

How can we reduce our spending?

Year 7

This unit is aligned with the following Australian Curriculum learning areas:
Mathematics, supported by English and Economics and Business



ASIC's  **MONEYSMART** Teaching



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How can we reduce our spending?

Year level	7
Duration of unit	9 hours*
Learning areas	Mathematics focus supported by English and Economics and Business

Unit description

Mia's family wants to spend less on their household expenses, including groceries. Mia's brother Alex needs a new wheelchair. To get one with some special features costs more than the family can afford at present. They want to save money by buying smart. One way of doing this is to look at savings they can make using comparative shopping. If they put away the money they save each week, by the end of the year they hope to have saved the difference between a basic wheelchair and one with special features.

In this unit, students examine the concept of comparative shopping in two different contexts — grocery shopping and mobile phone plans. This provides opportunities for mathematical investigation, including some homework and assessment.

By the end of the unit, students will have investigated the unit pricing of a variety of grocery items and related these understandings to mobile phone plans. Students will need to understand the use of different measurements, including those related to the comparative size of different data downloads. Students will perform calculations related to mobile calls, messaging and data downloads, based on unit price, to ensure that mobile phone costs remain within budget.

In the Summative Assessment task, students apply their learning and recommend ways in which their family can reduce their spending. They design a poster to substantiate their recommendations.

Knowledge and understandings

- ▶ Using unit pricing can help consumers make wise choices.
- ▶ Understanding mobile phone plans can ensure effective and cost-efficient mobile phone use.
- ▶ Mental arithmetic is useful in a range of practical contexts.

** Timings are provided as a guide only. Teachers will tailor the activities to suit the capabilities and interests of their class. The unit and student worksheets can be adapted to your needs.*

Links

The following table provides the relevant links to the Australian Curriculum learning areas, achievement standards and general capabilities.

Australian Curriculum learning areas and achievement standards	
Mathematics	Content Descriptions <ul style="list-style-type: none"> ▶ Strand: Number and Algebra <ul style="list-style-type: none"> — Sub-strand: Real Numbers <ul style="list-style-type: none"> ○ Round decimals to a specified number of decimal places (ACMNA156) — Sub-strand: Money and financial mathematics <ul style="list-style-type: none"> ○ Investigate and calculate 'best buys', with and without digital technologies (ACMNA174) ▶ Strand: Statistics and Probability <ul style="list-style-type: none"> — Data Representation and interpretation <ul style="list-style-type: none"> ○ Identify and investigate issues involving numerical data collected from primary and secondary sources (ACMSP169)
	Achievement Standards <p>By the end of Year 7, students solve problems involving the comparison, addition and subtraction of integers. They make the connections between whole numbers and index notation and the relationship between perfect squares and square roots. They solve problems involving percentages and all four operations with fractions and decimals. They compare the cost of items to make financial decisions. Students represent numbers using variables. They connect the laws and properties for numbers to algebra. They interpret simple linear representations and model authentic information. Students describe different views of three-dimensional objects. They represent transformations in the Cartesian plane. They solve simple numerical problems involving angles formed by a transversal crossing two lines. Students identify issues involving the collection of continuous data. They describe the relationship between the median and mean in data displays.</p> <p>Students use fractions, decimals and percentages, and their equivalences. They express one quantity as a fraction or percentage of another. Students solve simple linear equations and evaluate algebraic expressions after numerical substitution. They assign ordered pairs to given points on the Cartesian plane. Students use formulas for the area and perimeter of rectangles and calculate volumes of rectangular prisms. Students classify triangles and quadrilaterals. They name the types of angles formed by a transversal crossing parallel line. Students determine the sample space for simple experiments with equally likely outcomes and assign probabilities to those outcomes. They calculate mean, mode, median and range for data sets. They construct stem-and-leaf plots and dot-plots.</p>
English	Content Descriptions <ul style="list-style-type: none"> ▶ Strand: Literacy <ul style="list-style-type: none"> — Sub-strand: Interpreting, analysing, evaluation

	<ul style="list-style-type: none"> ○ Use comprehension strategies to interpret, analyse and synthesise ideas and information, critiquing ideas and issues from a variety of textual sources (ACELY1723) — Sub-strand: Creating texts <ul style="list-style-type: none"> ○ Plan, draft and publish imaginative, informative and persuasive texts, selecting aspects of subject matter and particular language, visual, and audio features to convey information and ideas (ACELY1725) <p>Achievement Standards</p> <p>By the end of Year 7, students understand how text structures can influence the complexity of a text and are dependent on audience, purpose and context. They demonstrate understanding of how the choice of language features, images and vocabulary affects meaning.</p> <p>Students explain issues and ideas from a variety of sources, analysing supporting evidence and implied meaning. They select specific details from texts to develop their own response, recognising that texts reflect different viewpoints. They listen for and explain different perspectives in texts.</p> <p>Students understand how the selection of a variety of language features can influence an audience. They understand how to draw on personal knowledge, textual analysis and other sources to express or challenge a point of view. They create texts showing how language features and images from other texts can be combined for effect.</p> <p>Students create structured and coherent texts for a range of purposes and audiences. They make presentations and contribute actively to class and group discussions, using language features to engage the audience. When creating and editing texts they demonstrate understanding of grammar, use a variety of more specialised vocabulary and accurate spelling and punctuation.</p>
<p>Economics and business</p>	<p>Content Descriptions</p> <ul style="list-style-type: none"> ▶ Strand: Knowledge and understanding <ul style="list-style-type: none"> ○ The ways consumers and producers interact and respond to each other in the market (ACHEK017) ○ Why and how individuals and businesses plan to achieve short-term and long-term personal, organisational and financial objectives (ACHEK018) ▶ Strand: Skills <ul style="list-style-type: none"> — Sub-strand: Interpretation and analysis <ul style="list-style-type: none"> ○ Interpret data and information displayed in different formats to identify relationships and trends (ACHES023) — Sub-strand: Economic reasoning, decision-making and application <ul style="list-style-type: none"> ○ Generate a range of alternatives in response to an observed economic or business issue or event, and evaluate the potential costs and benefits of each alternative (ACHES024) ○ Apply economics and business knowledge, skills and concepts in familiar and new situations (ACHES025) — Sub-strand: Communication and reflection <ul style="list-style-type: none"> ○ Present evidence-based conclusions using economics and

business language and concepts in a range of appropriate formats, and reflect on the consequences of alternative actions (ACHES026)

Achievement Standards

By the end of Year 7, students describe the interdependence of consumers and producers in the market. They explain the importance of short- and long-term planning to individual and business success and identify different strategies that may be used. They describe the characteristics of successful businesses and explain how entrepreneurial capabilities contribute to this success. Students identify the reasons individuals choose to work and describe the various sources of income that exist.

When researching, students develop questions and gather data and information from different sources to investigate an economic or business issue. **They interpret data** to identify trends. **They** propose alternative responses to an issue and **assess the costs and benefits of each alternative. They apply economics and business knowledge, skills and concepts to familiar problems. Students develop and present conclusions using appropriate texts, terms and concepts. They identify the effects of their decisions and the possible effects of alternative actions.**

General Capabilities

Typically, by the end of Year 7 students:

Literacy

- ▶ navigate, read and view a variety of challenging subject-specific texts with a wide range of graphic representations
- ▶ interpret and evaluate information, identify main ideas and supporting evidence, and analyse different perspectives using comprehension strategies
- ▶ use pair, group and class discussions and formal and informal debates as learning tools to explore ideas, test possibilities, compare solutions, rehearse ideas and arguments in preparation for creating texts
- ▶ use wide knowledge of the structure and features of learning area texts to comprehend and compose texts, using creative adaptations of text structures and conventions for citing others
- ▶ recognise and use aspects of language to suggest possibility, probability, obligation and conditionality

Numeracy

- ▶ solve complex problems by estimating and calculating using efficient mental, written and digital strategies
- ▶ identify and justify 'best value for money' decisions
- ▶ identify trends using number rules and relationships
- ▶ convert between common metric units for volume and capacity and use perimeter, area and volume formulas to solve authentic problems

ICT

- ▶ locate, retrieve or generate information using search facilities and organise information in meaningful ways

Creative & Critical Thinking

- ▶ pose questions to probe assumptions and investigate complex issues
- ▶ clarify information and ideas from texts or images when exploring challenging issues
- ▶ draw parallels between known and new ideas to create new ways of achieving goals

	<ul style="list-style-type: none"> ▶ generate alternatives and innovative solutions, and adapt ideas, including when information is limited or conflicting ▶ predict possibilities, and identify and test consequences when seeking solutions and putting ideas into action ▶ assess assumptions in their thinking and invite alternative opinions ▶ evaluate and justify the reasons behind choosing a particular problem-solving strategy ▶ justify reasons for decisions when transferring information to similar and different contexts ▶ differentiate the components of a designed course of action and tolerate ambiguities when drawing conclusions ▶ explain intentions and justify ideas, methods and courses of action, and account for expected and unexpected outcomes against criteria they have identified
Personal & Social Capability	<ul style="list-style-type: none"> ▶ identify and choose a range of learning strategies appropriate to specific tasks and describe work practices that assist their learning ▶ assess the extent to which individual roles and responsibilities enhance group cohesion and the achievement of personal and group objectives

Cross-curriculum priorities

N/A

Proficiency strands

▶ Understanding

- Students understand the unitary method and its use in comparing value. They understand the considerations involved in calculating mobile phone charges.

▶ Fluency

- Students perform calculations associated with comparative shopping and mobile phone use. They calculate totals and averages. They perform mental calculations in practical contexts.

▶ Problem Solving

- Students solve problems associated with reducing spending in a variety of practical contexts. Students identify and discuss a range of strategies for solving problems

▶ Reasoning

- Students perform calculations to justify their selection of a product. Students use national data to inform estimates.

Diversity of learners

The Australian Curriculum is based on the assumptions that each student can learn and that the needs of every student are important. These needs are shaped by individual learning histories and abilities as well as personal, cultural and language backgrounds, and socio-economic factors. Teachers may adapt or plan additional learning activities depending on the multiple, diverse and changing needs of their students.

National Consumer and Financial Literacy Framework

(Note: the student learnings in the National Consumer and Financial Literacy Framework are divided into, and are applicable over, bands covering two chronological years.)

Dimension	Student learnings by the end of Year 8
Knowledge and understanding	<ul style="list-style-type: none"> ▶ Explain why it is important to set and prioritise personal financial goals ▶ Identify implications of 'terms and conditions' such as fees, penalties, interest and warranties ▶ Analyse and explain the range of factors affecting consumer choices
Competence	<ul style="list-style-type: none"> ▶ Compare income, spending commitments and life-styles at different stages of life ▶ Determine the value of 'deals' when purchasing goods and services such as 'buy one, get one free' ▶ Justify the selection of a range of goods and services in a variety of 'real-life' contexts ▶ Identify and explain marketing strategies used in advertising and social media to influence consumer decision-making
Responsibility and enterprise	<ul style="list-style-type: none"> ▶ Recognise the importance of planning for their financial futures and appreciate that sacrificing current expenditure can bring long-term benefits ▶ Recognise that people have different ways of living and expectations according to their values and/or financial situation ▶ Recognise that their ability to make informed decisions about personal finance and financial products is strengthened by finding and evaluating relevant information and accessing reliable advice ▶ Demonstrate awareness that family, community and socio-cultural values and customs can influence consumer behaviour and financial decision-making

Sequenced teaching and learning activities

Introducing	Resources
<p>Activity 1 Comparing prices (90 minutes)</p> <p>Students perform mental and written calculations to support comparative shopping, and complete a PMI on 'Should we always choose the purchase with the best value for money?' (Cheapest). They also consider factors other than price that can determine the most suitable purchase.</p>	<ul style="list-style-type: none"> ▶ Worksheet 1: Comparing prices mentally ▶ Worksheet 2: Comparing prices using written calculations ▶ Worksheet 3: PMI chart – Should we always choose the purchase with the best value for money?
<p>Assessment: Diagnostic</p> <p>The PMI chart allows teachers to gauge students' understanding of considerations involved in comparative shopping. Students are observed as they perform and discuss mental calculations. This enables teachers to gauge the students' mathematical ability.</p>	
<p>Activity 2 Introducing unit pricing (60 minutes)</p> <p>Students examine how unit prices are calculated using specific examples, and undertake calculations to determine the unit price of a range of grocery items. They will then compare the cost of shopping with and without paying attention to unit pricing.</p>	<ul style="list-style-type: none"> ▶ Computer access/or printout of ACCC article on grocery unit prices ▶ Resource 1: Unit pricing ▶ Supermarket advertising brochures/online supermarket catalogues ▶ Worksheet 4: Calculating unit prices
Developing	Resources
<p>Activity 3 Mobile phone unit price comparison (120 minutes)</p> <p>Students explore some online learning objects about mobile phone plans, which compare unit prices of the different features. They will examine data downloads, compare and calculate the average size of downloading specific items to develop a data use profile, then determine if the use of mobile data is affordable.</p>	<ul style="list-style-type: none"> ▶ Computer access to MoneySmart Teaching online interactive mobile phone activities and learning objects ▶ Resource 2: Calculating mobile phone costs example ▶ Worksheet 5: Calculating mobile phone costs ▶ Video: 'Teens and Consumer Issues – MoneySmart Teaching' (5:09) https://www.youtube.com/watch?v=tw9SQNHXUKE
<p>Activity 4 Mobile phone plans with data (180 minutes)</p> <p>Students explore the considerations they need to make when purchasing phone plans with data usage. They determine how to stay savvy with the range of plans and offers available to them. They look at phone usage and compare to a</p>	<ul style="list-style-type: none"> ▶ Computer access accg.gov.au/consumers/internet-phone ▶ Worksheet 6: Calculating data downloads ▶ Four A3 sheets and Blu-Tack® ▶ Worksheet 7: Choosing a prepaid provider

Developing	Resources
<p>budget (relates to needs versus wants). They examine some typical phone 'cap' plans for value for money, possible savings and justify their choices.</p>	<ul style="list-style-type: none"> ▶ Website: https://www.optus.com.au/shop/mobile/prepaid/plans ▶ Website: vodafone.com.au/personal/prepaid (click on 'Get a prepaid SIM') ▶ Website: telstra.com.au/mobile-phones/prepaid-mobiles (click on 'Prepaid plans')
<p>Assessment: Formative</p> <p>Collect 'Worksheet 7: Choosing a prepaid provider', to assess students' understanding of concepts covered and to determine further learning needs.</p>	

Culminating	Resources
<p>Activity 5 Reducing our spending (90 minutes)</p> <p>Students identify household expenses where a change in spending habits can save money. They calculate the potential savings over a period of 6 months. They make recommendations to Mia on how to reduce costs.</p>	<ul style="list-style-type: none"> ▶ Worksheet 8: Smarter spending
<p>Assessment: Summative</p> <p>This task allows teachers to assess students' understanding of the concepts covered in the unit. Criteria for assessment are provided.</p>	

Assessment rubric

This rubric aligns with Year 7 Australian Curriculum: Mathematics, which is the focus of this unit. Teachers may wish to expand to include other learning areas. This rubric is intended as a guide only. It can be modified to suit teachers' needs and to be integrated into existing assessment systems. Teachers may also wish to collect the worksheets as work samples for individual student folios.

Student's name: _____

Skill	Relevant content description(s)	Relevant activities and worksheets	Competent	Developing at level	Needs further development	Notes
The student can understand and apply the conventions for rounding prices correct to two decimal places	Round decimals to a specified number of decimal places (ACMNA156)	Activity 2 Worksheet 4	The student determines all unit prices correctly to two decimal places for a range of grocery items	The student determines all unit prices to two decimal places for a range of grocery items. Occasional errors are corrected with little or no assistance	The student requires teacher guidance to apply the conventions for rounding correctly	
The student can perform mental and written calculations to determine 'best buys'	Investigate and calculate 'best buys', with and without digital technologies (ACMNA174)	Activity 1 Worksheets 1, 2 and 3	The student selects and uses efficient mental and written strategies to accurately calculate 'best buys'. The student provides a succinct and thorough justification of their solution	The student selects and uses appropriate mental and written strategies to calculate 'best buys'. Occasional errors are corrected with little or no assistance. The student provides acceptable justification of their solution	The student selects and uses some basic mental and written strategies to calculate some simple 'best buys'. Justification is unclear or not provided	
The student can apply the unitary method to identify 'best buy' situations, such as comparing the cost per 100 g	See ACMNA174 above	Activity 2 Worksheet 4	The student selects the correct pricing units for all grocery items and accurately calculates their unit prices	The student selects the correct pricing units for most grocery items and calculates their unit prices. Occasional errors are corrected with little or no assistance	The student requires teacher guidance and support to select and calculate the correct pricing units for grocery items	

Assessment rubric (cont)						
Skill	Relevant content description(s)	Relevant activities and worksheets	Competent	Developing at level	Needs further development	Notes
The student can locate data from a variety of sources including print and online	Identify and investigate issues involving numerical data collected from primary and secondary sources (ACMSP169)	Activity 2 Worksheet 4	The student independently and successfully locates and records all required information	The student locates and records all required information with some assistance	The student locates and records information with significant teacher guidance	
The student can interpret and apply given information	See ACMSP169 above	Activity 3 Worksheet 5	The student selects and uses all relevant data to accurately calculate total mobile phone costs for given scenarios	The student selects and uses relevant data to calculate total mobile phone costs for given scenarios. Occasional errors are corrected with little or no assistance	The student requires teacher guidance to select and use some relevant data before attempting to calculate total mobile phone costs for given scenarios	
The student can locate, read, discuss and analyse information from a variety of sources	See ACMSP169 above	Activity 4 Worksheets 6 and 7	The student records sensible estimates of mobile phone and data usage. The student makes thorough, meaningful and accurate comparisons between several prepaid plan offers and provides a clear, concise and fully justified recommendation for the best one based on needs and budget	The student records estimates of mobile phone and data usage. The student makes some valid comparisons between several prepaid plan offers and provides a recommendation with some justification for the best one based on needs and budget	The student records given estimates of mobile phone and data usage. The student requires teacher guidance and support to make simple comparisons between several prepaid plan offers. A recommendation is provided with unclear or no justification	

Assessment rubric (cont)

Skill	Relevant content description(s)	Relevant activities and worksheets	Competent	Developing at level	Needs further development	Notes
The student can explain and apply their learning by recommending ways in which spending can be reduced	Suggested Summative Assessment ACMNA156 ACMNA174 ACMSP169	Activity 5 Worksheet 8 (includes assessment criteria)	The student: <ul style="list-style-type: none"> – provides a clear and detailed explanation of a practical strategy for saving money – comments thoughtfully on the pros and cons of the strategy – researches cost differences thoroughly – calculates correctly the potential savings over a 6-month period – explains calculations clearly and includes unit price calculations where relevant – creates a well-designed, detailed and imaginative poster 	The student: <ul style="list-style-type: none"> – provides a satisfactory explanation of a practical strategy for saving money – comments on a few of the pros and/or cons of the strategy – researches some cost differences – calculates, with some errors, the potential savings over a 6-month period – explains most calculations and includes some unit price calculations where relevant – creates a poster that organises and displays most information satisfactorily 	The student: <ul style="list-style-type: none"> – provides minimal explanation of a practical strategy for saving money – comments on one or two of the pros and/or cons of the strategy – researches little about cost differences – attempts to calculate the potential savings over a 6-month period, but has little success – provides little or no explanation of calculations – creates a poster that lacks detail and organisation 	

Teacher notes

Activity 1

Comparing prices (90 minutes)

This unit is about finding ways to shop that can save money. The scenario below will be used as a context for learning in this lesson.

Scenario

Mia's family want to spend less on their household expenses, including groceries. Mia's brother Alex needs a new wheelchair. To get one with some special features costs more than the family can afford at present. They want to save money by buying smart. One way of doing this is to look at savings they can make using comparative shopping. If they put away the money they save each week, by the end of the year they hope to have saved the difference between a basic wheelchair and one with special features.

- ▶ Ask students to consider the importance of determining whether an article is a good buy or not and to think of everyday situations where mental arithmetic could be required to determine this. Examples could include:
 - understanding the cost of joining a gym while having it explained by a salesperson
 - comparing prices at a shop or supermarket (if unit prices are not provided)
 - discussing a quote (the amount of money a service will cost) with a tradesperson.
- ▶ Often there is more than one method to solve a mathematical problem. Explore options when calculating best buys in the following worksheets.
- ▶ Students complete **Worksheet 1: Comparing prices mentally**. They work with a partner or in a small group, discussing each scenario. Each group or pair should make sure that all members understand how each scenario was solved before progressing.
- ▶ Students perform mental calculations on the worksheet. Note their level of mathematical ability and identify areas that need to be addressed before proceeding with the unit.
- ▶ Students complete **Worksheet 2: Comparing prices using written calculations**.
- ▶ Discuss with the class questions 7b and 8 on **Worksheet 2: Comparing prices**:
 - Why is better value for money not necessarily the most suitable purchase?
 - What other factors should we take into consideration when making a purchase decision? (e.g. in Question 8 the lifespan of the product is considered)
 - Discuss inducements by supermarkets and other sellers to purchase larger quantities (e.g. three for the price of two). When should these offers be accepted? When should they be ignored?
- ▶ Students work in pairs to complete **Worksheet 3: PMI chart**. They develop a Plus, Minus and Interesting (PMI) chart for the question: Should we always choose the purchase with the best value for money?

- ▶ Collect the PMI charts and note students' understanding of the considerations involved in comparative shopping.
- ▶ As homework, ask students to discuss with their parents areas of the family budget where some savings could occur. Each student should write a list of at least five expenses where they and their family feel some money could be saved by changing spending habits. (If it is considered to be too intrusive for your students to ask about household budgets, you could provide an alternative task – identify, with their parents' help, how savings can be made in a supermarket context by identifying five products where money could be saved by changing their spending habits. NOTE – if making this alteration, you will need to adjust the culminating assessment task, outlined on **Worksheet 8: Smarter spending**.)

Notes

- ▶ The ABC program 'Checkout' is an excellent resource for developing competence in consumer and financial literacy.
- ▶ Start collecting advertisements and catalogues with prices of groceries – perhaps send a letter home to ask for these.

Activity 2

Introducing unit pricing (60 minutes)

Large supermarkets are required to display a unit price on most grocery items so that shoppers can compare prices and determine the product that provides them with the best value.

Examine how unit prices are calculated

- ▶ Unit prices are based on the most appropriate unit of measurement, which is usually written on the packaging.
- ▶ Students can look at unit pricing in real terms by visiting a supermarket or finding online grocery catalogues using the search term 'supermarket specials Australia'.
- ▶ The ACCC provides guidelines for unit pricing. Students work in pairs to answer the questions below. The ACCC website address is accc.gov.au.
 - What does ACCC stand for?
 - What is the purpose of the ACCC?
 - Students type 'grocery unit prices' into their search engine then read the information online to find the unit that would generally be used for products with the following quantities.

Quantity	Unit
365 g	100 g
250 mL	100 mL
3.5 L	
2.3 kg	

- ▶ Briefly discuss students' responses to these questions in class.

- ▶ Read through **Resource 1: Unit pricing** with the class. The handout models the calculations used to find unit prices. It is often reasonably simple to estimate an answer. For example:

In Question 2, 425 g is just less than half a kilogram, so we would expect the answer to be roughly double \$5.79. Once the answer is calculated it can be compared with the estimate. Alert students to the fact that occasionally the unit commonly used is counter-intuitive, as in Question 2 on the handout where a more intuitive unit would be 100g.

Calculating unit pricing

- ▶ Use advertising brochures or download examples from an online supermarket catalogue for the same grocery items e.g. breakfast cereal or shampoo. Using **Worksheet 4: Calculating unit prices**, students calculate the unit price for each item.
- ▶ In small groups, students consider the questions below.
 - How can unit pricing impact on grocery purchases?
 - How can unit pricing support a reduction in spending?
 - Is unit pricing well understood by shoppers?
- ▶ Provide students with a small list of groceries, or discuss and agree on a small list as a class. Divide the students into two groups. As homework, ask students to go to a supermarket and find the total price of the items on the list. Instruct the first group to choose brands based on unit pricing and the second group to make choices based on brand recognition.
- ▶ In class, divide the board into two sections – unit pricing and brand recognition. Invite students to write their total price in their section. Ask the class to average the results of the two groups and to find the difference between the averages.
- ▶ When calculating unit prices, round to two decimal places.

Broader application of unit pricing

- ▶ Mia's family has found that, by checking the unit prices for the items they need, they have reduced their weekly spending. Students should record all their findings to be used in their Summative Assessment task.
- ▶ Discuss briefly other purchases where unit pricing can be applied. Include both products and services. A range of household services can be included in the discussion e.g. internet use, phone services, gas and electricity supply, water use. Explain to students that the remainder of this unit will focus on mobile phone use but the principles covered can be applied to any area of spending.

Activity 3

Mobile phone unit price comparison (120 minutes)

Scenario

Mia's family now regularly uses unit pricing for comparing grocery purchases. They also wonder if the principles of unit pricing can help them reduce costs for services they access. Both Mia and her brother Alex have mobile phones that they mainly use to keep in touch with family. Mia has to make public transport connections between the bus and train and would like to have access to data on her phone to check the timetables if she misses a transport connection.

Mia and Alex do not fully understand how their mobile phone account works and hope that by analysing their costs they will be able to reduce this expense and save money for Alex's new wheelchair.

The following MoneySmart Teaching online interactive activities on mobile phone use can be used to reinforce and deepen the learning of Activities 3 and 4.

- ▶ **Advertising** – provides students with options within a scenario to subscribe to apps and to enter a competition that results in giving away personal data to advertisers who use this information to influence purchasing.
moneysmart.gov.au/teaching/teaching-resources/digital-activity-advertising
- ▶ **Calls, messaging and browsing** – features an interactive mobile phone usage tool. Students can see the impact that voice, text and data usage have on a pre-paid plan.
moneysmart.gov.au/teaching/teaching-resources/digital-activity-calls-messaging-and-browsing
- ▶ **Choosing a plan** – lets students see the mobile phone needs of four different teens and match these to a sample 'mobile phone plan'. Each selection a student makes receives feedback on why a particular plan may or may not suit the teen.
moneysmart.gov.au/teaching/teaching-resources/digital-activity-choosing-a-plan
- ▶ **Entertainment** – lets students make decisions about downloading videos and games and spending money on in-game items. They then see the consequences on their data usage and bill. Strategies for self-reflection are built into the activity.
moneysmart.gov.au/teaching/teaching-resources/digital-activity-entertainment
- ▶ **Mobile credit** – features an interactive tool that allows students to explore mobile phone usage and its impact on mobile credit. Once students have explored, they provide advice to other teens within the scenario to reinforce learning.
moneysmart.gov.au/teaching/teaching-resources/digital-activity-mobile-credit
- ▶ **Mobile phone advertising** – allows students to see how advertisers seek to influence consumers and to evaluate other sources of information such as friends and family. The activity also distinguishes between 'needs' and 'wants'.
moneysmart.gov.au/teaching/teaching-resources/digital-activity-mobile-phone-advertising

Introduce mobile phone plans

- ▶ With the class, read through and explain the example in **Resource 2: Calculating mobile phone costs example**. Discuss with students the meaning of 'flag fall'. This is a fixed cost included in the cost of every phone call. It is added to the variable cost, which depends on the length of the call, to obtain the total cost of the call.

- ▶ Students complete **Worksheet 5: Calculating mobile phone costs**.
- ▶ Show the video 'Teens and consumer issues – MoneySmart Teaching' (5:09) <https://www.youtube.com/watch?v=tw9SQNHXUKE>
- ▶ Discuss issues raised in the video, before students work in pairs to answer the following questions (internet access may be required for students who need to research the answer).
 - What is the difference between a capped plan and a prepaid plan?

Note that:

- some plans offer 'free talk time' e.g. for calls on the same network or between certain times of the day
 - there is data that is zero rated or free – e.g. Facebook.
 - What happens on each of these plans if you have used up your credit and wish to make additional calls, or use additional data?
 - Why do you think that prepaid is recommended over caps for young phone users?
 - What is 'bill shock' and which of the two types of plans does it more often relate to?
- ▶ Discuss students' answers to the questions.

Activity 4

Mobile phone plans with data (180 minutes)

Mobile phone and data download costs

Note

Mobile data enables a mobile device, such as a smartphone, tablet or mobile broadband modem, to access the internet without the need to plug into a fixed phone line. Data is often included in a mobile phone plan, but a data plan can also be purchased separately.

- ▶ Access this website with students:
 - acc.gov.au/consumers/internet-phone
- ▶ Organise students into three 'expert' groups. Each group selects, reads and discusses one aspect of buying a mobile phone plan with data. e.g. Choosing mobile plans, inclusions in mobile plans and managing data usage. Once each group has read and analysed their article, organise students into groups of three (or six), with one (or two) student from each 'expert' group. Students share with their group their understanding of the article they have read, and develop and record a group response to the question: What is mobile phone data? Share responses briefly with the class.
- ▶ Students document their findings as a brochure or guide to help others contemplating purchasing a mobile phone plan that uses data.

Can you afford data on your mobile phone?

Most 'bill shock' experiences occur in relation to mobile data plans. Young users are especially at risk if they do not understand the meaning of data limits, the consequences of exceeding them and how to track the use of data. Using a prepaid plan reduces risk, but young users still need sufficient awareness to ration credit over the duration of the plan.

Mia and Alex are trying to determine how much they can sensibly spend each month on internet access ('data') from their mobile phones. Write a list of questions Mia and Alex should ask themselves to help them make this decision.

- ▶ Students share their questions with the class. Questions that could be considered, include:
 - What other personal expenses do Mia and Alex have?
 - What is their source of income to pay the mobile account amount each month (timeframe)?
 - Is this income regular and long term?
 - Is accessing the internet from their phone a need or a want?
- ▶ Discuss alternative options for internet access that don't require a data plan or smartphone, e.g. wi-fi hotspots.
- ▶ Students work in groups to complete **Worksheet 6: Calculating data downloads**. The second Choice article above contains information that could be useful to students in estimating Mia's data usage. The meaning of Kb and Mb is explained on the worksheet. See **Worksheet 6: Calculating data downloads** for data download charges.
- ▶ Refer to some prepaid phone plans to align the anticipated usage to a phone. Choose prepaid plans that reflect the budget of the students in the class. Examples can be found at:
 - vodafone.com.au/personal/prepaid (click on 'Get a prepaid SIM')
 - telstra.com.au/mobile-phones/prepaid-mobiles (click on 'Prepaid plans')
 - optus.com.au/shop/prepaidmobile/prepaidoffers
- ▶ Alternatively, students could visit digital resource: <https://static.moneySMART.gov.au/teaching/resources/choosing-a-plan/index.html> to find a range of products suitable for specific types of users.
- ▶ Emphasise that most consumers have to review their expenses and compromise wants compared to needs so that expenses do not impact adversely on their income. Money is a limited resource, and spending should be prioritised so that money can be managed effectively.
- ▶ The pattern of phone usage is an important consideration in determining value for money and is the first step in managing phone usage to avoid 'bill shock'.
- ▶ Explain that some people might need data on their mobile phone plan and others might not need it but still want it. Organise students into groups and ask them to write some other examples of needs and wants.
- ▶ When students report their examples back to the class, discuss the following questions:
 - How do needs and wants vary from person to person?
 - Can you think of an example of an item that might be a want at one age and a need at another age?
 - Can you think of a situation where someone might genuinely need to have data as part of their mobile phone plan?
 - Can you think of some things that you want that others might genuinely need, and some things that you need that others might only want?
- ▶ Write the following four questions on A3 sheets and tack them to the wall in different areas of the classroom. Organise students into four groups. Each group starts with a different question and spends a few minutes discussing and recording their ideas and responses before moving to the next question.

1. What strategies can be used to record phone usage?
 2. What is the impact of confusing needs and wants on using a mobile phone?
 3. What challenges do mobile phone users face?
 4. What constraints are imposed on mobile phone consumers?
- ▶ After each group has returned to their starting point, they review and summarise the responses and report this summary back to the class.
 - ▶ Students complete **Worksheet 7: Choosing a prepaid provider**. Collect worksheets to determine further learning needs.
 - ▶ Class discussion:
 - How can we monitor how much credit we are using on our mobile phones?
 - How can we monitor how much data we are using on our mobile phones?
 - Where can we find help if we experience difficulties with our provider?
 - ▶ Many phones have features that allow users to track phone usage. Many providers offer online tracking of mobile phone use and mobile data use. Most providers offer SMS reminders when a percentage of credit has been used. If students have a problem with their provider, it is recommended that they ask their parents or another adult to contact their provider, and if that fails, to contact the Telecommunications Industry Ombudsman (tio.com.au).

Broader application of mobile phone comparisons

Mia's family has found that by using a prepaid plan with their mobile phones they can reduce their weekly spending.

Activity 5

Reducing our spending (90 minutes)

- ▶ Students complete and submit the assessment task described on **Worksheet 8: Smarter spending**.

Note

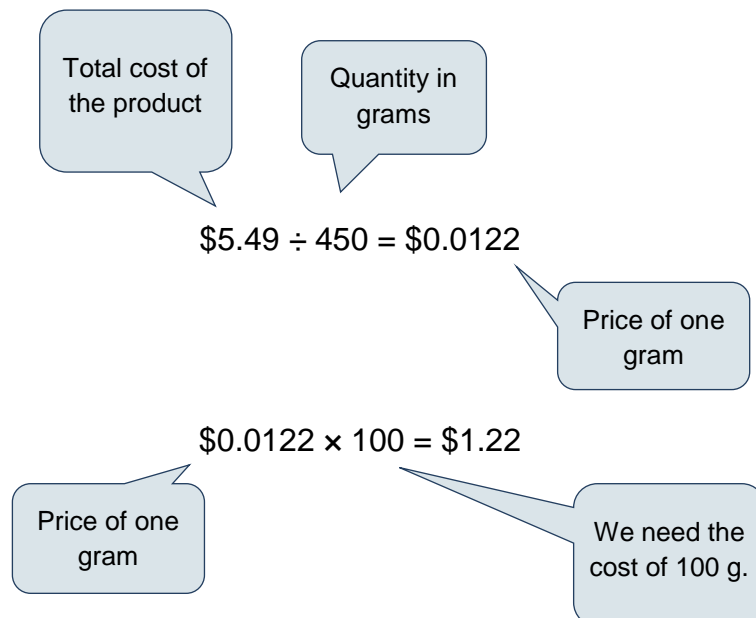
Worksheet 8: Smarter spending will need to be adapted if you used the alternative homework task in Activity 1.

- ▶ Each student describes to the class one of the five savings measures they have identified.

Resources

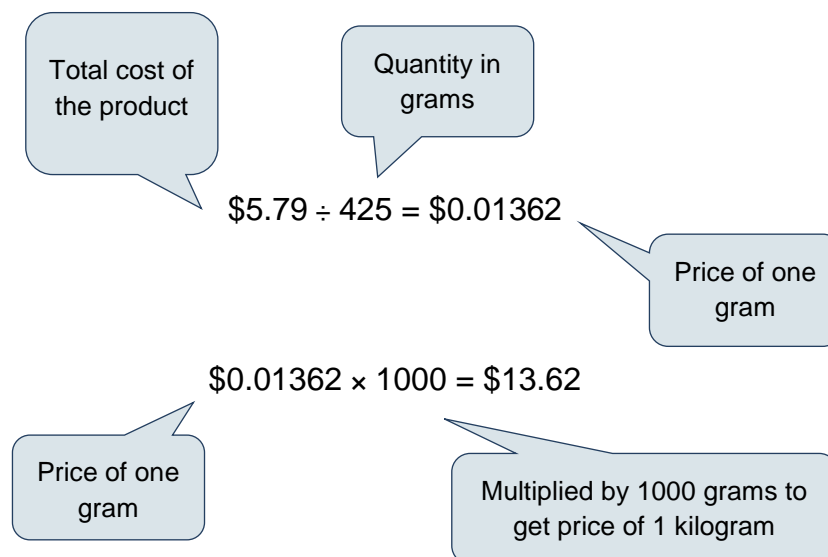
(These are worked examples)

1. If a 450 g energy food drink (powder form) costs \$5.49, how much would 100 g cost?



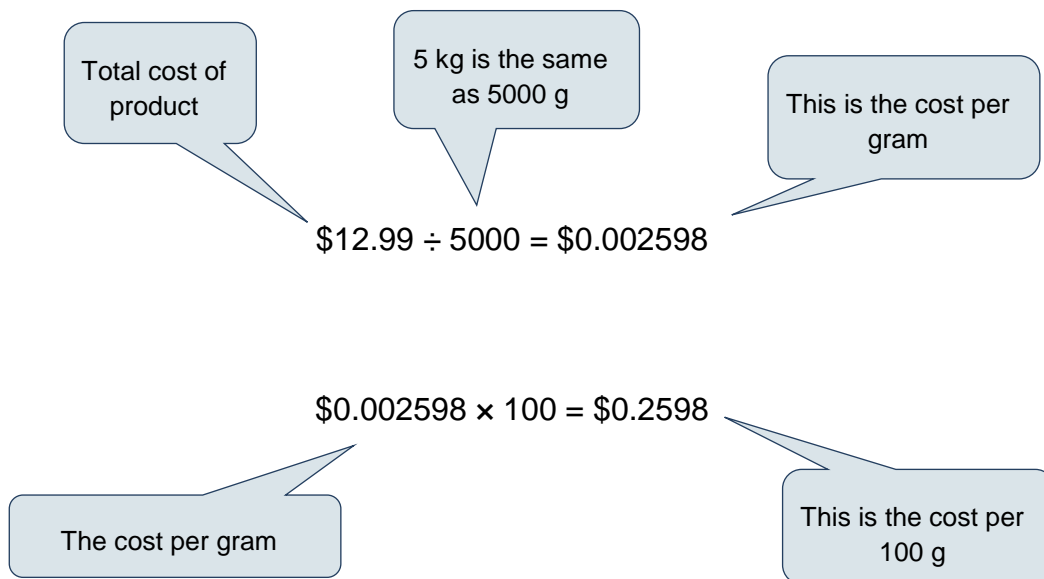
100 g would cost \$1.22

2. If 425 g tuna costs \$5.79, how much would 1 kg cost?



1 kg would cost \$13.62

3. If 5 kg of rice costs \$12.99, how much would 100 g cost?



The cost of 100 g would be 26 cents (to the nearest cent).

Resource 2: Calculating mobile phone costs – example

Mia's dad has an OzMobe mobile phone plan with the following costs:

- a standard call costs 80c per minute
- there is a 25c flag fall for all standard calls
- sending a text to another OzMobe mobile phone costs 5c
- sending a text to any other mobile phone costs 10c
- sending a photo costs 45c.

Calculate Mia's dad's total mobile phone cost for January, if:

- he makes 100 standard calls
- the average length of each phone call is 2 minutes
- he sends 50 texts, of which 15 are to OzMobe mobile phones
- he sends only two photos.

Solution:

Steps	Calculations
Calculate the average cost of a call	<p>The average standard call lasts 2 minutes. Each minute costs 80c. $2 \times 80 = 160$ Each call will cost approximately 160c plus a 25-cent flag fall. $160 + 25 = 185$ The average cost of a call will be 185c, or \$1.85.</p>
Calculate the total cost of his calls	<p>He makes 100 calls. $100 \times 1.85 = 185$ The total cost of his calls is \$185.</p>
Calculate the cost of his texts to OzMobe phones	<p>He sends 15 texts to Ozmobe phones. $15 \times 5 = 75$ The cost of his texts to OzMobe phones is 75c or \$0.75.</p>
Calculate the cost of his texts to non-OzMobe phones	<p>$50 - 15 = 35$ He sends 35 texts to non-OzMobe phones. $35 \times 10 = 350$ The cost of his texts to other phones is 350c or \$3.50.</p>
Calculate his cost for sending photos	<p>$2 \times 45 = 90$ The cost for sending photos is 90c or \$0.90.</p>
Find his total cost for the month	<p>$185 + 0.75 + 3.50 + 0.90 = 190.15$ The total cost for the month is \$190.15.</p>

Worksheets

Name: Class: Date:

Worksheet 1: Comparing prices mentally

Work in a small group. Read each of the questions below and discuss how they can be answered using mental arithmetic (no calculators and no writing!).

Make sure that each member of your group has understood how each answer is reached before moving on to the next question.

Write down which option is the best value for money in each situation.

1. 3 bananas for \$2 **or** 2 bananas for \$3?

2. 5 cricket bats for \$200 **or** 4 cricket bats for \$150?

3. 2 posters for \$10 **or** 4 posters for \$16?

4. 2 mobile phone apps for \$4 **or** 1 mobile phone app for \$1.75?

5. 5 movie tickets for \$50 **or** 6 movie tickets for \$55?

6. 200 g of chocolate drinking powder for \$2 **or** 600 g for \$7?

7. 9 stickers for \$4.50 **or** 3 stickers for \$2?

8. 4 electric erasers for \$12 **or** 5 electric erasers for \$16?

Worksheet 2: Comparing prices using written calculations

Work with a partner, but you should each write your own solutions in your mathematics workbook.

Example:

Michelle can buy 4 stickers for \$3.70 or 8 stickers for \$7.50. Which option is better value for money?

Solution:

For the first option, 4 stickers cost \$3.70.

8 stickers would cost twice this price – $2 \times 3.70 = 7.40$

So, 8 stickers would cost \$7.40.

This is less than \$7.50, so the first option is better value for money.

1. Alex's mother can buy 8 ice-cream cones for \$4.80 or 16 ice-cream cones for \$9.10. Which option is better value for money?

2. Tim's dad can buy 2 toothbrushes for \$4.30 or 6 toothbrushes for \$12.50. Which option is better value for money?

Worksheet 2: Comparing prices using written calculations (cont)

3. Monica can buy a packet of biscuits for \$2.50 or 3 packets for \$5. Which option is better value for money?

Example:

Bill can buy 4 football collector cards for \$4.80 or 5 football collector cards for \$5.50. Which option is better value for money?

Solution:

Method 1:

For the first option, 4 football collector cards cost \$4.80.

$$4.80 \div 4 = 1.20$$

So, each football collector card costs \$1.20.

$$1.20 \times 5 = 6.00$$

So, 5 football collector cards would cost \$6.00.

This is more than \$5.50, so the second option is better value for money.

Method 2:

For the first option, 4 football collector cards cost \$4.80.

$$4.80 \div 4 = 1.20$$

So, for the first option, the cost per football collector card is \$1.20.

For the second option, 5 football collector cards cost \$5.50.

$$5.50 \div 5 = 1.10$$

So, for the second option, the cost per football collector card is \$1.10.

The second option represents better value for money as the cost per football card is less.

Name: Class: Date:

Worksheet 2: Comparing prices using written calculations (cont)

4. Rick can buy 3 mobile phone apps for \$2.70 or 5 apps for \$4.00. Which option is better value for money?

5. Marielle can buy 7 muesli bars for \$4.90 or 5 muesli bars for \$3.45. Which option is better value for money?

6. Yuri can buy 2 kg of washing powder for \$7.20 or 3 kg for \$10.80. Which option is better value for money?

7. Suppose Yuri could buy 20 kg of washing powder for \$16.

- a. How would this compare to the best option you found in Question 6?
- b. Explain why this might not be a suitable purchase for Yuri, despite its value for money.

Name: Class: Date:

Worksheet 2: Comparing prices using written calculations (cont)

8. A pair of runners costs \$240. Suppose you wear them every day for two years.

a. How much does it cost per month to have these runners?

b. Compare the value of these runners to another pair that costs \$168, but lasts only for one year and two months.

Name: Class: Date:

Worksheet 3: PMI chart

Should we always choose the purchase with the best value for money?

Complete the Plus, Minus and Interesting chart by writing the positive (plus), negative (minus) and interesting aspects of the question, 'Should we always choose the purchase with the best value for money?'

Plus	Minus	Interesting

Name: Class: Date:

Worksheet 4: Calculating unit prices

Show your calculations.

Category	Item description (include weight/volume)	Calculations	Unit price (round to 2 decimal places)
Toiletry item			
Breakfast food			
Frozen meal			
Pasta			
Dessert			
Cleaning product			
Dairy product			
Eggs			

Worksheet 5: Calculating mobile phone costs

Read **Resource 2: Calculating mobile phone costs – example** then answer the questions below.

1. Mia’s cousin has a Tube-ular prepaid phone plan with the following costs:

- a standard call costs 35c per 30 seconds
- there is a 30c flag fall for all standard calls
- sending a text costs 10c
- sending a photo to a Tube-ular customer costs 50c
- sending a photo to anyone else costs \$1.

Using the table below, calculate Mia’s cousin’s total mobile phone cost for January, if:

- she makes 200 standard calls
- the average length of her phone calls is 3 minutes
- she sends 90 texts
- she sends 10 photos to her friends who are all customers of Tube-ular
- she sends 10 photos to other family members who are not customers of Tube-ular.

Steps	Calculations
Calculate the average cost of a call	
Calculate the total cost of her calls	
Calculate the total cost of her texts	
Calculate the cost of sending photos to her friends	
Calculate the cost of sending photos to her family members	
Find her total cost for the month	

Worksheet 5: Calculating mobile phone costs (cont)

2. Mia's uncle has a Spendify prepaid phone plan with the following costs:

- a standard call costs 20c per 30 seconds
- there is a 50c flag fall for all standard calls
- sending a text to a Spendify customer costs 20c
- sending a text to anyone else costs 40c
- sending a photo to a Spendify customer costs 35c
- sending a photo to anyone else costs \$2.

Calculate Mia's uncle's total mobile phone cost for January, if:

- he makes 150 standard calls
- the average length of his phone calls is 2 minutes and 30 seconds
- he sends 23 texts (to Spendify **and** non-Spendify customers)
- he sends 60 photos, and one-third of these are to Spendify customers.

Draw up your own table, similar to the table in Question 1, to set out your calculations.

Name: Class: Date:

Worksheet 6: Calculating data downloads

Work with your group to complete the table on the next page.

In the 'Number' column, estimate the number of web pages, text emails etc. you think Mia might use in one month. To make this estimate:

- ▶ consider the way you use data on your phone, **or** how you imagine you would use data on a mobile phone
- ▶ refer to the table showing data usage in the article you have read in class
- ▶ in the 'Data downloaded' column, calculate the data you would need for the number of web pages, text emails etc. you have specified. Make sure that you show your calculations.

Average data downloads

- ▶ 1 megabyte (MB) is equal to 1000 kilobytes (KB).
- ▶ A standard web page is likely to download between 200KB and 500KB of data
- ▶ Text-only emails are about 10KB
- ▶ Watching a YouTube clip is about 1MB for every two minutes of video watched
- ▶ Downloading a song from iTunes is roughly 5MB; an album is likely to be more than 50MB
- ▶ Average download for an app is 5MB
- ▶ A game application can be as large as 80MB

Name: Class: Date:

Worksheet 6: Calculating data downloads (cont)

KB usage calculator – Mia’s data usage for 1 month

Download	Number	Data downloaded (in KB)
Web page		
Text only email		
YouTube clip		
iTunes song		
Application		
Gaming application		
Total of data downloads		

Name: Class: Date:

Worksheet 7: Choosing a prepaid provider

Ozmobe, Tube-ular and Spendify offer prepaid plans.

	OzMobe	Tube-ular	Spendify
Call rate	80c per minute	35c per 30 seconds	20c per 30 seconds
Flag fall	25c	30c	50c
SMS to same provider/MMS	5c	10c	20c
SMS to a different provider	10c	10c	40c
MMS to the same provider	45c	50c	35c
MMS to a different provider	45c	\$1	\$2
Data	1.5GB (1500 MB)	1GB (1000MB)	1.5GB (1500MB)

Which of the phone plans – OzMobe, Tube-ular or Spendify – would you recommend for Mia? You will need to estimate some numbers related to her mobile phone use. Here is some information to help you. You will need to fill in some information based on what you have learned about how people use their mobile phones.

Information you are given	Things you need to estimate
Calls are mostly to family members who are with the same provider	The number of calls Mia would make in a month
Calls are usually less than 2 minutes She makes about one or two longer phone calls each a day	The average length of Mia's calls
She sends most of her texts to family and friends. Her family members are with the same provider but some of her friends are not	The number of texts Mia sends to family members and the number she sends to friends
She sends very few photos compared to her friends and family	The number of photos Mia might send in a month

Name: Class: Date:

Worksheet 7: Choosing a prepaid provider (cont)

Record each of your estimates based on your own estimates and on the data needs you calculated in the previous worksheet. Explain which provider you would recommend for Mia. Justify your answer and explain how this plan can save her money compared to the other two plans.

Worksheet 8: Smarter spending

In **Activity 1** you talked to your family and identified five expenses where you felt you might be able to save some money.

Complete the following for each of these expenses.

1. Write a strategy for saving money. For example, will you:

- consume less (i.e. buy less of a product, use less of a service)
- switch brands or providers
- change the way in which you use this product or service? (e.g. use electricity at off-peak times)

2. Explain any additional benefits (other than saving money) that could occur as a result of implementing your strategy.

Name: Class: Date:

Worksheet 8: Smarter spending (cont)

3. Explain any disadvantages to implementing your strategy.

4. Calculate the amount of money you can save over the next six months by implementing your strategy. Make sure that you explain your calculations. Include unit prices where relevant and show how these unit prices were calculated.

5. Create a poster for your family with your five recommendations for saving money.

Name: Class: Date:

Worksheet 8: Smarter spending (cont)

Criteria for assessment:

- ▶ Practical strategies for saving money are clearly explained.
- ▶ The pros and cons of each strategy are clearly explained.
- ▶ Cost differences have been researched.
- ▶ The savings over a six-month period are correctly calculated.
- ▶ The calculations are clearly explained.
- ▶ Unit price calculations are included where they are relevant.

You might like to take your poster home to show your family how they could save money over the next six months.

Discuss with them what the family could do if they had this extra money.

Solutions

Worksheet 1

(Students use mental strategies to compare prices)

1. 3 bananas for \$2 – more bananas for less money
2. 4 cricket bats for \$150 – cost per bat is \$37.50 instead of \$40
3. 4 posters for \$16 – compare by doubling or halving prices
4. 1 mobile phone app for \$1.75 – halve the price to compare
5. 6 movie tickets for \$55 – cost per ticket is approximately \$9 instead of \$10
6. 200 g of chocolate drinking powder for \$2 – triple the cost and compare to the 600 g price
7. 9 stickers for \$4.50 – triple or take one-third to compare prices
8. 4 electric erasers for \$12 – cost per eraser is \$3 instead of \$3.20

Worksheet 2

1. 8 for \$4.80, so 16 for \$9.60; therefore 16 for \$9.10 is better value
2. 2 for \$4.30, so 6 for \$12.90; therefore 6 for \$12.50 is better value
3. 1 for \$2.50, so 3 for \$7.50; therefore 3 for \$5 is better value
4. 3 for \$2.70, so \$0.90 per app **or** 5 for \$4.00, so \$0.80 per app; therefore 5 for \$4.00 is better value
5. 7 for \$4.90, so \$0.70 per muesli bar **or** 5 for \$3.45, so \$0.69 per muesli bar; therefore 5 for \$3.45 is slightly better value
6. 2 kg for \$7.20, so \$3.60 per kg **or** 3 kg for \$10.80, so \$3.60 per kg; therefore they each represent the same value for money
7.
 - a. 20 kg for \$16, so \$0.80 per kg which is \$2.80 per kg cheaper than the options in Question 6
 - b. The quantity may be too large for Yuri's needs/use and therefore may deteriorate over time and have to be thrown out, thus wasting money. It may also be too bulky to store and handle in such a large quantity. Being so cheap, it may not be a good quality washing powder, thus requiring more powder per use than the other brands and needing to be replaced sooner than expected.
8.
 - a. Cost per month = $240 \div 24 = \$10$
 - b. Cost per month = $\$168 \div 14 = \12
Therefore the \$240 runners are better value.

Worksheet 3

PMI Chart: 'Should we always choose the purchase with the best value for money?'*Some suggestions*

Plus	Minus	Interesting
<ul style="list-style-type: none"> ▶ Save money, keep within budget ▶ Suit large families to buy in bulk, cheaper ▶ Promotes competition between stores to reduce prices and attract customers wanting to save money 	<ul style="list-style-type: none"> ▶ Buying second hand cars or goods cheaply may work out more expensive in the long run if they need repair ▶ It may not be easy to resell goods that were purchased cheaper initially ▶ Quality and taste may be sacrificed for cost ▶ May not be as much variety with cheaper brands ▶ May have to buy in bulk to save money ▶ Lifespan of cheaper items may not be as long 	<ul style="list-style-type: none"> ▶ People may still choose brand over cost as they perceive it as less risky ▶ People view low price as either good value or low quality ▶ More expensive doesn't necessarily mean better quality ▶ Advertising can persuade purchasing decisions

Worksheet 4

(Example only – students research their own products and prices)

Category	Item description (include weight/volume)	Calculations	Unit price (round to 2 decimal places)
Toiletry item	Fresha Roll-on Deodorant 40 mL \$2.99	$\$2.99 \div 40 \times 100 =$ \$7.475	\$7.48/100 mL
Breakfast food	Earth's Goodness Bran 525 g \$2.99	$\$2.99 \div 525 \times 100 =$ \$0.5695	\$0.57/100 g or 57c/100 g
Frozen meal	Frozo Foods' Beef Stroganoff 350 g \$3.59	$\$3.59 \div 350 \times 100 =$ \$1.0257	\$1.03/100 g
Pasta	Mia Casa Spaghetti 500 g 89¢	$\$0.89 \div 500 \times 100 =$ \$0.178	\$0.18/100 g or 18c/100 g
Dessert	Dessert Delights Vanilla Ice-cream 2 L \$2.19	$\$2.19 \div 2000 \times 100 =$ \$0.1095	\$0.11/100 mL or 11c/100 mL
Cleaning product	Express Dishwashing Liquid 600 mL \$2.49	$\$2.49 \div 600 \times 100 =$ \$0.415	\$0.42/100 mL or 42c/100 mL
Dairy product	Happy Valley Tasty cheese 250 g \$4.75	$\$4.75 \div 250 \times 100 =$ \$1.9	\$1.90/100 g
Eggs	Gordon's Farm 1 doz. large eggs 700 g \$4.29	$\$4.29 \div 700 \times 100 =$ \$0.6129	\$0.61/100 g or 61c/100 g

Worksheet 5

1.

Steps	Calculations
Calculate the average cost of a call	$\$0.35 \times 2 \times 3 + \$0.3 = \$2.40$
Calculate the total cost of her calls	$200 \times \$2.40 = \480
Calculate the total cost of her texts	$90 \times \$0.1 = \9
Calculate the cost of sending photos to her friends	$10 \times \$0.5 = \5
Calculate the cost of sending photos to her family members	$10 \times \$1 = \10
Find her total cost for the month	$\$480 + \$9 + \$5 + \$10 = \$504$

2.

Steps	Calculations
Calculate the average cost of a call	$\$0.2 \times 2 \times 2.5 + \$0.5 = \$1.50$
Calculate the total cost of his calls	$150 \times \$1.5 = \225
Calculate the total cost of his texts (for example: 8 to Spendify customers and 15 to others)	$8 \times \$0.2 + 15 \times \$0.4 = \$7.60$
Calculate the cost of sending photos	$20 \times \$0.35 + 40 \times \$2 = \$87$
Find his total cost for the month	$\$1.5 + \$225 + \$7.6 + \$87 = \$321.10$

Worksheet 6

Students work in their group to estimate the number of various downloads on their mobile phone in a month and record this in the table on the worksheet. Using information provided that shows data usage, they then calculate data download in KB.

Example only

Download	Number	Data downloaded (in Kb)
Web page	200	$200 \times 350 = 70000$
Text only email	300	$300 \times 10 = 3000$
YouTube clip (average length 4 minutes)	60	$60 \times 2000 = 120000$
iTunes song	20	$20 \times 5000 = 100000$
Application	10	$10 \times 5000 = 50000$
Gaming application	3	$3 \times 80000 = 240000$
Total of data downloads		583000

Worksheet 7

Students use information provided on the worksheet and record their own estimates of the number and type of phone usage for this worksheet. **Students' solutions and justification will depend on their individual estimates and calculations.**

Example only

Mia's estimated monthly phone use and cost

Phone usage	Estimates	Ozmobe	Tube-ular	Spendify
Calls to family		Cost/min = \$0.8	Cost/min = \$0.7	Cost/min = \$0.4
– Short (use 2 mins)	60	Cost of calls + Flag fall	Cost of calls + Flag fall	Cost of calls + Flag fall
– Long (average 5 mins)	30	$\$0.8 \times 2 \times 60 + \$0.25 \times 60 = \$111$	$\$0.7 \times 2 \times 60 + \$0.3 \times 60 = \$102$	$\$0.4 \times 2 \times 60 + \$0.5 \times 60 = \$78$
		$\$0.8 \times 5 \times 30 + \$0.25 \times 30 = \$127.50$	$\$0.7 \times 5 \times 30 + \$0.3 \times 30 = \$114$	$\$0.4 \times 5 \times 30 + \$0.5 \times 30 = \$75$
Calls to friends		Cost/min = \$0.8	Cost/min = \$0.7	Cost/min = \$0.4
– Short (use 2 mins)	20	$\$0.8 \times 2 \times 20 + \$0.25 \times 20 = \$37$	$\$0.7 \times 2 \times 20 + \$0.3 \times 20 = \$34$	$\$0.4 \times 2 \times 20 + \$0.5 \times 20 = \$26$
– Long (average 5 mins)	6	$\$0.8 \times 5 \times 6 + \$0.25 \times 6 = \$25.50$	$\$0.7 \times 5 \times 6 + \$0.3 \times 6 = \$22.80$	$\$0.4 \times 5 \times 6 + \$0.5 \times 6 = \$15$
Texts to family	30	$\$0.05 \times 30 = \1.50	$\$0.1 \times 30 = \3	$\$0.2 \times 30 = \6
Texts to friends	60	$\$0.05 \times 40 + \$0.1 \times 20 = \$4$	$\$0.1 \times 60 = \6	$\$0.2 \times 40 + \$0.4 \times 20 = \$16$
Photos	10	$\$0.45 \times 10 = \4.50	$\$0.5 \times 4 + \$1 \times 6 = \$8$	$\$0.35 \times 4 + \$2 \times 6 = \$13.40$
Downloads (Worksheet 6)	0.583GB	1.5GB included	1GB included	1.5GB included
TOTAL COST		\$311	\$289.80	\$229.40

Note: For this example, 2 minutes was used for a short call and long calls were averaged at 5 minutes. The cost of texts to friends have been calculated using a mix of both the same provider and different provider rates. The estimates used in this example may vary considerably from those used by students.

Recommendation based on the example

Mia would be better with Spendify as her provider because it is her cheapest option based on the estimates used in this example. Including the cost of flag fall, a 2 minute call is only \$1.30 compared to \$1.85 and \$1.70 with the other two providers; Mia can continue talking for only 40 cents/minute compared to 80 cents and 70 cents with the others. Spendify offers a data allowance that more than satisfies Mia's estimated requirement. The higher cost of sending a photo with Spendify does not impact greatly as Mia sends very few photos. The cost of texting is higher with Spendify, but Mia saves on the cost of phone calls and she could monitor her use of texts.

Worksheet 8

Students complete and submit the assessment task outlined on this Worksheet. Each student describes the savings measures they have identified in Activity 1, so answers will vary accordingly. Marking criteria for this assessment are given on the Worksheet and in the Assessment rubric.