



Assessment: Algorithms: Counting coin values

Assessment task

Follow an algorithm to count the total value of a collection of coins.

Guidance:

Assessing student understanding of algorithms can be carried out effectively by setting activities and tasks that require students to create and follow a sequence of steps designed to achieve a specified goal or outcome. The assessment can include:

- statement of the problem
- identification of steps in a process
- description and communication of these steps
- implementing a given algorithm
- trialling and evaluating the algorithm
- modifying and refining the algorithm.

Provide students with this task to be completed individually.

Assess how a student follows an algorithm to complete a task. This algorithm is presented as a series of written steps.

To complete the task, provide each student with a collection of commercially available coins or printed using the resource Australian coins and notes.

Have students prepare a collection of coins to use when following the [Coin counting algorithm](#). Note the coins selected to check for accuracy with task completion.

Differentiation

To reduce cognitive load:

- limit task to using only 5c and 10c coins
- or encourage a small collection to count that does not include all coin values.
-

Alternatively, some students who have had experience with creating algorithms may be able to create their own algorithm. Ask students to compare their algorithm with the one presented to follow.



Algorithms: Counting coin values

You are following a series of steps written for a robot to add a collection of coins.

We call these steps an algorithm.

You can decide on the number of coins in your collection.

Here are some steps to get you thinking.

1. Look at these Australian coins. Write the value of each coin as a multiple of 5 and 10.

	Multiples of 5	Multiples of 10
		
		
		
		



2. Record your use of the coin counting algorithm.

3. Once you have followed the algorithm, answer these questions.

- How easy was the algorithm to follow? Did it work?
- Would you change anything or add some further steps? If so, what would you change?
- What happens if there are no coins of a certain value?



Coin counting algorithm

START

STEP 1. Sort the coins. Put the same value coins together into piles.

STEP 2. Order each pile of coins from lowest value to highest value.

STEP 3. Start the count to zero.

STEP 4. Is there a 5c coin?

If 'yes', add multiples of 5 for every coin to the count.

STEP 5. If 'no', is there a 10c coin?

If 'yes', add multiples of 10 for every coin to the count.

STEP 6. If 'no', is there a 20c coin?

If 'yes', add 2 multiples of 10 for every coin to the count.

STEP 7. If 'no', is there a 50c coin?

If 'yes', add 5 multiples of 10 for every coin to the count.

STEP 8. Have you counted all coins?

STEP 9. If 'no', return to STEP 4.

If 'yes', go to STEP 10

STEP 10. Display the count and stop.

END