

# 2015 Middle School Summer Engineering Technology Program

## Video Game/Web Design

Introduce students to basic programming concepts in a friendly, dynamic environment, focusing on real-world concepts like C-style code syntax, vector mathematics, coordinate systems, and implementation of logic.

### Schedule

**Monday:** Introduce students to the most core concepts of 2D game programming.

- 2D vectors
- Relationships between speed, direction, location, and time
- Tour of the GameMaker software interface
- Work-Along demonstration of a simple demo program

**Tuesday:** Guide students through the process of making their first game, a “Pong” style arcade game.

- Designing how the game will work
- Creating custom sprites by hand
- Managing collisions, player input, and other events
- Playing sounds
- Keeping score

**Wednesday:** Guide students through the process of making a more elaborate game, a WWII-themed vertical scrolling arcade shooter.

- Designing how the game will work
- Importing premade sprites and animations
- Artificial intelligence
- Scrolling 3D backgrounds
- Random number generation
- Random world generation

**Thursday:** Guide students as they design and begin prototyping original games of their own designs.

- Keeping designs realistic
- Drawing inspiration from other popular games

**Friday:** Help students finish their games and share them.

- Compiling their games into programs they can share
- Everyone demonstrates their game for the class
- Discussion on how games could be improved and expanded
- How to learn more about programming
- Basic intellectual property concepts, copyrights, and the pros and cons of open source licenses.

### Materials

The camp instructors will provide all resources required to participate, but bringing some materials of your own could help a student get the most out of the camp.

- **Laptop:** GameMaker is not intense software and does not require an expensive computer to run. Nearly any laptop running Windows 7, 8, or 8.1 will work, as long as the student is able to install software. *Mac is not supported and will not be usable in this camp.*
- **USB Drive:** Students who don't bring laptops will be working on school computers that get automatically wiped at the end of the day. Students are encouraged to bring USB drives they can save their work onto.