Computer Games

- Instructor - D.A. Forsyth
- Seminar -- this means
  - fewer formal lectures, discussion counts, grading informal
  - note-taking
- Grading
  - participation in discussion
  - homeworks, design exercises, project
- Wed, Fri, 11h00-12h15

Disavowals

- No-one's much of an expert
  - complicated phenomenon and complex industry
  - huge demands on technological breadth
- We don't necessarily approve of all
  - i.e. just because we look at grand theft auto doesn't mean you should drive over policemen
- One doesn't have to like games to think they're important
  - though it helps understand them

Who knows what?

- Who has played
  - Games on PC
  - Games on console
- Who is good at what kinds of games
- Graphics background
- HCI background
- Modelling background
- Design background
- Fiction/Authoring background

Major topics

-
- Graphics and modelling
  - Interaction
  - Physics, collision, etc
  - Rendering
  - Animation
- Game AI
  - Planning+scheduling
  - Strategy and tactics
- Authoring and design
- Interaction and interfaces
- Social Factors

Some Types of game

- Arcade games
  - Tank commander, defender, space invaders, pong, etc
- Shooters
  - FP: Doom, Turok, XIII, Quake, Red Faction, etc.
  - TP: Bloodrayne,
- Tactical/strategic games
  - Warcraft I-III, panzer general, Starcraft
- Role playing games
  - Adventure, Primal
- Toys (?)
  - Sims, Jurassic park,
- Cinematic games
  - Fatal frame, Silent Hill

Why do people play games?

- Discussion and exercise go here

History

- **1951 - Ralph Baer, an engineer with Loral, a company that develops and manufactures complex military airborne electronics, is instructed to "build the best TV set in the world." Baer suggests they add some kind of interactive game to the TV set to distinguish it from other companies' TVs, but management ignores the idea.**

- **1954 - Former US Korean War veteran David Rosen sees the popularity of mechanical coin-operated games on US military bases in Japan, so he starts Service Games to export these games to Japan. In the 1960s, Rosen decides to make his own coin-operated games, so he purchases a Tokyo jukebox and slot-machine company. The name SEGA, short for "SErvice GAmes," is stamped on the games that Rosen produces, and eventually Rosen adopts it as his company name.**

1961 - MIT Student creates Spacewar, the first interactive computer game on a mainframe computer. The unit took the entire floor space of a small house.

1976 - Apple Computers releases the Apple 1 computer: the first single-circuit board computer, with a video interface, 8K of RAM and a keypad.

1985 - Commodore-Amiga 1000, the first home multimedia PC with 3D color, sound and games, is introduced.

1989 - Sega Enterprises of Japan releases the Genesis in the U.S.

1971 - Magnavox begins developing the Odyssey, a TV plug-in device that plays the tennis game that becomes Pong.

1983 - Apple releases the "Lisa," the first personal computer to use a Graphical User Interface.

1961   **1971**   **1981**

1974 - Atari creates Home Pong launching the home video game industry.

1985 - Nintendo test markets the eight-bit Nintendo Entertainment System (NES) in New York.
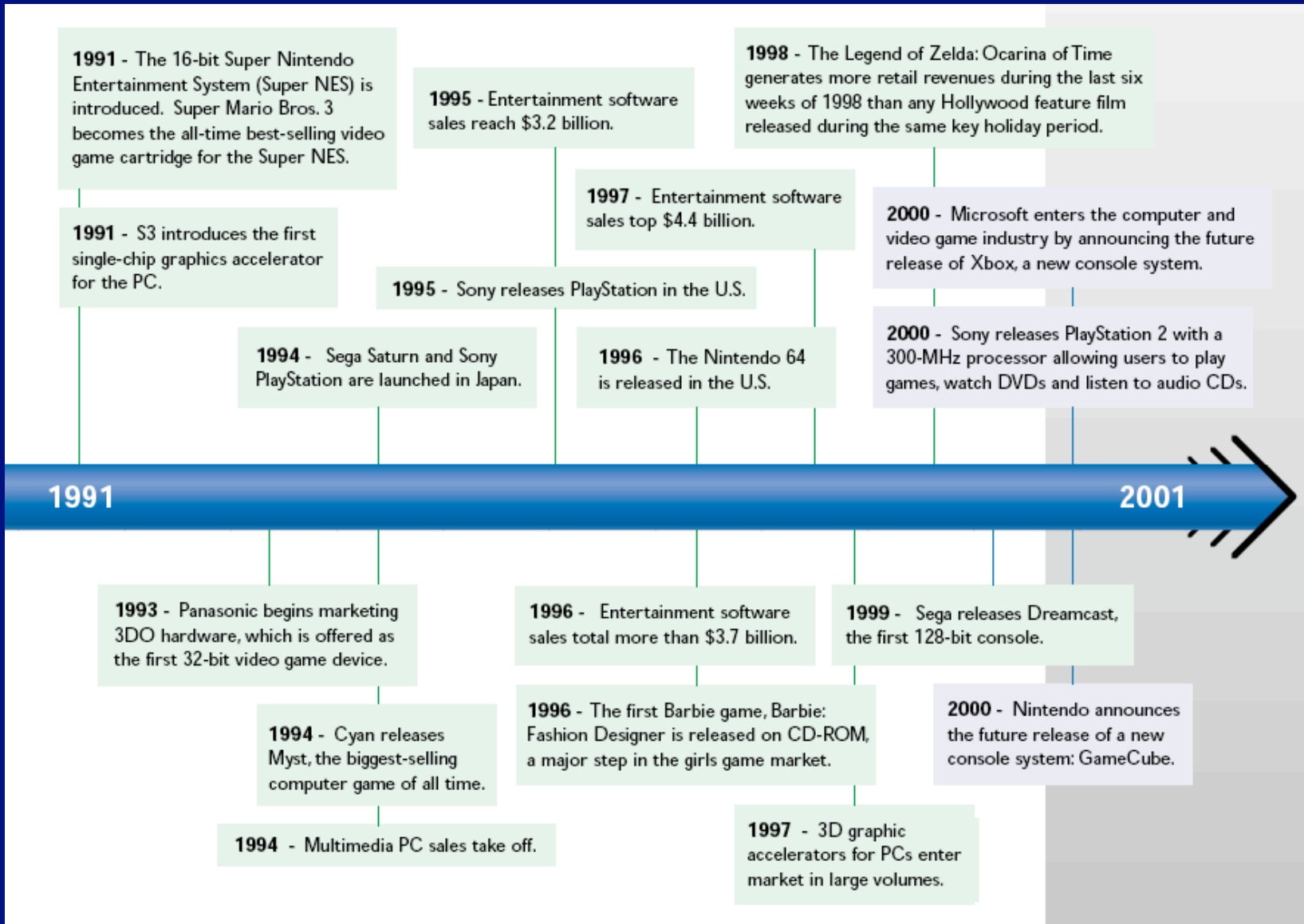
1966 - Sega Enterprises Ltd. Releases electronic shooting gallery game, Periscope, the first arcade game.

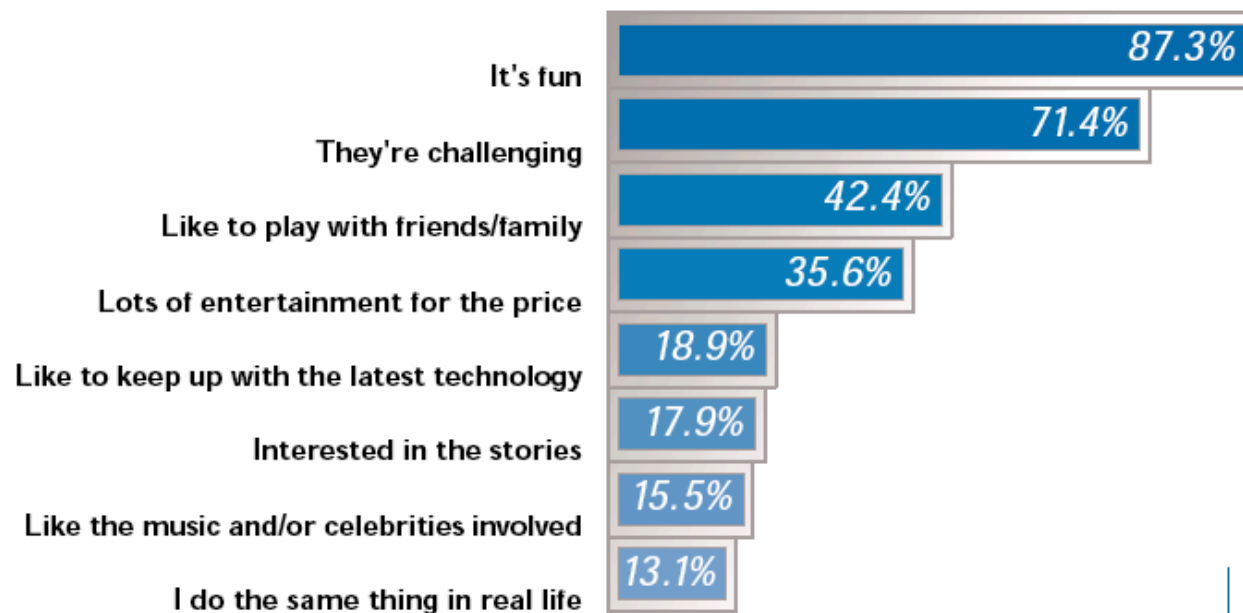**1981** - IBM introduces its personal computer, with Microsoft's 16-bit operating system, MS DOS 1.0.

1989 - Nintendo releases the Game Boy, the first portable, hand-held game system.

1990 - Microsoft introduces Windows 3.0 for the PC.

1991 - The 16-bit Super Nintendo Entertainment System (Super NES) is introduced. Super Mario Bros. 3 becomes the all-time best-selling video game cartridge for the Super NES.

1995 - Entertainment software sales reach $3.2 billion.

1998 - The Legend of Zelda: Ocarina of Time generates more retail revenues during the last six weeks of 1998 than any Hollywood feature film released during the same key holiday period.

1997 - Entertainment software sales top $4.4 billion.

2000 - Microsoft enters the computer and video game industry by announcing the future release of Xbox, a new console system.

1991 - S3 introduces the first single-chip graphics accelerator for the PC.

1995 - Sony releases PlayStation in the U.S.

1994 - Sega Saturn and Sony PlayStation are launched in Japan.

1996 - The Nintendo 64 is released in the U.S.

2000 - Sony releases PlayStation 2 with a 300-MHz processor allowing users to play games, watch DVDs and listen to audio CDs.

1991

2001

1993 - Panasonic begins marketing 3DO hardware, which is offered as the first 32-bit video game device.

1996 - Entertainment software sales total more than $3.7 billion.

1999 - Sega releases Dreamcast, the first 128-bit console.

1994 - Cyan releases Myst, the biggest-selling computer game of all time.

1996 - The first Barbie game, Barbie: Fashion Designer is released on CD-ROM, a major step in the girls game market.

2000 - Nintendo announces the future release of a new console system: GameCube.

1994 - Multimedia PC sales take off.

1997 - 3D graphic accelerators for PCs enter market in large volumes.

Why do people play games?

The three top reasons for playing games are because it's fun, they're challenging, and players like to play with friends and family.

Reason	Percentage
It's fun	87.3%
They're challenging	71.4%
Like to play with friends/family	42.4%
Lots of entertainment for the price	35.6%
Like to keep up with the latest technology	18.9%
Interested in the stories	17.9%
Like the music and/or celebrities involved	15.5%
I do the same thing in real life	13.1%

Why do people play games?

How long have most gamers been playing games?

The majority of most frequent game players have been playing for 6 years or more.

11-15 Years

16 or More Years

13%

17%

0 - 5 Years

44%

26%

6 -10 Years
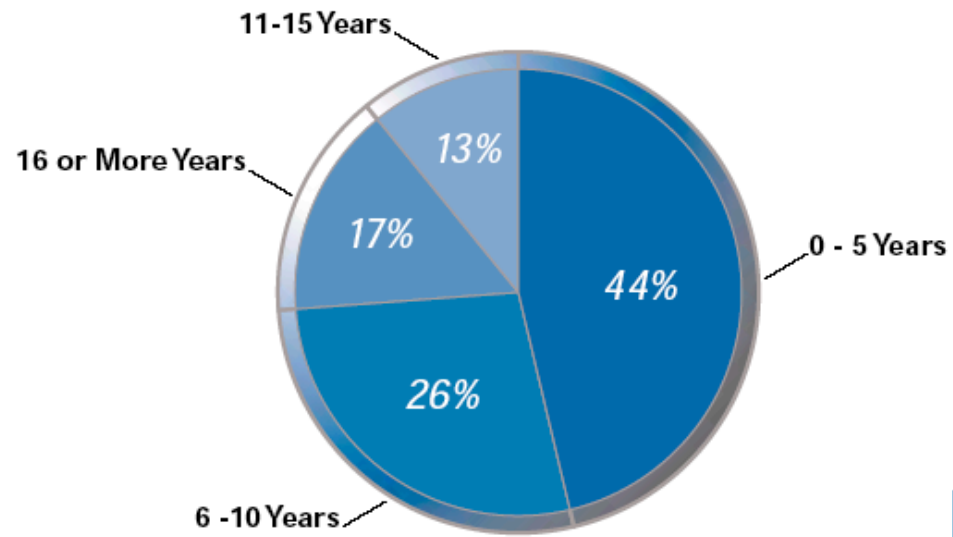
How long have most gamers been playing games?

Who's playing computer and video games?

People of all ages and both genders play games.

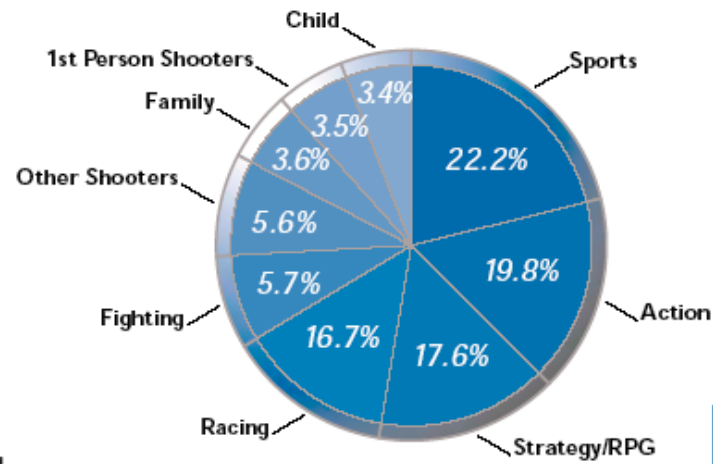Gender of most frequent PC game player
Female 38% / 62% Male

Gender of most frequent console gamer
Female 28% / 72% Male

Age of most frequent PC game player
18-35 yrs 26% / 36+ yrs 40% / Under 18 yrs 34%

Age of most frequent console game player
36+ yrs 19% / 18-35 yrs 36% / Under 18 yrs 45%
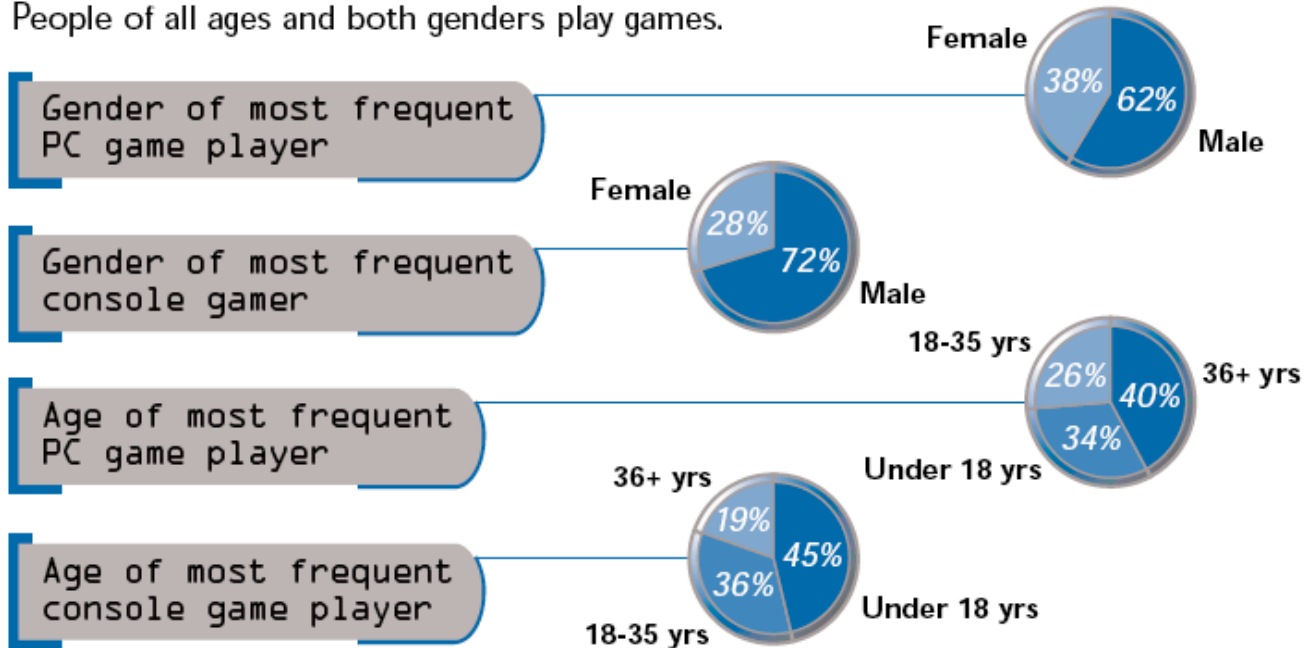
Who actually purchases games?

The vast majority of people who buy games are over 18, and both women and men purchase games.

Age of PC game buyers
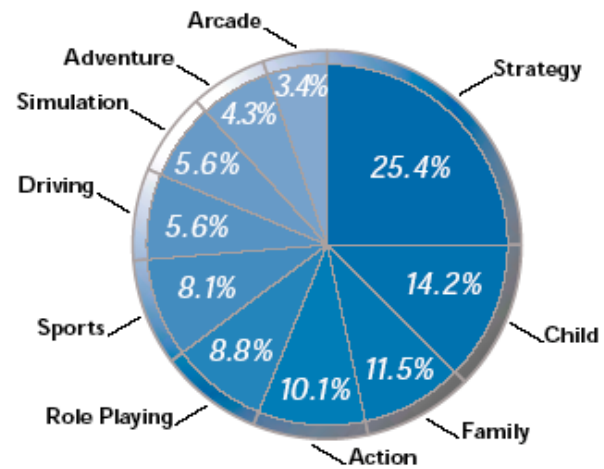
96% 18+ yrs

Age of console game buyers

18+ yrs 86%

Gender of most frequent PC game buyers

Male 45% 55% Female

Gender of most frequent console game buyers

Female 46% 54% Male
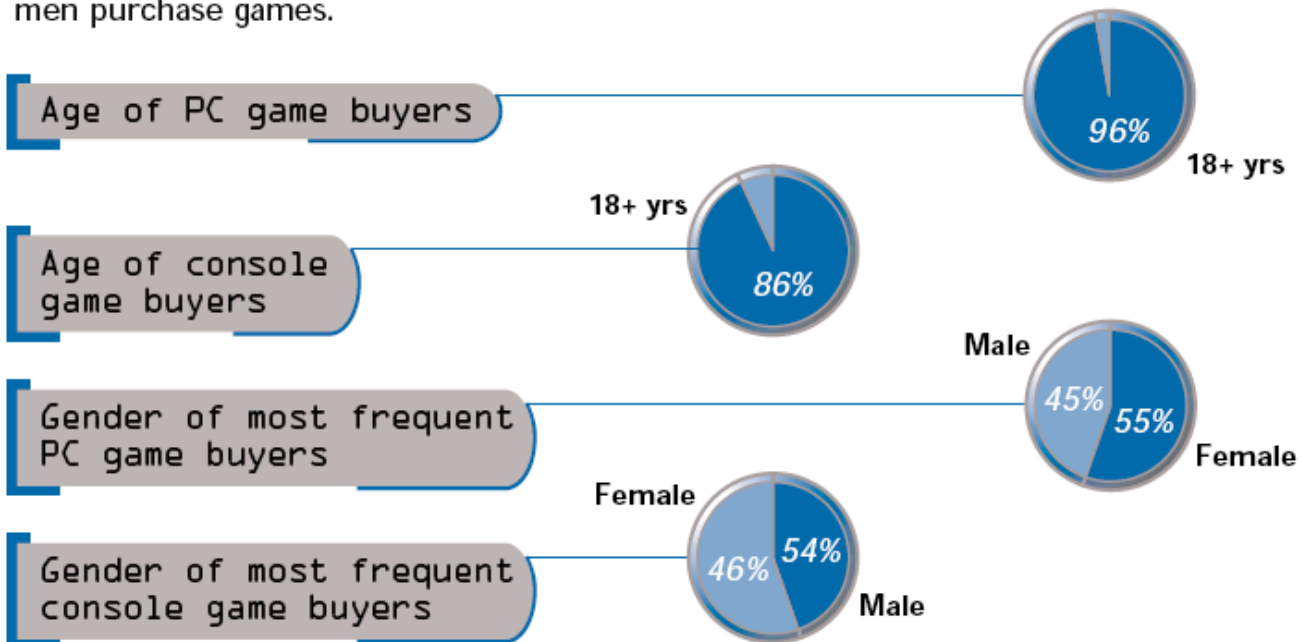
What were the best selling genres in 2001?

Child — 3.4%
1st Person Shooters — 3.5%
Family — 3.6%
Other Shooters — 5.6%
Fighting — 5.7%
Racing — 16.7%
Strategy/RPG — 17.6%
Action — 19.8%
Sports — 22.2%

Ranked by Units Sold

2001 video game sales by genre

Source: NPD FunWorld™

Arcade — 3.4%
Adventure — 4.3%
Simulation — 5.6%
Driving — 5.6%
Sports — 8.1%
Role Playing — 8.8%
Action — 10.1%
Family — 11.5%
Child — 14.2%
Strategy — 25.4%

Ranked by Units Sold

2001 computer game sales by genre

Source: NPD TechWorld™

What were 2001 computer and video game sales by ratings?

Early Childhood — 2.1%
Mature — 9.9%
Teen — 24.6%
Everyone — 62.3%
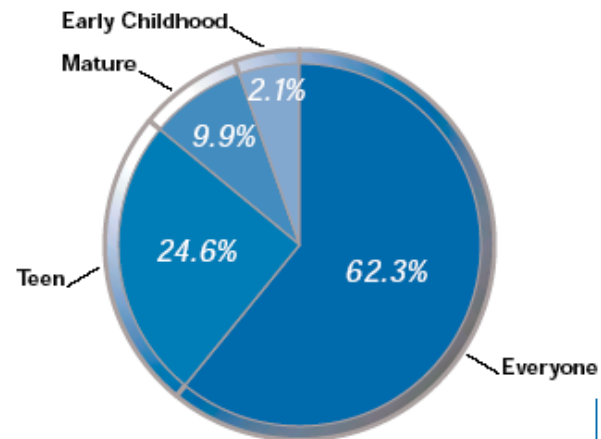
Ratings assigned by the Entertainment Software Rating Board

2001 computer & video game sales by rating

Source: NPD FunWorld™ and the IDSA
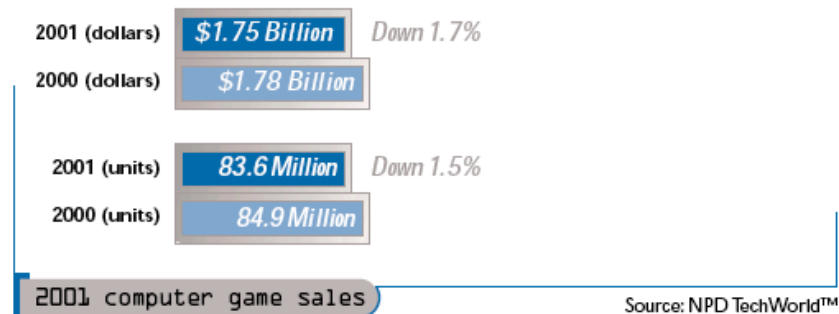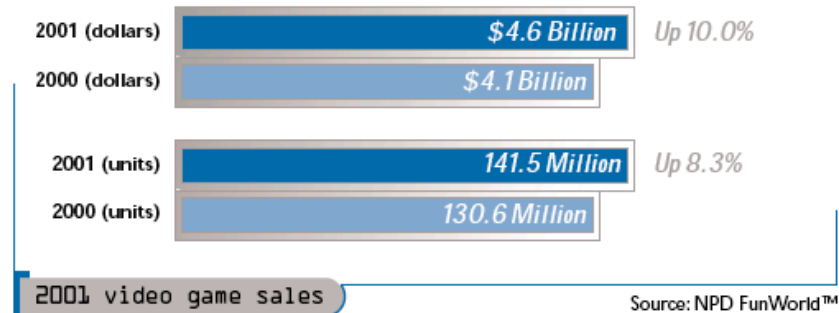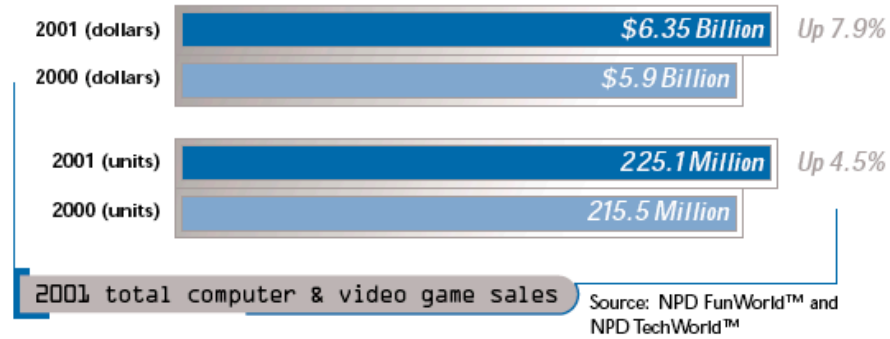
What were the top selling games in 2001?

Top 20 Best-Selling Video & Computer Game Titles — Ranked by Units Sold in 2001

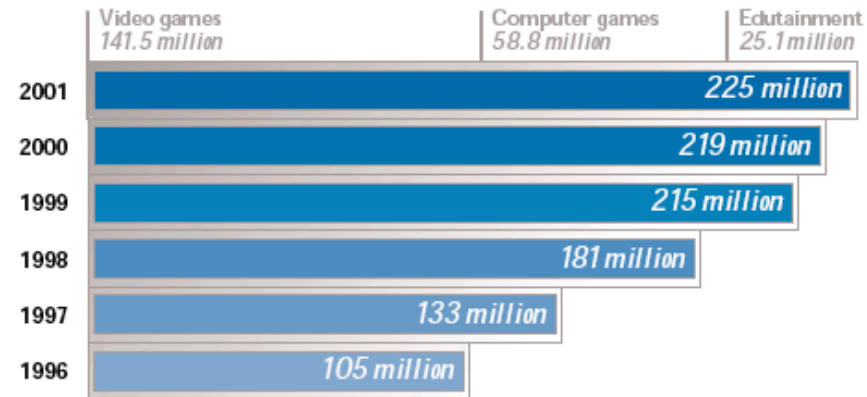| Rank	Title	Platform	Publisher	ESRB Rating
1	Grand Theft Auto 3	PS2	Take 2	M
2	Madden NFL002	PS2	EA	E
3	Pokemon Crystal	GBC	Nintendo	E
4	Metal Gear Solid 2	PS2	Konami	M
5	Gran Turismo 3: A Spec	PS2	Sony	E
6	Super Mario Advance	GBA	Nintendo	E
7	Tony Hawks Pro Skater 3	PS2	Activision	E
8	Tony Hawks Pro Skater 2	PSX	Activision	E
9	Pokemon Silver	GBC	Nintendo	E
10	Driver 2	PSX	Infogrames	T
11	Pokemon Gold	GBC	Nintendo	E
12	MP Roller Coaster Tycoon	PC	Infogrames	E
13	Pokemon Stadium 2	N64	Nintendo	E
14	Gran Turismo 2	PSX	Sony	E
15	Halo	XBX	Microsoft	M
16	H. Potter And The Sorcerer's Stone	PC	EA	E
17	H. Potter And The Sorcerer's Stone	PSX	EA	E
18	Final Fantasy X	PS2	Square EA	T
19	Mario Kart: Circuit	GBA	Nintendo	E
20	Tony Hawks Pro Skater 3	PSX	Activision	E

Source: NPD FunWorld™ and NPD TechWorld™

what's the bottom line?

How many computer and video games were sold in 2001, and how does that add up in terms of dollars?
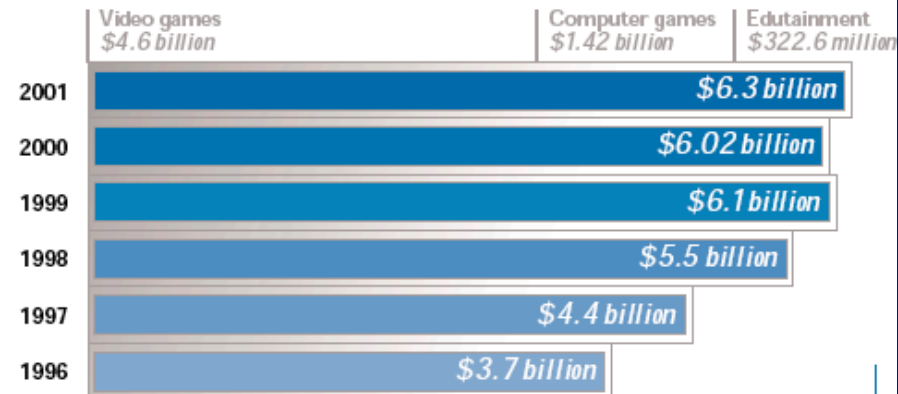
2001 (dollars)	$6.35 Billion	Up 7.9%
2000 (dollars)	$5.9 Billion	
2001 (units)	225.1 Million	Up 4.5%
2000 (units)	215.5 Million	

2001 total computer & video game sales

Source: NPD FunWorld™ and NPD TechWorld™

2001 (dollars)	$4.6 Billion	Up 10.0%
2000 (dollars)	$4.1 Billion	
2001 (units)	141.5 Million	Up 8.3%
2000 (units)	130.6 Million	

2001 video game sales

Source: NPD FunWorld™

2001 (dollars)	$1.75 Billion	Down 1.7%
2000 (dollars)	$1.78 Billion	
2001 (units)	83.6 Million	Down 1.5%
2000 (units)	84.9 Million	

2001 computer game sales

Source: NPD TechWorld™

How have industry sales grown in the past years?

	Video games 141.5 million	Computer games 58.8 million	Edutainment 25.1 million
2001	225 million		
2000	219 million		
1999	215 million		
1998	181 million		
1997	133 million		
1996	105 million		

Computer & video game unit sales growth

Source: NPD FunWorld™ and NPD TechWorld™

	Video games $4.6 billion	Computer games $1.42 billion	Edutainment $322.6 million
2001	$6.3 billion		
2000	$6.02 billion		
1999	$6.1 billion		
1998	$5.5 billion		
1997	$4.4 billion		
1996	$3.7 billion		

Computer & video game dollar sales growth

Source: NPD FunWorld™ and NPD TechWorld™

How significant is the overall demand for computer and video games in the U.S. economy? In 2000, its economic impacts, including direct and indirect economic effects, were:

- Employment for 219,600 people;
- Wages of $7.2 billion;
- Federal and state personal income tax revenues of $1.7 billion; and
- A $10.5 billion market for game software publishing, wholesaling, and retailing, as well as transporting, wholesaling, and retailing of some, but by no means all, complementary game hardware.

Demand for computer and video games directly affected the information, trade, and transportation sectors. In the information sector alone, which is where game software is produced, the economic impacts, including direct effects of demand for game software and the indirect effects of all industry spending initiated by the game software publishing industry, were:

- 124,500 jobs;
- $4.9 billion in wages;
- $1.2 billion in taxes; and
- A $9.3 billion market for game software publishing, wholesaling, and retailing.

	TITLE	PLATFORM	PUBLISHER	ESRB RATING
1.	Pokemon Silver	GBC	Nintendo	E
2.	Pokemon Gold	GBC	Nintendo	E
3.	Pokemon Stadium	N64	Nintendo	E
4.	Pokemon Yellow	GBOY	Nintendo	E
5.	Tony Hawks Pro Skater 2	PSX	Activision	E
6.	Legend of Zelda: Majora's Mask	N64	Nintendo	E
7.	Tony Hawks Pro Skater	PSX	Activision	T
8.	Gran Turismo 2	PSX	Sony	E
9.	Pokemon Blue	GBOY	Nintendo	E
10.	Pokemon Red	GBOY	Nintendo	E
11.	WWF Smackdown	PSX	THQ	T
12.	Tony Hawks Pro Skater	N64	Activision	E
13.	Pokemon Trading Card	GBC	Nintendo	E
14.	Super Mario Bros. Deluxe	GBC	Nintendo	E
15.	Madden NFL 2001	PSX	Electronic Arts	E
16.	Mario Party 2	N64	Nintendo	E
17.	Perfect Dark	N64	Nintendo	M
18.	WWF Smackdown 2	PSX	THQ	T
19.	Final Fantasy IX	PSX	Square EA	T
20.	WWF No Mercy	N64	THQ	T

Top 20 Best-Selling Computer Game Titles Ranked By Units Sold In 2000

	TITLE	PUBLISHER	ESRB RATING
1.	The Sims	Electronic Arts	T
2.	Who Wants to be a Millionaire	Disney Interactive	E
3.	Roller Coaster Tycoon	Hasbro Interactive	E
4.	Diablo 2	Blizzard	M
5.	Who Wants to be a Millionaire 2	Disney Interactive	E
6.	The Sims Livin Large	Electronic Arts	T
7.	Sim Theme Park World	Electronic Arts	E
8.	Age of Empires II	Microsoft	T
9.	Roller Coaster Tycoon: Loopy	Hasbro Interactive	E
10.	Roller Coaster Tycoon: Cork	Hasbro Interactive	E
11.	Slots	Masque Publishing	E
12.	Conquerors F/Age of Empires 2	Microsoft	T
13.	SimCity 3000	Electronic Arts	E
14.	C & C: Red Alert 2	Electronic Arts	T
15.	Sim Mania Pack	Electronic Arts	E
16.	Unreal Tournament	Infogames	M
17.	C & C: Tiberian Sun	Electronic Arts	T
18.	SimCity 3000 Unlimited	Electronic Arts	E
19.	Jumpstart Kindergarten 2	Knowledge Adventure	Not Specified

Turok questions

- Why do the bodies disappear?
- What is the blood for?
- Why is the structure so strongly constrained?

Warcraft questions

- Why is there no supply model?
- Why is there fog-of-war?
- Why is the opposing player so predictable?
- How does one build and tune so complex an interaction model to be "balanced"?

Fatal frame II

- Why are the protagonists young girls?
- Why does so little happen, yet it can be quite scary?

Jurassic Park

- Why is it so attractive?

Grand theft auto

- Why does the absurd motion not seem to matter?
- How are the issues of scale managed?
- How can the engine and world representation be so free in form?