# Lesson 22 – Sorting Algorithms

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| 40BThe Big Picture – Why is This Relevant? | 41BLearning Objectives: |
| * In the last lesson students used lists which they searched through. This lesson covers the theory behind what a list actually is as a data structure and then looks at how a list can be sorted. | * To understand how a bubble sort works * To understand how an insertion sort works |
| 42BEngagement – How Can I Engage Learners? | 43BAssessment for Learning |
| * Students will initially try to develop their own ideas for how a list can be sorted. They will then learn two new algorithms, bubble sort and insertion sort | **Expected progress:**   * To understand how an insertion sort works and the overall concept of the bubble sort   **Good progress:**   * To understand how an insertion and bubble sort works to sort a list and be able to carry out the sorts step by step on a list   **Exceptional progress:**   * To understand how the speed of sorting a list is impacted by the algorithm which is used |
| Links to KS3 Programme of Study | |
| * Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]. Use logical reasoning that compare the utility of alternative algorithms for the same problem * Make appropriate use of data structures [for example, lists] | |
| 44BKey Concepts: | 45BKey Words: |
| * A list is a data structure which can hold multiple items under one identifier name * A list can be sorted using bubble sort and insertion sort algorithms | * Bubble sort * Insertion Sort * List |
| 46BDifferentiation: | 47BResources: |
| A learners who complete the main task quickly may wish to create a storyboard to highlight how they could create dances to demonstrate the two algorithms. | * Lesson 22 ppt * Sorting Algorithms Worksheet * Insertion sort dance video: <https://www.youtube.com/watch?v=ROalU379l3U> * Bubble sort dance video: <https://www.youtube.com/watch?v=lyZQPjUT5B4> * A pack of post it notes for students to write their own list items on |
| Lesson Flow | |
| * Using the ppt highlight what a list is. Stress that the first item in the list is in position 0, not position 1. * Give students 5 minutes to try and come up with ideas as to how the list could be sorted. * Demonstrate the use of a bubble sort on the list. You may also support this through showing the dance video. * Students should then complete the bubble sort on the worksheet. * Demonstrate the use of an insertion sort on the list. You may also support this through showing the dance video. * Students should then complete the insertion sort on the worksheet. * Students should then write their own unsorted list and carry out a bubble and insertion sort on the list. They may wish to write the list items on individual post it notes so that they can move the cards around to demonstrate how the algorithms work. | |
| Making | |
| * There is no making activity in this lesson | |