History of Computer Games

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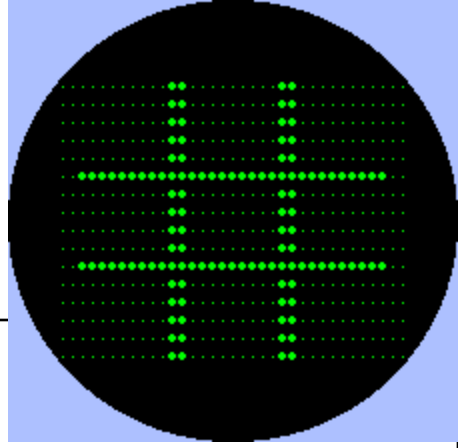
Derived from The Ultimate Game Developer's Sourcebook
The First Quarter: A 25 year history of video games, S.Kent
and sources on the WWW (wikipedia)

Pre-historic

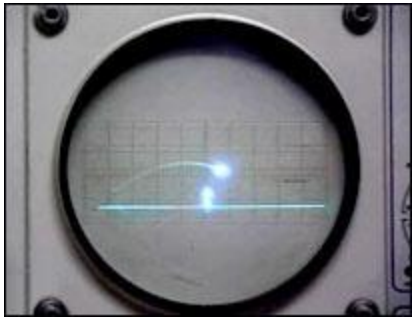
First “games”



- 1952
  - TicTacToe:
  - A.S.Douglas on a EDSAC vacuum-tube computer

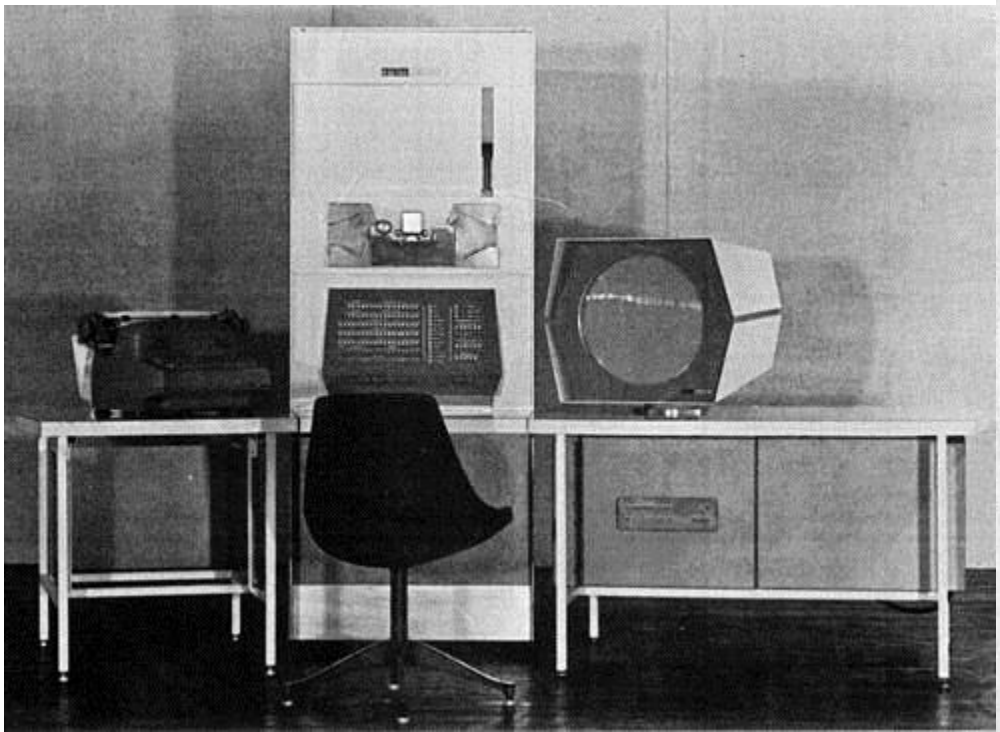
```
[OXO]
T56K
[M3]
PFGKIFAFRDLFUFOFE@A6FG@E8FEZPF
@&#9!8!7!!!!!!*NOUGHTS!AND!CROSSES
@&#6!5!4!!!!!!*!!!!!!!BY
@&#3!2!1!!!!!!*A!S!DOUGLAS#N!*C#M1952
@&@&*LOADING!PLEASE!WAIT#MMM
..PK
T45KP192F  [H-parm]
T50KP512F  [X-parm]
T46KP352F  [N-parm]

T64K
GKT48KP@TZ
[&-sequence]
P4FPFP1FP2FP3FP4FP8FP10FP12FP16F
P300FP32FAHOFU1FU2FK4098FM1FA2DPF
```

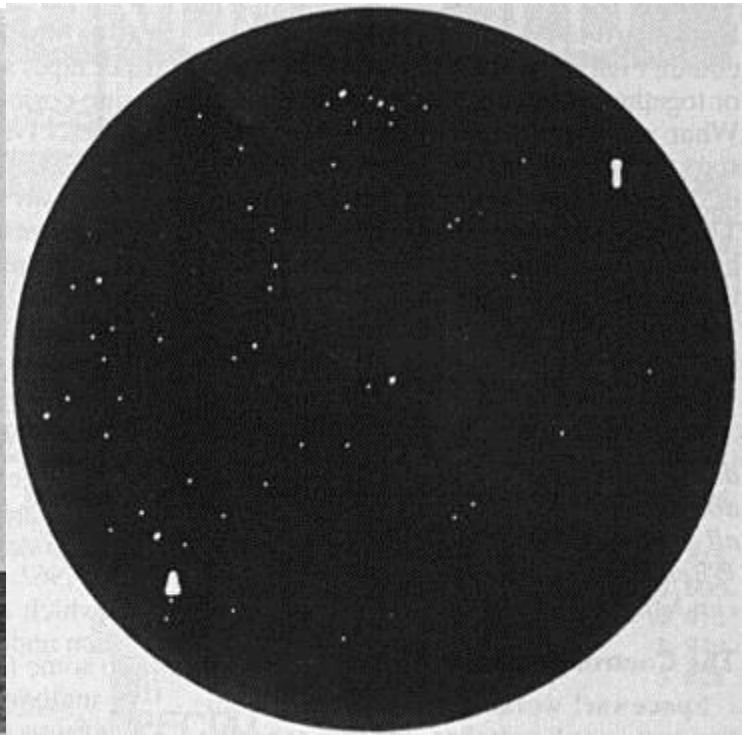
- 1958
  - Tennis for Two:
  - Willy Higginbotham on an oscilloscope connected to analog Donner computer



1960's and Early 1970's

- 1961-1962 SpaceWar! developed at MIT using vector graphics on PDP-1
- Sega releases Periscope:
  - electronic shooting game - first arcade game





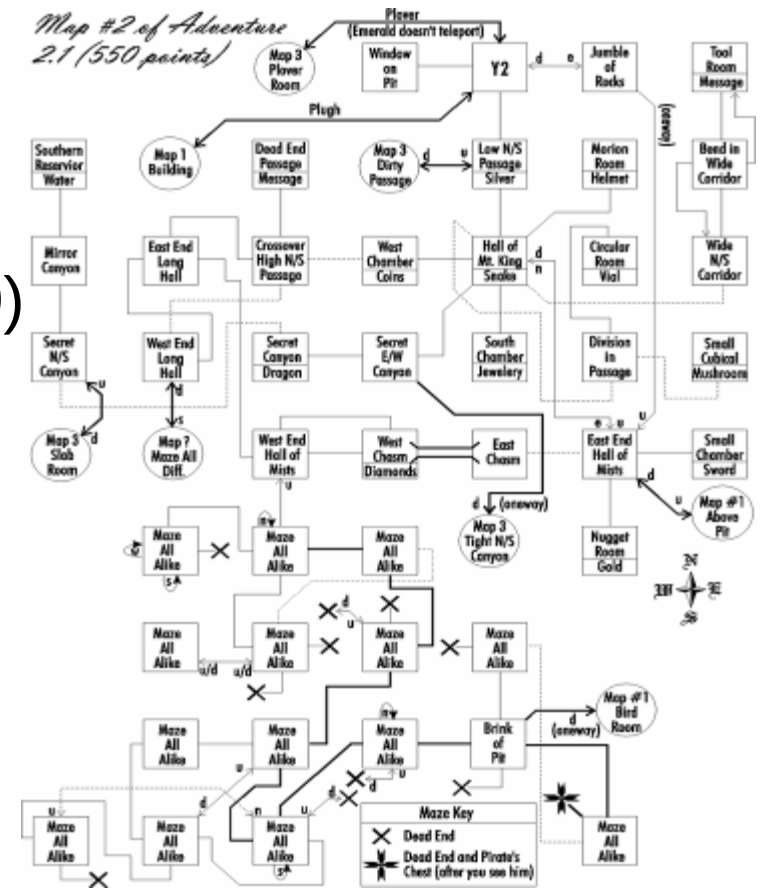
Classical Age

1971-1974
Birth of Commercial Games

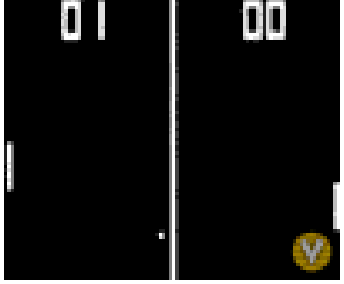
- 1971:
  - Nolan Bushnell [Nutting] develops Computer Space
    - First commercial arcade game
    - Based on SpaceWar!
    - Vector graphics, but really cool real-time space game
    - Too sophisticated for market. Fails
- 1972:
  - Bushnell starts Atari
    - Named after a move in GO
  - Odyssey by Magnavox – “Hockey”
    - First home TV game – analog not digital
    - 100,000 sold - $100/console –
- 1973:
  - Pong in Arcades by Atari
    - Sued by Magnavox
    - A huge hit in bars, pinball arcades, …
- 1974:
  - Kee releases Tank
    - First game to use ROM
    - Fake spinoff from Atari
  - Atari:
    - First racing game (*Trak 10*) & maze chase game (*Gotcha).*

1972-1976

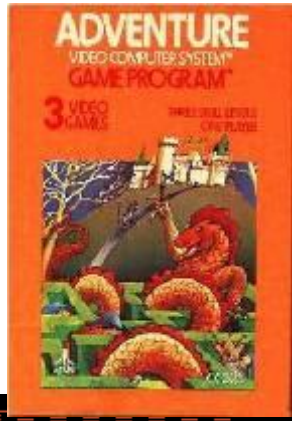
- Adventure: The Colossal Cave
  - William Crowther and Don Woods
  - First text-based adventure game
  - Ran on DEC mainframes (PDP-10)



Late-70's: Atari Expands



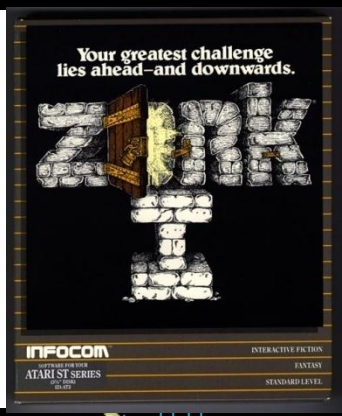
- 1976: Bushnell sells Atari to Warner for $26 Million
  - Warner markets Pong to home as a single game
  - Breakout designed by Steve Jobs and Steve Wozniak
- 1977: Atari introduces the 2600 VCS
  - First home game console with multiple games
  - 2K ROM , 128 Bytes of RAM
  - Very successful – 6M sold by 1980
- 1977: Apple starts selling the Apple II
- 1978:
  - Adventure for Atari comes out
    - Sold 1M copies, first Easter Egg
    - first action/adventure game
  - Space Invader developed by Taito in Japan
- 1979:
  - Activision is formed by Atari developers
    - Third party development houses start up
  - Atari 800 introduced - 8-bit
  - First MUD by Trubshaw & Bartle
    - First online multiplayer game

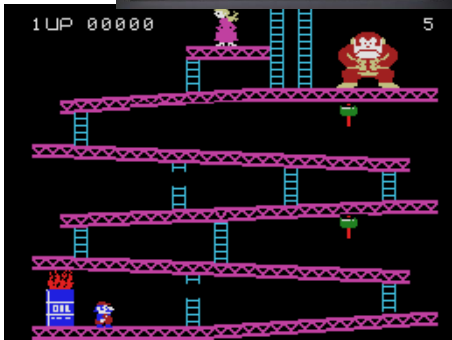


Medieval Times

1980-1981: Rise

- 1980:
  - Phillips Odyssey2 (1978) and Mattel Intellivision
    - Mattel had better graphics, but terrible controller
  - Namco has Pac-Man
    - >$1 billion (1980 dollars)
    - 300,000 arcade units sold since introduction
  - Atari doing $1 billion:
    - Asteroids & Battlezone released
  - Williams releases Defender
  - Zork released by Infocom, Ultima released
- 1981:
  - Game industry > $6 billion in sales
  - Nintendo: Donkey Kong [converted Radarscope]
  - Galaxian, Centipede, Tempest, Ms. Pac-Man
  - IBM introduces the IBM PC





1982: Clouds ahead

- Atari sales down 50% -- starts to loses $$’s
  - Releases 5200
  - But it still controlled 80% of the market
  - Atari buys rights to ET for $22 Million
  - Produced more PacMan cartridges than systems
    - 7 Million sold
    - 5 Million unsold ("worst coin-op conversion of all time“)
- Activision releases Pitfall
- ColecoVision gets Donkey Kong
- Game companies start just for home computers
  - Sierra On-Line, Broderbund, BudgeCo
- Electronic Arts is formed

1983: Crash

- Mattel losses $225 million from Intellivision
  - Doesn’t ship the Aquarius
  - Loses as much as it had made the four prior years.
- Atari loses money
  - Market flooded with poor quality games:
  - Fox, CBS, Quaker Oats, Chuck Wagon dog food
- Coleco crashes
  - Saved by Cabbage Patch Kids
- Commodore 64 - home computer
  - 17-22 million total sold
- Dragon’s Lair released
  - Laserdisk
  - 6 years to make - Bluth Studios

Crash & Resurgence

- 1984:
  - Industry drops to below $800 M
  - Apple introduces the Macintosh
    - Birth of modern computer: good resolution, sound
    - Games not a priority
    - 100,000 sold in first six months
  - King's Quest is released by Sierra On-Line
- 1985:
  - Nintendo introduces Nintendo Entertainment System
    - Strict control on software [62 M sold]
      - Lockout chip, and restricts companies to 5 games/year
      - Nintendo sells cartridges to software distributors
  - Atari tries to come back with 16-bit 520ST
    - Computer and Game system
  - Carmen Sandiego released by Broderbund

Failed Competition

- 1986:
  - Commodore ships Amiga: cool but marketing kills it.
    - Computer system designed to support games – 3D color
    - Developed by Atari hardware engineer Jay Miner. [6M sold]
  - Sega ships Sega Master System console.
    - Technically superior to Nintendo, but it ignores third-party developers and fails because of lack of games (and maybe Nintendo pressure on developers). [13M sold]
  - Atari ships 7800
  - Nintendo outsells competitors 10 to 1

b

1987-1989

- 1987:
  - Electronic Arts releases their first in-house game:
    - Skate or Die.
  - Serious games start to show up for IBM PC's.
    - VGA and SVGA help
- 1988
  - Tetris imported from Soviet Union
  - Coleco files for bankruptcy
- 1989:
  - Sega Genesis is released: 16-bit [29 M sold]
    - Attacks console market with EA sports titles
    - Aggressive marketing at older market (> 13 year old)
  - Nintendo sticks with 8-bit
    - Releases Gameboy [119 M sold]
  - Maxis releases SimCity

Console Wars

- 1990:
  - Nintendo releases Super Mario 3 - all-time best-seller 40M
  - Amiga and Atari ST die out
  - PC's and Consoles are major game platforms
  - Electronic Arts starts to acquire other game publishers
- 1991:
  - Nintendo launches Super-NES (16-bit) [49 M sold]
  - S3 introduces first single chip graphics accelerator for PC
  - Capcom releases Street Fighter II for arcades – big hit
  - id releases Wolfenstein 3D
  - Civilization published

- 1992:
  - PC gaming explodes
  - Nintendo has $7 billion in sales ($4.7B in U.S.)
    - Has higher profits than all U.S. movie and TV studios combined
  - Midway releases Mortal Kombat for arcades – extreme violence

Industrial Age

More Wars

- 1993:
  - Pentium chip is launched
  - Consoles (Sega and Nintendo) are 80% of game market
  - Panasonic ships Real-3DO: 32-bit (now out of business)
- 1994:
  - Atari ships Jaguar: 64 bit
    - Very expensive for console ~$700, >$100/game
    - Neither 3DO [2M sold] or Jaguar [.25 M] does particularly well
  - DOOM released by id
  - Sensible World of Soccer released
  - MYST released
    - all time biggest selling PC game until 2002
    - 6 M sold

32-bit Wars

- 1995:
  - Sega ships Saturn (32-bit) [9 M sold]
  - Sony ships Playstation (32-bit)
  - Microsoft releases Window 95
    - Includes the Game SDK - Direct-X
    - Bring major game performance to Windows
  - Internet and WWW start to expand
  - Full-motion video becomes a part of games
    - 7th Guest

Playstation

- Launched in U.S., Sept. 1995
- 300,000 polygons/sec., 30MIPS processor, 4MB RAM, 2MB VRAM
- 400 U.S. Titles
- 20% penetration in U.S. homes
- 102M sold by July 2009
- Analysis:
  - Multi-platform games look worse on Playstation
  - Playstation-only games look good, but grainy
  - Cheap and lots of them for software developers

1996-1998

- 1996:
  - Nintendo ships Ultra 64
    - Originally promised for 1995
  - Multi-player gaming goes commercial
    - Via modem and internet and network companies
      - TEN, Mplayer, …
- 1997:
  - 3D acceleration starts to standardize on 3D-FX
    - Games start to assume 3D acceleration
  - Pentium II's at 200Mhz make "serious" game machines
  - Ultima Online launches – first MMORPG in 3D
- 1998:
  - Lots of good PC games
  - Playstation rules consoles

Nintendo 64

- Launched in U.S., Sept 1996, $199
- 93.75 MH 64 Bit CPU, 64-bit MIPS co-processor
  - over 500,000,000 16-bit operations/sec
  - Built-in Pixel Drawing Processor (RDP)
- 4.5MB RAM, 150,000 polygons/sec
- Originally aimed at younger market
- 33M sold mid 2010
- Cartridge makes each game very expensive
- Very dependent on software
- Legend of Zelda: Ocarina of Time generates more revenue in last 6 weeks of 1998 than any film

Modern Times

1999-2001

- 1999
  - Dreamcast
  - Maximum Score for Pac-Man Achieved
    Billy Mitchell achieves the highest possible score for Pac-Man when he completes every board and winds up with a score of 3,333,360.
  - EverQuest is launched
- 2000
  - Development moves from PC to consoles
  - Playstation II
  - Diablo II sells 1 million units in 1 week
  - SIMS sells 2.3 million units ($95M)
    - + 1.4 mill. in expansions
- 2001
  - Gamecube (Nintendo)
  - Xbox (Microsoft)

Sega Dreamcast

- Sept. 9, 1999, $299 ($99 -> $49 -> $0), 128 bit
  - 10.6 Million units sold
- Hitachi 200 MHz CPU, PowerVR 3D, 16MB RAM
  - But faster than a 400MHz Pentium II for 3D
  - 3M polygons/sec
  - Fast CD-ROM loads
- Lost out to PS2 in software
  - Jan. 31, 2001 production halted
  - Moderately successful in U.S.
  - But not in Japan

Sony Playstation 2

- Launched May 4, 2000 in Japan
  - In U.S. on October 26, 2000: $299
  - 145 Million sold world wide by mid-2009
  - 1900 games developed
- Hardware
  - 128 Bit 300MHz processor
  - 3 Special purpose 150 MHz co-processors
  - 32MB DRAM: 3.2 GB/sec
  - DVD & CD
  - MPEG2 hardware
  - Dual Shock 2 analog controller
  - Chip set will be available for other platforms
  - 66M polygons/sec geometry – 16M polygons/sec curved
- Software development is tough

Nintendo GameCube

- Launch in Japan, Fall 2001
  - U.S. Nov. 2001
  - Sold 22M units worldwide
- Hardware
  - IBM Gekko processor 405 MHz
  - Geometry Engine
  - Mini-DVD
  - 6-12M polygons/sec (fully textured)
  - 24MB Main memory
  - 16MB A-memory
- Emphasis on easier development
  - High memory bandwidth 3.2 GB/sec
  - Fast frame buffers (5ns.)

Microsoft Xbox

- November 2001-2006
- Software
  - Direct X API
- Hardware
  - Pentium IV 733 Mhz
  - Custom 3-D 300Mhz GPU
  - 64MB Ram – 6.4 GB/sec
  - 8GB hard drive
  - DVD
  - 100 MBps Ethernet
- Performance
  - 150 million transformed and lit polygon
  - 100+ million polygons per second sustained performance (shaded, textured)
  - 300 million micropolygons/particles per second
  - 4 simultaneous textures
  - Full-scene anti-aliasing
  - 1920x1080 maximum resolution
  - HDTV support
- Other
  - Microsoft lost $4B on Xbox
  - 24M sold worldwide

Consoles 2002-2006

- Playstation dominates Xbox and Gamecube
- Xbox Live debuts
- Grand Theft Auto raises “issues”

PC 2002-2003

- 2002
  - Americas Army released as free game
  - SIMS becomes the best-selling PC game of all time (March 2002) > 16M copies
- 2003
  - SIMS Online fails
  - Star Wars Galaxies launch >
  - Second Life and There.com
  - EA grosses $2.5B in 2003

Games 2004-2005

- 2004
  - Madden sells 1.3M copies in first week
  - Sequels rule PC: SIMS 2, Halo 2, Half-life 2, Doom
  - Consoles: Slow growth - lower prices
  - 1,000,000 GBAs sold [81M by 2008]
  - Nokia Ships >1,000,000 N-Gages [3M sold]
  - Nintendo Launches DS >5 million units worldwide by March 2005
    - [78M sold by 2008]
  - Sony Launches PSP
    - 5 million units shipped by July 2005 [41M sold]
  - Shifting away from PC (15% sales) to Consoles
- 2005
  - World of Warcraft
    - 11.5 Million subscribers in 2009 ($750M/year subscriptions)
  - EA rolls along:
    - *Madden NFL 2006*, sold 1.7M in first week [6.5M total]
  - Gamestop and EB games merge

XBOX 360

- Available: November 2005
  - 55M units sold 2011
- Custom IBM PowerPC CPU
  - 3 symmetrical cores: 3.2 GHz each
  - 2 threads/core
  - VMX-128 vector unit/core
  - 1MB L2 cache
  - CPU Game Math: 9.6B dot product/sec
- Custom ATI Graphics Processor
  - 10MB DRAM
  - 48-way parallel floating point
  - Unified shader architecture
  - 500 million triangles per sec
  - 16 gigasamples/sec
  - 48 billion shader operations/sec
  - Supports 16:9, 720p or 1080i – HD output
- 512 MB of 700MHz GDDR3 RAM – unified memory architecture
  - 22.4 GB/s interface bus bandwidth
  - 256 GB/s memory bandwith to EDRAM
  - 21.6 GB/s front-side bus
- Overall system floating-point: 1 teraflop
- Detachable and upgradeable 20GB harddrive
- 12x dual-layer DVD ROM

Playstation 3

- 52M sold
- 7 Cell processors 3.2 GHz each [originally spec = 9]
- Graphics: Nvidia RSX 550 Mhz GPU 1.8 TFlops
  - 100 billion shader ops/sec
  - 300 million transitors
  - 51 billion dot products/sec
  - Full HD – 1080p
- Total 2.18 TFlops
- 512MB RAM
  - split between CPU and graphics
  - 25.6GB/s
- 512KB L2 cache
- 7 AltiVec vector processing units
- Blu-ray DVD [25GB] makes it very expensive
  - $800-840 to produce – sold at $499-$599

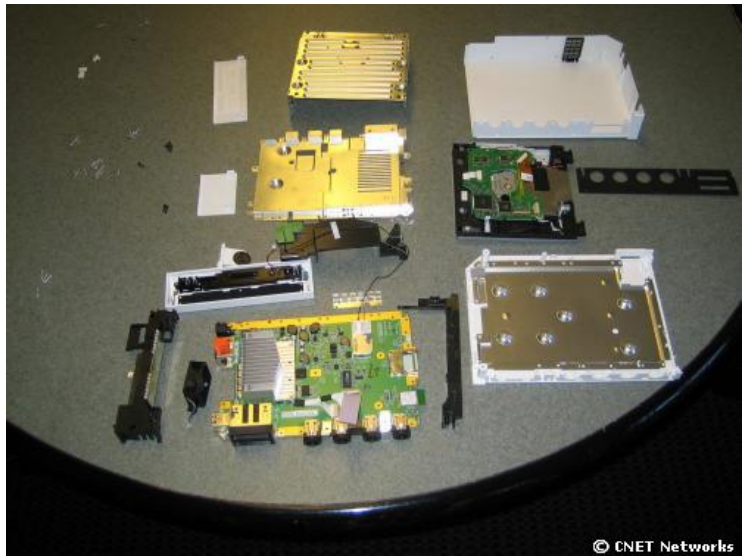
- Gabe Newell of Valve said "The PS3 is a total disaster on so many levels, I think it's really clear that Sony lost track of what customers and what developers wanted".

Nintendo Wii

Smallest Nintendo console to date:
729 Mhz PowerPC “Broadway”
64 MB GDDR3@700MHz
243 MHz ATI “Hollywood”

Wiimote controller
480p resolution
512MB internal flash memory

88M units sold.



PC Games All Time Best Sellers (2009)

1. The Sims (16 million) [100 million franchise total]
2. The Sims 2 (13 million)
3. World of Warcraft (11.5 million current customers)
4. Half-Life 2 (12 million)
5. StarCraft (11 million)
6. Half-Life (9 million)
7. Guild Wars (6.5 million)
8. Myst (6 million)
9. SimCity 3000 (5 million)
10. Riven (4.5 million)

Console Games All Time Best Sellers (2009)

1. Wii Sports (77 million)
2. Super Mario Bros. (NES – 40 million)
3. Tetris (Game Booy - 35 million)
4. Mario Kart Wii (Wii – 28 million)
5. Wii Sports Resort (Wii - 28 million)
6. Wii Play (Wii – 27 million)
7. New Super Mario Bros. (DS – 27 million)
8. Nintendogs (DS – 23 million)
9. Wii Fit (Wii – 23 million)
10. Pokémon Red, Blue and Green (Game Boy – 23 million)
11. Super Mario World (NES – 20 million)
12. Brain Age: Train Your Brain in Minutes a Day! (DS – 19 million)
13. Super Mario Bros. 3 (NES - 18 million)
14. Pokémon Diamond and Pearl (DS – 17 million)
15. Grand Theft Auto: San Andreas (PS 2 – 17 million)

Future?

Dominance of Causal Games
Iphone –

10 year life cycle for consoles?

Project Natal?