



# Coding Arcade: Game Design Essentials

Designed for learners in Grades 6-8



## Course Description:

In this course, students will dive into the world of game design by learning both block-based and text-based coding. They will create custom online arcade games, exploring essential game design concepts such as probability, level design, power-ups, and character customization. By the end of the course, students will have developed their own playable arcade games, showcasing their creativity and coding skills. Additionally, game design prepares learners with applicable skills in careers such as computer science, visual art, sound design, marketing, and product development.

## Equipment, Curriculum, and Training Available:

- No equipment required
- 15 Lesson Hours Curriculum and supporting materials
- Ongoing product and curriculum support

### Optionals:

- Professional development Facilitation by a trained STEM instructor
- Class Set of MeowBit or Adafruit Pybadge for downloading and playing games

Lesson	Learning Target Examples
<b>1. Microsoft MakeCode Arcade Introduction</b>	- Identify and define the elements of the Microsoft MakeCode Arcade software- Explore the different types of blocks in MakeCode Arcade
<b>2. Pac-Man Returns</b>	- Explore components to a collection style game- Investigate sprite movement and elimination through block based coding- Apply collection style game components in a MakeCode Arcade game
<b>3. Asteroid Attack!</b>	-Identify blocks that add user clicking interaction-Develop a launching sprite-Program a sprite to disperse objects based on an event-Create a cause and effect relationship between game sprites
<b>4. Enemy Evasion</b>	- Evade enemies to interact with helpful objects- Integrate a block code loop to check for updates- Program the automation of random spawning of enemies- Create backgrounds
<b>5. Maze Heist Manipulation</b>	- Develop an interactive world- Program interaction between sprites and worlds- Explore components to a maze style game- Define and create a tilemap
<b>6. Race Against the Clock</b>	- Incorporate scoring and timing components into an arcade game- Investigate the programming blocks needed to create a score and timing features
<b>7. Adventure in Backgrounds</b>	- Increase the longevity and interest in a game with a scrolling background- Use an if/then block to program a sprite to jump- Program a background to move as if the sprite is continuously moving vertically or horizontally
<b>8. Jump to the Rescue</b>	- Explore the use for platforms in an arcade style game- Increase a sprite's jumping and maneuvering abilities
<b>9. More Players, More Fun</b>	- Investigate the use for sprite effects- Create and use functions- Program similar code for the use of multiple players within one game
<b>10. Multilevel Games in MakeCode Arcade</b>	- Define elements involved in having multiple levels in a game- Define ways to advance in gaming- Write block-based code to advance and play in multiple levels of a game
<b>11. Design for a Client</b>	- Design a game incorporating multiple players - Program sprites to throw objects to win
<b>12. Redesign and Recreate</b>	- Improve a game from single level to multi-level- Modify the maneuverability of a sprite
<b>13. Playtesting and User Feedback</b>	- Strategize ways to collect user feedback- Create effective playtesting methods
<b>14. Multilevel Platformer Game Design</b>	- Design a complex retro style arcade game incorporating multilevel, platform, collection, and enemy evasion skills learned throughout the course- Create multiple sprites and backgrounds to be used in the game
<b>15. Multilevel Platformer Game Test</b>	- Test and revise the arcade game to improve user experience and enjoyment