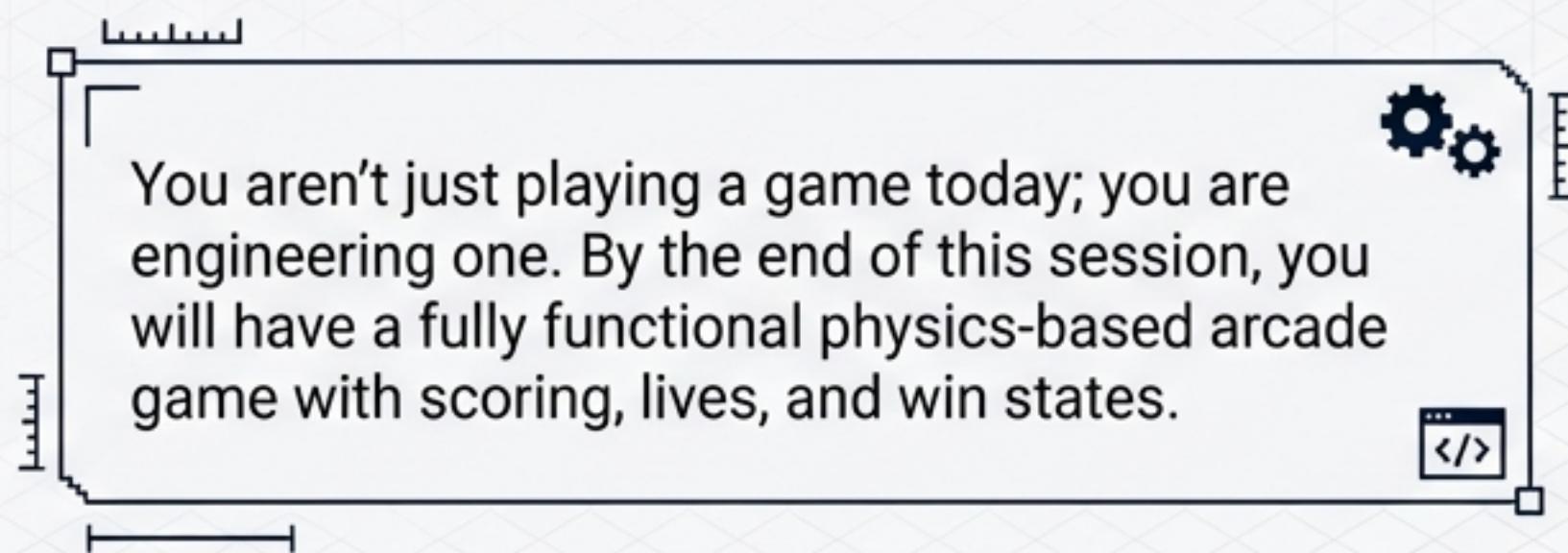


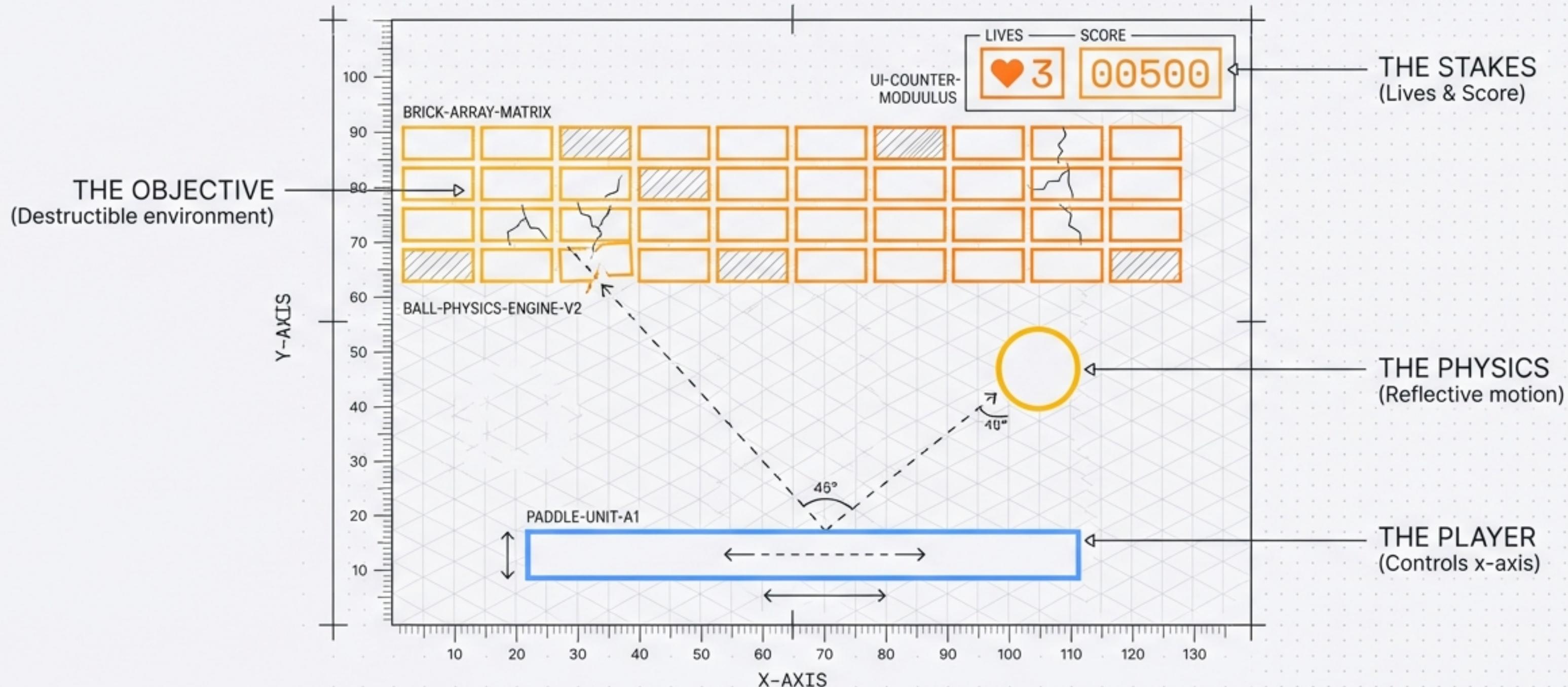
BUILD YOUR OWN BREAKOUT GAME

A Step-by-Step Developer Quest (Year 8)

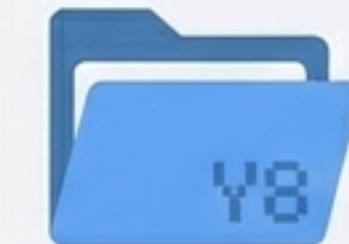


Mission Parameters: The Rules of Play

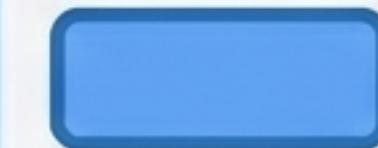
- **Win Condition:** Clear all bricks
- **Lose Condition:** Lives count reaches zero
- **The Goal:** Destroy the wall to survive



The Inventory: Asset Setup



Project Name:
Y8 Breakout –
[Your Name]



Sprite: Paddle
(Width 100–150)



Sprite: Brick



Action:
Delete default
Cat sprite

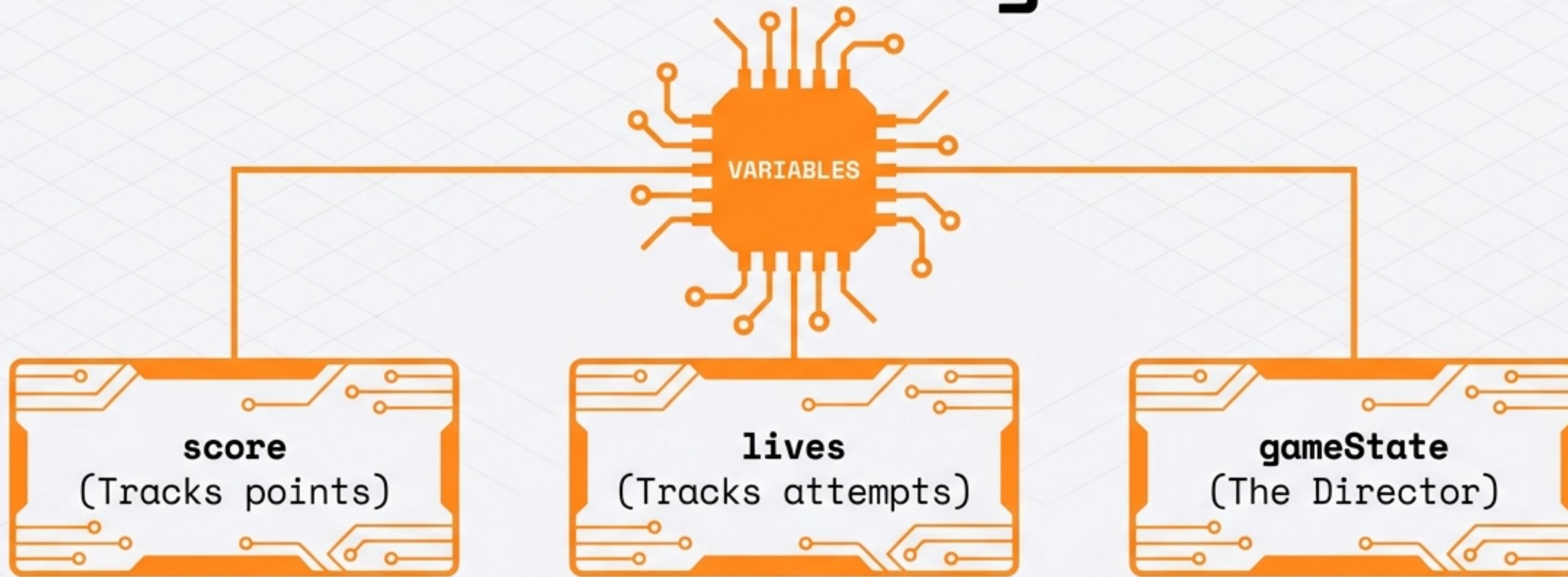


Sprite: Ball
(Size 10–20)



Backdrops: Start,
Game, Win/Lose

The Brain: Defining Variables

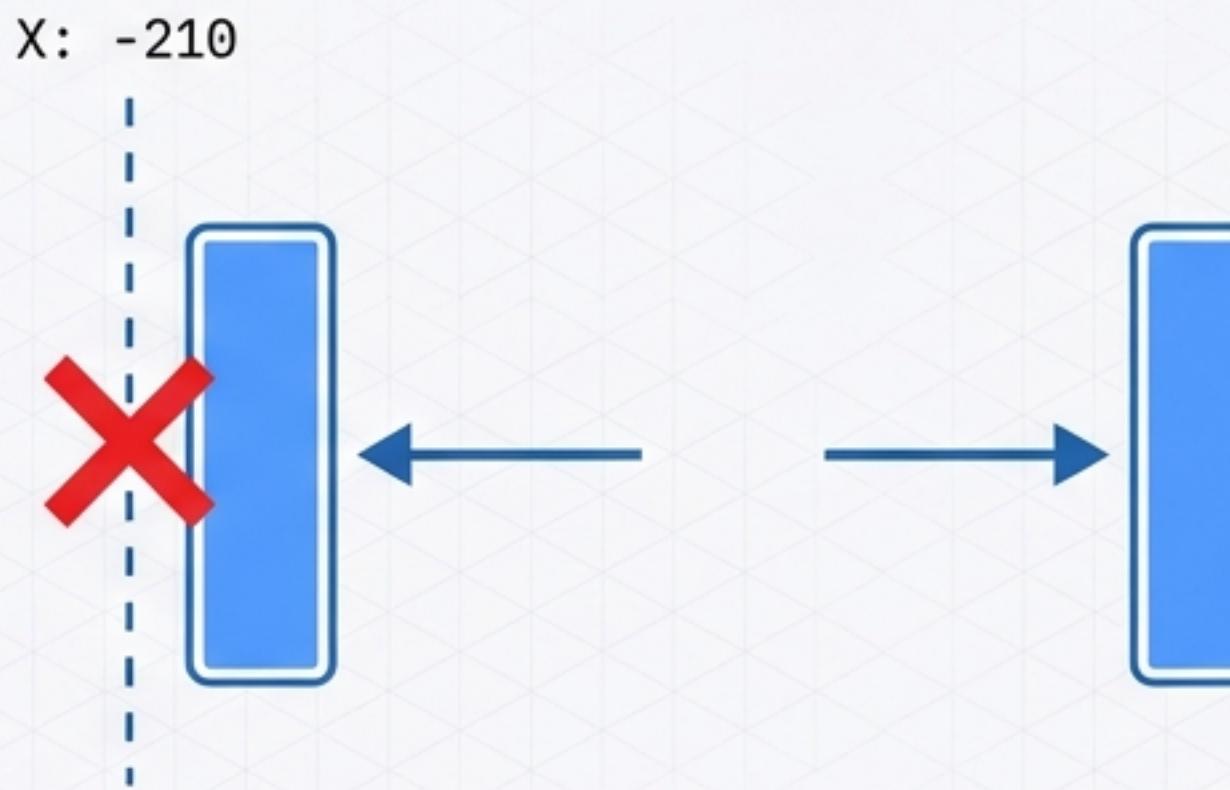


Go to the 'Variables' tab and create these three for 'All Sprites'.

Why gameState? This variable is the game director. It tells the code if we are waiting ("start"), active ("playing"), or finished ("gameover").

Level 1: Pilot Controls (Paddle)

The Logic



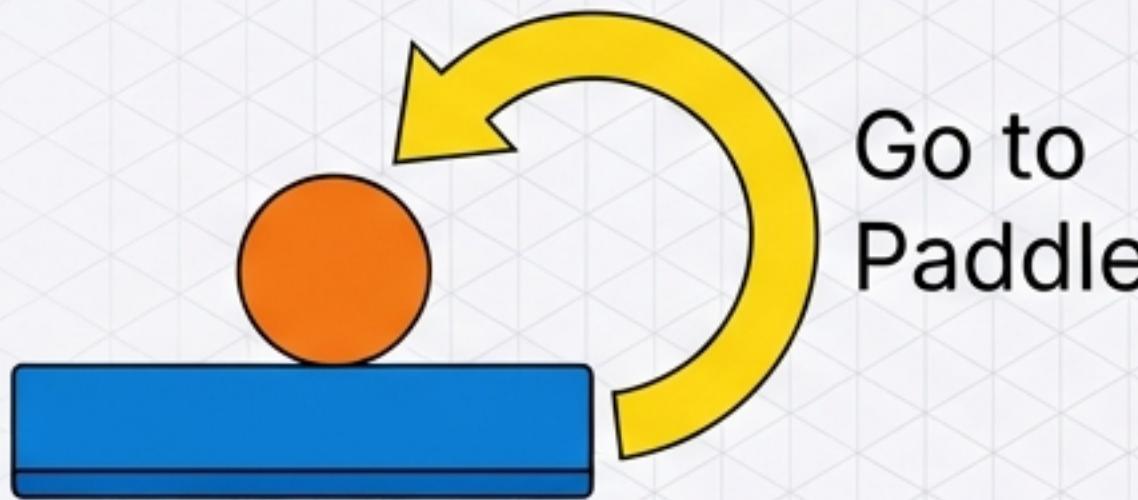
Goal: Move left/right.
Clamp position at walls.

The Code

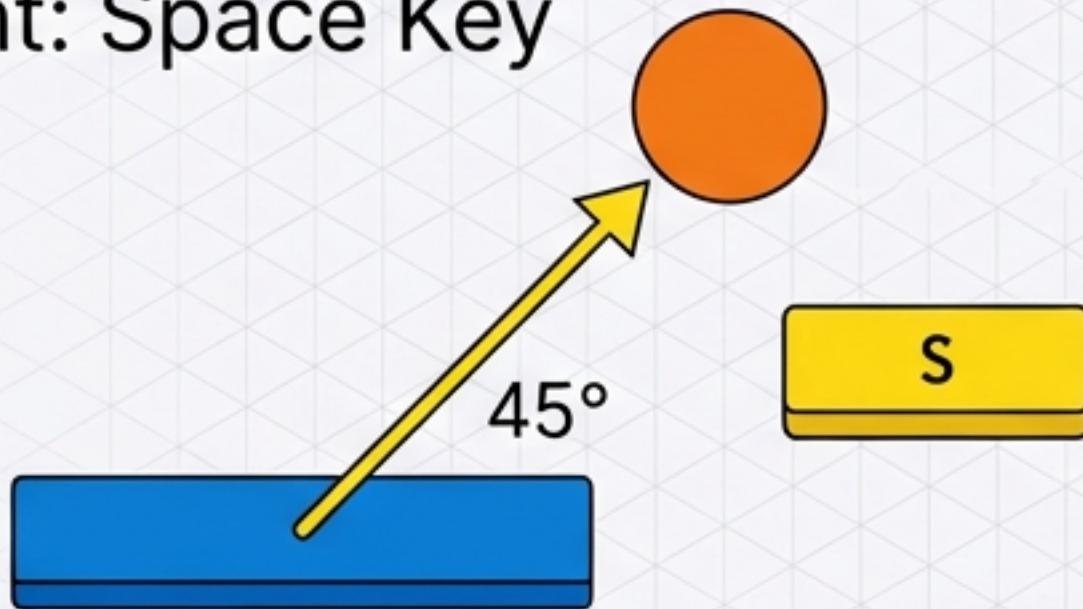
```
When green flag clicked
  Go to x: 0 y: -150
  Forever loop
    If key right arrow ▾ pressed then
      change x by 10
    End
    If key left arrow ▾ pressed then
      change x by -10
    End
    If x position < -210 then
      set x to -210
    End
    If x position > 210 then
      set x to 210
    End
  End
End
```

Level 2: Physics Engine (The Launch)

State: 'start'



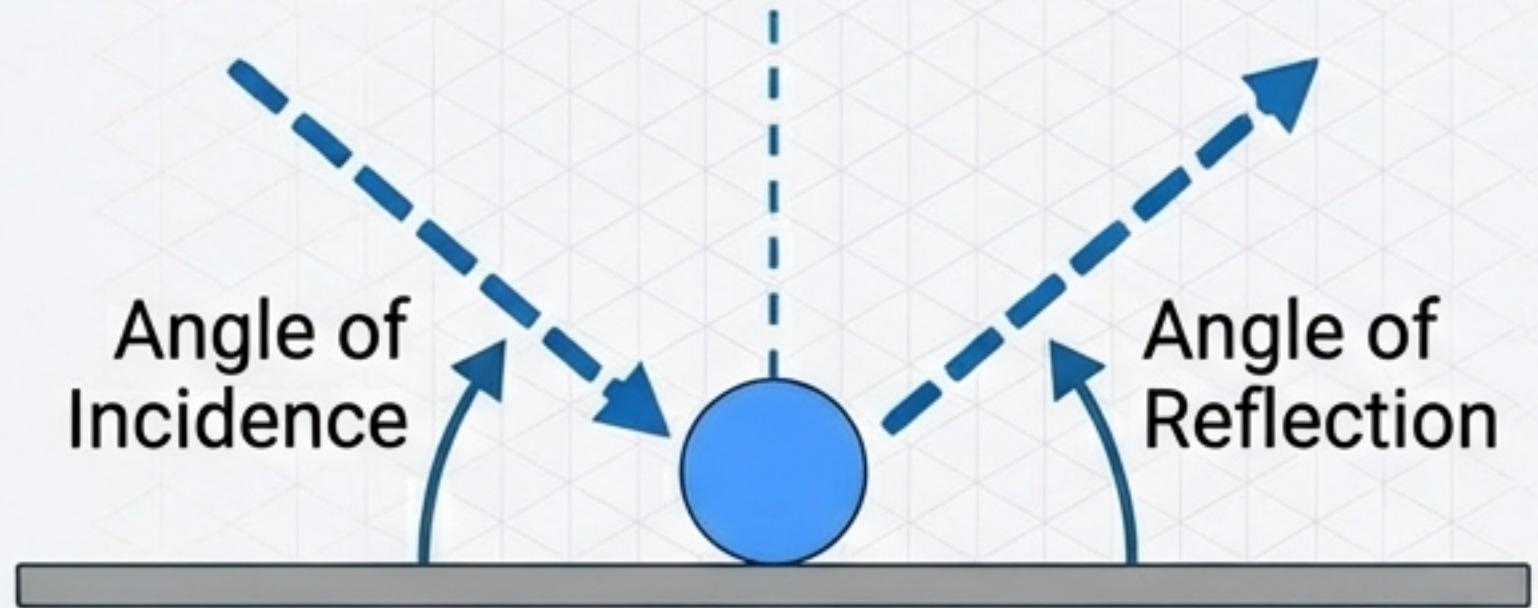
Event: Space Key



```
Set gameState to 'start'  
Forever:  
  If gameState = 'start' then:  
    Go to Paddle  
    If Key Space pressed then:  
      Set gameState to 'playing'  
      Point in direction (pick random 45 to 135)
```

Level 2: Physics Engine (Kinematics)

The Logic



Movement Code (Inside Forever Loop, if 'playing'):

```
Forever loop
  If gameState = 'playing' then:
    Move ballSpeed steps
    If on edge, bounce
```

The Code



Pro Tip: Vector illustration is such vector ball is in contact to the birth and of the paddle.

Paddle Collision Logic:

Standard:

```
Point in direction 180 - direction
```

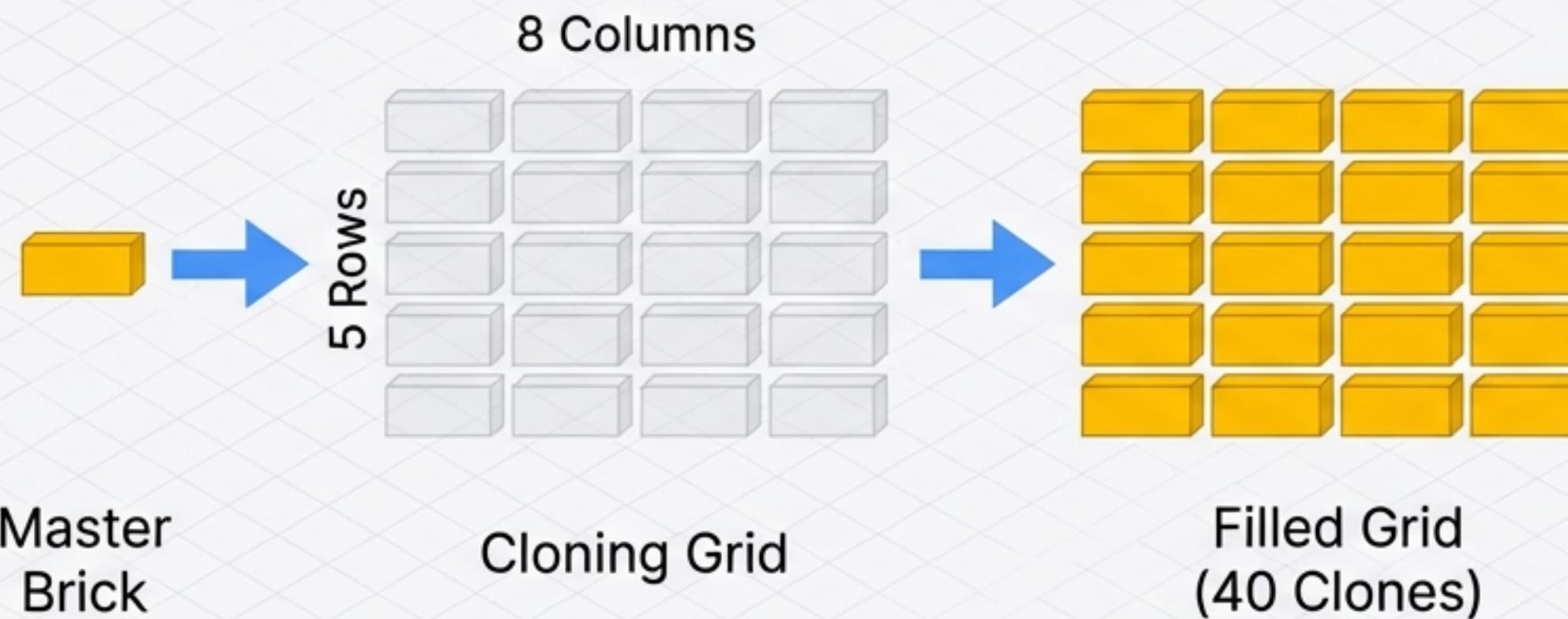
Pro Method:

```
Set direction to x position - paddle x * 2 + 90
```

Note: The Pro Method changes the bounce angle based on where the ball hits the paddle (Left side = Left bounce).

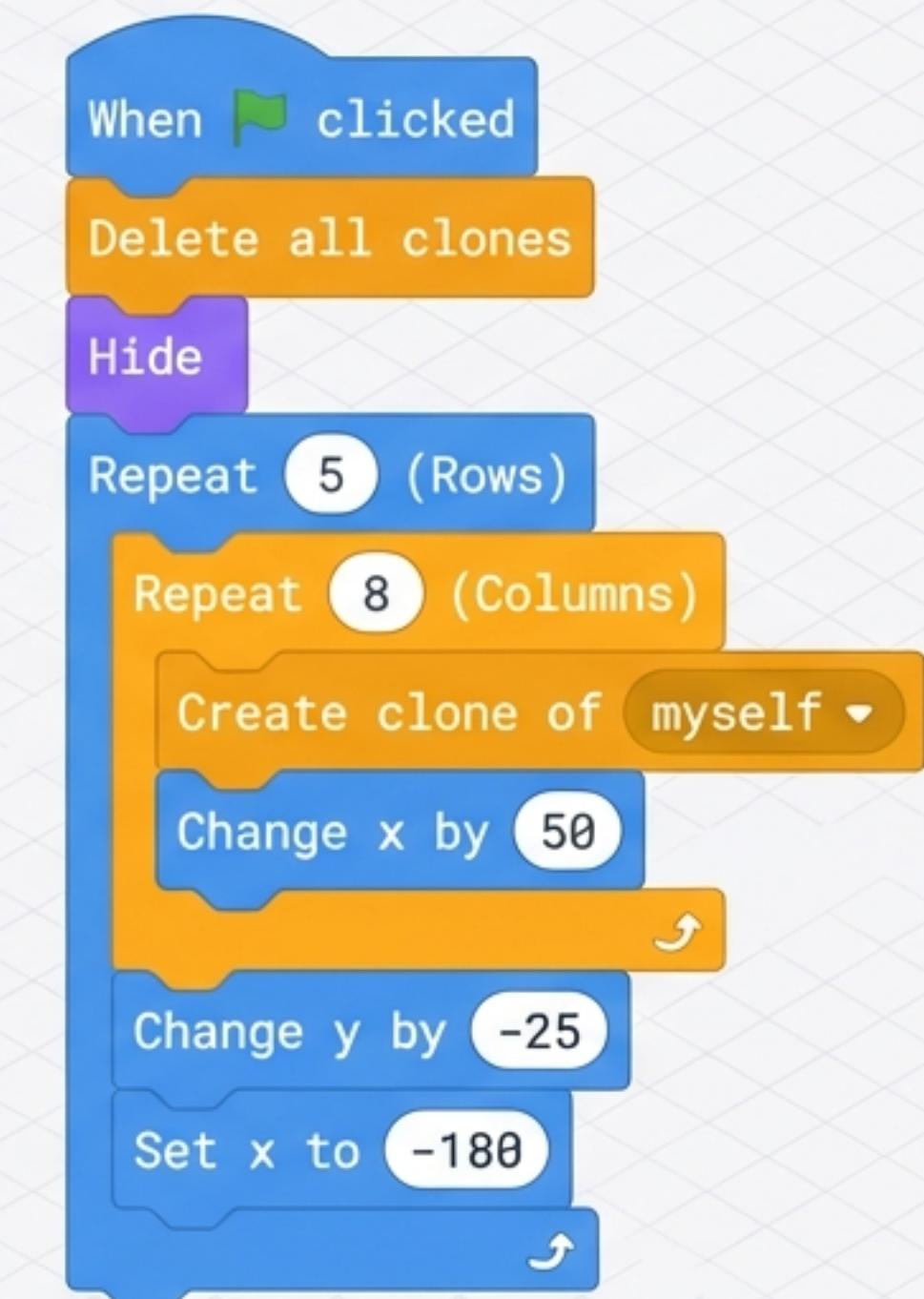
Level 3: Construction (Brick Cloning)

Visual Construction



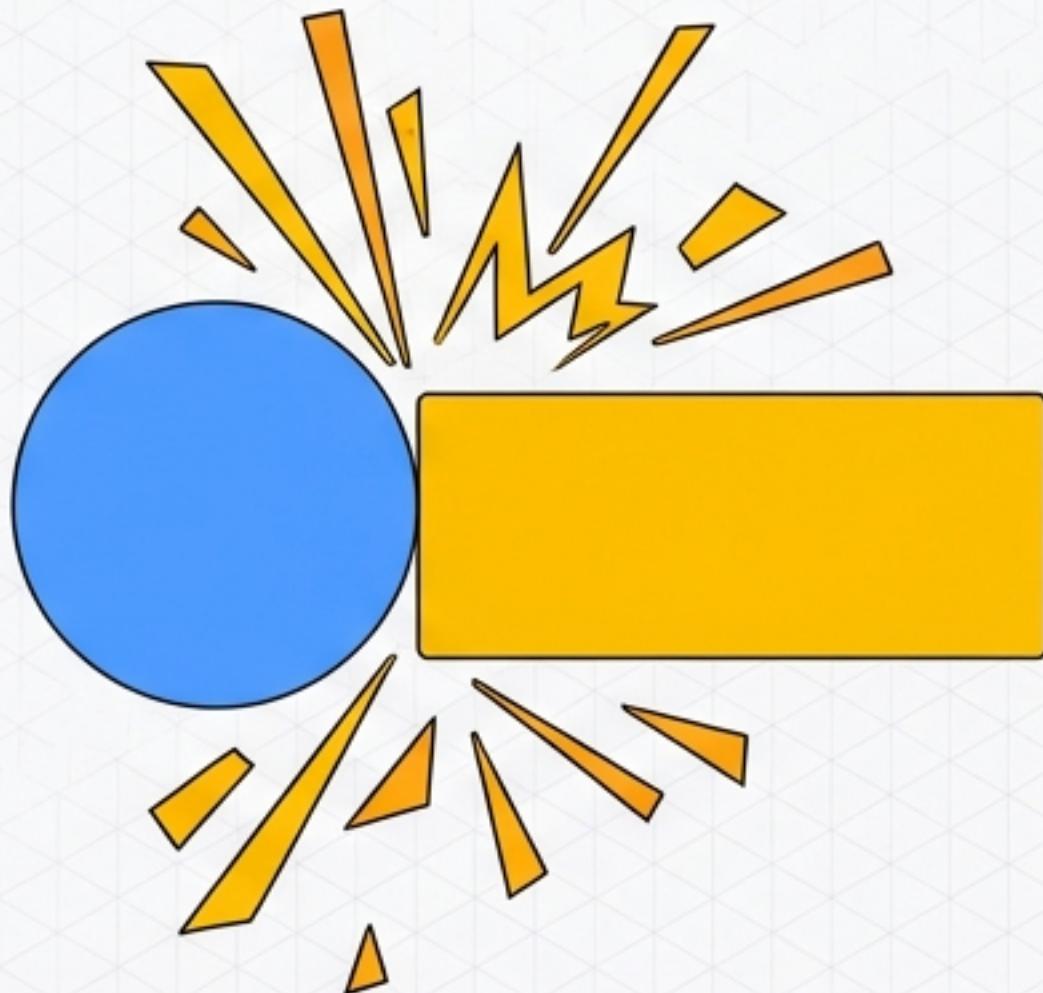
Efficiency Rule: Don't make 40 sprites.
Make 1 sprite and clone it 40 times.

Code Block Diagram (Nested Loops)



Level 4: Impact (Collisions & Scoring)

The Logic



Logic: The Brick detects the Ball.
Inter

The Code

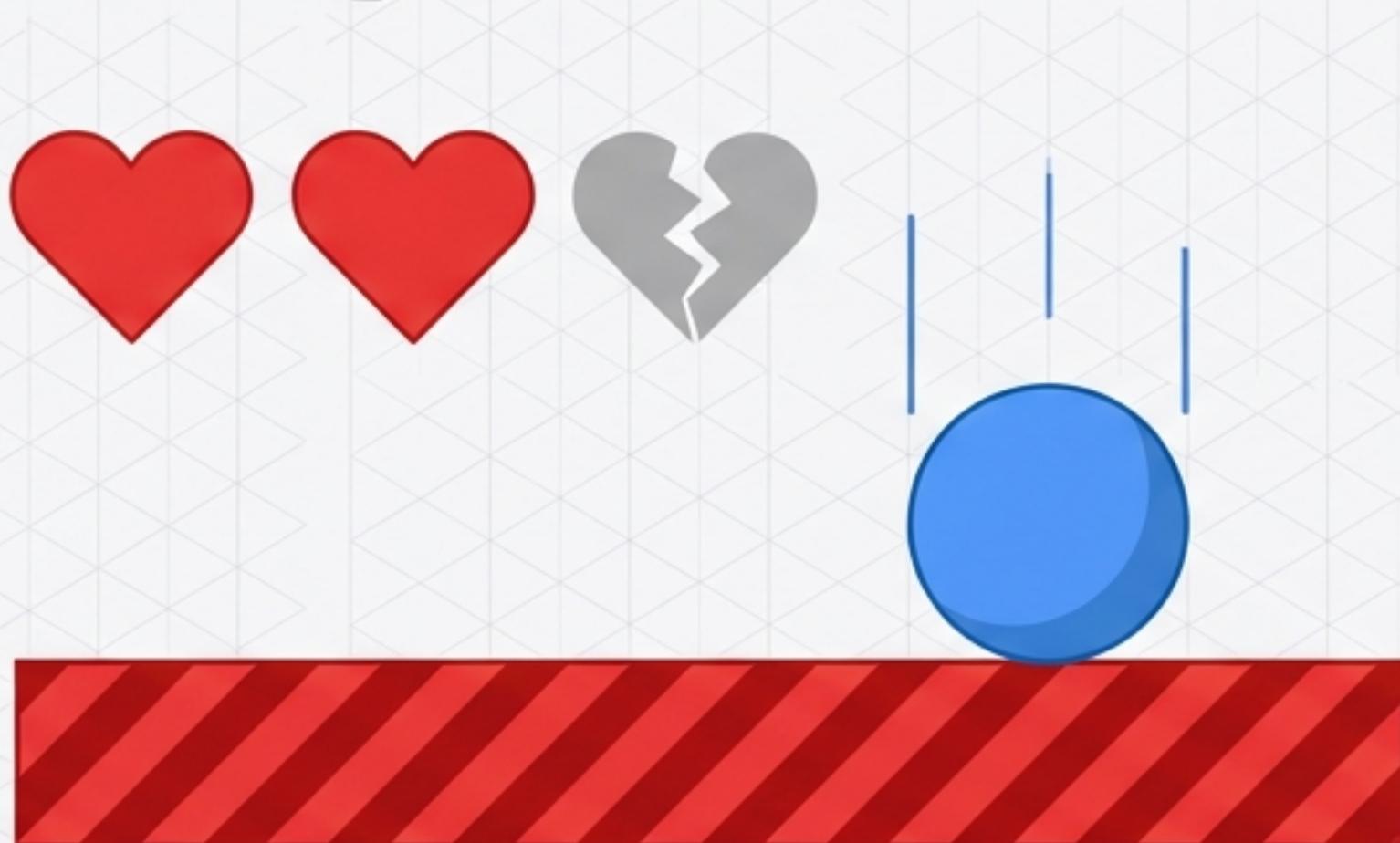
```
When I start as clone
Forever
  If touching Ball then:
    Change score by 1
    Delete this clone
```

A Scratch script attached to a clone. It starts with a "When I start as clone" hat, followed by a "Forever" loop. Inside the loop, there is an "If touching Ball then:" control block. This block contains two stacked script blocks: "Change score by 1" and "Delete this clone". A small arrow at the bottom right indicates the script loops back to the start of the forever loop.

CRITICAL: Use 'Delete this CLONE',
not 'Delete this sprite'.

Level 5: The Danger Zone (Lives)

The Logic



The Consequence: If the ball hits the floor, you lose a life and the round resets.

The Code

```
If y position < -170 then
    Change lives by -1
    Set gameState ▾ to 'start'
    Go to Paddle
```

Level 5: The End Game

Defeat

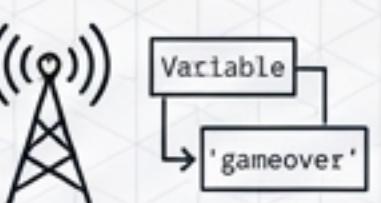


Logic

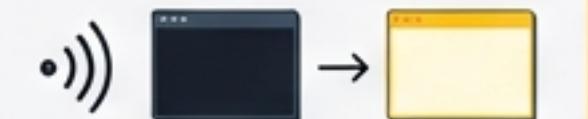
If lives = 0

Action

- Broadcast 'Game Over'
- Set gameState to 'gameover'



Stage Code: When I receive (signal) -> Switch Backdrop.



Victory



Logic

If bricksLeft = 0

Action

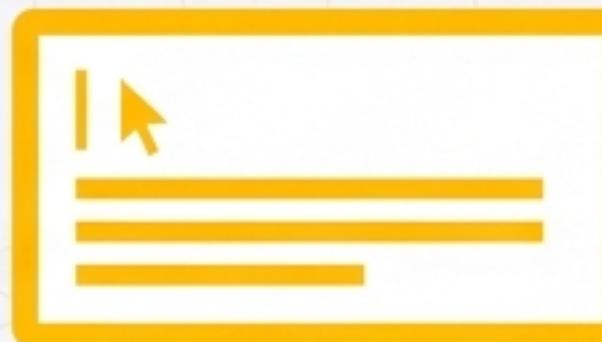
- Broadcast 'You Win'
- Set gameState to 'win'



Level 6: Polish & FX (The ‘Juice’)



Sound



UI

The Polish Checklist

1. **Audio:** Add ‘Pop’ sound on paddle bounce. A blue speaker icon with a wavy line next to a pixelated paddle and ball icon.
2. **Audio:** Add ‘Crunch’ sound on brick break. A yellow speaker icon with a wavy line next to a pixelated brick wall icon.
3. **UI:** Add “Press SPACE to Start” text to start screen.
4. **UI:** Ensure Score variable is visible (double-click to change style).
5. **Code:** Add ‘Stop All’ block after Game Over/Win broadcasts.

Press SPACE to Start

Score: 150 → A yellow-bordered box containing the text "Press SPACE to Start" above a score counter icon showing "Score: 150" being updated by a cursor arrow.



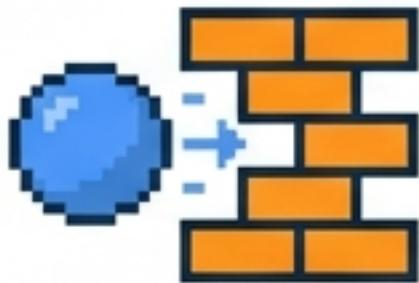
“Making it feel like a real arcade game.”

The Glitch Box: Troubleshooting



Problem:

Ball goes through bricks?



Fix:

Reduce **ballSpeed** (4-6). Don't move too many steps at once.

Problem:

Ball stuck in paddle?



Fix:

Add '**change y by 5**' immediately after touching paddle.

Problem:

Bricks won't delete?



Fix:

Check your block. Use '**delete this CLONE**', not '**sprite**'.

Challenge Mode: Extensions

Secure Upgrades (Try these first):

- **Levels:** When bricks cleared, reset board and increase speed.
- **Acceleration:** Increase speed every time paddle is hit.



Stretch Upgrades (Top Marks):

- **Power-ups:** Falling pills for wide paddle.
- **Combo Points:** Bonus for hitting multiple bricks in one flight.
- **Multi-ball:** Spawn two balls.



Submission Protocol

Share



1. Log In to Scratch.
2. Click the orange **SHARE** button (Crucial!).
3. Copy the URL: **scratch.mit.edu/projects/...**
4. Paste link into homework submission box.

Game On. Good luck.