

Algorithmic Procedures

Course/Duty Area: Programming/Using Algorithmic Procedures

Scenario:

Ms. Smith's programming class is planning to visit a local fifth-grade class to teach them about the basics of programming. They've decided to begin with the idea of algorithms. Students have identified simple processes such as doing laundry, solving a long division problem, or baking a cake as algorithms. Ms. Smith's students must find a way to introduce algorithms to the fifth graders in a fun and hands-on way so that the younger students come away with the ability to identify algorithms, analyze problems, and create solutions.

What Is An Algorithm?

An algorithm is a set of step-by-step procedures, or a set of rules to follow, for completing a specific task or solving a particular problem. Algorithms are all around us. The recipe for baking a cake, the method we use to solve a long division problem, and the process of doing laundry are all examples of an algorithm.

1. Introduction to Algorithms

Objective: Students will understand the concept of algorithms and their importance in programming.

Assessment: Students will write a short reflection on a real-life scenario where they follow an algorithm(e.g. making a sandwich).

Key Points:

Real-world examples(e.g., recipes, directions)

Basic components of an algorithm (i.e., input, process, output)

2. Analyzing Problems

Objective: Students will learn how to analyze a problem and break it down into manageable parts.

Assessment: Students will look over their short reflection and analyze for a problem

Key Points:

Identify the problem

Break it down into smaller components

3. Creating a solution

Objective: Students will develop a solution using algorithms.

Assessment: Students will write a pseudocode to explain their real-world example with all problems solved.

Key Points:

Brainstorm different approaches

Write the pseudocode

4. Determine the best solution

Objective: Evaluate your pseudocode and determine if it is the most reasonable one.

Assessment: Peer review to see if pseudocode will give the correct output.

Big Question: Does the algorithm contain the basic components (e.g., input, process, output)?

Focused Questions:

- Is the pseudocode written clearly?
- Are all steps described?

Student Project or Outcome: Student outcome will be a successful peer review of the code.

Project-Based Assessment: Students will write or type their code. The students need to focus on detail and make sure the correct output is obtained.

Scenario submitted by Elisa Bradford, Blue Ridge Technical Center, Warren County Public Schools