

## Pīkau Name: Computational Thinking: the International Perspective

### Video Name: Computational Thinking Example – Sorting Network

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Here is an easy computational thinking exercise that you can do. All you need is some space and chalk to mark out a special layout on the ground. It's a big hit with students; these students have done it so often that they can draw out the pattern from memory, and they even like to decorate it.

We're going to use this structure to sort some numbers. The main computational element is this square, made with chalk. Whenever two students meet up in one of these squares they compare the numbers they are carrying, and the one with the smaller number leaves to the left while the larger number leaves to the right. They keep following lines to the next square, comparing numbers until they get to the end, at which point the numbers are in sorted order. This can be used to sort anything that can be put in order, numbers, words, even musical notes or the life cycle of a butterfly.

There's a lot of ideas from computational thinking going on here. The big task of sorting things in order has been 'decomposed' (Decomposition) into the easy task of comparing two values. Working out how many steps are needed to complete the task is an example of 'Evaluation'. Going from sorting numbers to sorting words and notes is 'Generalisation'. Using a chalk drawing – and a decorated one! – for a computational element is an 'Abstraction'. And the whole idea of sorting requires an 'Algorithm'.

By the way this structure is called a 'Parallel Sorting Network'.

Below is a diagram of the Sorting Network referred to in this transcript. The layout is moved through from the bottom to the top, following the direction of the arrows.

