns and Relationships** • Generalise properties of multiplication and division with whole numbers • Use graphs, tables, and rules to describe linear relationships found in number and spatial patterns **GEOMETRY AND MEASUREMENT** **Measurement** • Use appropriate scales, devices, and metric units for length, area, volume and capacity, weight (mass), temperature, and and time. • Convert between metric units, using whole numbers and commonly used decimals • Use side of edge lengths to find the perimeters and areas of rectangle, parallelograms, and triangles and the volumes of cuboids • Interpret and use scales, timetables, and charts **Shape** • Identify classes of two-and three-dimensional shapes by their geometric properties • Relate three-dimensional models to two-dimensional representations, and vice versa **Position and orientation** • Communicate and interpret locations and directions, using compass directions, distances, and grid references **Transformation** • Use the invariant properties of figures and objects under transformations (reflection, rotation, translation, or enlargement). **STATISTICS** **Statistical investigation** • Plan and conduct investigations using the statistical enquiry	**NUMBER AND ALGEBRA** **Number strategies and knowledge** • Reason with linear proportions. • Use prime numbers, common factors and multiples, and powers (including square roots). • Understand operations on fractions, decimals, percentages, and integers. • Use rates and ratios. • Know commonly used fraction, decimal, and percentage conversions. • Know and apply standard form, significant figures, rounding, and decimal place value. **Equations and expressions** • Form and solve linear and simple quadratic equations. **Patterns and relationships** • Generalise the properties of operations with fractional numbers and integers. • Relate tables, graphs, and equations to linear and simple quadratic relationships found in number and spatial patterns. **GEOMETRY AND MEASUREMENT** **Measurement** • Select and use appropriate metric units for length, area, volume and capacity, weight (mass), temperature, angle, and time, with awareness that measurements are approximate. • Convert between metric units, using decimals. • Deduce and use formulae to find the perimeters and areas of polygons and the volumes of prisms. • Find the perimeters and areas of circles and composite shapes and the volumes of prisms, including cylinders. **Shape** • Deduce the angle properties of intersecting and parallel lines and the angle properties of polygons and apply these properties. • Create accurate nets for simple polyhedra and connect three-dimensional solids with different two-dimensional representations. **Position and orientation** • Construct and describe simple loci. • Interpret points and lines on co-ordinate planes, including scales and bearings on maps. **Transformation** • Define and use transformations and describe the invariant properties of figures and objects under these transformations.

○ Identifying patterns and trends in context, within and between data sets; ○ Communicating findings, using data displays **Statistical literacy** • Evaluate the effectiveness of different displays in representing the findings of a statistical investigation or probability activity undertaken by others **Probability** • Investigate simple situations that involve elements of chance by comparing experimental results with expectations from models of all the outcomes, acknowledging that samples vary.	cycle: ○ Determining appropriate variables and data collection methods; ○ Gathering, sorting, and displaying multivariate category, measurement, and time-series data to detect patterns, variations, relationships, and trends; ○ Comparing distributions visually; ○ Communicating findings, using appropriate displays **Statistical literacy** • Evaluate statements made by others about the findings of statistical investigations and probability activities **Probability** • Investigate situations that involve elements of chance by comparing experimental distributions with expectations fro models of the possible outcomes, acknowledging variation and independence • Use simple fractions and percentages to describe probabilities	• Apply trigonometric ratios and Pythagoras' theorem in two dimensions. **STATISTICS** **Statistical investigation** • Plan and conduct surveys and experiments using the statistical enquiry cycle: ○ determining appropriate variables and measures ○ considering sources of variation ○ gathering and cleaning data ○ using multiple displays, and re-categorising data to find patterns, variations, relationships, and trends in multivariate data sets ○ comparing sample distributions visually, using measures of centre, spread, and proportion ○ presenting a report of findings. **Statistical literacy** • Evaluate statistical investigations or probability activities undertaken by others, including data collection methods, choice of measures, and validity of findings. **Probability** • Compare and describe the variation between theoretical and experimental distributions in situations that involve elements of chance. • Calculate probabilities, using fractions, percentages, and ratios.
END OF YEAR 7	**END OF YEAR 8**	**WHAT DOES THIS LOOK LIKE AT WIS?**
Number and algebra In contexts that require them to solve problems or model situations, students will be able to: • apply additive and multiplicative strategies flexibly to whole numbers, ratios, and equivalent fractions (including percentages) • apply additive strategies to decimals • balance positive and negative amounts • find and represent relationships in spatial and number patterns, using: - tables and graphs - general rules for linear relationships. **Geometry and measurement** In contexts that require them to solve problems or model situations, students will be able to: • measure time and the attributes of objects, using metric and other standard measures • make simple conversions between units, using whole numbers • use side or edge lengths to find the perimeters and areas of rectangles and parallelograms and the volumes of cuboids, given whole-number dimensions • sort two- and three-dimensional shapes into classes, defining properties and justifying the decisions made • identify and describe the transformations that have produced given shapes or patterns • create or identify nets for rectangular prisms and other simple solids	**Number and algebra** In contexts that require them to solve problems or model situations, students will be able to: • apply multiplicative strategies flexibly to whole numbers, ratios, and equivalent fractions (including decimals and percentages) • use multiplication and division as inverse operations on whole numbers • apply additive strategies flexibly to decimals and integers • find and represent relationships in spatial and number patterns, using: - tables and graphs - equations for linear relationships - recursive rules for non-linear relationships • apply inverse operations to simple linear relationships. **Geometry and measurement** In contexts that require them to solve problems or model situations, students will be able to: • use metric and other standard measures • make simple conversions between units, using decimals • use side or edge lengths to find the perimeters and areas of rectangles, parallelograms, and triangles and the volumes of cuboids • sort two and three-dimensional shapes into classes, considering the relationships between the classes and justifying the decisions made • identify and describe the features of shapes or patterns that change or do not change under transformation	• Variety of groupings • Rotations • Students teaching students (peer tutoring) • Hands on activities • AWS/Pearson/NCM • Mathletics/study ladder • Numeracy Project • Figure it out • Independent activities • Otago Problem Solving • Study Ladder • Use of Maths Apps online/maths games • Khan Academy • Games/Dice/Cards • Maths Extension • Inter-syndicate planning/assessment • Programme analysis • Cool Maths Games • 24 Challenge • Daily learning of basic facts • Well resourced classrooms • Science Fair – statistics • ICAS Maths – school funds students where needed • House Points/recycling Points • Tie in with tech/arts/science contexts – connecting

• draw plan, front, side, and perspective views of objects • describe locations and give directions, using grid references, simple scales, turns, and points of the compass. **Statistics** In contexts that require them to solve problems or model situations, students will be able to: • investigate summary, comparison, and relationship questions by using the statistical enquiry cycle: - gather or access multivariate category and measurement data - sort data and display it in multiple ways, identifying patterns and variations - interpret results in context, accepting that samples vary and have no effect on one another order the likelihoods of outcomes for situations involving chance, checking for consistency between experimental results and models of all possible outcomes.	• create or identify nets for rectangular prisms and other simple solids, given particular requirements • draw or make objects, given their plan, front, and side views or their perspective views • describe locations and give directions, using scales, bearings, and co-ordinates. **Statistics** In contexts that require them to solve problems or model situations, students will be able to: • investigate summary, comparison, and relationship questions by using the statistical enquiry cycle: - gather or access multivariate category, measurement, and time-series data - sort data and display it in multiple ways, identifying patterns, variations, relationships, and trends and using ideas about middle and spread where appropriate - interpret results in context, identifying factors that produce uncertainty express as fractions the likelihoods of outcomes for situations involving chance, checking for consistency between experimental results and models of all possible outcomes.	maths to real life • Collaborative learning • Real life situations i.e. Commonwealth Games • Financial Literacy • Geometry in playground • Pre/Post tests and formative assessment

Key Competencies

Thinking	Using language, symbols, and texts	Managing Self	Relating to others	Participating and contributing
• Problem solving • Transferring knowledge • Bloom taxonomy • Articulate – solving a problem – ways to succeed • Reflection • Prior knowledge • Using strategies • Explaining strategies used • Active learning • Challenging self • Setting goals • Teach others	• Building maths vocab • Problem solving language • Hands on building and creating • Using maths resources • Working though ICT/visual aides • Understanding and using maths symbols	• Completing all set tasks • Working to time frames • Working independently • Challenging self • Identifying weaknesses and strengths • Asking questions • Asking for help • Marking work • Taking responsibility for learning • High expectations • Teach others	• Sharing ideas • Co-operating • Inclusion • Recognising diversity of classmates • Cultural awareness • Positive social interactions • Collaborating • Group work • Saying the same thing in different ways to help understanding • Sharing strategies to solve problems	• Experts in class • Listen/share • Share abilities • Sharing ideas • Co-operating • Developing a learning culture • Discussion/maths maintenance • Risk taking • Teach someone else

Review Date: June 2014

WHAKATANE INTERMEDIATE SCHOOL

MATHEMATICS OVERVIEW

	TERM ONE	TERM TWO	TERM 3	TERM 4
1	Number	Number	Number	Number
2				
3	Measurement	Algebra	Measurement	Algebra
4	• Measurement	• Equations and expressions	• Measurement	• Equations and expressions
5	• Shape	• Patterns and relationships	• Shape	• Patterns and relationships
6	Geometry	Statistics	Geometry	Statistics
7	• Position and orientation	• Statistical investigation	• Position and orientation	• Statistical investigation
8	• Transformation	• Statistical literacy • Probability	• Transformation	• Statistical literacy • Probability
9	Number	Number	Number	Number
10				

NB

- Suggested Strand topics, particularly in Number are a guide only and follow the achievement objectives. All analysis of data and identification of student need is paramount.
- Problem solving will be built into classroom programmes.
- Algebra may be built into the Number Strand.

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MATHEMATICS OVERVIEW

MATHEMATICS EXPECTATIONS	CLASSROOM EXPECTATIONS	ASSESSMENT
Every class has at least 4 hours of maths each week. • teaching groups • problem solving • learning activities - practical and digital • teacher engaged with students • lots of learning talk • critical thinking • practise • digital learning There is variation depending on the age, stage and needs of the children. Planning and teaching is based on the information gained from regular assessment and analysis of data. All lessons include the teaching of knowledge, strategies and problem solving within a problem-solving context. Yearly overview would cover all strands. Lesson Plans include: • Key competencies • Links to assessment and identification of needs • Term plans • Weekly plans with group rotations and practice activities • Target students and their needs/goals identified	• Number will be the focus of 40-60% of maths teaching time • Learning Intentions visible • Group rotations on whiteboard with tasks listed • Daily maintenance/basic facts and 4 operations practice • Modelling books may be used • Group Teaching • Appropriate Resources • Busy children engaged in their learning • Children who can talk about their learning and identify next learning steps • Problem solving • Collaboration • Digital learning opportunities	• The gathering, analysing, evaluating of data • Marking against learning intentions • PAT – Match, October • Student Voice • OTJs • Observation • Basic Facts – each term • 4 Operations – each term