

# BattleBugs Project Summary

AN EXTENSION OF THE AP COMPUTER SCIENCE A: "GRIDWORLD" CASE STUDY

## What is GridWorld?

The GridWorld case study is a comprehensive curriculum unit that is used as part of the AP Computer Science A: Java Programming class to introduce advanced programming concepts to students. In the world of modern computer programming it is now normal for programmers to be working with complex libraries of computer code written by other programmers on every project.

Indeed, it is almost impossible to conceive of a modern programming assignment that does not use extensive code written by others. The GridWorld unit allows students to work with an established base of computer code design to demonstrate good programming techniques known in the industry as "Best Practices."

## What is BattleBugs?

The BattleBugs project is an extension of this unit that aims to increase student's enthusiasm by using GridWorld to create a computer game. The project's secondary goal is to encourage an enthusiasm for computer game programming through two parallel mechanisms.

Advanced students were asked to take part in writing the actual game computer code that the whole class would then use as a group. For student's taking part in this aspect of the project they would learn about the complexities of writing computer code in a group environment. This is another aspect of modern computer programming that has become the norm. Working in this environment is a challenge in the best of circumstances so it is an invaluable experience for students.

After the game code was written it is possible for the entire class to join in the fun!

In the BattleBugs game students (and their teachers!) each write a computer program that control a virtual "BattleBug" that must compete in a battle arena against the BattleBugs written by their classmates. In this game there is no joystick or even player control. The "player" must write a program that will guide their BattleBug avatar during the fight.

Their program is restricted to instructing their BattleBug to take one action each turn. The action can be to move forward one square in the grid, turn 45 degrees either direction, attack a bug located directly in front of their bug, pick up a "bonus" sitting in the grid directly in front of them, use a bonus they already picked up, or choose to defend themselves to take less damage if attacked and gain the advantage of moving first on the next turn.

Initially bugs start out arrayed around the outside edge of the grid facing the center with a bonus located directly behind them. Whenever the number of bonuses on the board drops below half the number of living BattleBugs, a new bonus will be randomly placed on the board.

