## Tiverton High School Year 11

J277 GCSE Computer Science
Knowledge Organiser / Recap Part 7: Sorting and Searching

## Unit 2.1.3 Linear Search

Linear search means searching in a straight line from one end of the data to another until you find what you are looking for.


Linear search begins at the first item in the array.
Each item is compared with the item tha you are searching for - the target item.
the current item is the target item then the search stops, otherwise move on to the next item in the array and keep searching.

## Unit 2.1.3 Binary Search

Begin with sorted set of data. Search for target value POE12
AND18, BAC97, FLY77, HOP86, JAV16, POE12, TAL86, ZAR09

Identify position of middle value:
8 items $/ 2$ halves $=$ item 4

| item 0 | item 1 | item 2 | item 3 | item 4 | item 5 | item 6 | item 7 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| AND18, BAC97, FLY77, HOP86, | JAV16 | POE12, | TAL86, | ZAR09 |  |  |  |



## Unit 2.1.3 Bubble Sort

Start with the first two data values.
Repeat
Compare the current value with the next value Are they in the correct order?

If the values are in the wrong orde
then swap them around.
Move along one item
Until you have checked the last pair of values.
If you made any swaps at all, repeat the whole process again.

POE12, BAC97, FLY77, JAV16, TAL86, AND18 BAC9̣7, PWE12, FLY77, JAV16, TAL86, AND18 BAC97, POE12, FLY77, JAV16, TAL86, AND18 BAC97, FLY7?,- POE12, JAV16, TAL86, AND18 BAC97, FLY77, POE12, JAV16, TAL86, AND18 BAC97, FLY77, JAV16, POE12, TAL86, AND18 BAC97, FLY77, JAV16, POE122, TAL86, AND18 BAC97, FLY77, JAV16, TAL86, POE12, AND18 BAC97, FLY77, JAV16, TAL86, AND18, POE12 End of a single pass through the data. Swaps were made so carry out another pass.

## Unit 2.1.3 Insertion Sort

Begin with set of data to be sorted.
Create a new empty list to hold the sorted data
Repeat
Start with the first unsorted item.

Insert the first item into the list of sorted items at the correct place

Until the unsorted list is empty
AND18, BAC97, JAV16, FLY77, POE12, TAL866

## Unit 2.1.3 Merge Sort

Split the data into individual lists that contain one data value each.
Repeatedly combine (merge) pairs of lists, adding the first value from each list into the merged list.


