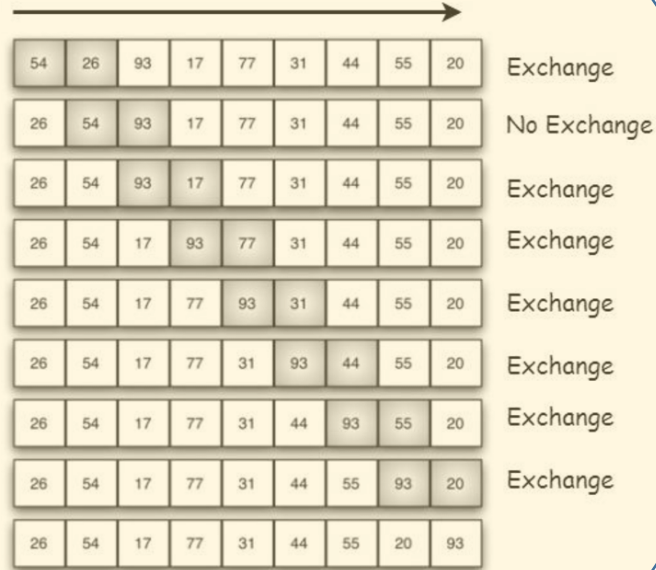


# Year 9 – Sorting Algorithms

## Bubble sort

- Starts at the left
- Each item is compared with the one on its right, if the left is larger they swap places
- Keep going through the list of items
- At the end of the first pass the largest item is at the end of the list
- Start the cycle again for the next pass
- Continue until the list is sorted.



## Notes and Tips

- Some sorts are more efficient than others
- Most sorts cannot be done in a single pass
- Bubble sorts always ends up with the biggest number on the right after the first pass
- Insertion sorts put the items in the right place straight away.
- Merge sorts splits until there is one element in a sublist and THEN starts to put the elements into order
- Sorting CAN be done on words as well as numbers

## Keywords

**element**      **pass**  
**sublist**      **list**  
**split**  
**merge**      **sort**

## Insertion sort

Leave the first item at the start:

5 is now inserted into the sorted list:

4 is now inserted into the sorted list:

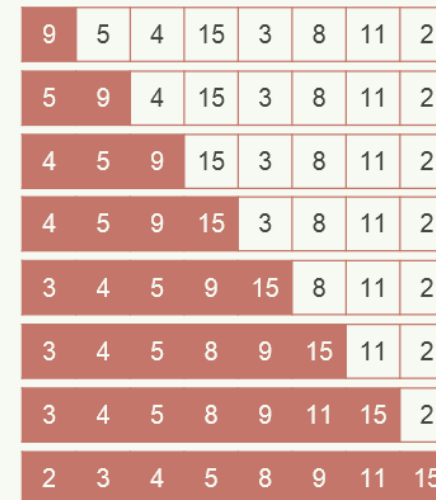
15 is now inserted into the sorted list:

3 is now inserted into the sorted list:

8 is now inserted into the sorted list:

11 is now inserted into the sorted list:

2 is now inserted into the sorted list:



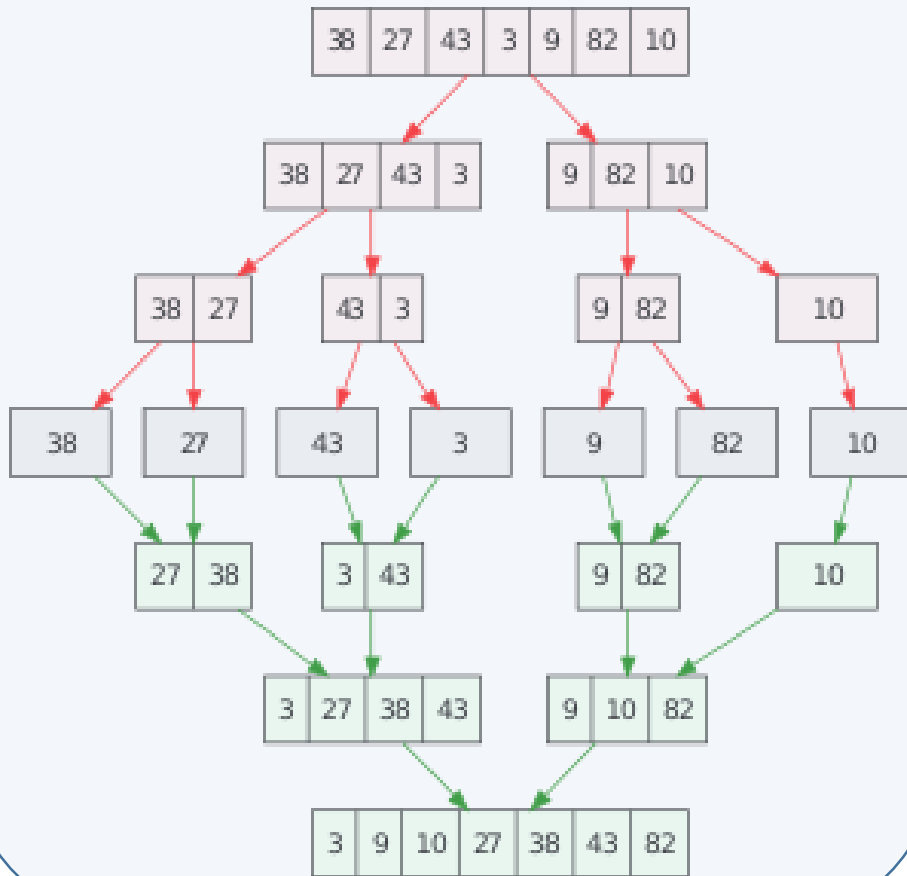
The number gets put into the right place straight away!

It's like arranging a hand of cards



## Merge sort

- Take unordered list and split it in half.
- Repeat steps until each sublist only has one item.
- Pair sublists and put items in the correct order
- Continue until the final ordered list has been created



## Activities

Use a bubble sort to put the following numbers in order  
12, 24, 33, 54, 13, 35, 34, 32, 19, 59, 58

Use a insertion sort to put the following numbers in order  
12, 19, 33, 52, 15, 23, 38, 42, 48, 27, 55

Use a merge sort to put the following numbers in order  
12, 49, 33, 22, 15, 43, 38, 42,

Define the following words related to sorting

Element \_\_\_\_\_

Pass Going through the steps of a sort once

Sublist \_\_\_\_\_

Split \_\_\_\_\_