# Math Edutainment Game for Girls Grades 1-6
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## Purpose

The purpose of this project is to create an engaging and educational game for girls in elementary school that will help girls develop crucial math skills, find greater confidence in their abilities, and continue to pursue their math, science, and technology educations. This web-based math "edutainment" game will feature a comprehensive plot, a diverse and stereotype-free cast of characters, rewarding game play, and six different mini-games.

## Features

This project uses Adobe Flash MX and ActionScript 2.0 to create an interactive, web-based math edutainment game. There are six mini-games:
• Flash card-style math skills
• Word problems
• Spatial skills training
• Pattern recognition
• Comprehensive knowledge test
• Female scientists and STEM career trivia

This game is driven by a comprehensive plot based on a fictional space station. The more mini-games the player completes, the more the plot will be revealed. In order to appeal to a diverse female audience, the game has an all-female cast of scientists and allows players to customize their own character. An in-game notebook allows players to learn more about subjects that interest them, get hints, and track their score at any time.

## Background

Many girls shy away from taking advanced STEM classes. Research done by the Girls, Math & Science Partnership states that boys still outperform girls in primary science, math, and technology classes. Girls are severely under enrolled in Advanced Placement Computer Science and Physics classes, and middle school boys typically have better performances and confidence in their abilities than girls in math and the core sciences. Several suggestions have been made to try and correct this problem:
• Giving girls control over abilities
• Creating a "New Science Girl" archetype to break old stereotypes
• Encouraging girls to explore math and science beyond the classroom
• Giving specific feedback
• Presenting strong female role models
• Providing spatial skills training.

Specific suggestions for implementation for edutainment games include:
• Strategy-based game play
• Social interactions
• Diverse and interesting characters
• Narrative plots
• Non-stereotyped creativity
• Appropriate challenge level.

## Analysis

This project was tested by 12 fourth and fifth graders at Cardinal Forest Elementary with the help of Mr. Fred Allard. The students were directed to my website (tjhsst.edu/~eclarke) and asked to take a survey after playing to test their overall confidence, interests, and opinions of the game. The response to the game was overall positive: 92% of the students said they would play again, and 58% rated it as "very fun". The flash card game came out as an overwhelming favorite, as did the doctor character who ran it. Interestingly, the girls showed a much higher confidence in math than in science and technology. It's possible that this is due to game play. Regardless, future development would incorporate more science and technology in simple mini-games.




Student Confidence after Gameplay

• "Encouraging girls in math and science: IES practice guide", Institude of Educational Sciences, 2007.
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• "Girls' beliefs", Girls in Math and Science Partnership, 2004.
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http://www.braincake.org/files/GMSP_StatsData.pdf (September 10, 2008)
• "Tech-savvy: educating girls in the new computer age", Commission on Technology, Gender, and Teacher Education, 2000.
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