VICTORYXR

VR EXPERIENCE

TEACHER SUPPORT GUIDE

Algebra Factory

(VR Experience)

TARGET GRADE	TOPIC
Algebra I / Pre-Algebra	(Mental Algebra & Multi-Step Linear Equations)

1 Learning Objectives & Assessment Goals

What This Teaches:

- **Mental Algebra & Variable Substitution:** Fluency in solving 1- to 3-step linear equations ($ax + b = c$, multi-unknowns) under some time pressure.
- **Integer & Component Manipulation:** Understanding numeric values, negative numbers, and combining/merging operations to form desired values.
- **Resource Management:** Strategic optimization of workspace and currency upgrades to enhance system efficiency.

What This Assesses:

- **Real-Time Fluency:** Speed and accuracy in isolating variables without written scratch work.
- **Error Analysis:** Ability to analyze loose components via scanning to verify capability values before insertion.
- **Adaptability:** Handling increasing conveyor speeds, higher frequency of incoming robot requests, and multi-variable logic.

2 How This Supports Students on Their Learning Journey

Kinesthetic & Gamified Reinforcement

Translates abstract variable substitution into tactile actions (pulling levers, scanning parts, inserting components into matching variable slots).

Scaffolded Progression

Begins with a guided tutorial before introducing faster conveyor belts, multi-object merging, and variable combinations.

Immediate Feedback Loop

Invalid parts are instantly rejected, while correct assemblies generate currency in the payout area behind the user.

Low-Stakes Failure State

Unfinished robots result in no payment for that turn ("no payment will appear; try again next shift"), encouraging continuous retry without punitive progress loss.

3 Key Instructional & Gameplay Components

Phase / Action	Student Action & Task Execution	Outcomes, Rewards & Penalties
Tutorial & Setup	Follow on-screen terminal guidance; pull lever to dispense components.	Unlocks main operational environment.

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Part Generation & Scanning	Pull lever to spawn loose components; use the **Scanner** to reveal part names and capability values.	Prepares items for variable slotting. Items must be scanned prior to insertion.
Solving & Inserting	Evaluate hover panel equations (e.g., $3x + 3 = 9 \Rightarrow x = 2$). Insert matching capability value into slot **X**.	**Correct:** Completes robot and adds to payout balance. **Incorrect/Invalid:** Part is rejected instantly.
Merging & Advanced Parts	Combine/merge two objects together to create higher values or negative numbers.	Enables completion of complex 2-3 unknown variable equations.
Workspace Maintenance	Press the **Vacuum Button** next to the dispenser to clear unwanted components.	Instantly destroys loose clutter to free physical workspace.
Upgrades & Payout	Turn around to collect earnings from the payout area between shifts; spend currency at the Upgrade Shop.	Increases part quality, system efficiency, and production speed for subsequent shifts.

4 Curriculum Integration & Classroom Implementation

When to Use:

Ideal as a **fluency-building lab** after introducing 1-step and 2-step linear equation solving, or as a **spiral review station** during Algebra units.

Suggested Session Format:

STEP 1
Warm-Up
5 mins

Practice 2–3 mental algebra warm-up problems on the board.

STEP 2
VR Station
15–20 mins

Students complete shifts in *Algebra Factory*, starting with the tutorial and progressing through upgrading production lines.

STEP 3
Debrief
5–10 mins

Have students reflect on strategies for merging numbers and managing workspace clutter under time constraints.