

How much love can fit into a shoebox?

Year 4

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



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How much love can fit into a shoebox?

Year level	4
Duration of unit	11 hours*
Learning areas	Mathematics focus supported by English

Unit description

In this unit students will investigate the possible contents of 'shoeboxes of love', which can be donated to children in need. They will discuss the differences between needs and wants, and compare the needs of others to their own.

In their investigation into the contents of their shoeboxes, students will use equivalent fractions, make connections between fractions and decimal notation, and solve problems involving purchases and the calculation of change. They will compare prices of items across a range of vendors.

Each student will present a plan for a shoebox of love, using the mathematics of the unit with supporting calculations and appropriate explanations. The class may choose to make and send a shoebox of love.

Knowledge and understandings

- Donating is a way of helping others.
- Money is used to buy goods; comparative shopping can save money.
- Money amounts can be named, modelled and ordered using place value and fractions.
- Making change with Australian coins is to the nearest 5 cents.

Pre-requisite skills

To undertake this unit, students need to be able to:

- understand fractions – equivalent fractions
- make connections between decimals and fractions
- round
- use place value
- be aware of the relationship between money and fractions
- add and subtract money using a calculator.

Acknowledgement

The idea to develop this unit of work came from [Operation Christmas Child by Samaritan's Purse](#). ASIC would like to acknowledge Samaritan's Purse as an organisation specialising in meeting the needs of people in crisis.

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

Unit plan

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
	<p>Strand: Number and Algebra</p> <ul style="list-style-type: none"> — Sub-strand: Money and financial mathematics <ul style="list-style-type: none"> ○ Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies (ACMNA080) — Sub-strand: Fractions and decimals <ul style="list-style-type: none"> ○ Investigate equivalent fractions used in contexts (ACMNA077) ○ Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation (ACMNA079) <p>Strand: Measurement and Geometry</p> <ul style="list-style-type: none"> — Sub-strand: Using units of measurement <ul style="list-style-type: none"> ○ Use scaled instruments to measure and compare lengths, masses, capacities and temperatures (ACMMG084) ○ Compare objects using familiar metric units of area and volume (ACMMG290)
	Achievement standards
	<p>By the end of Year 4, students choose appropriate strategies for calculations involving multiplication and division. They recognise common equivalent fractions in familiar contexts and make connections between fraction and decimal notations up to two decimal places. Students solve simple purchasing problems. They identify and explain strategies for finding unknown quantities in number sentences. They describe number patterns resulting from multiplication. Students compare areas of regular and irregular shapes using informal units. They solve problems involving time duration. They interpret information contained in maps. Students identify dependent and independent events. They describe different methods for data collection and representation, and evaluate their effectiveness.</p> <p>Students use the properties of odd and even numbers. They recall multiplication facts to 10 x 10 and related division facts. Students locate familiar fractions on a number line. They continue number sequences involving multiples of single digit numbers. Students use scaled instruments to measure temperatures, lengths, shapes and objects. They convert between units of time. Students create symmetrical shapes and patterns. They classify angles in relation to a right angle. Students list the probabilities of everyday events. They construct data displays from given or collected data.</p>
English	Content descriptions
	Strand: Language

- Sub-strand: Expressing and developing ideas
 - Incorporate new vocabulary from a range of sources into students' own texts including vocabulary encountered in research (ACELA1498)

Strand: Literacy

- Sub-strand: Interacting with others
 - Use interaction skills such as acknowledging another's point of view and linking students' response to the topic, using familiar and new vocabulary and a range of vocal effects such as tone, pace, pitch and volume to speak clearly and coherently (ACELY1688)
 - Interpret ideas and information in spoken texts and listen for key points in order to carry out tasks and use information to share and extend ideas and information (ACELY1687)
 - Plan, rehearse and deliver presentations incorporating learned content and taking into account the particular purposes and audiences (ACELY1689)

Achievement standards

By the end of Year 4, students understand that texts have different text structures depending on purpose and context. They **explain how language features, images and vocabulary are used to engage the interest of audiences**. They describe literal and implied meaning connecting ideas in different texts

They fluently read texts that include varied sentence structures, unfamiliar vocabulary including multisyllabic words. They express preferences for particular types of texts, and respond to others' viewpoints. **They listen for and share key points in discussions.**

Students use language features to create coherence and add detail to their texts. They understand how to express an opinion based on information in a text. They create texts that show understanding of how images and detail can be used to extend key ideas.

Students create structured texts to explain ideas for different audiences. **They make presentations and contribute actively to class and group discussions, varying language according to context.** They demonstrate understanding of grammar, select vocabulary from a range of resources and use accurate spelling and punctuation, re-reading and editing their work to improve meaning

General capabilities

Typically, by the end of Year 4 students:

Literacy

- Compose and edit a range of learning area texts
- Use pair, group and class discussions about learning area topics as learning tools to explore and represent ideas and relationships, test possibilities and to prepare for creating texts
- Use a growing range of subject-specific vocabulary to read, discuss and write about learning area topics

Numeracy

- Model, represent, order and use numbers up to five digits
- Estimate a solution to a problem then check the solution by recalling addition, subtraction, multiplication and division facts
- Estimate the change from simple purchases

	<ul style="list-style-type: none"> • Visualise, describe and order tenths, hundredths, 1-place and 2-place decimals • Solve problems using equivalent fractions for tenths, hundredths, 1-place and 2-place decimals • Collect, record and display data as tables, diagrams, picture graphs and column graphs • Describe possible outcomes from chance experiments using informal chance language and recognising variations in results • Estimate, measure and compare the length, temperature, volume, capacity and mass of everyday objects using metric units and scaled instruments
ICT	<ul style="list-style-type: none"> • Locate, retrieve or generate information from a range of digital sources • Create and modify simple digital solutions, creative outputs or data representation/transformation for particular purposes
Creative & Critical Thinking	<ul style="list-style-type: none"> • Collect, compare and categorise facts and opinions found in a widening range of sources • Reflect on, explain and check the processes used to come to conclusions • Identify and apply appropriate reasoning and thinking strategies for particular outcome • Draw on prior knowledge and use evidence when choosing a course of action or drawing a conclusion • Explain and justify ideas and outcomes
Personal & Social Capability	<ul style="list-style-type: none"> • Identify the various communities to which they belong and what they can do to make a difference
Intercultural Understanding	<ul style="list-style-type: none"> • Identify and describe variability within and across cultural groups • Imagine and describe the feelings of others in a range of contexts

Cross-curriculum priorities

Asia and Australia's engagement with Asia

Proficiency strands

- **Understanding** - Demonstrate an understanding of money concepts by transferring knowledge in unfamiliar situations (comparing Australian currency to, and learning about, other currencies)
- **Fluency** - Develop and use skills of place value, equivalent fractions and calculating ('What do you know about money?', 'Money fraction wall', 'Coin trading')
- **Problem solving** - Develop and apply the skills of problem solving by making choices, interpreting and investigating prices and finding a solution for a specific task (investigating and comparing costs in 'Shopping around')
- **Reasoning** - Develop the ability to reason by making connections, discriminating and comparing prices and applying knowledge of the empty number line to order fractions and decimals, and calculate change ('What do you know about money?', 'Rounding and giving change')

Diversity of learners

Teachers use the Australian Curriculum content and achievement standards first to identify current levels of learning and achievement, and then to select the most appropriate content (possibly from across several year levels) to teach individual students and/or groups of students. This takes into account that in each class there may be students with a range of prior achievement (below, at and above the year level expectations) and that teachers plan to build on current learning.

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 4
Knowledge and understanding	<ul style="list-style-type: none"> Recognise that different countries use different currencies Explain why similar goods and services may vary in price
Competence	<ul style="list-style-type: none"> Use money to buy basic goods and services in 'real-life' contexts Order and discuss reasons for spending preferences
Responsibility and enterprise	<ul style="list-style-type: none"> Explain the role played by the voluntary sector in the community to help those in financial need

Sequenced teaching and learning activities

Introducing	Resources
<p>Introduction: Shoebox of love (60 minutes)</p> <p>Introduces the concept of the shoebox of love project. Explores concept of 'underprivileged' people or children in need. Students brainstorm a list of items and classify them into needs and wants.</p>	<ul style="list-style-type: none"> Computer access YouTube access for World Vision video clips Butcher's paper or interactive whiteboard World map Digital resource: Needs and wants (optional) Year 3 integrated unit of work: The house of needs and wants (optional)
<p>Activity 1: What do you know about money? (90 minutes)</p> <p>Students explore money, its physical characteristics, different denominations, how it is obtained and what it is used for, and the concept of a 'cashless society'.</p>	<ul style="list-style-type: none"> Worksheet 1: What do you know about money? Internet access Digital resources to use for 'inspiration' (optional): <ul style="list-style-type: none"> Digital resource: Money match Digital resource: Money maps Digital resource: Money and people
<p>Assessment: Diagnostic</p> <p>Collect student work samples to determine student understanding of place value in relation to money.</p>	

Developing	Resources
<p>Activity 2: Money fraction wall (90 minutes)</p> <p>Students build a fraction wall that represents coins as fractions of \$1. They play a game in pairs to consolidate this understanding.</p>	<ul style="list-style-type: none"> • Worksheet 2: Money fraction wall, including: <ul style="list-style-type: none"> — Money fraction wall artwork (worksheet, p. 2) — Spinners (see instructions on worksheet, p. 3) • Pencils • Paperclips • Real/play money • Five 100cm long strips of paper • Fraction blocks
<p>Activity 3: Coin trading (60 minutes)</p> <p>Students play a game in which they trade coins of smaller denominations for their larger equivalent.</p>	<ul style="list-style-type: none"> • Worksheet 3: Coin trading, including tally sheet • 1 six-sided money die with the markings 5c, 5c, 10c, 10c, 20c, 50c per 3 students • Real/play money (multiples of 5c, 10c, 20c, 50c, \$1 and \$2)
<p>Activity 4: Rounding and giving change (90 minutes)</p> <p>Students explore making change in Australian currency and discuss other currencies. They work independently using an empty number line to solve problems about giving change.</p>	<ul style="list-style-type: none"> • Worksheet 4: Rounding and giving change • Real/play money • Supermarket price catalogues • For information on unit pricing consider these websites: <ul style="list-style-type: none"> — ACCC's Introducing Unit Pricing — ACCC Grocery Unit Prices
<p>Assessment: Formative</p> <p>Collect student work samples to determine students' abilities to round appropriately and calculate change to the nearest 5 cents.</p>	
<p>Activity 5: What could you buy for your shoebox? (90 minutes)</p> <p>Students identify suitable items to be included in their shoebox. They research and compare prices from different vendors for those items and suggest reasons for price differences.</p>	<ul style="list-style-type: none"> • Worksheet 5: What could you buy for your shoebox? • Cards showing 0–9 placed into an opaque bag or box • Junk mail catalogues, newspaper or online advertisements
<p>Assessment: Formative</p> <p>Collect student work samples to determine students' abilities to compare prices and suggest reasons for differences.</p>	

Developing	Resources
<p>Activity 6: Shopping around (60 minutes)</p> <p>Students order money amounts from highest to lowest using place value skills. Results are displayed for use in Activity 7.</p>	<ul style="list-style-type: none"> • Butcher's paper • Completed tables from Worksheet 5: What could you buy for your shoebox? • Materials for developing PowerPoint presentations or posters • Worksheet 6: Presenting a plan for your shoebox of love • Digital resource: Helping out • Centimetre cubes

Culminating	Resources
<p>Activity 7: A plan for your shoebox of love (120 minutes)</p> <p>Students use the mathematics from the unit, and the concept of donating, to plan a shoebox of love. They calculate the total cost, justify choices, specify notes and coins used for payment, and calculate change from a set budget.</p>	<ul style="list-style-type: none"> • Worksheet 6: Presenting a plan for your shoebox of love • Computer access (optional)
<p>Assessment: Summative</p> <p>Use student shoebox plans to assess student learning from the unit.</p>	

Assessment rubric

This rubric aligns with Year 4 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 perform simple addition and subtraction calculations with money.	Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies (ACMNA080)	Activities 1, 5 and 7 Worksheets 1, 5 and 6	The student selects and applies an appropriate mental and/or written strategy to add and subtract money amounts without error.	The student uses a mental and/or written strategy to add and subtract money amounts. Occasional errors are corrected with little or no assistance.	The student adds and/or subtracts money amounts with substantial errors. Teacher guidance is required to use an appropriate written and/or mental strategy.	
The student can round prices to the nearest 5 cents.	See ACMNA080 above.	Activity 4 Worksheet 4	The student applies the rules for rounding to the nearest 5 cents without error.	The student applies the rules for rounding to the nearest 5 cents and occasional errors are corrected with little or no assistance.	The student relies on a number line and/or play money to model and apply the rules for rounding to the nearest 5 cents. Teacher guidance may be required.	
The student can calculate change from \$2 and \$10.	See ACMNA080 above.	Activities 4 and 7 Worksheets 4 and 6	The student selects and applies an appropriate mental and/or written strategy to correctly calculate change.	The student uses a mental and/or written strategy to calculate change and occasional errors are corrected with little or no assistance.	The student relies on a number line and/or play money to model 'counting on' in order to give change. Teacher guidance may be required.	

Skill	Relevant content description(s)	Relevant activities and worksheets	Competent	Developing at level	Needs further development	Notes
The student can determine the fractional part each coin represents of a whole.	Investigate equivalent fractions used in contexts (ACMNA077)	Activities 2 and 3 Worksheets 2 and 3	The student understands the role of the denominator in describing the number of equal parts required to make the whole and completes both fraction walls accurately and without error.	The student colours the first fraction wall correctly but makes one or two errors, or is inaccurate, in completing the second fraction wall. The student requires little or no assistance to make corrections.	The student requires teacher guidance and/or relies on concrete materials to complete the first fraction wall.	
The student can use equivalent fractions with money amounts.	See ACMNA077 above.	Activities 2 and 3 Worksheets 2 and 3	The student recognises equivalent fractions represented by equal parts on the fraction wall and can write equivalent fractions without a visual aid.	The student determines equivalent fractions by using the fraction wall.	The student requires teacher guidance in understanding and determining equivalent fractions using a visual aid.	
The student can describe different amounts of money in relation to the place value of each digit.	Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation (ACMNA079)	Activity 1 Worksheet 1	The student rewrites all money amounts without error.	The student makes one or two errors, which are corrected with little or no assistance.	The student requires teacher guidance to apply place value in describing money amounts.	
The student can order money from smallest to largest amounts.	See ACMNA079 above.	Activity 1 Worksheet 1	The student correctly orders money amounts from smallest to largest.	The student makes one or two errors in ordering, which are corrected with little or no assistance.	The student requires teacher guidance to order money amounts from smallest to largest.	

Skill	Relevant content description(s)	Relevant activities and worksheets	Competent	Developing at level	Needs further development	Notes
The student can determine how to pay for an item using notes and coins.	See ACMNA079 above.	Activities 4 and 7 Worksheets 4 and 6	The student correctly determines payment for an item using the least amount of notes and/or coins.	The student correctly determines payment for an item but does not use the least amount of notes and/or coins.	The student requires teacher guidance to determine payment for an item using notes and/or coins.	
The student can use a ruler to measure and compare length.	Use scaled instruments to measure and compare lengths, masses, capacities and temperatures (ACMMG084)	Activities 6 and 7 Worksheet 6	The student uses the graduations on a ruler or tape measure to correctly determine and record the dimensions of their shoebox.	The student makes an occasional error reading and/or recording the graduations on a ruler or tape measure. The student requires little or no assistance to make corrections.	The student requires teacher guidance to read and record the graduations on a ruler or tape measure.	
The student can use scales to measure mass.	See ACMMG084 above.	Activities 6 and 7 Worksheet 6	The student uses the graduations on a set of scales to correctly measure and record the mass of an item.	The student makes an occasional error reading and/or recording the graduations on a set of scales. The student requires little or no assistance to make corrections.	The student requires teacher guidance to read and record the graduations on a set of scales.	
The student can use centicubes to compare volumes.	Compare objects using familiar metric units of area and volume (ACMMG290)	Activities 6 and 7 Worksheet 6	The student uses knowledge of volume to select the most appropriate items based on shape and size to maximise filling their shoebox.	The student uses some knowledge of volume to select items based on shape and size to fill their shoebox.	The student does not use any or much knowledge of volume to select items to fill their shoebox.	

Teacher notes

Introduction: Shoebox of love (60 minutes)

- A 'shoebox of love' is based on a project that provides gift-filled shoeboxes to children in need around the world – [Operation Christmas Child by Samaritan's Purse](#).
- A 'shoebox of love' would ideally contain one item from each of the following six categories: clothing, toys, school materials, personal hygiene, something special and something to love.
- Students must have an understanding of the meaning of 'underprivileged' or 'in need' and the concept of needs and wants.
- If students require a detailed explanation of the concept of 'needs and wants' you may wish to consider the digital resource: Moneysmart's 'Needs and wants' digiactivity and the Year 3 Integrated unit [The house of needs and wants](#).
- Show YouTube clips from [World Vision](#) to develop students' understanding of Third World countries, and what 'underprivileged' means.
- Locate some of the countries featured on a world map.
- After viewing several clips, create a retrieval chart comparing housing, clothing, food, schooling, entertainment, family income, etc. to highlight the differences in lifestyles between 'underprivileged' children and children in Australia.
- There could be a discussion about the fact that there are 'underprivileged' children in Australia as well.
- Describe the purpose of 'shoeboxes of love'. What do the students understand about the lives of underprivileged children? What differences might shoeboxes of love make to these children? Ask students how they would feel if they sent a child a shoebox of love.
- Brainstorm a list of some of the things that an underprivileged child might like to receive in a shoebox of love. Ask how this list might be different if the project were aimed at the students in the class. As a class, classify the list into needs and wants.
- See the digital resource 'Needs and wants' or the Year 3 Integrated unit 'The house of needs and wants'.
- Identify the six categories of suggested items for the shoebox of love (or bring in a shoebox of love that you have made yourself).
- Explain that each student will be given the opportunity to plan a shoebox of love, and that the class might vote on one to create and send, depending on financial limits.
- In order to cover the cost of shoebox items and the postage and handling fees, students will need to know about money. This provides the basis of Activity 1 to Activity 4 in this unit of work.

Note

The concept of giving can be used as a stimulus for similar activities with a more local focus, which do not necessarily involve spending money on postage.

Teachers may consider sending a shoebox to armed forces personnel serving overseas. There are guidelines for contents, etc available online, and postage is free from Australia Post if under a certain weight. This would be good if students have parents on active service.

Activity 1: What do you know about money? (90 minutes)

- **Warm-up:** Count by 50 cents to 30 dollars.
- Discuss what students know about money – you could use a digital mind map program to collect this information. This should include its physical characteristics, different denominations, how it is obtained and what it is used for.
- Explore students' understanding of a 'cashless society' in which money is transferred electronically between various accounts and via systems such as EFTPOS – using credit or debit cards. It should be pointed out that 'credit' is not your money.
- You may wish use the following **digital resources** to inspire students about the topic:
 - **Money match**
 - **Money maps**
 - **Money and people**
- Begin a class **word wall** (brainstormed list) about money.
- Revise the concept of **place value**, and demonstrate the link between place value in number and in money. Name and record some examples, such as:

$$\$76.35 = \$70 + \$6 + 30c + 5c$$

- Students work independently on **Worksheet 1: What do you know about money?** to describe different amounts of money in relation to the place value of each digit, and **order** money from smallest to largest amounts. Students also use their understanding of **place value** to complete simple addition and subtraction calculations involving money. In relation to question 6 on **Worksheet 1: What do you know about money?**, consider how realistic students' suggestions were in terms of prices for items.
- **After the worksheet:** Share answers and discuss why some numbers are more difficult to work with than others. Explain that zero signifies that there are no units in that place. Discuss the strategy of initially comparing the whole numbers when ordering money. Some questions and ideas for discussion are:
 - Which numbers were easier/harder to order? Why?
 - What strategies did you use to partition the money amounts into each place value amount?
 - How is partitioning money similar to/different from working with numbers? What calculations were involved?
 - Compare and contrast the suggestions for what could be bought for the different amounts.
 - Discuss whether these suggestions are reasonable.
 - Discuss the benefit of being able to rename amounts of money when calculating.

For example:

$$\$13.25 \times 4 \text{ can be handled mentally as } (\$10 \times 4) + (\$3 \times 4) + (20c \times 4) + (5c \times 4)$$

Diagnostic assessment

- Assessment questions include:
 - Were students able to transfer their place value knowledge to rename money?
 - Could students complete simple addition and subtraction calculations involving money?
 - How realistic were students' suggestions for the cost of items?

Activity 2: Money fraction wall (90 minutes)

- **Warm-up:** Count backwards by 20 cents from 20 dollars.
- Discuss how many of each type of coin is required to make 1 dollar. Revise basic fractions, emphasising the role of the **denominator** in describing the number of equal parts required to make the **whole**. Nominate 1 dollar as the whole, and then discuss what fraction each coin would be in relation to that unit. For example:

How many 50c coins are needed to make 1 dollar?

Two coins are required, therefore 50 cents is equal to one half ($1/2$) of a dollar.

How many 20c coins are needed to make 1 dollar?

Five coins are required, therefore 20 cents is equal to one fifth ($1/5$) of a dollar.

Note: These examples could be demonstrated using pretend coins or coin images on an interactive whiteboard.

- Continue to add to the class **word wall** about money.
- Model how to make a fraction wall using paper folding. Use a long strip of paper to represent one unit (in this case 1 dollar). Cut another strip the same length and fold it evenly in two – each portion representing a half (in this case 50 cents). Continue this folding process, using a new strip of paper for each fraction (representing different coin denominations). [**Hint:** strips that are about 100 centimetres long are the easiest to fold into the various fraction lengths.]
- Students then work with a partner to play 'Build a money fraction wall' and answer questions 2–4 of **Worksheet 2: Money fraction wall**.

Game: Build a money fraction wall

Aim: to be the first to colour in every section of the wall

Players need: one copy of the money fraction wall artwork per player (see page 2 of **Worksheet 2: Money fraction wall**), a spinner (see instructions on page 3 of **Worksheet 2: Money fraction wall**), a pencil and a paperclip

*(Depending on their ability level, students may use the fraction spinner **or** the spinner that shows money denominations. For the spinner showing money values, this becomes a matching game.)*

How to play:

- Player 1 flicks the paperclip at the base of the pencil. When it lands on a fraction on the spinner, player 1 must convert that fraction to its money equivalent – recognising that 1 dollar represents one whole unit.
- Player 1 colours in that portion on their money fraction wall.
- Player 2 takes a turn. And the game continues.
- If a player spins a fraction that is already fully coloured on their money fraction wall, that player can rename the fraction into equivalent fractions. For example, if a $1/5$ (or 20 cents) is scored but the player has no uncoloured spaces remaining, then it can be converted into $1/10$ and two $1/20$ (that is, one 10 cents and two 5 cents). If the fraction cannot be used **completely** by the player, it is forfeited and the player does not colour in any part of their wall for that round.
- The winner is the player who colours in their wall first.

- **After the game:** Discuss whether the game relied on skill or chance. Ask students:
 - What strategies did you use for converting fractions to coin equivalents?
 - What information does the denominator provide? What does a **numerator** of '1' mean?
- **Challenge** the students now to think of the whole as 2 dollars, and discuss how each coin will represent a different fraction compared to when the whole was 1 dollar. Using **Worksheet 2: Money fraction wall** have students partition the empty rectangle in question 5 to represent the value of each coin if the whole were 2 dollars.
- Discuss and share strategies for doing this and compare work samples.
 - Were students able to determine the fractional part that each coin represented when 2 dollars was equal to a whole?
 - How well did students understand the role of the denominator in this activity?

Activity 3: Coin trading (60 minutes)

- **Warm-up:** Ask students to imagine that you have four different coins in your pocket. What might their total value be?
- Revise the range of coins in the Australian currency using real/play money. Discuss how many of each are required before they can be traded for a coin of higher value – for example, five 20c coins can be traded for a \$1 coin; four 5c coins can be traded for a 20c coin.
- Discuss the concept of 'small change' and the disadvantages of carrying large quantities of coins in purses and pockets. Explain that some people empty their small change into a jar every night as a method of saving.
- Continue to add to the class **word wall** about money.
- Model how to play the coin trading game.

Game: Coin trading

Aim: to **trade** collections of lower-valued coins for one higher-valued coin whenever possible. This means students always have the fewest possible coins in play. The winner is the first student to collect a \$2 coin.

Alternatively, the game can end when a student reaches 5 dollars or after a specified playing time – the winner being the student with the most money, on the condition that there is no other coin trade possible.

Players use the tally sheet in **Worksheet 3: Coin trading** to keep track of their 'winnings'.

Players need: six-sided money die with the markings 5c, 5c, 10c, 10c, 20c, 50c (use stick-on labels to adapt a standard die); toy coins or counters (multiples of 5c, 10c, 20c, 50c, \$1 and \$2); and the tally sheet in **Worksheet 3: Coin trading**.

How to play:

- Students play the game in groups of three, with one student as the banker. The banker's role is to hand out and trade the coins, and ensure that the game is played according to the rules. Players can swap roles after each round.
- Player 1 rolls the die. The banker provides one toy coin or counter to the value of the amount thrown. The coin is placed on the tally sheet in **Worksheet 3**.
- Player 2 rolls the die, and follows the actions taken by player 1.

- Player 1 rolls the die again. If the two 'coins' accumulated by this player can be traded for one single coin of a higher denomination, the player requests a trade from the banker. For example, two 10c coins can be traded for one 20c coin.
 - Players continue taking turns rolling the die and trading whenever possible until one player is able to trade for a \$2 coin. That player wins the round.
 - Play three rounds, so that each player has a turn at being the banker.
- **During the game:**
 - Did students recognise when to trade their coins?
 - How well could students articulate what they were doing?
 - **After the game:** Discuss whether the game relied on skill or chance. Ask students:
 - What does a player need to roll on the die to get to 2 dollars with the fewest number of throws?
 - What coins would they collect and trade?
 - How does this compare to what a player needs to throw to get to 2 dollars in the greatest number of throws?
 - How might the game change if the winner were the first student to collect \$1.50 or 3 dollars?
 - Explain the benefit of trading multiple small denominations of currency for fewer, larger denominations. Ask students to give examples of when this might occur in real-life situations.
 - Tell students that shop assistants are trained to minimise the number of coins given in change to customers. Ask students to suggest why this might be.

Activity 4: Rounding and giving change (90 minutes)

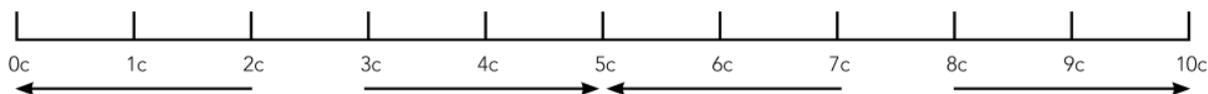
- **Warm-up:** Independently list coins of different values that together total \$2.50.
- Discuss the practice of **rounding** to the nearest 5 cents in everyday financial transactions. Explain that Australia's currency used to have 1c and 2c coins, and prices often still reflect this. For example, a supermarket item may be priced at 89 cents, even though we do not have coins equal to this exact amount. Explore supermarket price catalogues to demonstrate this. Explain that petrol is sold by volume, and fruit and vegetables are mostly sold by weight; the price of these items is usually rounded, because getting a final digit of zero or five is not guaranteed.
- Ask students what they know about other currencies.
- Continue to add to the class **word wall** about money, including other currencies.

Rounding to the nearest 5 cents

- Use a number line to model rounding to the nearest 5 cents.

Rounding rules

- Amounts that end in 0 or 5 stay the same.
- Round down amounts that end in 1 or 2.
- Round up amounts that end in 3 or 4.
- Round down amounts that end in 6 or 7.
- Round up amounts that end in 8 or 9.



'Counting on' using the empty number line

- Demonstrate how to *count on* using an *empty number line* in order to give change.



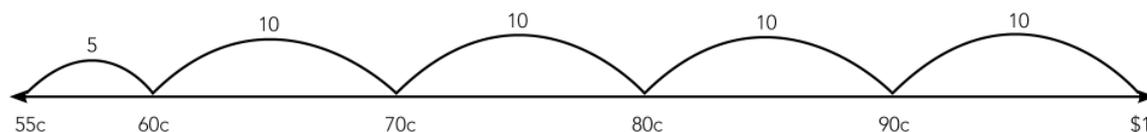
- Consider an item that costs 55 cents, which is paid for with 1 dollar. How can students work out how much change is owed? Use an empty number line. Write the cost at the left-hand end of the number line and the proffered amount at the right-hand end.



- Start the 'jumps' from the cost and count on 5 cents from 55 cents to 60 cents, then count on by tens to 1 dollar. Tally the numbers above the number line to get the answer – 45 cents change.

Note

Students may offer other solutions, such as 20 cents, 20 cents then 5 cents; the answer will still be the same.



- Give students practice in rounding and giving change through role-playing using real/play money.
- Using real/play money, students work independently to complete the questions in **Worksheet 4: Rounding and giving change**. Encourage students to draw empty number lines to support their thinking when calculating change. This activity offers suggestions for items that could be included in the class shoebox of love.
- **After the worksheet:** Invite students to share their answers and nominate students to demonstrate their solution on the board using an empty number line. In question 6 from **Worksheet 4: Rounding and giving change**, consider the combinations of notes and coins that students may have used to pay for the items.
 - Highlight the efficiency of minimising the notes and coins involved.
 - Discuss the benefit of having a mental image of an empty number line when making mental calculations. Similarly, remind students that **estimating** answers can help to reduce errors. Ask students to identify and explain which items on the worksheet they think would be most appropriate for their shoebox of love.

Formative assessment

- Collect students' work.
 - Were students able to round to the nearest 5 cents?
 - How well did they use the empty number line when calculating change?
 - How efficient were students' suggestions about the notes and coins that might be used as payment?
- Remind students that we round up or down in Australia because we no longer have 1c and 2c coins. Build on earlier discussions about other currencies and ask students if they know whether

the same situation exists in other countries. Students could be encouraged to ask parents and caregivers about other currencies, and perhaps bring some sample currencies into class.

Note

Year 2 Mathematics [unit of work: Kieren's coin](#) deals with other currencies. Year 3 Mathematics [unit of work: Sal's secret](#) provides strategies for giving change.

Activity 5: What could you buy for your shoebox? (90 minutes)

- **Warm-up:** Play 'Make the largest/smallest amount'. Write the numbers from zero to nine separately on small pieces of card, and place them in an opaque bag or box. Take four digits out and ask students to write each digit randomly in a blank box in their own copy of the following boxes:

\$□□.□□

Students aim to create the largest/smallest amount (as agreed prior to beginning the activity).

- Discuss how the price of similar goods may vary from store to store (and from store to market, store to online retailer, and so on). Talk about possible reasons for this price variance. Use junk mail catalogues, newspaper advertisements or online resources to demonstrate how to compare the prices of similar items. Introduce the term 'unit pricing' and explain that it helps people make comparisons of items. For information on unit pricing consider the following websites:
 - [ACCC's Introducing Unit Pricing](#)
 - [ACCC Grocery Unit Prices](#)
- Using **Worksheet 5: What could you buy for your shoebox?**, allocate each student one category from the six categories in the shoebox of love: clothing, personal hygiene, school materials, toys, something special and something to love. Students with the same category form groups to brainstorm items that could be included in their category. Each student nominates three brainstormed items that they are interested in pricing. Students estimate volume or capacity of their potential items and consider what might fit, what needs to be cut down, etc.
- Students work independently to research the price of each of their items from three different vendors. This can be done by looking at newspapers, magazines, junk mail catalogues and/or the internet. You should verify the content and address of internet sites before directing students to them. Students then complete the tables in **Worksheet 5: What could you buy for your shoebox?** to compare the three different prices and suggest possible reasons for them. Students calculate the potential savings associated with shopping around.
- **After the activity:** Discuss any benefits achieved from shopping around. Discuss the factors that might influence whether a person is able to shop around. Highlight the importance of comparing like with like when doing this activity and consider unit pricing where appropriate.

Formative assessment

- Collect students' work.
 - How did students identify items that were 'similar' across different vendors?
 - How well could students explain and demonstrate their calculations and thinking?
 - What strategies did students use to compare prices?

Activity 6: Shopping around (60 minutes)

- Students work in groups based on the category they researched in Activity 5. Students work with their completed tables from that activity. Each group lists on butcher's paper all the items that they researched, in order from most to least expensive (e.g. brush \$18.50, comb \$15, brush \$12, hair ties \$10, etc.). Display these lists in the classroom so that the whole class can use them. Questions and directions include:
 - Discuss the interesting features of each list.
 - Which category is the most/least expensive?
 - Which category has the greatest/least variety of items?
 - Was it difficult to find the price of any items?
 - Discuss why this was the case.
- What was the total cost of a shoebox of love?
- Students consider the capacity of their shoebox. Introduce the concept of volume and potential items that would fit snugly, utilising space. Students should consider shape and determine which shapes are more likely to fit into the box and suggest reasons why.
- Fill the shoebox with centimetre cubes. Start with the bottom layer. Ask students:
 - Do we need to fill the box to work out how many cubes?
 - Is there another way?
- Use centimetre cubes to mirror the shapes of potential objects for the shoebox.
- This is a good opportunity to practise estimating the volume of an object with irregular shapes and using the centimetre cubes to try to verify the estimation.
- Check the results of the cube activity in working out the volume of the shoebox and contents by using a ruler or tape measure to verify their volumes.
- The digital resource: [Helping out](#) will give students more exposure to the notion of helping others.

Activity 7: A plan for your shoebox of love (30 minutes)

Students use **Worksheet 6: Presenting a plan for your shoebox of love** to guide them in this activity.

- Discuss with the class to decide on an imaginary recipient of a shoebox of love. Students consider gender and age, then use the research from Activity 5. Students identify a maximum amount of money to be spent on the box. A summary of all aspects of the shoebox is presented to the class.
- Consider the options for the presentation of this activity, such as a PowerPoint show or a poster. As a class, discuss the criteria for the successful completion of this task. These are:
 - Ensure the contents of your shoebox are relevant to the age and gender of the recipient.
 - Choose one item from each of the six categories (from the lists created in Activity 5).
 - Explain why you chose each item. (This might relate to the cost, or to the benefit for the recipient.)
 - Show how you calculated the total cost of the contents of the shoebox.
 - Show at least two different combinations of notes and coins you could use to pay for the contents; you could either draw the combinations, list them or use pretend money (if your final presentation is on a poster).

- Show how you would calculate the change due from the maximum amount set by your teacher.
- Present your work clearly.

The introduction to this unit suggested that the class might vote for the plan of one shoebox to actually create and send. This would be a suitable completion point to the unit but should be considered in the context of the school setting. If you decide to do this, it is suggested that you send a letter to parents/carers asking for some money but suggesting that children have to do some work for it in return.

Worksheets

Name: Class: Date:

Worksheet 1: What do we know about money?

Use your knowledge of place value to answer these questions about money.

1. Rewrite the following amounts to show the true value of each digit. The first one has been done for you.

$$\$76.35 = \$70 + \$6 + 30c + 5c$$

$$\$27.85 = \underline{\hspace{15em}}$$

$$\$127.15 = \underline{\hspace{15em}}$$

$$\$30.45 = \underline{\hspace{15em}}$$

$$\$204.65 = \underline{\hspace{15em}}$$

$$\$103.05 = \underline{\hspace{15em}}$$

2. Rewrite the following amounts in order from smallest to largest.

\$3.15 \$34.35 \$41.50 \$5.05 \$30.15 \$13.45 \$105.45

3. Calculate the total of the three smallest amounts in question 2.

4. Calculate the total of the three largest amounts in question 2.

5. Calculate the difference between the largest amount and the smallest amount in question 2.

Name: Class: Date:

6. Choose three amounts from question 2 and write them in the first column of the table below. Beside each amount, name an item for the shoebox of love that would cost about that much.

Amount of money	Item that would cost about this much
1.	
2.	
3.	

Name: Class: Date:

Worksheet 2: Money fraction wall

1. Play 'Build a money fraction wall' with a partner.

Game: Build a money fraction wall

Aim: To be the first to colour in every section of your wall

You will need: one copy of the 'Money fraction wall' (see second page of this worksheet) per player, one spinner per player (see third page of this worksheet) copied onto light card and cut out, a paperclip, a pencil

How to play: Place a pencil point on the centre of the spinner with a paperclip around the point (see Figure 1). Flick the paperclip to make it spin. If playing with a spinner showing fractions, convert the fraction that it lands on into a money value (based on 1 dollar representing a whole unit) and colour in a matching section on your 'Money fraction wall'. If playing with a spinner showing money values, colour in a matching section on your wall. Your teacher will explain all the rules.

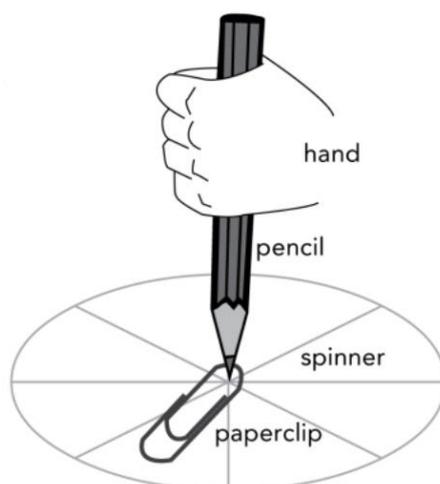
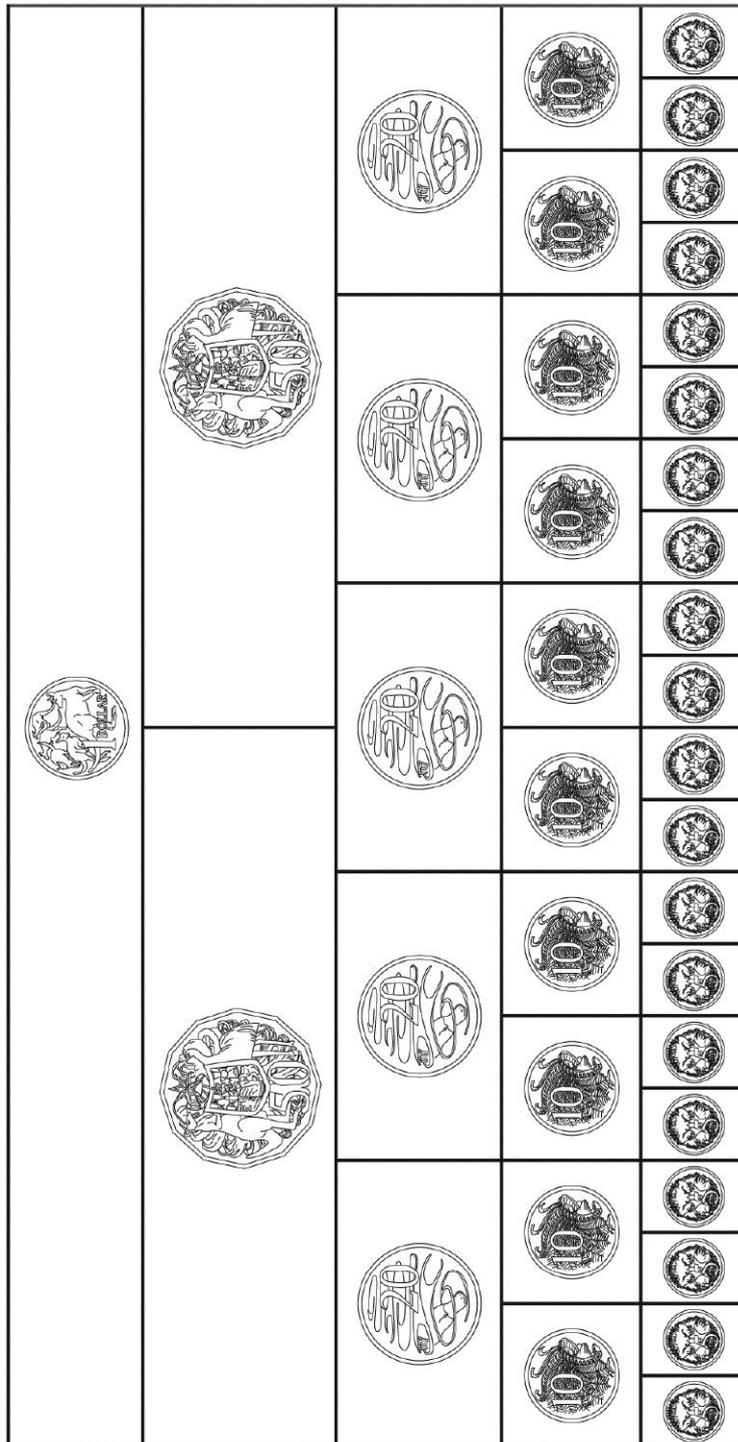


FIGURE 1: Using the spinner

Name: Class: Date:

Money fraction wall artwork

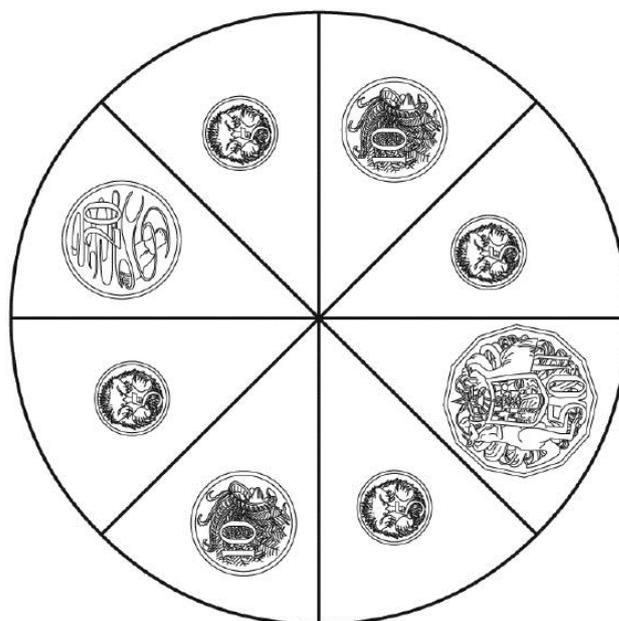
Each player will need one copy of the money fraction wall artwork for the 'Build a money fraction wall' game.



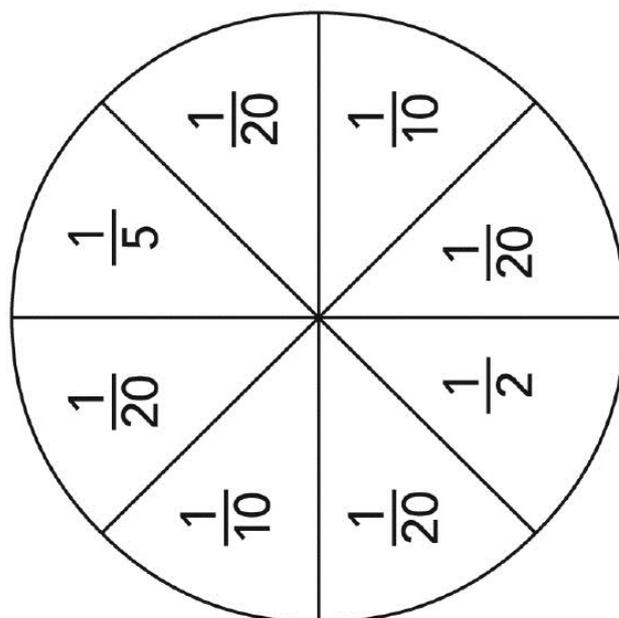
Name: Class: Date:

Spinners

Each player will need one copy of a spinner, copied onto light card and cut out, to play the 'Build a money fraction wall' game. Players will either use the spinner showing fractions **or** the spinner showing money values. Players will also need a pencil and a paperclip to use the spinner.



Spinner showing money values



Spinner showing fractions

Name: Class: Date:

2. How many of each of the following fractions are there in one whole?

a. halves _____

b. fifths _____

c. tenths _____

d. twentieths _____

3. Write down how many:

a. twentieths make $\frac{1}{5}$ _____

b. tenths make $\frac{1}{2}$ _____

c. tenths make $\frac{1}{5}$ _____

d. twentieths make $\frac{1}{10}$ _____

4. Circle the larger fraction in each pair. Use the money fraction wall to help.

a. $\frac{1}{20}$ $\frac{1}{2}$

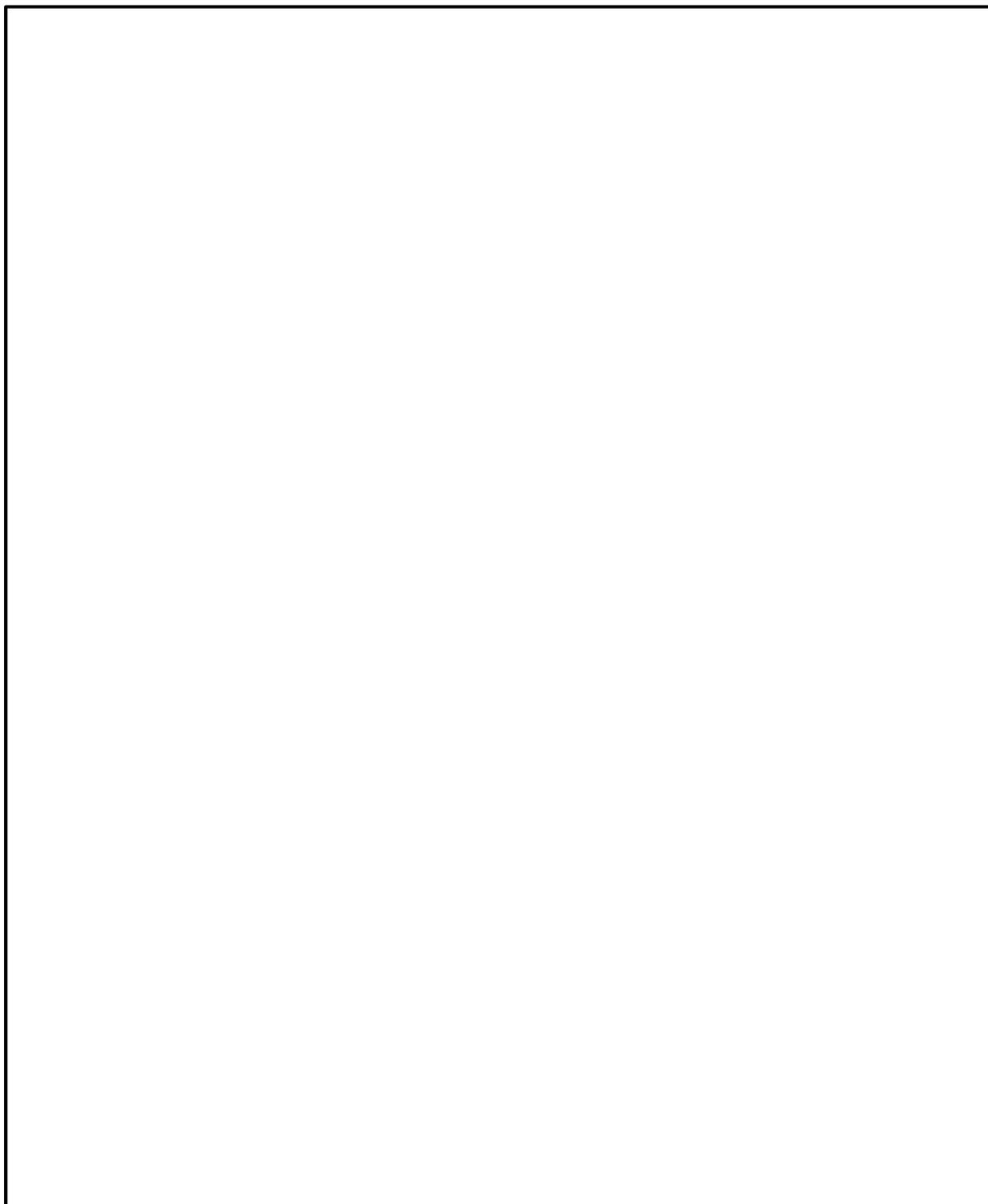
b. $\frac{1}{5}$ $\frac{1}{10}$

c. $\frac{1}{2}$ $\frac{1}{5}$

d. $\frac{1}{10}$ $\frac{1}{20}$

Name: Class: Date:

5. In the box below, draw a money fraction wall using 5c, 10c, 20c, 50c and \$1 coins. Show the fraction that each coin would represent if one whole unit were 2 dollars.



Name: Class: Date:

Worksheet 3: Coin trading

Play 'Coin trading' with a partner.

Game: Coin trading

Aim: To trade collections of lower-valued coins for one higher-valued coin whenever possible. This means you always hold the fewest coins possible.

You will need: A six-sided money die, counters or toy coins, and a tally sheet (see page 2 of this worksheet) for each player.

How to play: Place counters in the table to keep track of your 'winnings'. The winner is the first to trade for a \$2 coin. Play three rounds. Your teacher will tell you all of the rules.

Game rounds:

Round 1 winner: _____

Round 2 winner: _____

Round 3 winner: _____

Name: Class: Date:

Tally sheet

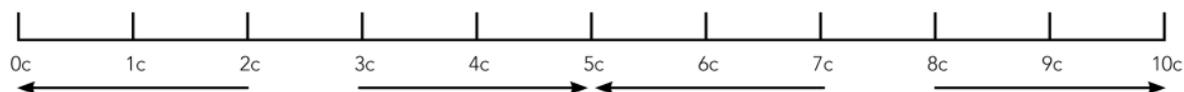
Each player will need one copy of the tally sheet to play the coin trading game.

			
			
			
			
			
			
Game round	1	2	3

Name: Class: Date:

Worksheet 4: Rounding and giving change

In Australia, when you pay cash for an item the price is either rounded up or down to the nearest 5 cents. This is because the Australian currency no longer uses 1c and 2c coins.



Look at the prices of the items in the list and answer the questions that follow.

75c gel pen	\$1.85 comic	\$8.25 jigsaw puzzle
\$3.45 key ring	\$3.20 hairbrush	\$2.99 picture frame
\$7.65 cap	92c rubber ball	
63c two stickers	\$1.85 notebook	

- Round the price of the following items to the nearest 5 cents.
 - stickers _____
 - rubber ball _____
 - picture frame _____
- Imagine that you have one \$2 coin. What change will you get if you buy the:
 - gel pen? _____
 - stickers? _____
 - comic? _____

Name: Class: Date:

3. What change will you get from 10 dollars if you buy the:

a. cap? _____

b. picture frame? _____

c. jigsaw puzzle? _____

4. Name one item from the list that you could not afford to buy if you had only 5 dollars.

5. How much more money would you need so that you could pay for that item?

6. What notes and coins could you use to pay for the:

a. cap? _____

b. jigsaw puzzle? _____

7. Which items from the list cost between 3 dollars and 8 dollars?

8. Which items from the list cost about 1 dollar?

9. What is the price **difference** between the cheapest item and the most expensive item in the list?

Name: Class: Date:

Worksheet 5: What could you buy for your shoebox?

The price of an item can depend on who makes it and who sells it.

1. Compare the cost of three **products** bought from three different vendors.

a. Circle the shoebox category you are going to investigate.

clothing personal hygiene school materials

toys something special something to love

b. Think of three products that belong in that category. For example, three school materials could be coloured pencils, a notebook and a calculator.

c. Find the price of each product from three different vendors. Use newspapers, magazines, junk mail catalogues or the internet for your research. Make sure that you compare a similar product sold by each vendor (for example, don't compare the price of a packet of 24 pencils with the price of a pack of 12).

Use the tables on the following pages to help you organise your research.

Name: Class: Date:

Item name 1: _____

Sold by	Price

What is the difference between the most and least expensive?

Show how you worked this out.

Item name 2: _____

Sold by	Price

What is the difference between the most and least expensive?

Show how you worked this out.

Name: Class: Date:

Item name 3: _____

Sold by	Price

What is the difference between the most and least expensive?

Show how you worked this out.

2. Why do you think the prices vary between vendors?

Name: Class: Date:

Worksheet 6: Presenting a plan for your shoebox of love

Talk to your teacher about how to present your work. You might like to create a PowerPoint presentation or a poster. Make sure that you:

- Consider the gender and age of the person you are giving the shoebox to. (The contents of the shoebox should be something that they would like and be of use to them in their daily life.)
- Choose one item from each of the six categories.
- Explain why you chose each item in terms of:
 - cost
 - how it would help the person who receives it
 - size/volume
 - weight/mass (consider postage costs).
- Show how you worked out the total cost of the items.
- Show at least two different collections of notes and coins you could use to pay for the total cost of the items.
- Show how you would calculate the change owing from the amount set by your teacher.
- Present your work clearly.



Solutions

Solutions for Worksheet 1: What do we know about money?

1. $\$76.35 = \$70 + \$6 + 30c + 5c$
 $\$27.85 = \$20 + \$7 + 80c + 5c$
 $\$127.15 = \$100 + \$20 + \$7 + 10c + 5c$
 $\$30.45 = \$30 + 40c + 5c$
 $\$204.65 = \$200 + \$4 + 60c + 5c$
 $\$103.05 = \$100 + \$3 + 5c$
2. $\$3.15$ $\$5.05$ $\$13.45$ $\$30.15$ $\$34.35$ $\$41.50$ $\$105.45$
3. $\$13.45 + \$5.05 + \$3.15 = \21.65
 Partition strategy $\$(10 + 3 + 5 + 3) + (40 + 10 + 5 + 5 + 5)c$
4. $\$105.45 + \$41.50 + \$34.35 = \181.30
 Partition strategy $\$(100 + 40 + 30 + 5 + 1 + 4) + (40 + 50 + 30 + 5 + 5)c$
5. $\$105.45 - \$3.15 = \$102.30$
 Strategy $(100 + 5 - 3) + (45 - 10 - 5)$
6. Individual responses required

Solutions for Worksheet 2: Money fraction wall

1. Money fraction wall – a game played by students in pairs. The teacher explains the rules. For example, if a student spins $1/2$, they colour 50 cents on the fraction wall.
2. a. halves 2
 b. fifths 5
 c. tenths 10
 d. twentieths 20
3. a. 4
 b. 5
 c. 2
 d. 2
4. a. $1/2$
 b. $1/5$
 c. $1/2$
 d. $1/10$

5.

\$2																			
\$1										\$1									
50c					50c					50c					50c				
20c		20c		20c		20c		20c		20c		20c		20c		20c		20c	
10c																			
5c																			

Solutions for Worksheet 3: Coin trading

Coin trading game – the teacher models how to play the game and students use the tally sheet.

Solutions for Worksheet 4: Rounding and giving change

1.
 - a. 65c
 - b. 90c
 - c. \$3

2.
 - a. \$1.25
 - b. \$1.35
 - c. 15c

3.
 - a. \$2.35
 - b. \$7
 - c. \$1.75

4. Cap or jigsaw puzzle

5. Cap would need \$2.65 and jigsaw would need \$3.25

6. Answers may vary. Examples are:
 - a. \$5 + \$2 + 50c + 10c + 5c
 - b. \$5 + \$2 + \$1 + 20c + 5c

7. Key ring, cap, hairbrush. Students could also include the picture frame, because it rounds up to \$3.

8. Gel pen, rubber ball

9. $\$8.25 - 63c = \7.62 or using rounded value for stickers, the answer would be $\$7.60$

Solutions for Worksheet 5: What could you buy for your shoebox?

1. The teacher allocates each student one category to investigate from the six shoebox of love categories. The student then chooses three different products that belong to that category and compares the prices of similar items from three different vendors.

Example: School materials

Item name: Coloured pencils (12 pack)

Sold by	Price
Officeworks	89c
Coles	\$3
Aldi	65c

Item name: 128-page exercise notebook

Sold by	Price
Officeworks	70c
Coles	75c
Aldi	90c

Item name: calculator (non-scientific)

Sold by	Price
Officeworks	\$15.98
Coles	\$11
Aldi	\$4.98

Difference between the most and least expensive:

Coloured pencils: $\$3 - \$0.65 = \$2.35$

Exercise book: $90c - 70c = 20c$

Calculator: $\$15.98 - \$4.98 = \$11$

2. Some possible reasons why the prices vary between vendors: not all items are of the same quality; some might be reduced prices to shift stock; overhead/rental costs vary between stores and online.

Solutions for Worksheet 6: Presenting a plan for your shoebox of love

Students present a plan for their shoebox of love – suggested summative assessment

- Checklist:
 - Consider the gender and age of the person to whom the shoebox is given. (The contents of the shoebox should be something that they would like and be of use to them in their daily life.)
 - Choose one item from each of the six categories.
 - Explain why each item was chosen – cost, how it would help the person who receives it, size/volume, weight/mass.
 - Show how the total cost of the items was calculated.
 - Show at least two different collections of notes and coins that could be used to pay for the total cost of the items.
 - Show how the change owing from the amount set by the teacher would be calculated.
 - Present work clearly.