4565: Computing Foundations for a Digital Age
Unit 4

Day 1 Lesson Plan: What Is Data?

Objective

Students will identify basic data types and explain how different data formats are used in computing.

RESOURCE - THIS CAN BE A CONFUSING TOPIC

Word Bytes

- **String** – A sequence of characters (like letters, numbers, or symbols) used to represent text in a program.
- **Boolean** – A data type that can only be true or false, often used in decision-making in programs.
- **JSON** – Short for JavaScript Object Notation, a way to store and share data using a structured, easy-to-read format.
- **Schema** – A blueprint that shows how data is organized in a database or file, like a map of where everything belongs.

Activities

Hook: Where Do You See Data?

- Students brainstorm ways they interact with data daily—texting, entering passwords, tracking steps, etc.
  Chart responses on the board.
- **Mini-Lesson: Classifying Data**
  Review common data types: string, numeric, Boolean. Explain the role of formats like tables, JSON, and schemas in storing and organizing data. Show examples from websites, apps, or Google Forms.

Step 1: Kick-Off Discussion – What *is* data?

Ask:

- ☐ What do we mean when we say *data*?
- ☐ Where do you see data used every day?

Examples students might offer: speed on a speedometer, search suggestions, school grades, number of likes on a post.
As students share, group their examples on the board by:

- Text-based
- Numbers

- Yes/No

Transition: “These fall into categories we call data types. Let’s explore them more closely.”

Step 2: Data Types Overview

Use a visual (or write examples on the board) to explain:

- **String** – Any text: names, words, phrases, combinations of letters and numbers
  Examples: “Mrs. Brewer,” “Room 210,” “jess@school.edu”
- **Numeric** – Any number: whole numbers, decimals, or measurements
  Examples: 87, 3.14, 2025, number of followers
- **Boolean** – A true/false or yes/no value
  Examples: “Do you agree?” → Yes/No; “Is this switch on?” → True/False

Class Check: Ask students to call out the type after each example or hold up 1 finger for string, 2 for numeric, and 3 for Boolean.

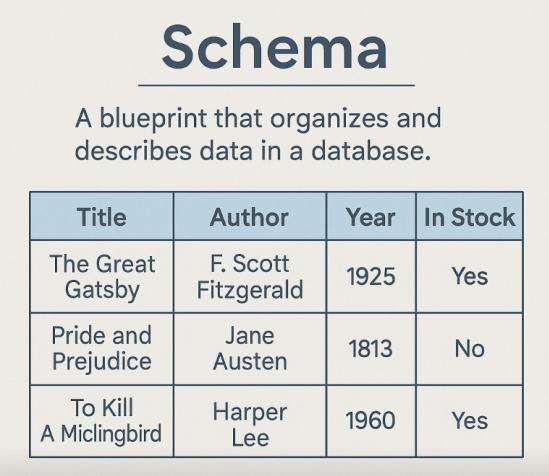
Step 3: Data Formats Overview

Explain how data is organized:

- **Table** – Data shown in rows and columns, like in spreadsheets or gradebooks
  Demo: Show a sample spreadsheet or data table
- **JSON (JavaScript Object Notation)** – A format used to structure and share data in web apps and software
  Example:

```json
{
  "name": "Jamie",
  "age": 14,
  "likesCoding": true
}
```

- **Schema** – A blueprint or plan for how data should be organized (fields, types, labels)
  Demo: Show the editing view of a Google Form and discuss how each question has a title, type, and validation



Wrap-Up Reflection Prompt:

Have students respond verbally or in writing:

- "What's one thing that surprised you about how data is organized?"
- "Why do you think it's important to understand different data types when working with information?"

Data Scavenger Hunt

Students move around the room (or explore a digital classroom) to find examples of string, numeric, or Boolean data.

Example prompts might include:

- Find something that contains a string of text.
- Identify a Boolean example (true/false question or switch).
- Point out where data might be formatted in a table or JSON.

Word Bytes Dictionary Update

Students add today's terms to their Word Bytes Dictionary with real-world examples:

- String – A name typed into a contact form
- Boolean – A checkbox marked "Yes" or "No"
- JSON – A structured file used to organize user data
- Schema – A layout showing customer info is stored in a database