# Lesson 21 – Searching Algorithms

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| 40BThe big picture – why is this relevant? | 41BLearning objectives: |
| * A common task in Computer Science is to search for an item in a list. This lesson introduces students to two methods of searching: linear search and binary search | * To understand how a linear search works * To understand how a binary search works |
| 42BEngagement – How can I engage learners? | 43BAssessment for learning |
| * Students will enjoy creating the dance routine which demonstrates how the different searches work. | **Expected progress:**   * Students will understand how to perform a linear search on a list of items   **Good progress:**   * Students will understand how to perform a linear and binary search on a list of items and the circumstances where each can be used   **Exceptional progress:**   * Students will create an effective dance routine demonstrating the effectiveness of the linear and binary search |
| 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 | |
| 44BKey concepts: | 45BKey words: |
| * A linear search will work with any list, whether it is in order or not * A binary search will only work with a sorted list * A binary search is more efficient when search for an item in a sorted list than a linear search | * Linear search * Binary search * List |
| 46BDifferentiation: | 47BResources: |
| More capable learners may wish to compare the two dances and the effectiveness that each has on the search of the list. As the list gets bigger they should demonstrate how much more effective the binary search is than the linear search on a sorted list. | * Lesson 21 ppt * Linear search dance: <https://www.youtube.com/watch?v=-PuqKbu9K3U> * Binary search dance: <https://www.youtube.com/watch?v=iP897Z5Nerk> |
| Lesson flow | |
| * Using the ppt introduce students to the concept of searching for an item in a list. We are going to look at two different methods – linear and binary. Ask students to think of any step by step suggestions that they could follow to search for an item in the list. Give students 5 minutes in pairs to discuss ideas. Regroup and discuss findings. * Using the ppt for support demonstrate how the linear and binary search work. Only a linear search will work on a unsorted list. A binary search requires the list to be in order. Discuss how much more efficient a binary search is when searching through longer lists. Every time you check an item you reduce the size of the list by 50%. * Students should then work in groups to create two dance routines which demonstrate the different searches. These could be filmed and used as exemplars with future groups. | |
| Making | |
| * There is no making activity in this lesson | |