Name: _____   **Date:** _____

Answer Key: Pizza Party Logic: Coding Concepts for 8th Grade

Build sharper algorithmic thinking by analyzing how variables, loops, and logic control real-world systems like digital kitchens and space probes.

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1. A weather station uses the logic: 'IF high_wind AND heavy_rain THEN trigger_alarm'. Which condition would cause the alarm to sound?

Answer: C) Both high winds and heavy rain are detected.

> The 'AND' operator requires both conditions to be true simultaneously for the entire statement to evaluate as true and trigger the event.

2. Imagine a variable 'fuelLevel' starts at 100. A function 'flyRocket()' subtracts 10 each time it is used. If 'flyRocket()' is called 4 times, what is the current value of 'fuelLevel'?

Answer: C) 60

> Initial value (100) minus the total consumption (10 * 4 = 40) equals 60. This demonstrates how variables mutate over time.

3. In programming, a function can only be used once per program execution.

Answer: B) False

> The primary benefit of a function is reusability; you can 'call' it as many times as needed to perform the same task with different data.

4. Which of these is the most efficient way for a music app to display every song in a playlist of 500 tracks?

Answer: B) Using a loop to iterate through the list of songs.

> Loops are designed to automate repetitive tasks, making them the most efficient tool for handling large collections of data like a playlist.

5. A smart thermostat is programmed to turn on the heater if 'temp < 68'. Which programming concept is being used here to make this decision?

Answer: B) A conditional statement

A conditional statement (like an IF statement) allows a program to branch its logic based on whether a specific evaluation is true or false.

6. If you change the value of a variable halfway through a program, the program will still remember the original value it started with without being told to store it elsewhere.

Answer: B) False

When you assign a new value to a standard variable, the old value is overwritten in memory unless you purposefully saved it in an auxiliary variable.

7. Why would a programmer use a 'parameter' inside a function, such as 'calculateTax(totalPrice)'?

Answer: C) To allow the function to use external data to perform its task.

Parameters act as inputs for functions, allowing the same logic to be applied to different values passed into it.

8. You are building a game where a player jumps 10 times. To avoid writing 'jump()' ten times, you should use a _____.

Answer: C) For loop

A 'for loop' is perfect for situations where you know exactly how many times a specific action needs to repeat.

9. In an 'if-else' block, both the 'if' code and the 'else' code can execute at the exact same time for the same condition.

Answer: B) False

Control flow is mutually exclusive in if-else blocks; if the condition is true, the 'if' part runs; if false, the 'else' part runs. Never both.

10. A robot vacuum cleaner continues to move until its 'batteryLow' sensor returns TRUE. This is an example of what kind of control structure?

Answer: A) A while loop

A 'while loop' repeats an action as long as a certain condition remains true (or until it becomes true), which is ideal for persistent behaviors.