

AIS Maths Curriculum Overview Pre-School

By the end of Pre-School students will:

Data Handling

- begin to discuss and identify outcomes that will happen, won't happen and might happen.
- sort real objects into *sets* by attributes.
- begin to create a graph of real objects in a group situation.

Measurement

- begin to identify, compare and describe attributes of real objects and situations: longer, shorter, heavier, empty, full, hotter, colder.
- identify, compare and sequence events in their daily routine: before, after, bedtime, story-time.
- begin to discuss aspects of time; e.g. today and tomorrow.

Shape and Space

- begin to sort, describe and compare simple 2-D and 3-D *shapes* according to attributes such as size or form.
- begin to explore and describe the paths, regions and boundaries of their immediate environment (inside, outside, above, below) and their position (next to, behind, in front of, up, down).

Pattern and Function

- begin to find and describe simple *patterns*.
- create simple *patterns* using real objects. (ABAB)

Number

- read numbers to 10
- begin to *model* numbers to 10
- count, and order numbers to 10
- begin to compare numbers to 10
- begin to use *ordinal numbers* to describe the position of things in a sequence (1st, 2nd, 3rd)
- begin to use the language of mathematics: more, less and number names.
- use *1-1 correspondence*
- begin to explore the *conservation* of number through the use of *manipulatives* (... = ...)

AIS Maths Curriculum Overview Pre-Kindergarten

By the end of Pre-Kindergarten students will:

Data Handling

- discuss and identify outcomes that will happen, won't happen and might happen.
- sort, label and classify real objects into *sets* by attributes.
- as a member of a group create and begin to understand the purpose of a graph.

Measurement

- identify, compare and describe attributes of real objects and situations: longer, shorter, heavier, empty, full, hotter, colder.
- label and compare objects using non standard units of measurement.
- identify, compare and sequence events in their daily routine: before, after, bedtime, story time, today, tomorrow.
- begin to understand lengths of time-day, week, month, year.

Shape and Space

- sort, describe and compare simple 2-D and 3-D *shapes* according to attributes such as size or form.
- explore and describe the paths, regions and boundaries of their immediate environment (inside, outside, above, below) and their position (next to, behind, in front of, up, down).

Pattern and Function

- find and describe simple *patterns*.
- create simple *patterns* using real objects.
- begin to create more complex patterns eg. AAB, ABBA.
- begin to recognize patterns within numbers e.g. 12, 21.

Number

- read, write and *model* numbers to 10.
- begin to read write and model numbers to 20.
- count, compare and order numbers to 20.
- begin to use the *base 10 system* to 100.
- begin to *estimate* quantities to 10.
- use *ordinal numbers* to describe the position of things in a sequence.
- *model* number relationships to 10.
- use the language of mathematics: more, less, numbers, how many all together?
- use *1-1 correspondence*.
- explore the *conservation* of number through the use of *manipulatives*.
- begin to select and explain an appropriate method for solving a problem.

AIS Maths Curriculum Overview

Kindergarten

By the end of Kindergarten students will:

Data Handling

- sort and label objects into *sets* by one or more attribute.
- record and represent data.
- look at different representations of the data set.
- collect, display and interpret data for the purpose of finding information.
- understand the purpose of graphing data.
- as a member of a group, create a *pictograph* and simple *bar graph* from a *graph* of real objects, and interpret data by comparing quantities: more, fewer, less than, greater than.

Measurement

- *estimate*, measure, label and compare using *nonstandard units of measurement*: length, time.
- use a calendar to determine the date, and to identify and sequence days of the week and months of the year.
- *estimate*, identify and compare lengths of time: hour.
- read the time to the hour.

Shape and Space

- use what they know about *2-D shapes* to see and describe *3-D shapes*.
- sort and label *2-D* and *3-D shapes* using appropriate mathematical vocabulary: *sides*, *corners*, *circle*, sphere, *square*, cube
- create *2-D shapes*.
- find and explain *symmetry* in their immediate environment.
- create and explain simple symmetrical designs
- give and follow simple directions e.g. forwards, backward and general boundaries. Introduce left and right.

Pattern and Function

- create, describe and extend *patterns*.
- recognize, describe and extend *patterns* in numbers: even, skip counting, 2s, 5s and 10s.
- identify patterns and rules for addition: $4 + 3 = 7$, $3 + 4 = 7$ (communative patterns).

Number

- read, write and *model* numbers, using the *base 10 system*, to 100.
- count (in 1s, 2s, 5s and 10s), compare and order numbers to 100.
- *estimate* quantities to 100.
- use mathematical vocabulary and symbols of *addition* and *subtraction*: add, subtract, +, −.
- read, write and *model addition*.
- describe the meaning and use of *addition*.
- use *fraction* names (half, quarter) to describe part and whole relationships.
- *estimate* the reasonableness of answers.

AIS Maths Curriculum Overview

Grade 1

By the end of Grade 1 students will:

Data Handling

- sort and label objects into *sets* by one or more attributes.
- record and represent data.
- look at different representations of the data set.
- discuss and compare data represented in teacher generated *Venn* diagrams.
- collect, display and interpret data for the purpose of finding information.
- understand the purpose of graphing data.
- create a *pictograph* and simple *bar graph* from a *graph* of real objects, and interpret data by comparing quantities: more, fewer, less than, greater than.
- discuss, identify, predict and place outcomes in order of likelihood: impossible, unlikely, likely and certain.

Measurement

- *estimate*, measure, label and compare using *nonstandard units of measurement*: length, *mass*, time and temperature.
- use a calendar to determine the date, and to identify and sequence days of the week and months of the year.
- *estimate*, identify and compare lengths of time: day, week, month.
- estimate, identify and compare lengths of time: hour and half hour.
- read the time to the hour and the half hour.

Shape and Space

- use what they know about *2-D shapes* to see and describe *3-D shapes*.
- sort and label *2-D* and *3-D shapes* using appropriate mathematical vocabulary: *sides*, *corners*, *circle*, sphere, *square*, cube.
- create *2-D shapes*.
- find and explain *symmetry* in their immediate environment.
- create and explain simple symmetrical designs.
- visualize paths between locations, estimating distances, which way to turn (consolidating left and right), comparing distances, recording written directions, counting and adding distances.

Pattern and Function

- create, describe and extend *patterns*.
- recognize, describe and extend *patterns* in numbers: even, skip counting, 2s, 5s and 10s.
- identify *patterns* and rules for *addition*: $4 + 3 = 7$, $3 + 4 = 7$ (*commutative property*).
- identify *patterns* and rules for *subtraction*: $7 - 3 = 4$, $7 - 4 = 3$.
- *model*, with *manipulatives*, the relationship between *addition* and *subtraction*: $3 + 4 = 7$, $7 - 3 =$

4.

Number

- read, write and *model* numbers, using the *base 10 system*, to 100.
- count (in 1s, 2s, 5s and 10s), compare and order numbers to 100.
- *estimate* quantities to 100.
- use mathematical vocabulary and symbols of *addition* and *subtraction*: add, subtract, +, −.
- read, write and *model addition*.
- automatically recall addition and subtraction facts to 10.
- describe the meaning and use of *addition and subtraction*.
- use *fraction* names (half, third, quarter) to describe part and whole relationships and to make a whole.
- *estimate* the reasonableness of answers.
- select and explain an appropriate method for solving a problem.

AIS Maths Curriculum Overview Grade 2

By the end of Grade 2 students will:

Data Handling

- discuss, compare and create *sets* from data that has *subsets* using *Venn* and other diagrams.
- design a *survey*, process and interpret the data.
- collect and display data in a *bar graph* and interpret results.
- use probability to determine mathematically fair and unfair games and to explain possible outcomes.

Measurement

- *estimate*, measure, label and compare using formal methods and *standard units of measurement*: length, time and temperature.
- measure using non standard and standard units.
- select appropriate tools and units of measurement.
- *model addition* and *subtraction* using money.
- read and write the time to the hour, half hour and quarter hour.
- be introduced to reading and writing the time to intervals of 5 minutes on 12-hour clocks.

Shape and Space

- sort and describe: *triangles*, *hexagons*, *trapeziums*.
- identify, describe and *model congruency* in *2-D shapes*.
- combine and transform *2-D shapes* to make another shape.
- create symmetrical *patterns*, including *tessellation*.

Pattern and Function

- analyse *patterns* in number systems to 100.
- recognize, describe and extend more complex *patterns* in numbers.
- Understand and use the relationship between addition and subtraction $4 + 3 = 7$, $7 - 3 = 4$.
- understand and use number *patterns* to solve problems (missing numbers).

Number

- read, write and *model* numbers, using the *base 10 system*, to 100 (understanding of place value).
- count, compare and order numbers to 100.
- *estimate* quantities to 100.
- count in 2s, 5s, 10s.
- automatically recall basic *addition* and *subtraction* facts up to 24 (e.g. $12+12=24$, $23-11=12$).
- *model addition* and *subtraction equations* to 100 (with and without *regrouping*).
- use and describe multiple strategies to solve *addition* and *subtraction* problems.
- compare *fractions* using *manipulatives* and using fractional notation.
- reasonably *estimate* answers: rounding and *approximation*.
- select and explain an appropriate method for solving a problem.

AIS Maths Curriculum Overview

Grade 3

By the end of Grade 3 students will:

Data Handling

- discuss, compare and create *sets* from data that has *subsets* using *tree*, *Venn* and other diagrams.
- design a *survey*, process and interpret the data.
- collect and display data in a *bar graph* and *line graph* and interpret results.

Measurement

- *estimate*, measure, label and compare using formal methods and *standard units of measurement*: length and *mass*, time and temperature.
- measure using non standard and standard units.
- select appropriate tools and units of measurement.
- describe measures that fall between numbers on a measure *scale*: 3 1/2kg, between 4cm and 5cm.
- *estimate*, measure, label and compare *perimeter* and *area*.
- *model addition* and *subtraction* using money.
- read and write the time to 5 minute intervals, on 12-hour clocks.

Shape and Space

- sort, describe and *model* regular and irregular *polygons*: *triangles*, hexagons, *trapeziums*.
- identify, describe and *model congruency* in *2-D shapes*.
- combine and transform *2-D shapes* to make another shape.
- create symmetrical *patterns*, including *tessellation*.
- understand an *angle* as a measure of rotation by comparing and describing rotations: whole turn; half turn; quarter turn; north, south, east and west on a compass.
- locate features on a grid using *coordinates*.

Pattern and Function

- analyse *patterns* in number systems to 100.
- recognize, describe and extend more complex *patterns* in numbers.
- understand and use the relationship between *addition* and *subtraction*: $4 + 3 = 7$, $7 - 3 = 4$.
- identify *patterns* and rules for *multiplication* and *division*: $4 \times 3 = 12$, $3 \times 4 = 12$, $12 \div 3 = 4$, $12 \div 4 = 3$.
- *model*, with *manipulatives*, the relationship between *multiplication* and *division*.
- *model*, with *manipulatives*, the relationship between *multiplication* and *addition* (repeated addition).
- *model*, with *manipulatives*, the relationship between *division* and *subtraction*.
- understand and use number *patterns* to solve problems (missing numbers).
- *model multiplication* as an *array*.

Number

- read, write and *model* numbers, using the *base 10 system*, to 1000 (understanding of

place value).

- count, compare and order numbers to 1000.
- be introduced to negative integers.
- *estimate* quantities to 1000.
- count in 2s, 5s, 10s, and explore other numbers (7s, 8s etc).
- automatically recall and use basic addition and subtraction facts.
- automatically recall (within 3 seconds) multiplication tables to 12.
- *model addition and subtraction equations* to 1000 (with and without *regrouping*).
- be introduced to the standard algorithms for addition and subtraction for three digit numbers.
- use mathematical vocabulary and symbols of *multiplication* and *division*: times, divide *product*, *quotient*, %, +
- use and describe multiple strategies to solve *addition* and *subtraction* problems
- read, write and *model multiplication* and *division* problems
- compare *fractions* using *manipulatives* and using fractional notation
- use mathematical vocabulary and symbols of *fractions*: *numerator*, *denominator*, *equivalence*
- understand and *model* the concept of *equivalence* to 1: two halves = 1, three thirds = 1
- reasonably *estimate* answers: rounding and *approximation*
- select and explain an appropriate method for solving a problem.

AIS Maths Curriculum Overview Grade 4

By the end of Grade 4 students will:

Data Handling

- design a *survey* and systematically collect, organize and record the data.
- create, interpret, discuss and compare data displays (*bar/line graph*) including how well they communicate information.
- find, describe and explain the *range, mode, median* outlines and gaps in a set of data.
- use a spreadsheet to tabulate data sets and generate graphs.
- understand that probability is how likely something is to occur.
- use a *numerical probability scale* of 0 to 1 and 0% to 100%.

Measurement

- select and use appropriate *standard units of measurement* when estimating, describing, comparing and measuring.
- use procedures for finding *area*.
- begin to develop procedures for finding volume.
- tell time to the minute.
- determine times worldwide.
- use and timetables (12 and 24 hour) and timelines.
- understand that an *angle* is a measure of rotation.

Shape and Space

- use the geometric vocabulary of *2-D* and *3-D shapes*: parallel, *edge, vertex*.
- classify, sort and label all types of *quadrilaterals*: *trapezium, parallelogram, square, rectangle*.
- understand and use the vocabulary of *lines, lines of symmetry, rotational and mirror symmetry*.
- describe, classify and *model 3-D shapes*.
- turn a *2-D net* into a *3-D shape* and vice versa.
- read and plot *coordinates* in four *quadrants*.

Pattern and Function

- understand and use the relationship between *multiplication* and *addition*.
- understand and use the relationship between *multiplication* and *division* (*inverse function*).
- understand and use the relationship between *division* and *subtraction*.
- *model* and explain number *patterns*.
- begin to use real-life problems to create a number *pattern*, following a rule.

Number

- read, write and *model* numbers, using the *base 10 system*, to 10 000; and to hundredths (understanding of place value).
- automatically recall (within 3 seconds) and use basic number facts (addition, subtraction, multiplication and division) to 12.
- skip count in all single digits (e.g. 2s, 5s, 6s, 8s) and landmark numbers (e.g. 10s, 25s,

100s).

- use and describe multiple strategies to solve *addition* and *subtraction* problems.
- have mastered the standard algorithms for addition and subtraction with four digit numbers including.
 - numbers with 0 in the minuend.
 - begin to solve multiple *digit multiplication* and *division* problems.
 - be introduced to two digit by two digit multiplication.
 - be introduced to the long division algorithm with a single digit divisor (with remainders).
- read, write and *model common fractions* ($1/2$, $1/3$, $1/4$, $1/5$, $1/6$, $1/8$, $1/10$, $6/8$, $3/4$).
- compare and order *fractions* of values 0-2 including improper fractions and mixed numbers ($1/2$, $1/3$, $1/4$, $1/5$, $1/6$, $1/8$, $1/10$, $1\ 1/2$, $4/3$, $4/6$, $1\ 1/2$, $5/8$).
- *model* equivalency of *fractions*: $2/4 = 1/2$.
- use the mathematical vocabulary of *fractions*.
- begin to make sense of remainders understand the characteristics of and relationships between multiples, factors, primes and squares.
- begin to develop and use strategies for solving word problems i.e. guess and check, draw a picture, make a table, work backwards, solve a simpler problem, make an organized list.
- begin to develop and use strategies for estimation.
- begin to read, write and *model* the *addition* and *subtraction* of decimals to the hundredths.
- begin to round decimals to a given place or whole number.
- select and defend the most appropriate and efficient method of solving a problem: mental estimation, mental arithmetic, pencil and paper *algorithm*, calculator.

AIS Maths Curriculum Overview Grade 5

By the end of Grade 5 students will:

Data Handling

- plan and design surveys; formulate, test, define and refine survey questions.
- be introduced to identifying data sets as numerical or categorical.
- be introduced to converting a whole data set to fractions, decimals and/or percentages.
- practice creating, interpreting, discussing and comparing data displays including tables, basic histograms and pie charts (to the nearest 10%).
- introduce finding, describing and explaining range, mode, median, outliers and gaps in a set of data qualitatively.
- systematically collect, organize and record data in tables and select appropriate means of displaying data.
- understand that probability is how likely something is to occur.
- begin to understand the relationship between experimental and theoretical probability.
- practice using a numerical probability scale of 0 to 1 divided into $\frac{1}{2}$ and $\frac{1}{4}$ using spinners.

Measurement

- select and use appropriate *standard units of measurement* when estimating, describing, comparing and measuring (cm, dm, m, cm^2 , dm^2 , cm^3).
- use measuring tools, with simple *scales*, accurately (cm, dm, m).
- convert between cm, dm, and m.
- understand that the accuracy of a measurement depends on the situation and the precision of the tools.
- develop, use, describe and justify procedures for finding *area* (cm^2 , dm^2).
- develop, use, describe and justify procedures for finding *perimeter* (cm, dm, m).
- develop, use, describe and justify qualitatively procedures for finding volume as well as calculate the volume of a rectangular prism.
- determine the qualitative relationships between *area*, *perimeter* and *volume*.
- use *decimal notation* in measurement: 3.2cm, 1.47kg.
- understand that an *angle* is a measure of rotation.
- measure and construct *angles* in *degrees* using a protractor.

Shape and Space

- extend their use the geometric vocabulary of *2-D* and *3-D shapes*.
- classify, sorting and labeling all types of *triangles* and *quadrilaterals*.
- be introduced and begin to use the vocabulary of types of *angle*: *obtuse*, *acute*, *straight*, *right*

- locate read and plot *coordinates* on a coordinate grid.

Pattern and Function

- understand and use the relationships between the four operations.
- model and explain growing number patterns using tile designs, tables and graphs.
- begin to relate number patterns to graphical shapes.
- begin to model and use distance, time and speed relationships to create number patterns following motion stories.
- begin to compare graph shapes to describe the rates of growth.

Number

- begin to read and write base 10 numbers to millions and beyond and thousandths (understanding of place value).
- model base 10 numbers to 10 000 and thousandths.
- confidently, quickly and accurately use mental and written strategies (including using formal algorithms) based on numerical reasoning to find:
 - sums and differences of multiple digit numbers including differences with 0 in the minuend
 - products of two and three digit numbers
 - quotients with possible remainders of up to four digit dividends using single or double digit divisors
- make sense of remainders.
- understand the characteristics of and relationships between multiples, factors, primes and squares.
- round numbers to a given place.
- develop and use strategies for estimation.
- begin to develop and use an awareness of the reasonableness of an answer.
- use the mathematical vocabulary of *fractions: decimals and percentages*.
- understand equivalency of fractions and percentages ($1/2$, $1/4$, $3/4$, 1.0).
- read, write and model common, improper fractions and mixed numbers.
- practice comparing and ordering fractions of values between 0-2 with unlike denominators, including improper numbers and mixed numbers ($1/2$, $1/3$, $1/4$, $1/5$, $1/6$, $1/8$, $1/10$, $1/100$, $1\ 1/2$, $4/3$, $4/6$).
- *begin to model* equivalency of *fractions*: $2/4 = 1/2$.
- begin to model addition and subtraction of fractions pictorially.
- begin to compare and order decimals to thousandths.
- begin to understand percent as “out of 100”.
- begin to read, write and model percentages.
- begin to identify and use relationships between fractions, decimals and percents.
- develop and use strategies for solving word problems i.e. guess and check, draw a picture, make a table, work backwards, solve a simpler problem, make an organized list.

- automatically (within 3 seconds) recall and use basic number facts to 12.