Name: _____ **Date:** _____

Answer Key: Debug the Dragon's Path: A 1st Grade Algorithm Challenge

Can you spot the error in a hero's map? Students evaluate multi-step sequences to find the most efficient route through a logic puzzle.

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1. Pip the Penguin wants to get to his ice cream. His plan is: 1. Walk 2 steps. 2. Turn left. 3. Jump. If the ice cream is actually to his right, what should Pip do to fix his plan?

Answer: A) Change step 2 to 'Turn right'

To fix a mistake in an algorithm (debugging), you must change the step that is sending the character in the wrong direction.

2. To make a peanut butter sandwich, which sequence of steps is the MOST logical for a robot to follow?

Answer: B) Get bread, spread jam, put together

Algorithms must be ordered correctly. You cannot spread jam or put a sandwich together before you get the bread.

3. If an algorithm works but takes 100 steps to do something that could be done in 3 steps, it is an efficient solution.

Answer: B) False

Efficiency means finding the shortest or fastest way to solve a problem with the fewest steps possible.

4. You are building a LEGO tower. You realize the bottom brick is the wrong color. What is the BEST way to decompose this problem?

Answer: C) Take off top bricks, swap bottom brick, rebuild

Decomposition involves breaking a problem into manageable steps: removing parts, fixing the error, and putting it back together.

5. A robot is stuck in a loop: 'Step forward, Step backward.' To reach a finish line in front of him, he should ___.

Answer: B) Remove the 'Step backward' command

The 'Step backward' command is preventing him from moving toward the finish line, so removing it fixes the algorithm.

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6. True or False: There is only ever ONE right way to write an algorithm to solve a problem.

Answer: B) False

Many different sets of steps can solve the same problem, though some might be faster or easier than others.

7. You want to draw a square. Which instruction is the MOST important to repeat four times?

Answer: C) Draw a line and turn 90 degrees

A square has four equal sides and four corners; repeating a line and a specific turn creates this shape.

8. Before you give a robot the 'Go' command, you should ___ your steps to make sure they work.

Answer: C) Test

Testing is a critical part of the problem-solving process to find bugs before the final execution.

9. Look at these two ways to get to the door: 1. Walk through the wall. 2. Walk through the open hallway. Why is path 2 better?

Answer: A) It is a possible step

Algorithms must use realistic, executable steps. Walking through a wall is an impossible command for a computer or person.

10. In a hard problem, searching for a specific toy by looking through every single box is more efficient than looking only in the 'Toy Box.'

Answer: B) False

Filtering (only looking where the item is likely to be) is a more efficient algorithm than checking every possibility.