



Lesson idea: How many ways with coins?

Use this lesson as a guide to conduct a number talk, to compare and contrast different representations of Australian coins.

Materials:

- Slide deck [Compare contrast coins](#).
- A blank page for each student (loose leaf or in maths book)
- Scissors, glue, pencil
- [Australian coins](#) handout

Tuning in

Slide 1

Show the class the first slide from [Compare, contrast coins](#). Compare and contrast this image pair.



Image credit: Istock.com/hddigital

Question 1: *How are the two sets the same and how are they different?*

Give think time, then invite students to share their ideas.

Students may notice:



Same	Different
<p>Coins are organised in columns.</p> <p>Coins are organised from biggest value to smallest.</p> <p>Both sides have equivalent value – both make 25 cents.</p> <p>Both have a mix of only 10 cent and 5 cent coins.</p> <p>Both have only one coin of one value (5c or 10c) and multiple coins of the other value.</p>	<p>The number of coins (three coins in the left set, four in the right set).</p> <p>Each L-shape is facing in opposite directions.</p>

Question: *What are some other ways that 25 cents could be made using coins? We've got two here already. What other coin combinations are possible?*

Give think time. While students are thinking, start a list on the board to display the existing examples from the slide.

$$\underline{25 \text{ cents}}$$

$$\textcircled{10} + \textcircled{10} + \textcircled{5}$$

$$\textcircled{10} + \textcircled{5} + \textcircled{5} + \textcircled{5}$$

Then invite students to share their ideas. List all possibilities generated on the board.



25 cents

$$(10) + (10) + (5)$$

$$(10) + (5) + (5) + (5)$$

$$(5) + (5) + (5) + (5) + (5)$$

$$(20) + (5)$$

Slide 2

Question 1: *How are the two sets the same and how are they different?*



Image credit: [Istock.com/hddigital](https://www.istock.com/hddigital)

Give think time. Then invite students to share their ideas

Students may notice:

Same	Different
<p>Both sides have equivalent value.</p> <p>Both make 50 cents.</p>	<p>Both sets use completely different coins (50c on left, 20c and 10c on right).</p> <p>There are different numbers of coins (one in the left set, three in the right set).</p>



Question 2: What are some other ways that 50 cents could be made using coins? We've got two ways here already. What other coin combinations are possible?

25 cents

$$\textcircled{10} + \textcircled{10} + \textcircled{5}$$

$$\textcircled{10} + \textcircled{5} + \textcircled{5} + \textcircled{5}$$

$$\textcircled{5} + \textcircled{5} + \textcircled{5} + \textcircled{5} + \textcircled{5}$$

$$\textcircled{20} + \textcircled{5}$$

50 cents

$$\textcircled{50c}$$

$$\textcircled{20} + \textcircled{20} + \textcircled{10}$$

Give think time.

While students are thinking, add a new list on the board (or chart paper) with the existing examples from the slide.

Then invite two ideas to be shared; two other ways of making 50 cents. Add these to the list.

25 cents

$$\textcircled{10} + \textcircled{10} + \textcircled{5}$$

$$\textcircled{10} + \textcircled{5} + \textcircled{5} + \textcircled{5}$$

$$\textcircled{5} + \textcircled{5} + \textcircled{5} + \textcircled{5} + \textcircled{5}$$

$$\textcircled{20} + \textcircled{5}$$

50 cents

$$\textcircled{50c}$$

$$\textcircled{20} + \textcircled{20} + \textcircled{10}$$

$$\textcircled{20} + \textcircled{20} + \textcircled{5} + \textcircled{5}$$

$$\textcircled{20} + \textcircled{10} + \textcircled{10} + \textcircled{10}$$

How many more?



Exploration

Pose the challenge:

Ask students to share an estimate on the number of ways to make 50 cent pieces using Australian coins. Collect and record some estimates from students ready to volunteer their thinking.

Tell the group that they will have some time now to investigate if they can find out all the possible ways to make 50 cents. Once they are absolutely certain they have found all of the different ways to make 50 cents, there will be another challenge.

Keeping a record

Students may prefer to draw their different coin combinations. Or they may like to cut out and paste different coin combinations onto their investigation page. They may also have their own recording idea. What is important is that all recordings clearly present findings in line with the task.

Pose an additional challenge

Once students have found all possibilities for 50 cents, invite them to explore all the possible ways to make \$1.

Wrap

Before bringing the class back together, give the group 2–3 minutes to finalise their recordings and gather their thoughts. Invite students to reflect on any or all of these questions:

- What was interesting?
- What did you struggle with?
- What are you left wondering about?

Bring the group together in a circle.

Invite each member to share one item from their reflection.

Ask: *Are we sure yet about how many different ways to make 50 cents? How many different ways did people find?*

Collect all answers without judgement. Ask if anyone feels ready to explain why they are so certain that they have found all possible ways.