**Title**: First to finish

***SUB HEADING***: Compare algorithms

**Summary Text:** Compare algorithms designed to complete the same task, and evaluate each for efficiency.

**Year Level**: F–2

# Suggested steps

Provide students with a number of tasks that can be completed in different ways (each has the same outcome). Challenge students to complete each task in the least possible time.

* Enable students to repeat the tasks to develop more efficient processes.
* Students can work in pairs, groups or individually, with a reward for those who complete the tasks most efficiently and fastest. For example, counting a large number of coins and notes; setting a table for ten people using cutlery for three courses; preparing buttered ham-and-cheese sandwiches for the entire class; sorting and counting coloured Lego blocks; sorting and grouping numbers; sorting and grouping familiar words; sorting pairs of coloured socks; sorting and counting mixed lollies or Smarties.
* Ask students to (with or without support) write down the steps they followed to complete their task.

# Discussion

* Discuss the various methods that students used to complete the same task.
* Encourage students to suggest reasons why some students were able to complete tasks faster than others.
* Record the processes. For example, when counting money it is faster to *group* notes and coins and *then* add, rather than to count every coin and note individually. Similarly, grouping similar items of any kind and adding the total number in each group is faster than counting each item separately.

# Why is this relevant?

Designing an algorithm usually starts with a problem that needs to be solved. When problems are too large to solve by hand, we can use computers to solve the problem. This activity supports students to understand that there are different methods or sets of instructions that can be used to solve problems or complete set tasks. Some methods are more efficient than others.

This activity also helps students understand that they can adapt their processes and instructions based on their observations of a resulting outcome (successful or unsuccessful, efficient or inefficient). They are then able to provide a set of instructions to achieve a desired outcome more efficiently.

# Assessment

## Teacher assessment

Evaluate students' understanding by observing processes undertaken in completing set tasks, eg did students adapt the steps taken to complete tasks after consideration of more efficient processes?

# Australian Curriculum Alignment

## Technologies – Digital Technologies

Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems [(ACTDIP004)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP004)

## General Capability: Critical and Creative Thinking

**Generating ideas, possibilities and actions**

**Imagine possibilities and connect ideas**

build on what they know to create ideas and possibilities in ways that are new to them

**Seek solutions and put ideas into action**

investigate options and predict possible outcomes when putting ideas into action

**Think about thinking (metacognition)**

describe the thinking strategies used in given situations and tasks

**Apply logic and reasoning**

identify reasoning used in choices or actions in specific situations

**Draw conclusions and design a course of action**

identify alternative courses of action or possible conclusions when presented with new information

**Evaluate procedures and outcomes**

evaluate whether they have accomplished what they set out to achieve