## MLS – F1 Decimals, Percentages and Money

### Overview

| MLS-F1 Decimals, Percentages and Money | Unit Duration |
| --- | --- |
| The topic Financial Mathematics involves the development of students’ basic number and calculation skills and the application of these to problems of earning, spending, saving and borrowing money in real-life situations. |  |

| Subtopic focus | Outcomes |
| --- | --- |
| Decimals, percentages and money focuses on carrying out simple money calculations using decimals and percentages and using there to calculate interest. The knowledge, skills and understanding in this subtopic builds on Life Skills Year 7-10 outcomes and content for Number and Algebra. | A student:* Explores mathematical concepts, reasoning and language to solve problems MALS6-1
* Demonstrates understanding of money MALS6-5
* Explores money management skills and financial decision-making MALS6-6
* Engages with mathematical skills and techniques, including terminology, to investigate, explain and organise information MALS6-13
* Communicates mathematical ideas and relationships using a variety of strategies MALS6-14
 |
| Related Mathematics Standard outcomes | ****Related Numeracy CEC outcomes**** |
| MS11-1, MS11-5, MS11-9, MS11-10, MS1-12-1, MS1-12-5, MS1-12-9, MS1-12-10, MS2-12-1, MS2-12-5, MS2-12-9, MS2-12-10 | N6-1.1, N6-1.2, N6-1.3, N6-2.1, N6-3.1, N6-3.2 |

All outcomes referred to in this unit come from the [Stage 6 Mathematics Life Skills Syllabus](https://educationstandards.nsw.edu.au/wps/portal/nesa/11-12/stage-6-learning-areas/stage-6-mathematics/mathematics-life-skills-2017)
© NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2017

### Adjustments

Examples of adjustments can be found on the NESA website under [Adjustments](https://www.educationstandards.nsw.edu.au/wps/portal/nesa/11-12/Diversity-in-learning/stage-6-special-education/adjustments).

|  |  |
| --- | --- |
| Student’s name | Adjustments |
| e.g. John Smith | Requires learning material to be printed on blue paper. |
|  |  |

### Unit of learning

| ContentStudents learn to: | Suggested teaching strategies and resources | Differentiation and modifications | Date and initial |
| --- | --- | --- | --- |
| F1.1: Decimals and moneyStudents:* Read, write, order and compare decimal numbers
* Recognise, match, sort, order and use Australian currency to purchase items
* Read, write money amounts in numerals and words
 | Introducing Decimals* THINK PAIR SHARE activity: What I know about decimals and what am I unsure of?

As a class brainstorm:* What are decimals?
* Real life examples
* Building vocabulary: Identify key terms and gather students’ prior knowledge of the unit. The [Maths Dictionary for kids](http://www.amathsdictionaryforkids.com/qr/qr.html) provides a definition and visuals to match to support various student learning styles.
* Class discussion:
* What is money and what is it used for?
* How do you get money? (Earn)
* What are the different types of money we have in Australia?
* Discuss the value of each money item.
* This student activity supports students to build connections to the value of money in symbolic and concrete forms. Provide students with different amounts of fake money and ask students to state the value in written form. The placement of the digits in the correct place value is critical. This teacher resource scaffolds the activity.

**Resource**: f1-understanding-place-value.DOCX, f1-place-value-money.DOCX* I HAVE, WHO HAS activity: In this game students can practice identifying and counting Australian money. Each student is given a piece of paper with a visual picture of money on it and they are to walk about the classroom to find their pair.

For example, student A has $1.50 and they need to find a partner who has 5c.Extension activity: they are to form groups as per teacher instruction. For example, form groups with a total of $2.00 etc.**Resource:** f1-i-have-who-has.DOCXInterpreting place value* [Math Antics – Decimal Place Value:](https://www.youtube.com/watch?v=KG6ILNOiMgM) this clip is an introductory video to decimals and place value. The video provides numerous examples that students can follow along with.
* Decimals place value chart and money: Demonstrate on the classroom board the decimal place value chart. After explaining each component of the chart, you can progress into money place value.

For example: $10.50 would be $10 in whole numbers and the 50c would be in the $10$ths and $100$ths section of the place value chart.Teacher resource: identify money and decimals * [Creating decimals activity](https://nzmaths.co.nz/node/1863): As a class students’ can play create your own decimal game using a deck of cards. This is a good activity as the ownership is back on the students to try and create a decimal closest the decimal given by the teacher.

Read and order decimals* In small groups students are given a packet of [decimal cards](https://www.teacherspayteachers.com/Product/Decimal-Point-Cards-333338?st=fdbae7f40f8712222644ef0bc39e4347) and are to work as a group to order decimals in ascending and descending. It is recommended to start with tenths before progressing to hundredths.
* Incorporate the use of skip counting.
* *Extension:* Students to select two cards and try to add the decimals together.
 |  |  |
| * Add and subtract decimals correct to two decimal places using a variety of strategies, including mental, written and calculator techniques as appropriate
* Multiply and divide money amounts by 10 or 100 by moving the decimal point
* Multiply and divide decimals correct to two decimal places using a variety of strategies, including mental, written and calculator techniques as appropriate
 | Adding and Subtracting Decimals* Using [DESMOS](https://teacher.desmos.com/activitybuilder/custom/5f5ac295db0b732c87d2f7ee) students will access the activity to revise adding and subtracting decimals through creating expressions to match the given criteria.
* Adding and subtracting decimals: Using [Math-Aids](https://www.math-aids.com/) online resources that provide teacher created worksheets for students to complete and follow along on and complete. The website allows you to create custom worksheets based on students' abilities.

Introduction to Money* As an introduction to money students can access the [Matching Money DESMOS Activity](https://teacher.desmos.com/activitybuilder/custom/5f62e05bd69f37271a7b77a6) where is provides students with an opportunity to match the correct amount of the picture of the Australian dollar notes and coins with the correct amount.
* For example: $5.00 would match the picture of a $5 note.
* How much money do I have? This worksheet is an extension on the DESMOS activity as above. This worksheet focuses on students adding money together based on the visuals supplied.

**Resource:** f1-how-much-money.DOCX* Ordering decimals: based on students’ prior knowledge and completing of the above DESMOS activity students are to arrange Australian money (coins and notes) in order of value from the smallest to the biggest value.
* Teacher Note: You will need a copy of the all Australian money for students for this activity.
* What can I buy for lunch? For this activity you will need a copy of the school canteen menu. Students are to work out what they can buy for lunch from the school canteen based on a set budget they have been given for the day. Students are to add their food items of choice prices together to work out the gran total for lunch and record how much change they have.
* Extension Activity: Students are to order their chosen food items from most expensive to least expensive into a table. This will allow students to practice ordering money.

**Resource:** f1-what-can-i-buy-for-lunch.DOCX |  |  |
| * Recognise that other countries use different currencies
* Explore conversions between Australian dollars and foreign currencies, for example:
* Japanese
 | Currency Conversion – Money around the world* THINK PAIR SHARE: What does currency mean?

As a class brainstorm:* Why do different countries have different words for money and different values?
* When would we need to convert money? E.g. travelling
* As a class demonstrate the currency convertor available using google and take them through an explanation of what it is and how it’s used. Google’s currency convertor will show the current currency rate. Go through Australian dollars ($) in comparison to other countries such as: US, China, Japan and/or New Zealand etc.
* Currency around the world. Students will investigate the value of the Australian dollar in other countries identified on the worksheet.

**Resource**: f1-value-of-aussie-dollar.DOCX* Currency conversion tool: using this [DESMOS activity](https://www.desmos.com/calculator/jln6sduwn4) demonstrating currency conversions that supports the conversion rates in Australia and the United States. Using the tool, it will facilitate the learning to complete the worksheets on Currency conversions.
* Currency Conversion worksheet is to be completed using the DESMOS activity and can be completed in individually, pairs and/or small groups. It provides students with the opportunity to distinguish different currencies and how each country has different values.

**Resource:** f1-currency-converter.DOCX* Extension activities: Have student research the prices of different items and compare the cost in US and AUS dollars.
 |  |  |
| * Estimate costs and change on purchases for example:
* Select appropriate coins and notes to tender after estimating costs
* Use rounding to estimate the amount of change due, e.g. to the whole dollar or 50c
* Recognise whether they have been given the correct change during a purchase
* Calculate change due on purchases using a range of strategies, including concrete materials, mental, written and calculator techniques as appropriate
 | Estimating Costs* Class Discussion: As a class discuss what the word ‘estimate, estimation or estimating’ means. Estimation is about making a guess about things such as money, amounts, distances and/or time. Estimation is about having a guess about a certain thing such as amount, money, time etc. For example, we estimate when we buy items to ensure we stick to a budget or if we have enough money.
* Explore the key words related to estimation such as: estimate, about, round, nearest, closest and approximate.
* Demonstrate estimation techniques such as rounding.
* The Price is Right: This activity provides students the opportunity to use estimating the costs of everyday items. For this activity you will need pictures or physical items to show students and each student will be required to estimate the purchase price using rounding. Once students have written down their estimations, you are to reveal the cost of items and students can compare their costs to their estimations.
* Estimating Costs Worksheet: As a class, small groups or individually students are to guess the estimated costs and the actual costs for each question. Students will be required to add multiple items. Important that students use rounding to complete the worksheet.
* Extension: As above, students are to estimate the costs for items and work out the actual costs. For this section of the worksheet students will be required to estimate the change each person may receive.

**Resource:** f1-estimating-costs.DOCX* [Math-Aids](https://www.math-aids.com/Estimation/) online resources provide student worksheets to introduce students to estimation. The worksheets introduce estimation without the use of money and provides them with the instructions on how to estimate and what is required.
* Adding and subtracting decimals: Using [Math-Aids](https://www.math-aids.com/) online resources that provide teacher created worksheets for students to complete and follow along on and complete. The website allows you to create custom worksheets based on students' abilities.
* [Great Schools Org](https://www.greatschools.org/library/cms/73/25173.pdf) provide great worksheets in relation to estimating. The worksheets can be completed individually and as a small group. Students are given money amounts and they are to estimate each amount and add the final estimation and the final addition of the question. From there students can compare their estimation in relation to the answer.
* [Math Games Estimating interactive](https://www.mathgames.com/estimation) game is online game that students can complete individually or as a class. They are required to read the question (word problem) and estimate the number based on the question. It’s a game of multiple choice and they receive automatic feedback on their answer.

Rounding of Money:* THINK PAIR SHARE: As a class discuss the following opening questions in relation to rounding of money.
* Why do we have to use rounding when it comes to money?
* Can we pay for items that cost $2.98 using cash and not paying via card?
* Work through examples as a class on how rounding works when you are required to round up or when you are required to round down. Provide examples during discuss for students to work out when to round. Using the number line (below) can assist with rounding to the nearest dollar.
* Using the ‘[Rounding of Money Number Line](https://www.teacherspayteachers.com/Product/Australian-Money-Rounding-Number-Line-1424991)’ number line can be a helpful tool for students to round money. The Number line is a free resource available from Teachers Pay Teachers.
* Rounding Decimals task cards: As a class student’s, can work in small groups to work through the task cards on rounding money to the specified instruction per task card. Their answers are to be written on the task answer sheet card.
 |  |  |
| * Interpret calculator displays involving decimal answers in the context of money, for example:
* Understand that 0.5 means $0.50 or that a calculator answer of 4.567 cannot be recorded as $4.567
 | Decimals and Money with Calculators:* As a class, demonstrate how to make calculations on the calculator using decimals. If possible, use the calculate on the smartboard. To demonstrate the importance of each button and which ones they will be using for adding and subtracting money.
* Using calculators: Using [Math-Aids](https://www.math-aids.com/) online resources that provide teacher created worksheets for students to complete and follow along on and complete. The website allows you to create custom worksheets based on students' abilities.
* What’s the missing amount? This worksheet is an extension of adding and subtracting money. Students are required to find the missing value when they have been provided with the answer. Discuss and demonstrate with the class how they are to find the missing value. An example has been provided on the sheet.

*Check for Understanding: Prior to progressing to F1:2 consolidate and revise to ensure students understanding.* |  |  |
| F1.2: Percentages and moneyStudents:* Recognise, read and write % symbol as ‘per cent’
* Recognise and explain the meaning of a percentage as a part of 100
* Interpret the use of percentages in everyday life, for example:
* What is meant by 25% off in a sale, or an 80% goal-kicking success rate
 | Introduction to Percentages* THINK PAIR SHARE activity: What do I know about percentages and unsure of? As a class brainstorm:
* What are percentages?
* Real life examples
* Building Vocabulary: Identify key terms and gather students’ prior knowledge of the unit. Using the [Maths Dictionary for kids](http://www.amathsdictionaryforkids.com/) identify the meaning for the word ‘percent’ and where would you see it in everyday life situations. It provides a definition and visuals to match to support the various student learning styles.
* Percentages: Completed the DESMOS activity individually students are to work through matching up the correct percentage to the image supplied on the page.
* [Math Antics – What are Percentages?](https://www.youtube.com/watch?v=JeVSmq1Nrpw) This short introductory clip demonstrates students what is a percentage and what it means with the use of visuals and various examples.

Percentages of 100s Chart -DESMOS Activity* Students are to work independently to complete the DESMOS activities based on the 100s chart. The activities range from multiple choice selecting the right percentage based on a colour or colouring the 100s chart based on the question asked.
* Students are to complete the worksheet based on the DESMOS activity finding a percentage of a 100s chart.
* Extension Activity: on page two of the worksheet's students are to add percentages together using the coloured 100s chart.

**Resource**: f1-working-with-percentages.DOCX |  |  |
| * Recognise that there are alternate methods of using a calculator to calculate percentages of amounts, for example:
* Using a % key or using ‘percentage x amount’ or using the decimal equivalent of the percentage
* Calculate the percentage of an amount using while number percentages, for example:
* In a 10% off sale, there is a jumper with a full price of $100. How much will the jumper cost on sale?
* Calculate percentage decreases and increases using a calculator in the context of money problems, for example:
* Discounts
* GST
 | Recognising amounts of percentages - DESMOS Activity* Students are encouraged to use this DESMOS Activity on the computer individually at their own pace or in small groups. This activity provides a visual representation of percentages of a value. By moving the sliders students can change the values and the percentages.
* Teachers should encourage students to adopt visual representations, similar to the DESMOS activity, to solve problems independently.

Calculating percentages:* Teacher Note: demonstrate to students the percentage (%) button and how to calculate percentages on a calculator.
* Written Percentage Strategies: When discussing written strategies for percentages reiterate what a percentage is, what's definition and its symbol. Complete the written percentage worksheet. Students can use the calculator as demonstrated in previous activity to complete the worksheets.
* [Math Antics – Find a Percent of a Number](https://www.youtube.com/watch?v=rR95Cbcjzus) this short clip introduces students to finding a decimal of a number and/or amount.
* Using [Maths Salamanders](https://www.math-salamanders.com/) resources and worksheets, they provide some very good simple percentage worksheets that can be used to identify percentages of numbers using (10%, 50% and 100% or a number). These are starting point to use calculators to work out percentages of a quantity and/or number.
* Match the maths problem with the correct change. In this activity students are to work out the percentage of certain items and calculate the change they will get.

Identifying discounts on everyday products:* As an introduction to discounts of item – present various visuals to students showing the various forms of advertising relating to discounts on everyday products. Examples can be viewed through catalogues such as Woolworths, Coles, Kmart, Target, Big W and/or JBHIFI. As a class discuss
* Why do we have advertising and discounts on items?
* What is the intended purpose of having discounts?
* Calculating discounts of items: Using catalogues (Big W, Target, Kmart etc) students are to select items from their chosen catalogue. Filling in the worksheet students are to calculate a percentage off discount on each item (for example, calculate 10% off, 25% off etc. A starting point students’ in small groups or as a class they are to calculate 10% or 50% off general items.
* Examples could include selecting items to make up an outfit to wear for a day or a job interview or select items that could be eaten for lunch at school and / or buying a present for someone.
* Example: selecting an item from each page or certain given pages.

**Resource:** f1-what-is-my-sale-price.DOCX |  |  |
|  | Revision: Decimals and Percentages* Completing the [DESMOS](https://teacher.desmos.com/activitybuilder/custom/5f694e69451d9a32571e6cb3) activity (individually or as a class) students take the opportunity to revise decimals and percentages and what they have learnt over the course of this unit. In this DESMOS Activity students are presented with a picture and they are to identify what its percentage and what is the decimal.
* Pairs match-up: Students can play a game of pairs and are to match up the decimals with their correct percentages.
* Decimal and Percentage wordsearch – incorporating the use of the glossary words.

**Resource:** f1-wordsearch.DOCX* Extension Activity (Literacy) - students are to select a range of words from the word list and write sentences and/or write their own definitions.
 |  |  |

### Evaluation

|  |
| --- |
|  |

### Glossary

|  |  |
| --- | --- |
| Term | Description |
| Addition or Add | To join and add together two or more numbers together for a final sum. |
| Decimal | A decimal is a numeral in the decimal number system. The decimal number system is the base 10, place-value system most commonly used for representing real numbers.For example, the decimal 6.75, the integer part is 6 and the fractional part is 0.75. |
| Estimate | To estimate is to judge the value, number or quantity of a calculation roughly. |
| Estimation | A skill requiring being able to conceptualise and mentally manipulate numbers or quantities to find an approximate answer. The capacity to make reasonable adjustments to numbers is essential in estimating. |
| Four Operations | The four operations are addition, subtraction, multiplication and division. |
| Jump Strategy | The jump strategy is used to add or subtract numbers typically by increments of hundreds, tens and ones. The description relates to recording jumps between numbers on a simple line. |
| Money | A value and/or currency made up of notes and coins. Money is earnt and used to purchase goods. |
| Multiplication or Times | A mathematical operation where a number is times by itself however many times the question asks.For example, 2 + 2 + 2 = 2 x 3 |
| Number Line | A number line gives a pictorial representation of real numbers. |
| Operation | The process of combining numbers or expressions. The operations include addition, subtraction, multiplication and division. |
| Order | Arrangement according to size, amount or value. |
| Percentage | A percentage is a fraction whose denominator is 100. It is used to denote a proportion; for example, 50% of a quantity. |
| Place Value | The value of a digit as determined by its position in a number relative to the ones or units place.For example. 24.2 - the value of 2 is twenty. |
| Rounding | The decimal expansion of a real number is rounded when it is approximated by a terminating decimal that has a given number of decimal digits to the right of the decimal point. |
| Subtraction | To take an amount away from another amount. For example: 6 - 4 =2 |
| Whole Number | A whole number is a non-negative integer, that is, one of the numbers 0, 1, 2, 3, … Sometimes it is taken to mean only a positive integer, or any integer. |

### Supplementary resources