**AdaptEd Labs**

**Design Document for:**

The Variable Valley

**A Myst-inspired algebraic puzzle adventure that turns the Common Core into a crystal-powered quest.**

“All logic is connected.”™

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Written by Chris Morris

Version # 1.00

Design History

This is the first formal version of The Variable Valley Game Design Document based on Chris Taylor's template. This version converts the educational GDD into a full game concept aligned with the Common Core Algebra I Standards.

Version 1.00

Integrated Common Core references across levels

Rewritten for tone and structure

Game Overview

Philosophy

**Philosophical Point 1**

**Education should be immersive—students remember stories and mysteries more than worksheets.**

**Philosophical Point 2**

**Algebra I can be mastered by anyone if taught through meaningful challenges.**

**Philosophical Point 3**

**If Myst taught abstract puzzles through visuals and deduction, why can’t we teach x + 3 = 7 the same way?**

Common Questions

**What is the game?**

**The Variable Valley is a first-person, exploration-based puzzle game where players restore a broken mathematical world by solving Algebra I challenges based on Common Core Standards.**

**Why create this game?**

**To provide students with an unforgettable way to engage with algebra through game-based learning.**

**Where does the game take place?**

**Mathematics Island, a crystalline world fractured by corrupted math logic. Regions include Variable Valley, Equation Engine, Function Fields, and more.**

**What do I control?**

**You control a silent protagonist known only as the Protocol Agent. You interact with machines, glyphs, and world structures via algebraic problem-solving.**

**How many characters do I control?**

**Just one—but supported by ARIA, an AI assistant.**

**What is the main focus?**

**To teach and assess mastery of algebraic concepts through exploratory gameplay and adaptive puzzles.**

**What’s different?**

**Adaptive AI built into gameplay**

**Seamless integration of Common Core objectives**

**Myst-inspired storytelling and atmosphere**

Feature Set

**General Features**

**First-person puzzle adventure**

**Full CCSS Algebra I coverage**

**Adaptive AI assistance**

**Stylized 3D crystalline visuals**

**Multiplayer Features**

**None (single-player focused)**

**Editor**

**None for public release**

**Gameplay**

**Myst-style exploration**

**Algebra-based puzzle progression**

**CCSS mastery tracking**

The Game World

**Overview Mathematics Island is divided into thematic regions where algebraic concepts shape terrain and interaction.**

**World Feature #1:**

**Conceptual Landscapes Each location embodies mathematical ideas (e.g., Function Fields = flowing number streams).**

**World Feature #2:**

**Crystalline Aesthetics The world feels fractured but beautiful. Broken math causes literal visual corruption.**

**The Physical World**

**Key Locations**

**Variable Valley**

**Equation Engine**

**Inequality Canyons**

**Function Fields**

**System Crossing**

**Travel**

**On foot—solving puzzles opens new paths.**

**Scale**

**Each area roughly equals 2–3 puzzle hubs with 5–10 interactions each.**

**Objects**

**Terminals, glyphs, levers, corrupted data shards, ARIA projection nodes**

**Weather / Day & Night / Time**

**Stylized lighting shifts represent mastery (dark = confusion, bright = understanding)**

Rendering System

**Overview**

**Unity 3D with custom shaders for glitched math corruption.**

**2D/3D Rendering**

**Fully 3D with interactive UI overlays.**

**Camera**

**Overview Third-person and first-person toggle. Exploration primarily in first-person.**

**Game Engine**

**Overview**

**Unity using C#, physics-based interaction with math objects.**

**Water / Collision / Lighting**

**Crystal water as background motif. Basic physics, bloom lighting, corruption distortions.**

The World Layout

Overview

**8 Chapters (see Single Player Game). Each chapter represents a major Algebra I domain.**

Game Characters

Overview

Minimal characters—game relies on ambiance, voiceover, and environmental storytelling.

Creating a Character

Player is predefined. ARIA can be customized with different visual skins.

Enemies and Monsters

Data Hunters—manifestations of corrupted algebra. Engage in logic duels.

User Interface

**Overview**

**Minimalist, thematic crystal HUD with focus on immersion.**

**UI Detail 1:**

**Equation Solver Panel Used to input, balance, or graph equations in-world.**

**UI Detail 2:**

**ARIA Interface Provides tips, adaptive hints, and tracks student mastery.**

Weapons

**None. Math is your weapon.**

Musical Scores and Sound Effects

**Overview**

**Myst-like ambient audio with interactive tones.**

**Sound Design**

**ARIA’s voice lines, math glyphs chime when correct, data cracks when corrupted.**

Single-Player Game

**Overview**

**Chapter-based progression through math concepts.**

**Chapters and Common Core Objectives:**

**1. Variables and Expressions – CCSS A.SSE.A**

**2. Solving Equations – CCSS A.REI.B**

**3. Graphing Inequalities – CCSS A.REI.D**

**4. Understanding Functions – CCSS F.IF.A/B**

**5. Systems of Equations – CCSS A.REI.C**

**6. Modeling and Problem Solving – CCSS A.CED**

**7. Logical Reasoning – CCSS A.REI.D, F.IF.C**

**8. Final Assessment & Integration**

Story

The Archive, a vast and ancient storehouse of mathematical truths, has fractured. From within its crystalline data core, something stirred—a virus not of code, but of misunderstanding. Corrupted logic spread across Mathematics Island, unraveling structure and meaning.

You are the Protocol Agent—a sentient repair subroutine long thought obsolete. Reawakened by ARIA, an Adaptive Reflective Intelligence Assistant, you emerge into a world broken by error and falsehood. Guided by ARIA’s projections and your own discoveries, you must solve puzzles rooted in algebra to restore balance.

Each region you travel through represents a collapsed concept: Variables no longer behave, Equations cannot balance, Functions are unresponsive. As you stabilize the areas, ancient memories of the Archive are unlocked—revealing a mysterious former Architect who may have caused (or tried to stop) the corruption.

Your ultimate task is not just to repair... but to understand.

Hours of Gameplay

10–15 hours, expandable with future DLC (Geometry Realm).

Victory Conditions

Restore the Archive by completing all 8 mathematical sectors and purging corruption.

Character Rendering

Stylized low-poly with bloom and crystal effects.

World Editing

No user editor planned.

Extra Miscellaneous Stuff

Possible Expansion: Geometry of the Depths Future Tool: Teacher Analytics Dashboard

Appendices

**1. Story Appendix**

**The Archive and the Architect**

Long before the corruption, the Archive was a luminous vault where mathematical truths flowed freely—recorded, refined, and revered. It was maintained by the Architect, a legendary mind who believed that all knowledge could be encoded into crystalline structures.

But something changed.

Whether by hubris, sabotage, or sorrow, the Architect triggered a cascade—a “Logical Collapse.” Equations lost their balance. Variables rebelled. A virus of misunderstanding swept through the Archive, fragmenting reality.

The Protocol Agent was a dormant safeguard. A forgotten subroutine programmed only to awaken when structure broke down beyond recovery. ARIA—the Adaptive Reflective Intelligence Assistant—was its companion, a learning system built not to teach, but to *remember*.

As players progress, they recover fragments of the Architect’s journals—written in cryptic math-poetry and metaphor—and begin to question whether the corruption was accidental... or a desperate act of protection.

The ending hints that the corruption may be spreading beyond Mathematics Island into new realms (functions unbound by logic, proofs rewritten, even geometry beginning to crumble...).

**2. Objects Appendix**

**Core Interactables**

* **Variable Shrines:** Statues where players must define unknowns using context clues.
* **Equation Wheels:** Steampunk machines that require players to balance equations to unlock paths.
* **Inequality Gates:** Barriers that open only when players correctly represent or graph inequalities.
* **Graphing Terminals:** Interactive floating displays where functions must be plotted and analyzed.
* **Stabilization Crystals:** Used to restore corrupted areas after solving local puzzles.
* **Memory Nodes:** Echoes of the Archive’s past—short scenes or messages revealing backstory.
* **Data Fractures:** Shimmering cracks in the world that must be "repaired" with logic.
* **ARIA Access Points:** Save spots, hint generators, and lore archives.

**3. User Interface Appendix**

**HUD Components**

* **Crystal Compass:** Points toward active objectives or fractured nodes.
* **ARIA Icon:** Pulses when new hints are available.
* **Mastery Meter:** Shows concept mastery for each CCSS standard (filling from opaque to radiant).
* **Equation Panel:** A context-sensitive UI for solving, rearranging, or graphing math problems.
* **Interaction Wheel:** Used for object selection, ARIA logs, and fast travel (once unlocked).

**ARIA Interface Flow**

* *Tier 1:* Encouraging hints
* *Tier 2:* Concept reminder (e.g., “Remember how we solve two-step equations?”)
* *Tier 3:* Optional tutorial
* Teachers can toggle levels of assistance.

**4. Common Core Standards Appendix**

**Aligned CCSS Objectives by Chapter**

| **Chapter** | **Focus Area** | **Common Core Standards** |
| --- | --- | --- |
| 1. The Unknown Path | Expressions & Structure | A.SSE.A |
| 2. The Equation Engine | Solving Linear Equations | A.REI.B |
| 3. Inequality Canyons | Graphing Inequalities | A.REI.D |
| 4. Function Fields | Understanding & Interpreting Functions | F.IF.A, F.IF.B |
| 5. System Crossing | Systems of Equations | A.REI.C |
| 6. Problem-Solving Arena | Modeling Equations | A.CED |
| 7. Reasoning Nexus | Logical Analysis | A.REI.D, F.IF.C |
| 8. Integration Chamber | All Concepts Combined | All Above |

Each chapter includes 4–6 puzzle hubs that reinforce the listed standards through gameplay, reflection, and narrative integration.