

This document is a foundational overview defining the fundamental computer science concepts of data structures and algorithms, emphasizing their relationship to efficiency.

## **Top 3-5 Most Important Ideas and Definitions**

### **1. Data Structure:**

- **Definition:** A specific method for organizing and storing information, often in a computer's memory, so that it can be used effectively, specifically for efficient search and retrieval.

### **2. Algorithm:**

- **Definition:** A clearly specified set of simple, step-by-step instructions that must be followed sequentially to solve a particular problem or accomplish a task.

### **3. Efficiency Goal:**

- **Definition:** The core purpose of utilizing data structures is to improve the overall efficiency of algorithms by allowing for better organization, storage, search, and retrieval of information.

### **4. Interdependence of Structure and Algorithm:**

- **Definition:** Achieving efficiency requires a successful pairing; a "good data structure" cannot improve performance if it is coupled with an "improper algorithm."

## **Bullet Points of Other Important Facts Mentioned**

- Definitions for data structure were cited from NIST (2004), Encyclopedia Britannica (2014), and Geeks for Geeks (undated).
- Definitions for algorithm were cited from Weiss (2013) and Bhasin (2015).
- The organization of information is usually assumed to take place "in memory."
- Data structures are organized specifically so data can be "used effectively."