

## Algorithms

### Lesson 9 – Expert Coding in Minecraft with JavaScript

1. What is the definition of a program?
2. What is a code segment in a program?
3. How does the order of an algorithm impact its outcome?
4. Can algorithms be written in different ways but still accomplish the same tasks?
5. Consider the two algorithms shown on screen. What might happen when executing each algorithm with the same steps but different orders?
6. What is sequencing?
7. What is iteration?

8. What is selection in creating algorithms?
9. What statements can be used when writing algorithms?
10. What are the different ways to create algorithms?
11. What advantages does using existing correct algorithms offer during development?
12. What is a problem and what is an instance of a problem?
13. What are the two main problems in programming? Explain each one.
14. What does “algorithmic efficiency” refer to?
15. Explain the concept of time complexity and its relevance to algorithmic efficiency.

16. How can analyzing and comparing different algorithms help optimize program performance?
17. Define “polynomial efficiency” and its relevance to algorithm performance.
18. How does time complexity relate to polynomial efficiency?
19. Algorithms with exponential or factorial efficiencies are examples of algorithms that run in an \_\_\_\_\_.
20. What is the purpose of using heuristics in problem-solving?

### **In Game Assessment References:**

\*\*For Activity Assessments, students will build the code completely on their own. They need to press C at the activity area and create a new project. When complete, they will save their MakeCode file and upload it to the portal for grading.

### **Activity Assessment 1:**

Write two different algorithms that both build a 4 x 4 solid square (only one level high) on the ground using cobblestone blocks. Run the code inside of a chat command with the word run.

## Activity Assessment 2:

Import the file and then modify the code to build a solid cube that 4x4.

## Final Assessment: Mini Game

This game is intended to be a maze that the player must get through in 20 seconds. The player must eat the food in the chests to gain time to get through the maze before the time is up. The last item the player will eat is the cookie which will call the win function.