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# 📋 Quick Reference Card: Event Pairs & Max Position

## The Two Golden Rules

### Rule #1: Event Pairs Required

✅ COUNTED ❌ NOT COUNTED  
play → pause play → [close]  
play → ended resume → [close]  
resume → pause pause → resume (not watching)  
resume → ended [any single event]

### Rule #2: Max Position = Highest

maxPosition = MAX(all currentTime values)  
  
Example:  
 play(0) → pause(30) → resume(20) → [close]  
 maxPosition = MAX(0, 30, 20) = 30s ← Not 20!

## Peter’s Example at a Glance

### Events

10:00:00 ▶️ play(0s)  
10:00:30 ⏸️ pause(30s)  
10:00:35 ▶️ resume(20s) ← rewound 10s  
10:01:05 ❌ [close]

### Calculation

Segment 1: play(0) → pause(30) = 30s ✅  
Segment 2: resume(20) → [close] = 0s ❌  
  
totalWatchTime = 30s  
maxPosition = 30s (not 20s!)  
watchPercentage = 10%

## Common Scenarios

| **Scenario** | **Events** | **Watch Time** | **Max Pos** |
| --- | --- | --- | --- |
| Normal | play(0) → pause(30) | 30s | 30s |
| Browser close | play(0) → pause(30) → resume(30) → [close] | 30s | 30s |
| With rewind | play(0) → pause(30) → resume(20) → [close] | 30s | 30s |
| Fixed version | play(0) → pause(30) → resume(20) → pause(50) | 60s | 50s |

## Why Max Position Uses 30s (Not 20s)

Event: pause(30s) → maxPosition = 30s  
Event: resume(20s) → maxPosition = MAX(30, 20) = 30s ✅  
  
The MAX() function always keeps the highest value!

## The Fix: Add Closing Events

**Problem:**

resume(20s) → [close] = ❌ Not counted

**Solution:**

resume(20s) → pause(50s) = ✅ 30s counted!

Implement: Heartbeat events or beforeunload handler

## Quick Questions

**Q: Why isn’t the segment after resume counted?** A: No closing event (pause/ended). We don’t know when they stopped.

**Q: Why maxPosition = 30s when they rewound to 20s?** A: MAX function keeps highest value (30 > 20).

**Q: How much did Peter actually watch?** A: Probably 60s, but only 30s can be confirmed.

**Q: Is the session in the data?** A: Yes! It shows up with 30s watch time and flags.