

STEM Fuse – GAME:IT JUNIOR

GAME:IT JUNIOR Learning Objectives, Standards & Skills

We take great pride in the fact that **GAME:IT JUNIOR** is not simply a terrific introductory level computer programming course, but a lot more. We do focus on programming skills but also on each discipline related to STEM (science, technology, engineering and math).

Using game design and development as the teaching vehicle, **GAME:IT JUNIOR** exposes your students to a wide range of concepts and technical skills in six separate areas that will greatly help them succeed in the future.

1. Technical skills related to software development, computer programming & graphic design
2. Creative, innovative & critical thinking
3. Communication and collaboration as an individual and part of a team
4. Using appropriate and accessible digital tools for research and learning
5. Using engineering, physics & mathematical concepts critical to game development
6. Post-secondary and career options & resources related to STEM

1. Technical Skills

- A. Programming through a drag-n-drop method
- B. Programming by writing code using GML
- C. Follow technical and increasingly complex programming instructions in order and detail
- D. Program original game projects
- E. Use digital design resources and color theory to draw and animate sprites, objects, platforms, backgrounds and loops
- F. Become familiar and competent in using game engines (Game Maker); open files, save files, create and program original material, integrate separate files into a final game project, create and edit audio sound effects & music
- G. Technical writing; user instructions, game directions, game rules and document development process within a development team

2. Creative, Innovative & Critical Thinking

- A. Learn steps of the engineering design cycle (discover- evaluate, design- evaluate, develop- evaluate, deliver- evaluate) and how it works as a practical problem solving method
- B. Use gained technical skills to improve game programs
- C. Use gained technical skills to create, design & program original working games
- D. Troubleshoot existing game programs to fix bugs and ensure performance
- E. Test fellow classmate's games to ensure performance
- F. Perform self-evaluations of projects against the required established directives

- G. Perform evaluations of classmate's projects against the required established directives
- H. Develop a marketing plan for original programmed game to include; target audience, current competition, delivery options, product pricing, logo design and strategy to spend budgeted funds

3. Communication & Collaboration

- A. Form game development groups to achieve directive of creating original game
- B. Assign tasks to members of development group to achieve directive of creating an original game
- C. Use the engineering design cycle within the development team to achieve directive of creating original game
- D. Project management; students will have opportunity to lead a development team, assign tasks, evaluate progress, facilitate communication among team members and ensure that project is completed within time deadline
- E. Conduct two in-class presentations including demonstration of original game

4. Using Digital Research Tools

- A. Use appropriate internet websites to gather and analyze research on a variety of subjects including; game development, marketing statistics, post-secondary education options and careers in game development & technology
- B. Use appropriate wiki's and blogs to engage other (distance) users of Game Maker for research, ideas and help

5. Engineering, Physics & Math

- A. Learn how the process used in designing and developing software can be applied to other design and development projects like bridges, buildings and machines
- B. Learn how basic physics concepts like gravity, acceleration, velocity, speed, trajectory, Newton's Laws of Motion, force & elasticity are used in game development
- C. Use required mathematical techniques to perform physics calculations in determining how physics is used in gaming compared to the real world
- D. Use knowledge of math & physics to evaluate behavior in games in the "virtual world" as compared to the "real world"

6. Further Career, STEM & Post-secondary Education Options

- A. Research how technical & communication skills used in game design translate to other technology industries and businesses
- B. Research required post-secondary diplomas, certificates & degrees needed to gain employment in game development and other technology based industries
- C. Research career trends, wage data and employment opportunities in game development and technology based industries