YuMi Deadly Maths

Year 5 Teacher Resource:
NA – Bright budgeting

Prepared by the YuMi Deadly Centre
Faculty of Education, QUT

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through education*

ACKNOWLEDGEMENT

We acknowledge the traditional owners and custodians of the lands
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Year 5   Number and Algebra

Bright budgeting

Learning goal	Students will make calculations with money amounts and make financial decisions.
Content description	Number and Algebra – Money and financial mathematics • Create simple financial plans (ACMNA106)
Big idea	Number – part-whole
Resources	Envelopes with receipts and invoices, Receipts and Invoices worksheet (table with two columns: Total Spent and GST); Maths Mat, elastics; catalogues, e.g. JB Hi-Fi, Dick Smith, Big W; calculators; envelopes with $100 play money; float for each shop; pads, pencils

Reality

Local knowledge	Students describe the ways they get money of their own – e.g. pocket money, birthday gifts, working for Grandma, interest on their money in the bank – and what they do with the money they have, e.g. spend it, save it, save up for something special, Christmas gifts.
Prior experience	Revise rounding of money to the nearest five cents and percentage, especially 10%.
Kinaesthetic	Maths Mat: Students use elastics to show $50 (5 rows of 10). *This is how much the item cost the seller to produce plus the amount of profit the seller wants to make. The government now charges 10% or $\frac{1}{10}$ of the $50 as GST. How much is the government getting as GST?* [$5]. Students use another elastic to show the extra GST of $5. *How much must the seller charge the customer now to retain the profit?* [$50 + GST $5 = $55 or 100% of the cost price including profit PLUS 10% of the cost that goes to the government as GST]. *What fraction of the selling price of $55 is the GST of $5?* [$\frac{5}{55} = \frac{1}{11}$]. Lucky Dip: Students take one envelope from a basket with envelopes containing receipts and invoices. They examine the receipts and invoices and record in a table the Total Spent and GST component. *Check the GST on your invoice with calculators. How will you do this?* [divide the total on the invoice or receipt by 11 to find the GST component or $\frac{1}{11}$ of the total equals the GST]. Students compare all their invoices with a partner and discuss the pattern they see in all these amounts [the GST is $\frac{1}{11}$ of the total]. *How do we know what the seller's cost was?* [take the GST away from the Total on the invoice]. Have students research the GST: GST information – Flinders University: http://www.flinders.edu.au/finance/tax-information/gst-information/ *Note:* Some items on a receipt/invoice may be asterisked as GST free, in which case the total GST on the invoice will be smaller than 10% of the base cost and the calculation of GST from the total may not be exactly $\frac{1}{11}$.

Abstraction

Body	Act it out: Point of sale – set up shops for various outlets with catalogues on the "counter" so that students can compare advertised amounts in spending their $100 cash. Encourage students to "shop around" and prepare a plan of the items they want to purchase, prioritising them so that their spending does not exceed their budget of $100. Prompt them to compare prices so that they purchase the item from the shop with the least cost and examine the catalogues closely to buy at sale prices. Always round to the nearest 5 cents and estimate what the change will be. Reverse: Calculate the change to be received from purchased items, rounding to the nearest 5 cents, estimating their change and continually checking to see they are spending within their budget.

Hand	Students search online for the cheapest prices for their wish list of goods. Note that price may determine quality and therefore only goods that are the same model and brand can be equally compared. Write a spending plan for their wish list that is not to exceed $500. Have two sections: *Income* (sources or where the money has come from) and *Expenditure* (where the money is going). List the name of the goods to be purchased, the shop, the full price, the sale price, and keep a running total. Calculate the sale price where all goods have a reduction of 25%. Calculators may be used.
Mind	*Close your eyes and see a receipt for a total of $33. How much GST has been charged?* [$\frac{1}{11}$ × $33 = $3]. *In your mind, see what the total on the invoice is if the GST is $24.50* [GST is 10% of cost, so cost = $24.50 × 10 = $245; Total on invoice = $245 + $24.50 = $269.50].
Creativity	*Create a spending plan for your wish list of goods. The sky's the limit but you must be able to show the goods and the total you have spent and also the sources of this money.*

Mathematics

Language/ symbols	GST, goods, services, tax, component, spending plan, budget, income, expenditure, purchase, cost, financial plan, savings, balance, overspending, profit
Practice	Calculators may be used in the following examples.

1. You are having a birthday party. Create a list of items to be purchased to help make your party a great celebration. Search the web to calculate the budget you will need to be able to carry out your plan. Look at your savings account. Are you overspending? How can you cut down the cost? Search:
   www.colesmyer.com.au and www.homeshop.com.au

2. Create the budget spreadsheet for this information and calculate the balance:

   INCOME: Walk neighbour's dog – $5, owed from a friend – $3, pocket money – $4, money for birthday – $12

   EXPENDITURE: Pay for school excursion – $3, buy Mum a birthday gift – $9.90; buy a pencil case – $3.90.

3. Worksheet exercises (examples below):

   (a) The cost of a watch is $410 excluding GST. Find the total cost including GST.

   (b) Your dad stops to fill up with petrol at Sam's petrol station. The car takes 80 litres at $1.60 per litre. How much profit does Sam make on the deal if he bought the petrol at $1.30 per litre? (Remember the GST.) [Cost: 80 × $1.30 = $104 + GST: 10% × $104 = $10.40 so Sam's cost = $114.40. Selling price: 80 × $1.60 = $128. Profit: $128 – $114.40 = $13.60]

   (c) A crate of 20 two-litre bottles of milk is sold at $2.75 a bottle and a profit of $4 is made on the sale. What did the milk cost to buy per bottle? (There is no GST on milk. It is one of the essentials and so is exempt from GST.)

   (d) JB Hi-Fi is having a one-day sale and giving 10% off everything storewide. What will you pay for a laptop originally marked at $1350 if you buy it during the one-day sale?

Connections	Relate to money, percentage, ratio, bank interest.

Reflection

Validation	Students write a list of where budgets and financial plans are necessary in the real world, e.g. family budgets, holiday budgets, wedding budgets, school financial planning, business and government financial planning.

Application/ problems	Provide applications and problems for students to apply to different real-world contexts independently; e.g. *With $60 you must select enough food for three days for a family of three. This includes breakfast, lunch and dinner; one family member is 11 years old and the other two are adults. List each grocery item and its price.*
Extension	**Flexibility**. Students are able to understand, prioritise and apply the many factors that need to be considered in financial planning, e.g. GST, sales, budget, income, expenditure, necessity versus treats.
	Reversing. Students are able to move between planning a budget ↔ modelling it ↔ interpreting financial plans ↔ naming the GST component ↔ calculating the amount of GST, starting from and moving between any given point.
	Generalising. *Financial planning is essential to ensure all parts of society live within their means. Income determines the amount available for expenditure. The GST is a tax that applies to most goods and services. The GST is 10% of the selling price*.
	Changing parameters. *How much more would you have to pay on a $50 pair of shoes if the GST changed to 12.5% and the same profit margin was kept as when the GST was 10%?*
	Calculate bank interest on savings.

Teacher's notes

- Students need a thorough understanding of division by 10 to be able to calculate GST on the selling price without a calculator. Calculators can be used for division by 11 when calculating GST from the total invoice.

- Students need to be taught the skill of visualising: closing their eyes and seeing pictures in their minds, making mental images; e.g. show a picture of a kookaburra, students look at it, remove the picture, students then close their eyes and see the picture in their mind; then make a mental picture of a different bird.

- Suggestions in Local Knowledge are only a guide. It is very important that examples in Reality are taken from the local environment that have significance to the local culture and come from the students' experience of their local environment.

- Useful websites for resources: www.rrr.edu.au; https://www.qcaa.qld.edu.au/3035.html

- Explicit teaching that **aligns with students' understanding** is part of every section of the RAMR cycle and has particular emphasis in the Mathematics section. The RAMR cycle is not always linear but may necessitate revisiting the previous stage/s at any given point.

- Reflection on the concept may happen at any stage of the RAMR cycle to reinforce the concept being taught. Validation, Application, and the last two parts of Extension should not be undertaken until students have mastered the mathematical concept as students need the foundation in order to be able to validate, apply, generalise and change parameters.