## Semester 1

<table>
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<th>Week</th>
<th>Content</th>
<th>Text</th>
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<td>Week 1 – 3</td>
<td>Space and Measurement. Number and Algebra:</td>
<td>Chapter 1</td>
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Assessments for Year 11 and Year 12: 2 Projects and 5 Tests

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Approx 55 hours  
approx 3-4 hrs per week - 4 (1 hour) periods

**Progress Reports**

Progress reports will be distributed at least twice a term. Students can use progress reports to track their performance.
1. Number and algebra
   (19 hours)

1.1 Estimation and calculation
1.1.1 use rule of order with +, −, ×, ÷, squares, square roots and brackets when calculating
with whole numbers and decimals
1.1.2 round decimals to the nearest multiple of ten, unit or tenth
1.1.3 estimate sums, difference, products and quotients by rounding
1.1.4 use mental/written computation:
   - calculate simple percentages of quantities
   - add and subtract integers, decimals and common fractions e.g. \( \frac{1}{4} + \frac{3}{4} \)
   - multiply integers, decimals, common fractions by single digit whole numbers
   - divide integers and decimals by single digit counting numbers.
1.1.5 convert between common fractions, decimals and percentages of quantities
1.1.6 order fractional, decimal and percentage quantities that are close e.g. \( \frac{1}{2} \) and 30% of
$100
1.1.7 convert between fractions, decimals and percentages with a calculator
1.1.8 use calculators and spreadsheets to add, subtract, multiply and divide numbers,
   adhering to and utilising conventions of the technologies
1.1.9 recognise that multiplying and dividing by fractions and decimals can increase or
decrease the original amounts
1.1.10 order and record on the number line:
   - decimals with different numbers of decimal places
   - positive and negative whole and decimal numbers.

1.2 Equivalence, equations and inequalities
1.2.1 generate number equivalent statements that recognise the associative, commutative
   and distributive properties e.g. \( 25 \times 6 + 25 \times 4 = 25 \times (6 + 4) = 250 \)
1.2.2 recognise that letters stand for variable numbers in algebra
1.2.3 use algebraic conventions, such as \( 2 \times k = 2k \) and \( k \times k = k^2 \)
1.2.4 substitute into formulas directly to evaluate quantities such as area \( A \) given \( r \) for the
   formula, \( A = \pi r^2 \)
1.2.5 write word sentences and constraints symbolically including sentences like ‘a taxi
   charge is $4.80 flag fall and $1.35 per kilometre’
1.2.6 solve one- and two-step equations with a single algebraic term using the guess, check
   and improve, work-backwards and balance methods e.g. \( x^2 = 2000, \ 2x + 3 = 12 \)
1.2.7 substitute to validate solutions of equations
1.2.8 state truth sets for word statements and graph them on the number line e.g. numbers
   between 4 and 10
1.2.9 generate pairs of numbers that satisfy equations e.g. \( x \ y = 36 \).

1.3 Finance
1.3.1 construct spreadsheets and use them to make financial decisions, including budgeting
   for personal use, budgeting for an activity
1.3.2 read and interpret information from financial statements, such as pay slips, debit/credit
   card statements, bank statements, telephone accounts, rent statements, invoices,
   retail store statements and income tax statements
1.3.3 compare financial statements, such as mobile phone plans, rewards programs,
   internet plans, interest-free terms.
2. Space and Measurement
(18 hours)

2.1 Time
2.1.1 calculate elapsed time including the duration of events
2.1.2 interpret complex timetables and schedules such as tide charts
2.1.3 integrate information to schedule events in which time is a variable
2.1.4 calculate and use everyday rates including speed in kilometres per hour (conversions not included).

2.2 Length, area, mass, volume and capacity, angle
2.2.1 read between calibrations on scales when measuring
2.2.2 relate the diameter of a circle to its circumference
2.2.3 estimate area of a circle by counting squares
2.2.4 use decimal approximations for $\pi$
2.2.5 use formulas to calculate:
   - circumference of a circle
   - area of a circle.
2.2.6 use Pythagoras’ theorem to calculate the sides of right triangles.

2.3 Location
2.3.1 describe scales with ratios
2.3.2 interpret maps using map coordinates, ratio scales, compass directions and bearings.

2.4 Transformations
2.4.1 use a grid to enlarge, reduce or distort a 2D figure by whole number and unit fraction scales
2.4.2 describe the properties of transformations e.g. corresponding points on the image and object are the same distance from a line of reflection
2.4.3 describe the position and orientation of 3D objects after translation, reflection and rotation e.g. in the context of moving furniture
2.4.4 use geometric language to describe transformed figures.

3. Chance and data (18 hours)

3.1 Collect and organise data
3.1.1 frame short sets of survey questions in context
3.1.2 choose a ‘fair’ sample for a survey (not a formal random sample)
3.1.3 plan recording sheets for survey data
3.1.4 collect and record data, and check and edit the record
3.1.5 group measurement data in tables with provided equal sized class intervals.

3.2 Represent data
3.2.1 construct one- and two-way frequency tables
3.2.2 construct column graphs showing frequency and compound (i.e. clustered) column graphs for two sets of data
3.2.3 construct frequency histograms for ungrouped data and data grouped in equal sized class intervals
3.2.4 calculate mean, median and mode for ungrouped frequency data
3.2.5 calculate relative frequency, and proportions of data in fractional, decimal and percentage forms
3.2.6 describe spread of datasets informally (data are spread out, tightly packed)
3.2.7 describe spread using range and lowest and highest scores.

3.3 Interpret data
3.3.1 read information from tables, circle graphs (pie charts with simple percentages, and frequency graphs, reading between calibrations on scales)
3.3.2 discern advantages and disadvantages of using frequency graphs rather than tables to display data
3.3.3 discern the relative advantages of the various ‘averages’ (mean, median and mode)
3.3.4 compare datasets using mean, median, lowest and highest scores and range
3.3.5 use words that acknowledge uncertainty when comparing data sets such as ‘scores for … tend to be more spread than scores for …’
3.3.6 calculate numbers of data in categories from relative frequency and proportions
3.3.7 report on collected data, including sampling methods and justification for them.
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<th>Week</th>
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| Week 18-20 | **NUMBER**  
Skills revision  
- Powers  
- Square and cube roots  
- Ratios and rates  
**Finance**  
- Simple and compound interest  
- Account balance  
- Depreciation  
- Inflation  
- Loan repayments  
- Buy now versus buy later | Chapter 1 |  
Test 1  
Number and Algebra |
| Week 1-2 | **Angles and Triangles**  
- Angle size  
- Trig ratios  
- Direct proportion | Chapter 2 | Project 1  
Test 2 |
| Week 3-4 | **CHANCE AND DATA**  
Probability (4 hours)  
- Sample spaces  
- Calculate  
- Compare experimental results with calculated results  
**Simulation**  
- Design  
- Interpretation of results | Chapter 3 | Test 3 |
| Week 5 | **Data Analysis (6 hours)**  
- Scatterplots  
- Interpretation | Chapter 4 |  
| Week 6-7 | **Surface area and volume**  
- Prisms, pyramids, cones, cylinders  
- Building shapes | Chapter 5 | Project 2  
Test 4 |
| Week 8 | **Networks**  
- Traversibility  
- Shortest path  
- Two directional flow  
- Shortest arcs |  |  |
Week 9-10

**Graphs**
- Cartesian plane – four quadrants

**Patterns**
- One and two step rules

Chapter 6

Test5

Assessments for Year 11: 2 Projects and 5 Tests

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Assessments for Year 12: 2 Projects and 4 Tests

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**Progress Reports**

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Unit content

1. **Number and algebra**  
   (23 hours)

1.1 **Estimation and calculation**
   1.1.1 use common percentage, decimal and fractional equivalents
   1.1.2 round whole and decimal numbers to given degrees of accuracy and to suit contexts
   1.1.3 calculate with powers using written methods and calculators
   1.1.4 calculate with square and cube roots using calculators
   1.1.5 calculate with ratios and rates in contexts such as the number of litres of petrol to travel 450 km if consumption is 7.8 L/100 km.

1.2 **Functions and graphs**
   1.2.1 locate and plot points in the four quadrants of the Cartesian plane, joining points if appropriate for problem contexts
   1.2.2 sketch graphs to represent function relationships in contexts including travel graphs
   1.2.3 describe how quantities appear to be related using graphs of points and continuous graphs, including travel graphs
   1.2.4 distinguish dependent and independent variables and assign independent variables to the horizontal axis on graphs.

1.3 **Patterns**
   1.3.1 describe symbolically:
     – one- and two-step rules that link each element in a number pattern to position
     – one- and two-step recursive rules for patterns with a given starting number, using arithmetic operations and powers.
   1.3.2 check and revise rules to ensure correct meaning, taking into account order of operations
   1.3.3 follow one- and two-stage rules to extend sequences and predict results.

1.4 **Finance**
   1.4.1 make decisions about loans and investments:
     – calculate simple interest
     – calculate interest compounded yearly, monthly and daily, using recursion with technology
     – calculate repayments and balance amounts for loans
     – compare loans and investments with simple and compound interest.
   1.4.2 calculate depreciation and inflation
   1.4.3 determine ‘best buys’ using ratio and proportion.

2. **Space and measurement**  
   (15 hours)

2.1 **Length, area, mass, volume and capacity, angle**
   2.1.1 use formulas to calculate surface area and volume of prisms, pyramids, cones, cylinders, spheres and hemispheres
   2.1.2 use inversely the formulas for:
     – areas of squares, rectangles, circles
     – volumes of rectangular right prisms, cylinders, cones, spheres and hemispheres
   2.1.3 convert between metric units e.g. kilometres to metres
   2.1.4 convert between derived metric units and across units e.g. cubic metres to cubic centimetres, square metres to hectares
   2.1.5 use angle measure in degrees
   2.1.6 use trigonometric ratios (sine, cosine, tangent) to calculate sides and angles (degree measure) of right triangles
   2.1.7 use direct proportion to estimate where direct measurement is not possible e.g. estimate the height of a tree.

2.2 **Networks**
   2.2.1 represent information as networks
   2.2.2 investigate the traversability of networks, intuitively and with algorithms
   2.2.3 develop and use systematic methods for the shortest path between vertices of simple networks e.g. two-directional flow.

3. **Chance and data**  
   (17 hours)

3.1 Conduct chance experiments
3.1.1 conduct simulations to model real world events with outcomes that are not equally likely.

3.2 Quantify chance
3.2.1 use long run relative frequency to estimate probabilities
3.2.2 list sample spaces for one-stage events with repetition to reflect likelihood of outcomes
3.2.3 calculate simple probabilities using sample spaces and the number of favourable outcomes divided by the total number of outcomes
3.2.4 use fractions, decimals and percentages to describe probability and move freely between them
3.2.5 use the facts that probabilities sum to 1 and range from 0 to 1 to check probabilities.

3.3 Interpret chance
3.3.1 predict the results for repetition of simulations with the same number of trials
3.3.2 use probabilities to predict proportions and number of outcomes that are likely to satisfy provided criteria in \( n \) trials
3.3.3 recognise predictions are not always realised
3.3.4 recognise the law of large numbers (that outcomes for successive trials follow no describable pattern but relative frequency of outcomes is predictable for a large number of trials)
3.3.5 order outcomes from least likely to most likely, using fractional, decimal and percentage probabilities
3.3.6 explain probability statements in common usage
3.3.7 identify factors that could compromise the simulation of real world events
3.3.8 use chance terminology when describing events ("probability of", "complement of").

3.4 Collect and organise data
3.4.1 plan the collection of bivariate data to investigate situations specified by the teacher
3.4.2 predict what data will show
3.4.3 plan recording sheets involving tables
3.4.4 collect and record data and check and edit the record.

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Welcome to Unit 1D/E Mathematics. The following is a set of guidelines to help you succeed in this subject. You must ensure you bring the following items to each lesson.

1. File with an abundant source of paper.
2. Your textbook by Nelson and other relevant worksheets.
3. Calculator, minimum requirement scientific calculator
4. Pens, pencils, etc.

It may be useful to organise your work with the following sections:

1. Journal - Used for class notes and examples that should be kept separate from their practice examples.
   (This must include special notes and examples on using graphic calculators).
2. Work Section
3. Assessments - All assessments to be kept in an A4 display folder until final grading is complete.

HOMEWORK
Homework when necessary. There are two types of homework:

1. The first type includes finishing off a certain number of questions from the text or worksheet.
   If you are struggling with an exercise you should seek help as soon as you can from a friend or myself.
2. The second type of homework is study.

ASSESSMENT
- You will be allocated a grade for this unit (A, B, C, D, E, U). Your grade will be determined purely by the results you obtain in common assessments as outlined in the program assessment schedule. You must do your best in each assessment.
- Students who cheat in, or pass on information to another student about an assessment task, will be awarded a mark of zero for that component of the assessment program.
- Student Notes may be used as directed in tests.
- Students with frequent absences from assessment tasks will have their situation reviewed.

______________________________
Dear Parent

Could you please sign below to acknowledge that you have seen the summary of classroom organisation for Unit 1D/E Mathematics. This is also an invitation to contact me through the school if you have any concerns regarding your child's progress in this subject.

Kind Regards

Mathematics Teacher

Students Name ________________________ Parent/Guardian

Signature. ________________________