

## 1. Game Title: Core Guardian

## 2. Concept & Theme:

*Core Guardian* is a fast-paced arcade defense game set in deep space. The player acts as the final line of defense for a fragile energy core, controlling a "Photonic Shield" that orbits the center. The primary theme is "Radial Survival," where threats do not come from a single direction but converge from all 360 degrees. **Uniqueness:** Unlike standard shooters that rely on X/Y axis movement, this game uses a **radial coordinate system**. The player is stationary but must possess 360-degree awareness. The combination of mouse-aiming for precision and keyboard controls for accessibility creates a distinct "twitch-reflex" gameplay loop unlike generic clones.

## 3. Gameplay Instructions

- **How to Play:** Red "Void Seekers" spawn from the screen edges and fly toward the center. You must rotate the blue shield to physically block them before they hit the core.
- **Controls:**
  - **Mouse:** Move cursor to aim shield instantly (Recommended).
  - **Keyboard:** Left/Right Arrows to rotate; Enter to Start/Retry.
  - **Touch:** Tap left/right side of screen.
- **Objectives:** Block enemies to score points and survive as speed increases.

## 4. Rules & Mechanics

- **Scoring:** +10 Points for every enemy blocked. Score is shown on HUD.
- **Win/Lose:** This is an infinite survival challenge. **Game Over** occurs immediately if a single enemy bypasses the shield and hits the core.

## 5. Technical Implementation

- **Logic:** Uses **Trigonometry** ( $\text{Math.cos}$ ,  $\text{Math.sin}$ ) to calculate circular spawning coordinates and movement vectors.
- **Collision:** Custom **radial collision detection** checks Euclidean distance and angle difference (normalized to  $0-2\pi$ ) rather than standard bounding boxes.
- **Tech Stack:** HTML5 Canvas for 60FPS rendering; JavaScript state machine for game flow; CSS media queries for responsive mobile/desktop layout.

## 6. Student Details

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