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|  | **Campbell House School Teaching and Learning Program** | | | | | | | | | | | | | | | |
| **Title/Type of Unit: Mathematics – Financial Mathematics**  **Duration: 11 weeks** | | | | | | | | | | | | | | | |
| **Syllabus Outcomes**  **Stage 5** | *A student:*  MA5.1 – 2WM Selects and uses appropriate strategies to solve problems  MA5.2 – 1WM Selects appropriate notations and conventions to communicate mathematical ideas and solutions  MA5.3 – 2WM generalises mathematical ideas and techniques to analyse and solve problems efficiently  MA5.1 – 5NA operates with algebraic impressions involving positive integer and zero indices, and establishes the meaning of negative indices for numerical bases  MA4 – 10NA uses algebraic techniques to solve simple linear and quadratic equations  MA5.1 – 7NA graphs simple non-linear relationships | | | | | | | | | | | | | | | |
| **Connectedness**  **Why does this learning matter?** | **Students learn to:**  Investigate and calculate the Goods and Services Tax (GST), with and without the use of digital technologies   * Investigate and calculate the Goods and Services Tax (GST), with and without the use of digital technologies * calculate GST and GST-inclusive prices for goods purchased in Australia, given the pre-GST price * interpret GST information contained on receipts (Communicating) * investigate efficient methods of computing the GST and GST-inclusive prices (Problem Solving) * explain why the value of the GST itself is not equivalent to 10% of the GST-inclusive price (Communicating, Reasoning) * determine the pre-GST prices for goods, given the GST-inclusive price * explain why the pre-GST price is not equivalent to 10% off the GST-inclusive price (Communicating, Reasoning)   Investigate and calculate 'best buys', with and without the use of digital technologies (ACMNA174)   * solve problems involving discounts, including calculating the percentage discount * evaluate special offers, such as percentage discounts, 'buy-two-get-one-free', 'buy-one-get-another-at-half-price', etc, to determine how much is saved (Communicating, Problem Solving) * calculate 'best buys' by comparing price per unit, or quantity per monetary unit, eg 500 grams for $4.50 compared with 300 grams for $2.75 * investigate 'unit pricing' used by retailers and use this to determine the best buy (Problem Solving) * recognise that in practical situations there are considerations other than just the 'best buy', eg the amount required, waste due to spoilage (Reasoning) * use price comparison websites to make informed decisions related to purchases under given conditions (Problem Solving) | | | | | | | | **Students learn about:**  Solve problems involving earning money   * calculate earnings from wages for various time periods, given an hourly rate of pay, including penalty rates for overtime and special rates for Sundays and public holidays * use classifieds and online advertisements to compare pay rates and conditions for different positions (Problem Solving) * read and interpret examples of pay slips (Communicating) * calculate earnings from non-wage sources, including commission and piecework * calculate weekly, fortnightly, monthly and yearly earnings * calculate leave loading as 17.5% of normal pay for up to four weeks * research the reasons for inclusion of leave loading provisions in many awards (Reasoning) * use published tables or online calculators to determine the weekly, fortnightly or monthly tax to be deducted from a worker's pay under the Australian 'pay-as-you-go' (PAYG) taxation system * determine annual taxable income by subtracting allowable deductions and use current tax rates to calculate the amount of tax payable for the financial year * determine a worker's tax refund or liability by comparing the tax payable for a financial year with the tax already paid under the Australian PAYG system (Problem Solving) * investigate how rebates and levies, including the Medicare levy and Family Tax Benefit, affect different workers' taxable incomes (Problem Solving) * calculate net earnings after deductions and taxation are taken into account | | | | | | | |
| **Background and Key Ideas** | Program focuses on extending and strengthening preliminary numeracy skills and place value understandings. It puts an understanding of why numbers have value and helps them think about how to combine quantities and eventually how this process connects with written procedure. The programs content focuses on equipping students with skills to use, save and receive money. Students work towards being able to work with money at a cashier level. Students are required to think logically and gain practice in working the most efficient phone plan, payment plans and premiums. Students are using abstraction when trying to solve problems. Students use background knowledge of whole numbers, rounding and the four mathematical operations. | | | | | | | | | | | | | | | |
| **Literacy Continuum** | Reading Texts | Comprehension | | | Vocabulary Knowledge | | | Aspects of Writing | Aspects of Speaking | | | Phonics | Phonemic Awareness | | | Concepts About Print |
| **Student:** …  **Literacy Aspect:** Vocabulary Knowledge  **Element:** cluster 7 and cluster 10  **Teaching activities linked to program to increase learning:**  Knows the meaning of commonly used words in increasingly challenging texts and can demonstrate this knowledge when reading, writing and speaking.  Students will use common words such as sum, subtract, add, addition, multiply, relationship between, greater than, smaller than. Students are to apply these terms in varying complex contexts.  Demonstrates understanding that words can have different meanings in different contexts. Demonstrates expanded content vocabulary by drawing on a combination of known and new topic knowledge. | | | | | | | | | | | | | | | |
| **Numeracy Continuum** | Counting Sequences | | Counting as Problem Solving | | | Pattern and Number Structure | | | Place Value | | Multiplication and Division | | | Fraction Units | | Length, Area and Volume |
| **Student:** …  **Numeracy Aspect:** Multiplication  **Element:** 4 and 5  **Teaching activities linked to program to increase learning:**  Uses skip counting or a double count and perceptual markers to represent groups.  Students multiply ours by rates of pay. Students use multiplication to find values of commission, PAYG tax, commission and leave loading.  Use of multiplications to find percentages of whole numbers. | | | | | | | | | | | | | | | |
| **Quality Teaching** | | | | | | | | | | | | | | | | |
| **Intellectual Quality** | | | | **Quality Learning Environment** | | | | | | **Significance** | | | | | | |
| * IQ1 Deep Knowledge * IQ2 Deep Understanding * IQ3 Problematic Knowledge * IQ4 Higher-order Thinking * IQ5 Metalanguage * IQ6 Substantive Communication | | | | * QLE1 Explicit Quality Criteria * QE2 Engagement * QE3 High Expectations * QE4 Social Support * QE5 Students’ Self-regulation * QE6 Student Direction | | | | | | * S1 Background Knowledge * S2 Cultural Knowledge * S3 Knowledge Integration * S4 Inclusively * S5 Connectedness * S6 Narrative | | | | | | |
| **Teaching and Learning Lesson Overview** | | | | | | | | | | | | | | | | |
| **The Elements of Learning & Achievement**    F:\Mock ups\Square elements\Numeracy.jpg        E:\Final V1\Final sq NO border\Sq Technology no bdr.jpg | Number and Algebra content specific  **Week 1:**  F:\Mock ups\Square elements\Numeracy.jpg**Review of number facts and long addition and subtraction.**  *Activity:*Place values of numbers smaller than 1000 subtraction. **NO REGROUP**   * Teacher demonstration. * Recover expansion. 3725 as 3000 + 700 + 20 + 5. * 15 pens minus 10 =   10 means it is 1 ten and 0 ones, meaning we are subtracting from the tens column.   * Examples 2 – 4:   2. 26 = 20 + 6 3. 39 = 30 + 9  - 5 = - 5 - 6 = - 6    4. 310 = 300 + 10 5. 29 = 20 + 9  - 9 = - 9 -19 = -10 + 9  - Worksheet: *Place value subtraction no regroup*  *Activity:*Place values of numbers smaller than 1000 subtraction. **REGROUP**   * Teacher example: demonstrate and discuss. * Recover expansion. 3725 as 3000 + 700 + 20 + 5. * Teacher demonstrate examples 1- 5. Show all examples like question 5.  1. 15 2. 12 3. 22 4. 142   - 6 - 6 - 14 - 36  5.  378 = 300 + 70 + 8 or  -59 = - 50 + 9  example to students that they don’t need to expand the question when they understand where to line up the two numbers.  F:\Mock ups\Square elements\Numeracy.jpgWorksheet: *Place value subtraction regroup*  *Activity:*Place values subtraction with two regroups or across zero’s.   * Teacher example: demonstrate and discuss. * Revise simple subtraction with one regroup * Show two examples, one with two regroups and one with subtraction across zeros. Class discussion. * Examples are first two from both sheets.   F:\Mock ups\Square elements\Numeracy.jpgWorksheet: *1. Two regroups*   1. *Regroup across zero.*   **Week 2:**  **Introduction and pre-assessment of money facts.**  *Activity:* Cents and making change worksheets and skill check 1.  Students complete worksheet on making change from $1.00  Adjustment 1 – students use scaffold worksheet to convert the written question into numeric form.  Adjustment 2 – students use coin and note money trays to problem solve with visual counters.  *Activity:* Cents and making change worksheets and skill check 1 and 2.  Students complete worksheet on making change from a $20 bill.  Adjustment 1 – students use scaffold worksheet to convert the written question into numeric form.  Adjustment 2 – students use coin and note money trays to problem solve with visual counters.  *Activity:* Hourly rates worksheets and skills check 1 and 2.  Worksheets focus on checking student’s skills of hourly rates. Students are required to use multiplication strategies to problem solve hourly rates of employment.  Adjustment – students use multiplication chart to assist in long multiplication.  F:\Mock ups\Square elements\Numeracy.jpgF:\Mock ups\Square elements\Numeracy.jpg  Activity: Income worksheets and skills check 1 and 2.  Worksheets focus on checking students understanding of hourly rates and weekly salary. Students use multiplication strategies to problem solve hourly rates of employment. Students use addition strategies to add rates from various days. Students focus on changing hourly rates for public holidays and weekend work to add and find whole week pay.  Adjustment 1 – students use multiplication chart to assist in long multiplication.  Adjustment 2 – students use coin and note money trays to problem solve with visual counters.  F:\Mock ups\Square elements\Numeracy.jpgF:\Mock ups\Square elements\Numeracy.jpg  *Activity:* Salary skill check worksheet 1.  Students are to work on the worksheet Skill Check 1.  Adjustment: some students may need to use the printable calendar for support.  *Activity:* Daily -Addition of money. Students will work through addition problems set out as word problems.  1 lesson per week Making cents-  Students will work through hand out 3. They will need to look at the phone bill and the call charges to answer the questions. You can discuss questions as a whole group, as a small group, or as individuals.  **Week 3:**  **Introduction and pre-assessment of money facts.**  *Activity:* Working with percentages skills check 1 and 2.  F:\Mock ups\Square elements\Numeracy.jpgF:\Mock ups\Square elements\Numeracy.jpgWorksheet pre-tests students understanding and background knowledge of percentages and rates. Students problem solve percentage rates of whole numbers.  Adjustment 1 – students use multiplication chart to assist in long multiplication.  Adjustment 2 – Students may require counters to assist in keeping track of percentages.  *Activity:* Working with percentages skills check 1 and 2.  Worksheet pre-tests students understanding and background knowledge of percentages and rates. Students use calculators to problem solve percentage rates of disjointed numbers.  Adjustment 1 – students use multiplication chart to assist in long multiplication.  Adjustment 2 – Students may require counters to assist in keeping track of percentages.  Activity: Converting percentages to decimals skills check 1 and 2.  Worksheet pre-tests students understanding and background knowledge of converting percentages to decimal skills. Students problem solve percentage into decimal places. Students complete 10%, 20%, 25%, 50% equations manually and complete part number conversions with a calculator.  Adjustment 1 – students use multiplication chart to assist in long multiplication.  Adjustment 2 – Students may require counters to assist in keeping track of percentages.  Activity: rounding skills check 1.  Worksheet pre-test students understanding and background knowledge of rounding to the nearest cent.  **Week 4:**  **Wages and salary:**  *Explicit teaching for the week.*    Write this information on the board and ask students to copy it down:  People who work usually earn a wage or a salary. A **wage** is calculated by the number of hours worked and is usually paid weekly. People such as supermarket cashiers, electricians and gardeners earn a wage. Wage earners can earn more income by working extra hours (overtime).  A **salary** is a fixed annual amount paid weekly, fortnightly or monthly. People such as architects, software designed and police earn a salary. Salary earners do not earn overtime pay but can receive benefits such as a company car, expense account, shares in the company or paid medical expenses.  *Activity:* Go through the following examples with the students:  Example 1:    Example 2:      Example 3:    *Activity:* Students to do Exercise 8-01 on pages 286-288 of New Century 9.  *Activity:* Students are to [www.seek.com.au](http://www.seek.com.au) to find a job advertisement for 1-3 jobs, print the advertisement and share the following information with the class   * a brief job description and whether the job is full-time or part-time, permanent or casual * whether a salary or wage is paid, and how much * whether there are any other payments, incentives, or benefits that may come with the job.   Activity: Salary worksheet 1 and 2  **Week 5:**  **Overtime pay**  *Explicit teaching:*  Students write the following information in their books:  Wage earners can receive **overtime** pay when they work more than their standard number of hours.  The two most common rates for overtime pay are:   * time-and-a-half = 1.5 X normal hourly rate * double time = 2 X normal hourly rate.   *Activity:* Go through the following examples with the students:  Example 4:      Example 5:    E:\Final V1\Final sq NO border\Sq Technology no bdr.jpgF:\Mock ups\Square elements\Numeracy.jpgExample 6 and Example 7 on pages 290-91.  *Activity:* Students are to work through Exercise 8-02 on pages 291-93 on the New Century 9 textbook.  Activity: Students complete overtime worksheets 1 and 2.  **Week 6:**  **Technology: Calculating Incomes and budgeting.**  *Activity:* Students are to use Microsoft Excel to calculate the incomes of employees at JB hifi.  Students to complete activity on page 293 of the New Century 9 textbook.  Steps to do this are:  Step 1 - Open your income and expenses Excel worksheet.  Step 2 - Select an empty cell beneath the last item in your "income" column.  Step 3 - Type "Total Income" in this cell, then press the "Enter" key.  Step 4 - Select the cell directly beneath the "Total Income" label.  Step 5 - Type "=SUM(" into this empty cell.  Step 6 - Select the first entry in your "Income" column, press the "Shift" key, select the last income item in that column, then press the "Enter" key to calculate your income total.  Step 7 - Select an empty cell beneath the last item in your "Expenses" column.  Step 8 - Type "Total Expenses" in this cell, then press the "Enter" key.  Step 9 - Select the cell directly beneath the "Total Expenses" label.  Step 10 - Type "=SUM(" into the empty cell.  Step 11 - Select the first entry in your "Expenses" column, press and hold the "Shift" key, select the last expense item in the same column, then press the "Enter" key to calculate your total expenses.  Activity: Birthday party budgeting. Students use birthday party budget worksheet to plan a part for 10 people. Students must divide $50 between the ten people at the party and use their problem solving skills to do so. Students may use Microsoft Excel to budget. (Making cents student worksheet booklet.)  Activity: Budgeting for a phone plan. Students put real life learning into action by planning a budget from a weekly salary and again for an hourly salary. Students may use Microsoft Excel to budget. (Making cents student worksheet booklet with adjustments for salary.)  Activity: Students are given $5,000 budget to plan a holiday. Students research a place they wish to travel and plan a holiday. Students must include the following in their budget:   * Transport/travel * Accommodation * Activities * Food   **Week 7:**  **Savings account and Income Tax.**    *Activity:* using a savings account. (Making cents booklet page 13)  Student handout 3: *A letter from the bank*  • Student handout 4: *Game instructions Using a savings account*. Dice and  counters.  E:\Final V1\Final sq NO border\Sq Technology no bdr.jpgF:\Mock ups\Square elements\Numeracy.jpgF:\Mock ups\Square elements\Numeracy.jpg• Student handout 5: *Savings account statement*.  Overview:  Introduce and develop students’ understanding of some of the language associated with finance. Introduce the calculations associated with depositing and withdrawing money (debit and credit) from a savings account by playing a game.  1. Develop students’ financial language skills: Use Student handout 3: *A letter from the bank*. Explain the different financial terminology highlighted by students using the *Glossary of financial term s* included with this material. Ask students to give reasons why this understanding is important. What do students think happens when people don’t know these financial terms ?  2. Financial literacy game: *Using a savings account*  Teaching note: it may be necessary to develop students’ calculation skills before undertaking the financial literacy game.  Refer to Mathematics learnings pages 11–14.  Copy Student handout 5: *Savings account statement* to record game responses. Supply one counter each and dice to use in the game.  Explain the terms *Credit* (add) and *Debit* (minus). Explain and model for students the procedure, using the recording sheet to calculate the *Balance* using *Credit* (add) and *Debit* (minus) in the *Savings account statement*.  Refer to Student handout 4: *Game instructions Using a savings account* for game procedure.Review with students what happened in the game. Answerand explain any questions on the financial terminology usedand the financial transactions that took place.  Income tax explicit teaching:  - Teacher to go through examples on pages 300-301.  - Students to go through activities on pages 301-302.  *Activity:* The ATO website has an online calculator for income tax. Visit the website and search ‘Simple Tax Calculator’ to find the income tax calculator for individuals.  Refer to page 302-303 for further instructions  Activity: selecting a savings account (Making cents workbook page 9).  F:\Mock ups\Square elements\Numeracy.jpg**Week 8:**  **Commission, piecework and leave loading**  *Explicit teaching for the week.* Students write in booklets.  Some workers are paid by the amount of time they work, but by the number of items they make or process.  *Commission*  Commission is earned by salespeople or agents of a business or a company. It is calculated by the percentage of the value of items sold or income made. A fixed amount called a retainer may also be paid. Real estate agents and actors’ agents earn a commission.  - Teacher to go through examples on pages 295-297.  *Activity:* Students to work through Exercise 8-03 on pages 297-299.  *Activity:* Students to research a job where a salesperson is paid commission and calculate how much they would earn in a week, month, and year.  Activity: piecework worksheet.  Activity: leave loading worksheet.  **Week 9:**  **PAYG tax and net pay**  *Explicit teaching for the week.*  To avoid paying income tax as a huge sum at the end of the financial year, tax is deducted from your gross pay every payday by your employer. This is called PAYG (Pay as you go) tax. The total amount of PAYG tax paid over the year is usually more than the actual income tax payable, so at the end of the financial year you will receive the difference as a tax refund. However, if the PAYG tax is paid less than the income tax payable, you will have a tax debt and have to pay more.   * Teacher to go through Example 15 on 304 of the textbook.   *Gross pay and net pay*  Gross payis the total amount a person earns or receives each payday.  Most income earners have a variety of deductions made against their gross pay before they receive it, including PAYG tax, superannuation contributions, union fees and health fund payments.  The amount of income left after the deduction is called **net pay**.  Teacher to go through Example 16 on 305 of the textbook.  F:\Mock ups\Square elements\Numeracy.jpgStudents to complete Exercise 8-05 on pages 305-307.  *Technology*: *PAYG Tax Calculator*  Students to find the PAYG tax payable and net pay for each of the following:   1. $505 a week 2. $1466 fortnightly 3. $2730 monthly   F:\Mock ups\Square elements\Numeracy.jpg**Week 10:**  **Goal Setting**  Begin by asking students what career they like to pursue when they are older.  Ask students to go onto the following website and research how much someone in that field would get paid hourly, weekly, monthly and annually.  www.payscale.com/research/AU/Country=Australia/Salary  When students have completed doing their research, ask them to fill in the Financial Mathematicsworksheet.  **End of unit assessment task.** | | | | | | | | | | | | | | **The Australian General Capabilities**  Aboriginal and Torres Strait Islander histories and cultures boriginal and Torres Strait Islander histories and cultures  Asia and Australia's engagement with Asia sia and Australia's engagement with AsiaSustainability ustainability  Critical and creative thinking ritical and creative thinking  Ethical understanding thical understanding  Information and communication technology capability nformation and communication technology capability  Intercultural understanding ntercultural understanding  Literacy iteracy  Numeracy umeracy  Personal and social capability ersonal and socail capability  Civics and citizenship ivics and citizenship  Difference and diversity ifference and diversity  Work and enterprise ork and enterprise | |
| **Special Needs Adjustments** | | | | | | | **School to Work** | | | | | | | | | |
| One-on-one support where required  Short lessons  Engaging topics  Behaviour management strategies  For individualised adjustments, please see personalised learning plans. | | | | | | | Improved communication skills  Building strength in mental calculations  Developing understanding in converting between mathematical units  Language development  Collaborative learning  Self-manage  Building skills for further development in financial mathematics. | | | | | | | | | |
| **Assessments. Type. Weight. Due Date** | | | | | | | | | | | | | | | | |
| **Assessment 1:** Salary worksheet  **Due date:** Week 4  **Type:** Assessment for learning task.  **Assessing:** skills in problem solving and knowledge and recall  **Weight:** 30%  5% using decimal places and rounding to nearest cent.  5% accuracy in finding annual salary  10% accurate methods to compare salary.  10% accurate method to change weekly and fortnightly pay into salary.  **Assessment 2:** Budgeting to buy an animal activity. Students provided with visuals and price tags. Students complete “what I need and what I want” table and budget table. Students complete self assessment sheet on conclusion of activity.  **Due date:** Week 6  **Type:** Assessment for and as learning task.  **Assessing:** Evaluation skills and skills in critical thinking.  **Weight:** 20%  10% Evaluation and self-reflection thought out and considered.  10% Can accurately use addition and budgeting table to create budget.  **Assessment 3:** Salary, Income, Budgeting, PAYG, Tax and calculating income written assessment task  **Due date:** Week 10  **Type:** Assessment of learning task.  **Assessing:** skills in problem solving and understanding.  **Weight:** 50% total  5% accurate method and result in rounding and decimal place work.  5% accurate method and result in calculating percentages of whole numbers  10% accurate method and result in calculating Commission, piecework and leave loading overtime.  10% accurate method and result in responding to budgeting  10% accurate method and result in responding to Salary questions  10% accurate method and result in responding to PAYG tax. | | | | | | | | | | | | | | | | |
| **Resource List** | | | | | | | | | | | | | | | | |
| All resources are in corresponding lesson and week folders in file | | | | | | | | | | | | | | | | |

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| **Teacher Evaluation**  **Comments / Variations** | |
| Guiding Questions  What worked well?  What needed to be changed?  What do I think the students gained from this lesson?  How well did this unit match the Elements of Learning and Achievement?  What did I learn?  How will I use this experience to extend my practice in the future? | |
| **Date Commenced**: | **Date Finished**: |
| **Teachers Signature**: | **Assistant Principals Signature**: |