

4565: Computing Foundations for a Digital Age

Unit 1

Day 3 Lesson Plan: What Are Algorithms?

Objective

Students will understand the concept of an algorithm by writing and following step-by-step instructions to complete a task and by applying algorithmic thinking through real-world and kinesthetic challenges.

Word Bytes

- **Algorithm** – A step-by-step set of instructions a computer follows to solve a problem or complete a task.
- **Process** – A running program or task being executed by the operating system.

Materials

- Bread, peanut butter, jelly, napkins, plates, plastic knives/spoons, wet wipes (if doing the PBJ activity)
- Blindfold and small prize (if doing the Robo Walker challenge)
- Optional: printed recipe recording sheet or Google Doc version

Activities

Warm-Up Prompt

- Ask: "What's something you do every day that has specific steps—and what happens if you skip one?"
- Briefly introduce the term "algorithm" and relate it to routines, recipes, or directions.

PBJ Algorithm Challenge

- Students work in pairs to write a detailed algorithm for making a peanut butter and jelly sandwich.
- Challenge: The teacher will follow the written instructions *literally*—if the steps are vague (e.g., “put on peanut butter”), the teacher might place the whole jar on the bread.
- After a few demos, allow students to revise their algorithms, then actually make their own PBJ sandwiches (or simulate the task if food isn't available).
- Optional resource: [PBJ Algorithm Recording Sheet – Make a Copy](#)

Kinesthetic Activity: Robo Walker Algorithm

- One student is blindfolded (the "Robo Walker"), and their partner (the "Captain Algorithm") gives step-by-step instructions to navigate across the room to a prize or target.
- Rules: Only verbal commands. No touching or guiding. Encourage specific instructions like "Take two steps forward" instead of "Go that way."
- Debrief: What was difficult? How did being vague vs. specific affect the outcome?

Class Reflection & Full-Circle Examples

- Discuss: "Why do computers need such exact instructions?"
- Prompt: "How do these activities help you think differently about what coding really is?"
- Students add both "algorithm" and "process" to their Word Bytes dictionary with examples.
- Suggested examples:
 - Algorithm: A recipe for chocolate chip cookies
 - Process: The app that's currently running on your phone