Lesson 7: Dodge the Block – Build a Mini Game!

🧠 Goal

Students will build a keyboard-controlled mini-game where a red box dodges falling obstacles.

They will apply event handling, movement logic, timers, and collision detection using plain HTML, CSS, and JavaScript.

⏱️ Duration: 90–120 minutes

Level: Intermediate (students know events, `setInterval`, DOM)

🧭 Lesson Outline

1. Warm-Up (10 min)

Ask students:

- “Have you played games where you control a character with arrow keys?”
- “What do you think happens behind the scenes when something moves or falls?”

🧪 Demo: A simple box that moves left/right with keyboard

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2. Project Overview: Dodge the Block (5 min)

- You control a red square
- Black blocks fall from the top
- Don’t let them hit you, or it's game over!
- We'll add scoring & leaderboard next class

3. Step-by-Step Build (60–75 min)

✅ Step 1: Set up game area & player

- A fixed-size `div` as game area
- A red box inside, positioned absolutely
- Use arrow keys / WASD to move the red box

```
document.addEventListener("keydown", function(e) {
  if (e.key === "ArrowRight") { /* move right */ }
});
```

✅ Step 2: Make obstacles fall

- Use `setInterval()` to create black falling blocks every 1–2 seconds
- Move them downward every 20–50ms

```
let top = 0;
let fall = setInterval(() => {
  top += 5;
  block.style.top = top + "px";
}, 50);
```

✅ Step 3: Detect collision

- Use `getBoundingClientRect()` to get box & block positions
- If overlapping → game over
- Stop everything with `clearInterval()` and show alert or view change

```
function checkCollision(player, block) {
  const p = player.getBoundingClientRect();
  const b = block.getBoundingClientRect();
```

```
  // If boxes overlap → collision!
}
```

✅ Step 4: Game Over State

- Stop movement & block generation
- Show “Game Over” screen or message

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4. Polish & Playtest (15–20 min)

- Add a background color
- Add score tracking (increase score over time or for each dodge)
- Ask students to tweak:
  - Faster blocks
  - Change controls
  - Make blocks spawn at random `left` positions

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5. Wrap-Up & Preview (10 min)

✅ Key Takeaways

Concept	What We Used
Keyboard Events	`keydown`, movement
Game Loop	`setInterval`
Collision Detection	`getBoundingClientRect()`
DOM Manipulation	`createElement`, `style.position`

👀 Next Time:

- Add Home/Game/Game Over views
- Save scores using `localStorage`
- Show a leaderboard 🏆

🧩 Optional Challenge

- Make player move smoother with `keydown` + `keyup`
- Use `requestAnimationFrame()` instead of `setInterval()`
- Add simple animations (e.g. shake on collision)
