



Binary Searching

Instructional Days: 1-2 days

Topic Description: Students will learn what the Binary Search algorithm is, how to use it, and when to use it. They will also learn when to use linear searching and when to use binary searching

Objectives:

The student will:

- Understand what the binary search algorithm is and how to use it
- Understand the difference between linear and binary searching
- Understand when it makes sense to use binary searching instead of linear searching

Outline of the Lesson and Teaching Strategies:

- Introduce the idea of searching in sorted lists (5-10 minutes)
 - Discuss how one might search through a sorted list and why a linear search is not efficient in this case
 - Watch the “Searching a Dictionary” video
 - Talk about the “Video Discussion” questions as a class
- Complete the “Binary Searching” activity (20 minutes)
 - Have students complete the activity in pairs
 - Make sure students understand how the activity works before starting
 - You may want to go over the directions to the activity as a class before letting the students pair up
 - There are some key differences between this activity and the activity done in the Linear Searching section. Make sure students are aware of these differences!
 - Discuss the activity as a class by answering the “Activity Discussion” questions

Lesson Plan: Binary Searching

- Make sure students can articulate the method they used to find the card and how this method varies from the method they used in the Linear Searching activity
- Formally introduce binary searching (10-15 minutes)
 - Talk about the material discussed in the “Binary Searching: What is it?” section
 - Watch the “Binary Search” video
 - Make sure all the students understand what binary searching is, when to use binary searching, and how binary searching could have been used in the activity.
 - Watch the “Binary Searching Example” video
 - Talk about the “Binary Searching Example” video using the “Video Discussion” questions as a guide
 - Make sure students understand that the student in the video was using the binary searching technique until the end where he picked the end cup instead of the middle cup. This was a lucky guess but over time he will find the number he is looking for more quickly by choosing the middle cup than by choosing the cup on either end
- Discuss the differences between linear and binary searching (10-15 minutes)
 - Have students answer the questions in the “Linear Searching vs. Binary Searching” section
 - Make sure students understand that binary searching is much faster than linear searching but that binary searching requires a sorted list

Resources:

- All the resources including the worksheets are available on the Searching Overview page of the muddX website