# Pocket money: Saving for an item

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| Year levelStrand(s)Lesson lengthCD Code: | * Year 4
* Number / Algebra
* 60 mins
* [AC9M4N08](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/year-4/content-description?subject-identifier=MATMATY4&content-description-code=AC9M4N08&load-extra-subject=MATMATY4&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&achievement-standard=469f391e-4f16-45cb-8957-757f74968350&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)
* [AC9M4A02](https://v9.australiancurriculum.edu.au/f-10-curriculum.html/learning-areas/mathematics/year-4/content-description?subject-identifier=MATMATY4&content-description-code=AC9M4A02&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)
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| Lesson summary | In this lesson students use efficient strategies when performing calculations involving money. They are guided to use the 4-step problem solving method to support unpacking the problem, generating a plan to solve it, and checking their ability to work mathematically.  |
| Learning intention | * We are learning to use efficient problem-solving strategies to solve problems involving money.
* We are guided to use the 4-step problem solving method to support unpacking the problem, generating a plan to solve it, and checking their ability to work mathematically.
* We will explore different strategies to find the difference between money amounts. They will also calculate how many weeks they will need to complete jobs before they can purchase their item.
* We will communicate their thinking and justify their approach to the problem and their solutions.
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| Success criteria | By the end of this lesson, students can:* use their proficiency with addition and multiplication facts to add and subtract, and multiply and divide money amounts efficiently
* find the difference between money values
* use efficient strategies to calculate the money required to purchase items
* show learning behaviours such as persistence, risk-taking and a growth mindset during the lesson.
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| Why are we learning about this? | Working with money is an essential skill in life. From the beginning of primary school, we learn that there is an exchange process when we want to buy something. We also learn about needs and wants. It is important to understand the importance of spending, sharing and saving. As we move into our teen and then adult years, we experience handling our own money and make financial decisions based on our earnings and what we can afford. |
| Prerequisite student knowledge and language | It is expected that students have:* familiarity with the concept of pocket money
* estimation approaches to making an estimate
* different strategies to calculate the difference between money values involving dollar and cents
* multiplicative thinking skills to find the total of money amounts over the period of time.
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| **Resources** | Teacher’s slides (PowerPoint) |

Curriculum information

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| Achievement standard | Students use their proficiency with addition and multiplication facts to add and subtract, multiply and divide numbers efficiently. |
| Content description(s) | Students develop efficient strategies and use appropriate digital tools for solving problems involving addition and subtraction, and multiplication and division where there is no remainder. [AC9M4N06](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/year-4/content-description?subject-identifier=MATMATY4&content-description-code=AC9M4N06&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)Students recall and demonstrate proficiency with multiplication facts up to 10 x 10 and related division facts; extend and apply facts to develop efficient mental strategies for computation with larger numbers without a calculator. [AC9M4A02](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/year-4/content-description?subject-identifier=MATMATY4&content-description-code=AC9M4A02&load-extra-subject=MATMATY4&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&achievement-standard=dcd63472-8bfc-44b2-8873-3cc57a9c5abe&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick) |
| General capabilitiesCross-curriculum priority | **General capabilities**Numeracy: * Multiplicative strategies [Level 6](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/year-4/general-capability-snapshot?subject-identifier=MATMATY4&content-description-code=AC9M4A02&general-capability-code=N&element-code=NN&sub-element-index=0&sub-element-code=NNMuS&load-extra-subject=MATMATY4&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&achievement-standard=dcd63472-8bfc-44b2-8873-3cc57a9c5abe&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick), [Level 7](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/year-4/general-capability-snapshot?subject-identifier=MATMATY4&content-description-code=AC9M4N06&general-capability-code=N&element-code=NN&sub-element-index=1&sub-element-code=NNMuS&load-extra-subject=MATMATY4&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&achievement-standard=dcd63472-8bfc-44b2-8873-3cc57a9c5abe&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)
* Additive strategies [Level 8](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/year-4/general-capability-snapshot?subject-identifier=MATMATY4&content-description-code=AC9M4N06&general-capability-code=N&element-code=NN&sub-element-index=0&sub-element-code=NNAdS&load-extra-subject=MATMATY4&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&achievement-standard=dcd63472-8bfc-44b2-8873-3cc57a9c5abe&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)
* Understanding money [Level 7](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/year-4/general-capability-snapshot?subject-identifier=MATMATY4&content-description-code=AC9M4N08&general-capability-code=N&element-code=NN&sub-element-index=2&sub-element-code=NNUnM&load-extra-subject=MATMATY4&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&achievement-standard=dcd63472-8bfc-44b2-8873-3cc57a9c5abe&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)

Critical and Creative Thinking: * Interpret concepts and problems Inquiring [Level 3](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/year-4/general-capability-snapshot?subject-identifier=MATMATY4&content-description-code=AC9M4N06&general-capability-code=CCT&element-code=CCTANA&sub-element-index=0&sub-element-code=CCTANAA&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)
* Identify, Process and Evaluate information [Level 3](https://v9.australiancurriculum.edu.au/f-10-curriculum/learning-areas/mathematics/year-4/general-capability-snapshot?subject-identifier=MATMATY4&content-description-code=AC9M4N06&general-capability-code=CCT&element-code=CCTINQ&sub-element-index=0&sub-element-code=CCTINQB&detailed-content-descriptions=0&hide-ccp=0&hide-gc=0&side-by-side=1&strands-start-index=0&subjects-start-index=0&view=quick)
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| Areas of challenge | Some students may: * have challenges reading and understanding the problem – there is choice in the way the money can be distributed if students decide to allocate a different value to the jobs performed (The problem doesn’t state that the jobs are all of equal value.)
* find moving from additive to multiplicative thinking when calculating costs for a four-week period difficult (repeated addition to multiplication)
* find shifting to abstract thinking difficult – estimation is an approximate value, not an exact value
* need to move from inefficient to efficient strategies that are embedded in their learning.
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| Strategies | [Classroom talks](https://www.mathematicshub.edu.au/plan-teach-and-assess/teaching/teaching-strategies/classroom-talks/)[Explicit teaching](https://www.mathematicshub.edu.au/plan-teach-and-assess/teaching/teaching-strategies/explicit-teaching/) [Differentiated teaching](https://www.mathematicshub.edu.au/plan-teach-and-assess/teaching/teaching-strategies/differentiated-teaching/) |

Lesson structure

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| Learning hook10 mins | Download and use the teacher’s slides to accompany your teaching. You will find this in the ‘What you need’ section of the online lesson plan: Saving for an item.**Introduction*** Use slides 2–5 to get students thinking about problems involving money calculations and the strategies to solve the problems. Undertake a [Classroom talk](https://www.mathematicshub.edu.au/plan-teach-and-assess/teaching/teaching-strategies/classroom-talks/) focused on money calculations.
* Go to the next slide and encourage students to think about this question individually. Be creative and explore different options.
* Invite students to share their thinking.

[Explicit teaching](https://www.mathematicshub.edu.au/plan-teach-and-assess/teaching/teaching-strategies/explicit-teaching/):if students do not make links between the money amounts, use questioning and feedback, for example, ‘The first image refers to an item with a total value of $100’ and ‘What connections can you make between the other monetary values and $100?’**Learning hook*** Launch the problem by engaging students with questions, such as: ‘Have you ever found something in a shop or online and thought to yourself “I would really love to have one of those?” What was the item?’ ‘Why did you want this item?’
* Explain that today’s problem is about three characters and the items they would like to buy (slide 6): Maree wants new basketball runners; Angelo would like a new skateboard and Ralph is desperate for a rescue dog.
* Explain the term pocket money so students can fully engage in the task.
* Explain that these characters have already earned money by performing jobs at home and receiving pocket money. They have each saved some money, although not enough to buy their item. Your task is to use the information about the characters’ current savings and the cost of the item to calculate how many more weeks of jobs they need to complete before they have enough money to buy their item.

[Explicit teaching](https://www.mathematicshub.edu.au/plan-teach-and-assess/teaching/teaching-strategies/explicit-teaching/):make the learning intention and success criteria explicit. You may choose to write them on the board, display them on a slide, or provide them to students as a handout. Have students talk to each other explaining what they are going to be learning about today. |
| Explore45 mins | * Go to slide 7 to summarise what we know.
* Explain that each child has decided to continue to do some jobs around the house to earn pocket money. Each child has different jobs to do so they earn different amounts: Maree saves $5 per week; Angelo saves $4.50 per week and Ralph saves $5.50 a week. Ask the following, ‘If each child continues to earn the same amount of pocket money each week, how long would it take them to save up so they can buy their item of choice?’
* Use the 4-step problem solving model to structure your thinking.
* Suggest to students that when they get to the solve stage (Apply and do), to use efficient strategies to work out:
	+ how much each child needs to buy their item
	+ how many weeks of jobs do they need to complete to earn enough money to buy their item.

**Differentiation** (enable):To reduce cognitive load, students could solve the problem using one of the characters. Enabling prompt: Whole dollar amounts only (Maree’s example first). What is the difference between $125 and $65? Could you use the following strategies to help you? For instance, demonstrate an open number line: You could start at $65 and use a landmark number such as 100. Work out how much more to make $100 and then how much more to make $125. Also demonstrate a subtraction algorithm. **Differentiation** (extend):Use prompts, such as, ‘Which character should be able to buy their item first?’ ‘Prove it in at least two different ways.’ Have students explain their thinking to you or their peers. * Once students have had a chance to read and understand the problem further, encourage them to create a plan and begin to solve the problem. During this stage, roam and use questioning to support students to develop a plan and choose mathematical strategies they could use to help solve the problem. Identify useful approaches for students to share.

Learning from our peers* Allow for opportunities for students to share their thinking and approaches. While they are explaining their strategies, begin to create an anchor chart that reflects their ideas.
* Use astrategy such as Fishbowl to allow students to share their ideas and conduct explicit teaching. This is a variation of Classroom talks where students form two circles, one inside the other. The students in the inside circle share their preferred strategies and approaches to the problem-solving task, using mathematical language as they explain their thinking, while the students on the outer circle listen and gain an insight into the strategies used by their peers, as well as from the explicit teaching of efficient strategies by their teacher.

Explicit teaching: Look for opportunities to build on the ideas of students and use as moments for explicit teaching. For example, what strategies were used to work out the difference between the amount already saved and the amount required (for example, a number line to represent mathematical ideas related to ‘difference’) and the number of weeks required to save the additional funds (for example, multiplicative thinking). Use teacher modelling to explain how to work out the difference between the amount already saved and the amount required. Open number lineExplain that we can use open number lines to calculate the difference between two numbers (Slide 9). Maree started with $65, but her item cost $125. How much more money did she need to reach a total of $125? Maree needed to find the difference between $65 and $125. Bar model Inverse operation ‘+’ and ‘–‘ Go to slide 10 to show another strategy for calculating the difference by using subtraction: $125 − $65 = ? Use a bar model (introduced in the previous lesson, Partitioning money amounts) to explain inverse operations, for example: ? + $65 = $125; and $125 − $65 = ?Subtraction algorithm Referring to slide 11, show how to calculate the number of weeks Maree needs to complete her jobs to save enough money to purchase new basketball runners. Say,‘In our worked example we calculated that Maree needs $60 (the difference between $125 and $65) before she can purchase her new basketball runners. We now need to work out how many weeks it will take Maree to earn the $60.’ Select **s**trategies that are most applicable to the students’ level.Look for a pattern/apply a rule Refer to the table in slide 12 to highlight pattern recognition to inform us about rules we can follow to work out unknown values.* Total earnings divided by $5 = number of weeks
* $60 divided by $5 = 12 weeks.

Doubling and halving * From slide 13, show how we can employ doubling and then halving to find solutions.
* I know that $10 x 6 = $60. Halve $10 to $5 and double 6 to 12.
* $10 x 6 weeks = $60
* $5 x 12 weeks = $60

Inverse operation (x and ÷) (Slide 14)* $5 x ? = $60
* Use division for example: $60 divided by $5 = ? weeks

Allow students time to continue using their strategy of choice to solve the problem and work towards the ‘communicate’ step. Reflect on the shared strategies during the fishbowl and incorporate these new ideas into the ‘applyanddo’ step of the process. |
| Summary and reflection5 mins | * Students share their problem-solving strategies. Select a few students to talk about the Apply and do section. What maths did they use to solve the problem? They communicate their answers to the problem.
* Be explicit about the communication of ideas in terms of the problem. For example, if a student says, ‘I got 25’, ask them to rephrase the answer in terms of the problem. You may need to scaffold responses by asking: ‘How much money did the child start with? How much more money did they need to save? How did you work that out?’
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| Assessment | The following suggestions are recommended for formative assessment for this lesson.• Keep a record of their problem-solving strategies. • Have students keep a portfolio of problem-solving activities to show growth and to document learning. |