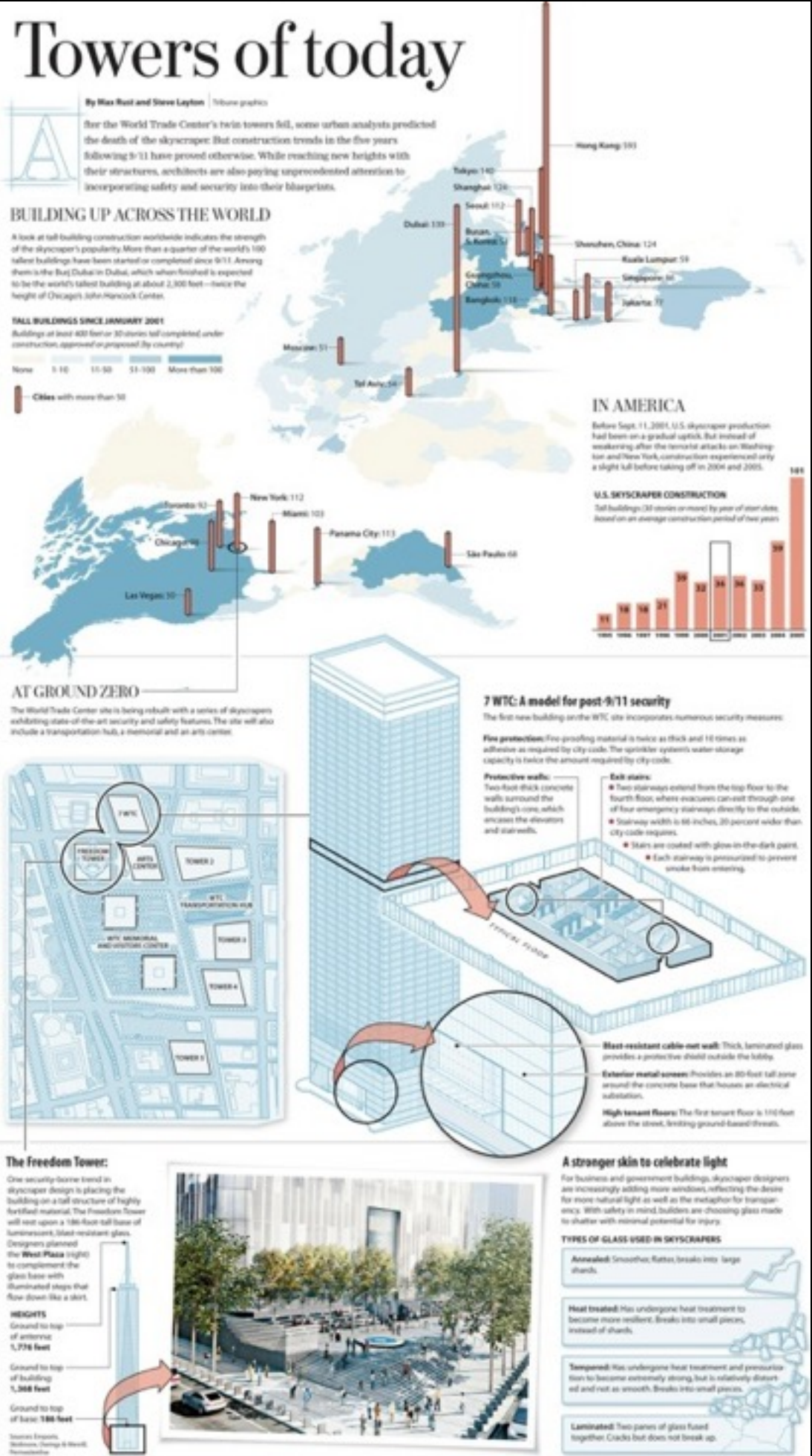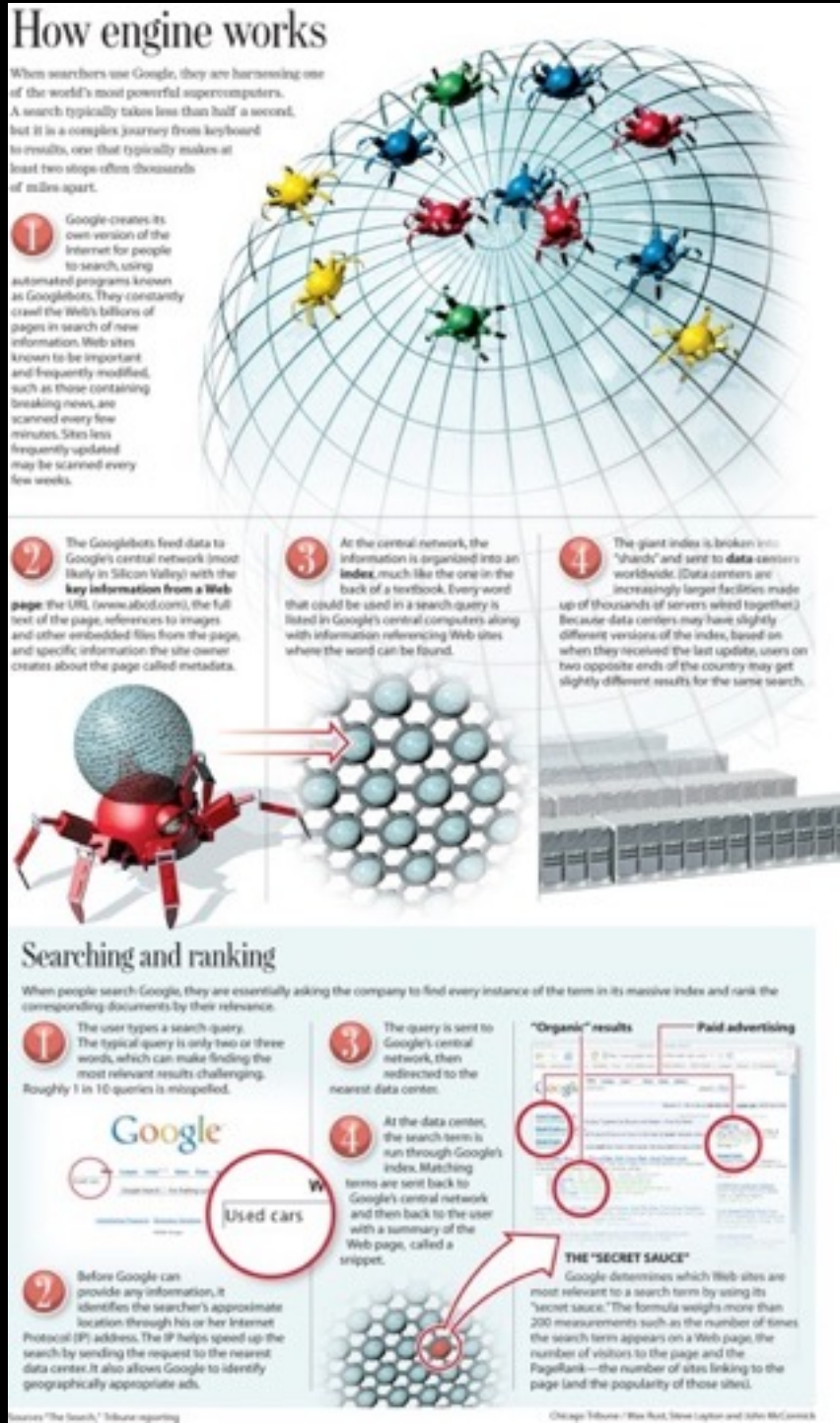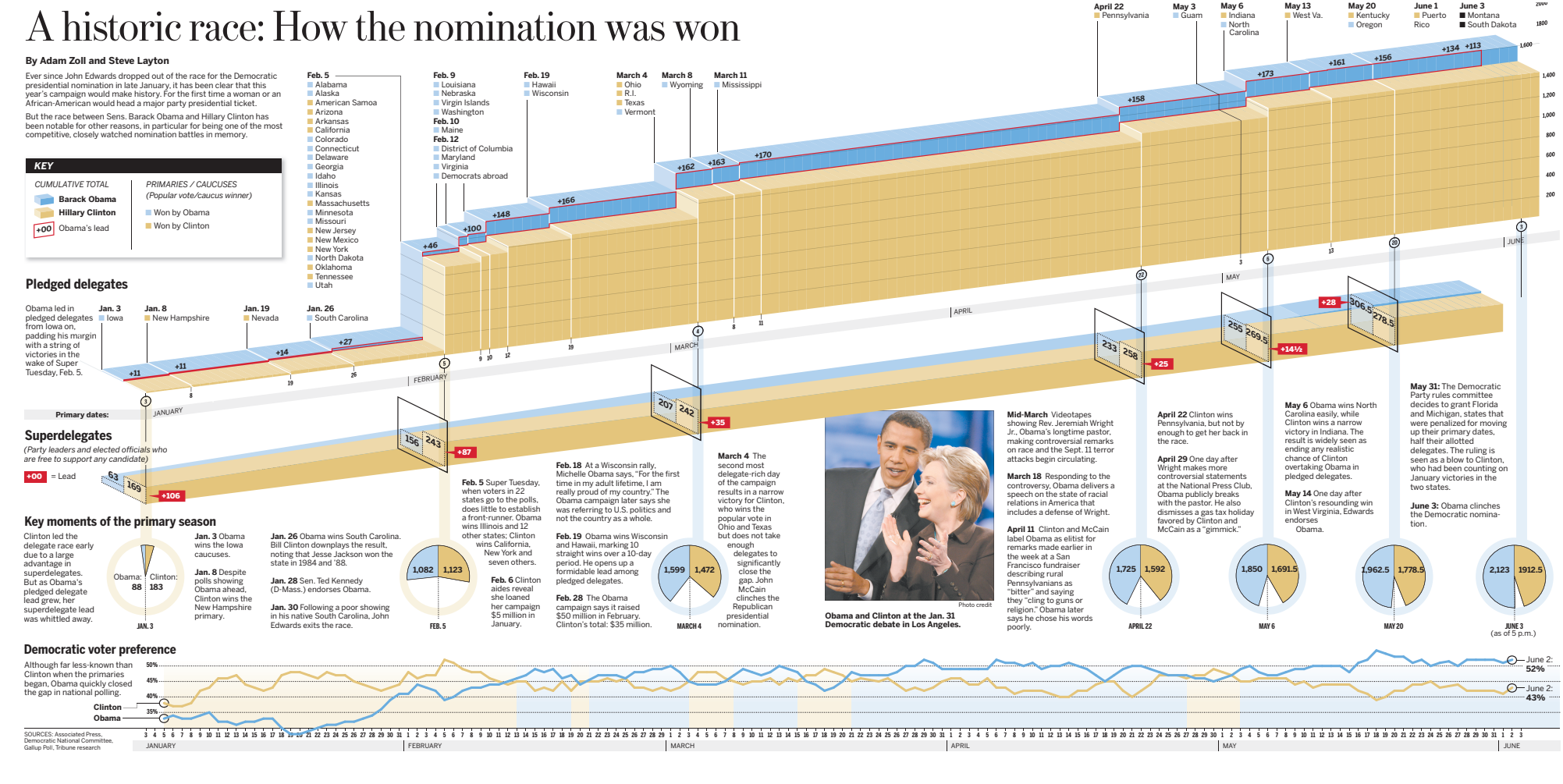# IDV460

INTERACTIVE DATA VIZ SPRING 16

INFOGRAPHICS 101

Infographics

There are many ways to define infographics — it basically boils down to any visual representation of information used to inform the viewer.
They can generally grouped into three large (and overlapping) categories: maps, charts and diagrams.

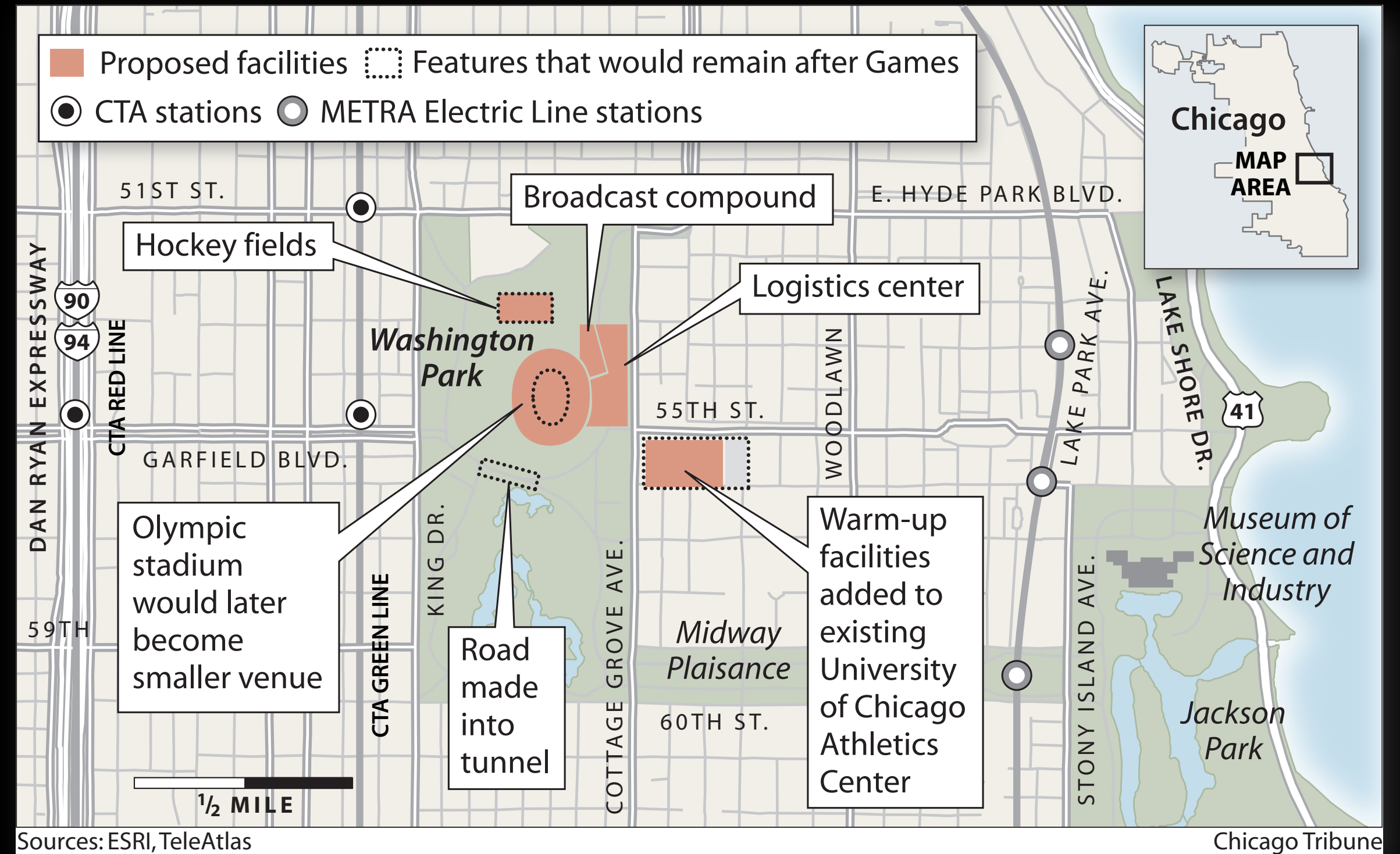# Maps

Locator maps are still important as infographics — after all, everything happens somewhere.

Smolensk
Site of crash

RUSSIA

Moscow

Minsk

Warsaw

BELARUS

POLAND

Kiev

UKR.

300 MILES

EUROPE

RUSSIA

MAP AREA

ASIA

Maps

And maps can still provide important information about geographic specifics, such as proposed facilities for a hypothetical Olympic effort.

Proposed facilities Features that would remain after Games
CTA stations METRA Electric Line stations

Chicago
MAP AREA

51ST ST.
E. HYDE PARK BLVD.
Broadcast compound
Hockey fields
Logistics center
DAN RYAN EXPRESSWAY
CTA RED LINE
Washington Park
LAKE PARK AVE.
LAKE SHORE DR.
55TH ST.
WOODLAWN
GARFIELD BLVD.
Olympic stadium would later become smaller venue
CTA GREEN LINE
KING DR.
Road made into tunnel
COTTAGE GROVE AVE.
Midway Plaisance
Warm-up facilities added to existing University of Chicago Athletics Center
Museum of Science and Industry
STONY ISLAND AVE.
59TH
60TH ST.
Jackson Park
½ MILE
Sources: ESRI, TeleAtlas
Chicago Tribune

Maps

But the advent of online services like Google maps and mobile apps have rendered the average map a little less useful as an infographic staple.
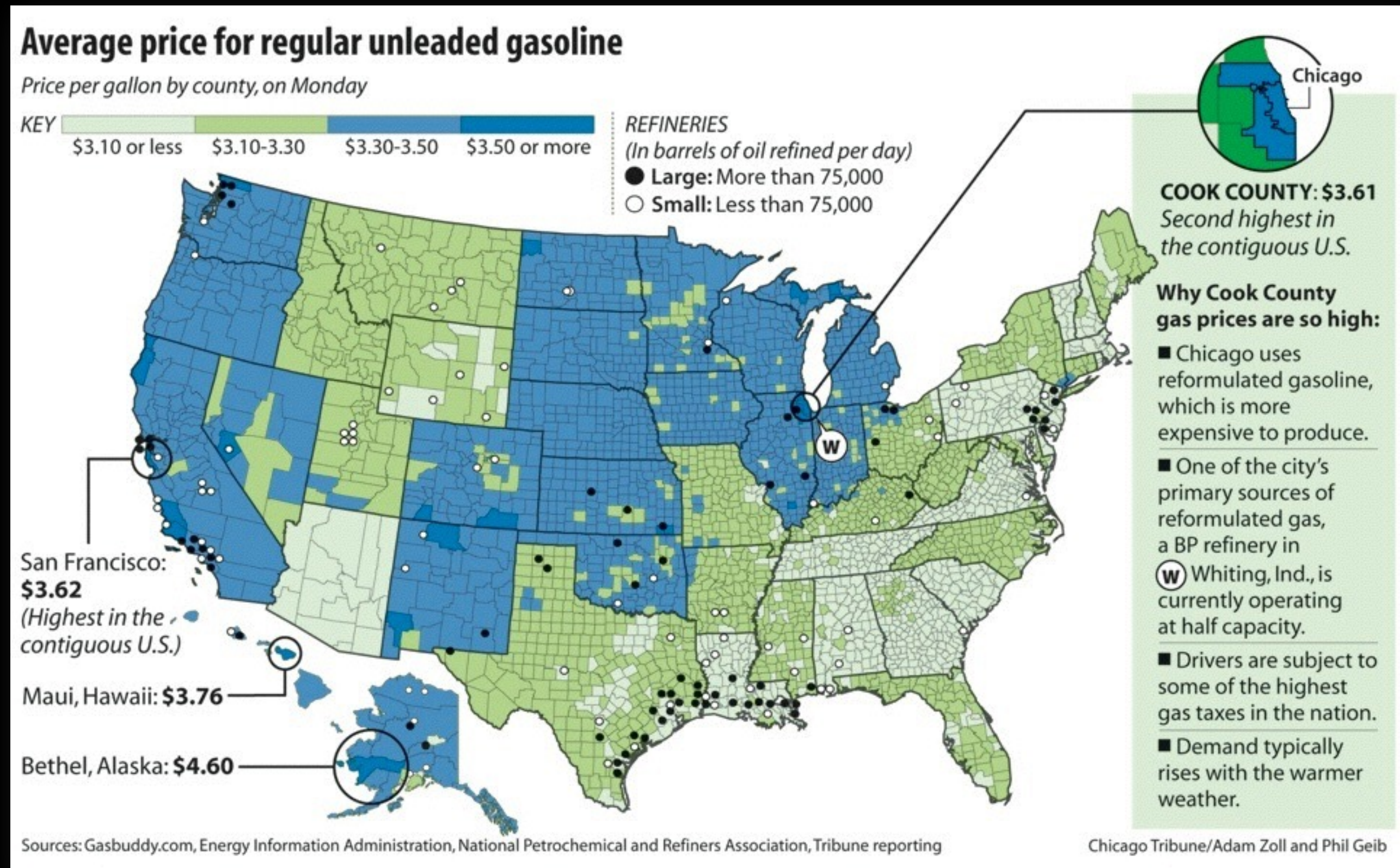
Maps

But the advent of online services like Google maps and mobile apps have rendered the average map a little less useful as an infographic staple.

Maps

Fortunately, maps can still become effective graphics by doing more than merely showing where things are.

Maps

Some maps are still created using a modern version of the transparency-on-screen tracing (by tracing over a scan). But high-end software can produce highly complex datamaps by "marrying" spreadsheet data to a shape file.
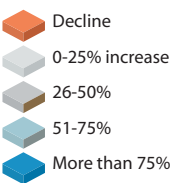
On the whole, Chicago prospered during the 1990s. Median incomes and home values soared in trendy neighborhoods surrounding the Loop, but poverty remained entrenched in many South and West Side neighborhoods with large minority populations.

CHICAGO NEIGHBORHOODS

NEIGHBORHOOD	HOUSEHOLD INCOME 1999	% CHG.	HOME VALUE 1999	% CHG.	POVERTY RATE 1999	CHG.	B.A. DEGREE % in 2000	CHG.
1 Albany Park	40,711	10.8	171,741	22.7	17.7	0.2	19.0	1.4
2 Archer Heights	39,431	-7.7	128,036	26.4	6.4	2.1	8.2	-0.6
3 Armour Square	22,756	25.0	144,135	9.1	31.1	-4.9	16.7	3.8
4 Ashburn	53,633	1.6	116,625	6.7	6.9	2.7	19.0	6.6
5 Auburn Gresham	34,238	-7.7	90,454	4.6	20.6	2.4	10.4	2.3
6 Austin	33,663	0.4	109,937	19.0	24.1	-1.6	8.7	0.6
7 Avalon Park	44,344	-4.9	96,151	8.6	8.4	-5.1	21.7	1.6
8 Avondale	36,677	1.9	151,021	38.2	17.4	0.0	12.4	-0.7
9 Belmont Cragin	43,159	7.1	147,258	18.6	11.2	2.8	9.9	-0.1
10 Beverly	66,823	1.4	176,331	26.7	4.0	0.4	49.8	5.6
11 Bridgeport	35,535	5.3	138,731	49.2	18.1	3.5	16.9	6.4
12 Brighton Park	36,245	4.3	108,381	40.6	17.3	4.7	6.9	-0.7
13 Burnside	34,790	-0.5	78,900	6.7	29.1	7.6	12.1	4.2
14 Calumet Hts.	46,326	-10.1	104,659	6.0	11.9	4.1	26.2	4.8
15 Chatham	32,341	0.0	99,049	8.4	17.7	2.9	19.0	3.0
16 Chicago Lawn	35,983	3.7	91,411	13.8	19.8	1.5	9.4	-0.8
17 Clearing	45,533	0.2	132,280	16.3	6.9	2.5	11.3	2.9
18 Douglas	24,835	41.9	208,449	36.9	41.2	-8.2	25.5	4.1
19 Dunning	49,367	3.2	163,822	11.8	5.2	0.7	16.7	4.2
20 E. Garfield Park	24,216	48.8	98,699	84.5	35.2	-12.9	7.7	2.8
21 East Side	39,724	6.8	90,758	15.0	12.4	-0.6	7.1	1.2
22 Edgewater	35,766	6.0	243,594	45.9	17.1	0.2	41.9	6.7
23 Edison Park	57,083	3.3	210,983	14.3	2.4	0.3	30.2	10.4
24 Englewood	18,955	6.2	63,889	12.1	43.8	0.6	5.2	1.1
25 Forest Glen	68,269	-1.1	266,688	15.6	2.6	1.3	43.2	5.0
26 Fuller Park	18,412	64.5	65,536	15.0	34.6	-14.6	5.9	1.6
27 Gage Park	36,463	-9.1	97,790	23.0	19.0	7.6	5.8	-0.1
28 Garfield Ridge	45,436	2.6	135,222	21.4	10.1	0.6	11.4	3.0
29 Grand Blvd.	14,178	47.3	179,849	168.6	46.9	-17.8	9.9	4.5
30 Gtr. Grand Crssng	27,916	11.8	83,847	8.8	28.5	-0.5	12.4	1.9
31 Hegewisch	43,665	3.5	95,251	8.3	10.6	2.9	10.8	4.6
32 Hermosa	38,159	5.9	132,002	18.6	16.7	0.7	8.1	-0.2
33 Humboldt Park	28,728	6.4	95,270	32.7	31.1	-2.7	5.3	1.4
34 Hyde Park	35,991	-3.5	271,020	-7.9	16.5	-1.7	65.0	1.8
35 Irving Park	42,037	8.3	174,816	29.6	11.3	1.1	22.4	4.0
36 Jefferson Park	49,640	4.0	182,209	16.6	4.9	1.1	22.1	5.7
37 Kenwood	36,612	19.2	297,354	64.1	24.0	-2.6	44.7	6.5
38 Lakeview	53,881	25.5	392,967	51.7	8.7	-1.9	70.8	17.7
39 Lincoln Park	68,613	24.2	518,063	18.7	8.6	-1.4	78.0	9.8
40 Lincoln Square	40,898	15.2	217,098	38.2	11.4	-1.8	38.1	14.2
41 Logan Square	36,245	19.1	176,024	79.7	19.8	-6.6	4.0	11.6
42 Loop	65,128	0.0	202,476	-22.7	11.9	1.8	64.4	8.0
43 Lower West Side	27,763	2.2	109,264	83.1	27.0	-0.8	9.3	4.0
44 McKinley Park	36,010	0.4	97,339	35.8	13.1	2.2	9.6	2.6
45 Montclare	46,636	4.5	156,963	16.0	5.6	0.1	14.9	3.5
46 Morgan Park	53,133	8.6	119,827	19.4	11.5	0.3	27.2	5.3
47 Mt. Greenwood	57,493	6.1	134,423	21.4	3.9	-0.3	20.9	4.9
48 Near North Side	57,811	10.9	625,692	-8.3	15.2	-4.8	67.4	9.3
49 Near South Side	34,329	274.5	335,101	-14.7	32.3	-30.2	42.5	32.8
50 Near West Side	29,588	135.2	204,411	24.5	37.5	-17.0	38.3	17.6
51 New City	25,647	-3.1	81,706	44.7	34.5	0.4	6.1	2.3
52 North Center	51,758	32.7	293,678	106.8	8.6	-3.6	48.1	24.8
53 North Lawndale	18,342	8.3	81,473	38.1	45.2	-3.1	7.0	2.9
54 North Park	49,208	4.4	199,301	9.5	10.5	3.1	37.5	4.7
55 Norwood Park	53,402	1.0	195,574	11.0	4.3	2.0	24.7	5.9
56 Oakland	10,739	57.3	165,186	145.2	52.5	-19.8	9.5	5.0
57 O'Hare	43,542	-9.2	228,265	-1.0	8.0	2.9	29.3	4.9
58 Portage Park	45,117	4.0	163,899	15.9	8.0	2.4	18.5	4.3
59 Pullman	30,966	-9.6	82,881	11.2	22.4	3.7	11.6	-0.9
60 Riverdale	13,178	52.8	54,601	-11.9	56.3	-6.6	2.7	-1.9
61 Rogers Park	31,602	-1.9	180,569	23.6	21.3	1.8	32.0	-1.6
62 Roseland	38,237	-0.8	89,084	6.7	17.6	-1.2	14.0	1.4
63 South Chicago	28,227	-8.1	85,045	5.6	29.7	4.6	12.5	2.8
64 South Deering	34,789	-9.5	75,629	8.4	19.6	1.2	10.4	1.4
65 S. Lawndale	32,320	7.8	105,201	59.7	26.5	2.5	4.7	1.4
66 South Shore	27,748	2.5	105,537	17.6	27.1	-0.2	18.2	2.2
67 Uptown	32,328	21.7	270,300	45.6	24.9	-6.4	39.5	11.5
68 Washington Hts.	43,201	-5.8	91,067	3.4	12.4	0.8	16.4	3.9
69 Washington Pk.	15,160	33.9	86,217	42.2	51.6	-6.8	5.9	2.3
70 West Elsdon	45,310	8.8	126,748	20.5	6.9	1.5	9.1	0.8
71 W. Englewood	26,693	-10.4	69,558	12.5	32.1	1.5	4.8	-0.5
72 W. Garfield Pk.	23,121	13.6	87,676	35.9	35.9	4.9	5.0	1.8
73 West Lawn	47,017	0.0	119,816	13.7	7.4	2.2	11.4	2.4
74 West Pullman	40,478	-5.2	82,281	0.8	22.0	2.7	10.3	1.5
75 West Ridge	41,144	-2.8	189,474	10.1	14.3	1.6	35.6	5.1
76 West Town	38,915	50.2	271,194	175.8	20.7	-11.2	34.7	22.9
77 Woodlawn	18,266	-0.9	84,160	17.2	39.4	2.4	12.7	3.4
CHICAGO	38,625	9.0	132,400	26.6	19.6	-2.0	25.5	6.0
ILLINOIS	46,590	7.2	130,800	20.9	10.7	-1.2	26.1	5.1
U.S.	41,994	7.7	119,600	13.4	12.4	-0.7	24.4	4.1

CHANGE IN MEDIAN HOME VALUE, 1989-99

Decline | 0-15% increase | 16-30% | 31-45% | More than 45%

West Town: +176%
Near North Side: $625,692 (1999)
Loop: -23%
Riverdale: $54,601 (1999)

CHANGE IN POVERTY RATE*, 1989-99

More than 3 point increase | 0-3 point increase | 0.1-3 decrease | 3.1-6 decrease | More than 6 point decrease

Edison Park: 2.4% (1999 rate)
Gage Park: 8 point increase
Near South Side: 30 point decrease
Riverdale: 56.3% (1999 rate)
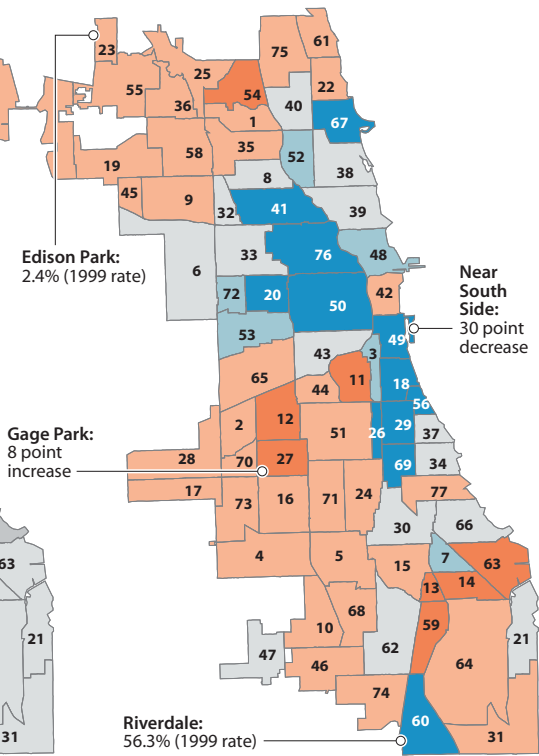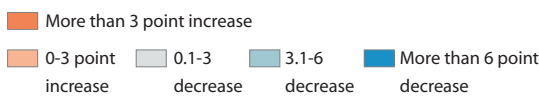
CHANGE IN PERCENT WITH B.A. DEGREE, 1990-2000

Decline | 0-4 point increase | 4.1-8 | 8.1-12 | More than 12 point increase

Lincoln Park: 78% have bachelor's
Near South Side: 33 point increase
Riverdale: 2 point decrease, 3% have bachelor's

Biggest increase in income: up 2,025% to $155,562 (in Near West Side bounded by Kinzie, Leavit, Washington and Western)

Near West Side thrives

The Near West Side felt the effects of gentrification during the 1990s, as the community's median income jumped 135 percent and its median home value rose 25 percent.

MEDIAN HOUSEHOLD INCOME
By census block groups

No population | Less than $20,000 | $20,001-40,000 | More than $40,000

1989   1999

KINZIE | 17TH ST. | PENN ST. | Chicago River

CHANGE IN MEDIAN HOUSEHOLD INCOME, 1989-99
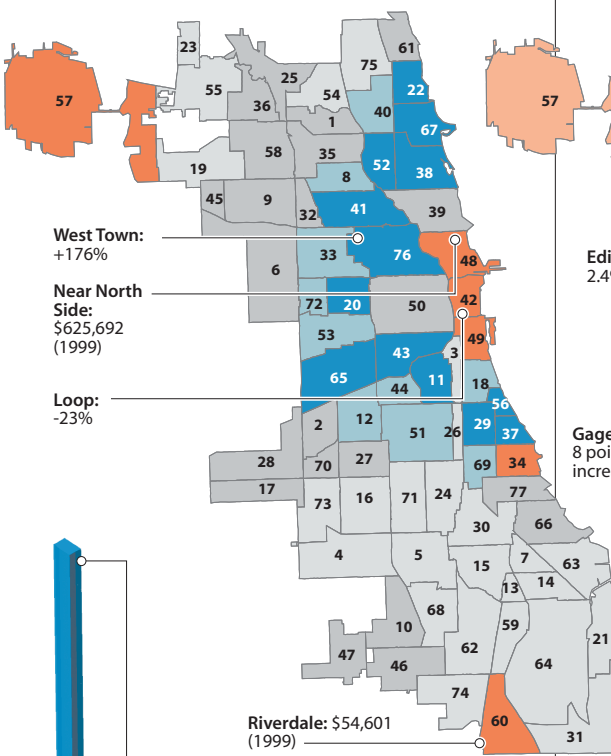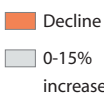By census block groups

Decline | 0-25% increase | 26-50% | 51-75% | More than 75%

Biggest decrease in income: -77% to $9,000 (in North Lawdale bounded by Roosevelt, Pulaski, Fillmore and Independence)

Not part of city | IRVING PARK RD. | W. BELMONT | NORTH AVE. | W. 65TH ST. | W. 87TH ST. | E. 138TH ST.

*The U.S. Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is poor. In 2000, a family of four with two children would be considered poor if its income before taxes was less than $17,463.

Note: All 1989 numbers adjusted to 1999 dollars. Data on people with bachelor's degree or higher is based on the population 25 and over.

Source: U.S. Census Bureau, Northeastern Illinois Planning Commission

Chicago Tribune/David Constantine and Chris Soprych

Maps

And of course, maps can still make for powerful and compelling visuals.

Maps

Maps can also be re-imagined in inventive ways. In these examples, maps are distorted so their shapes represent data. These are called "cartograms."
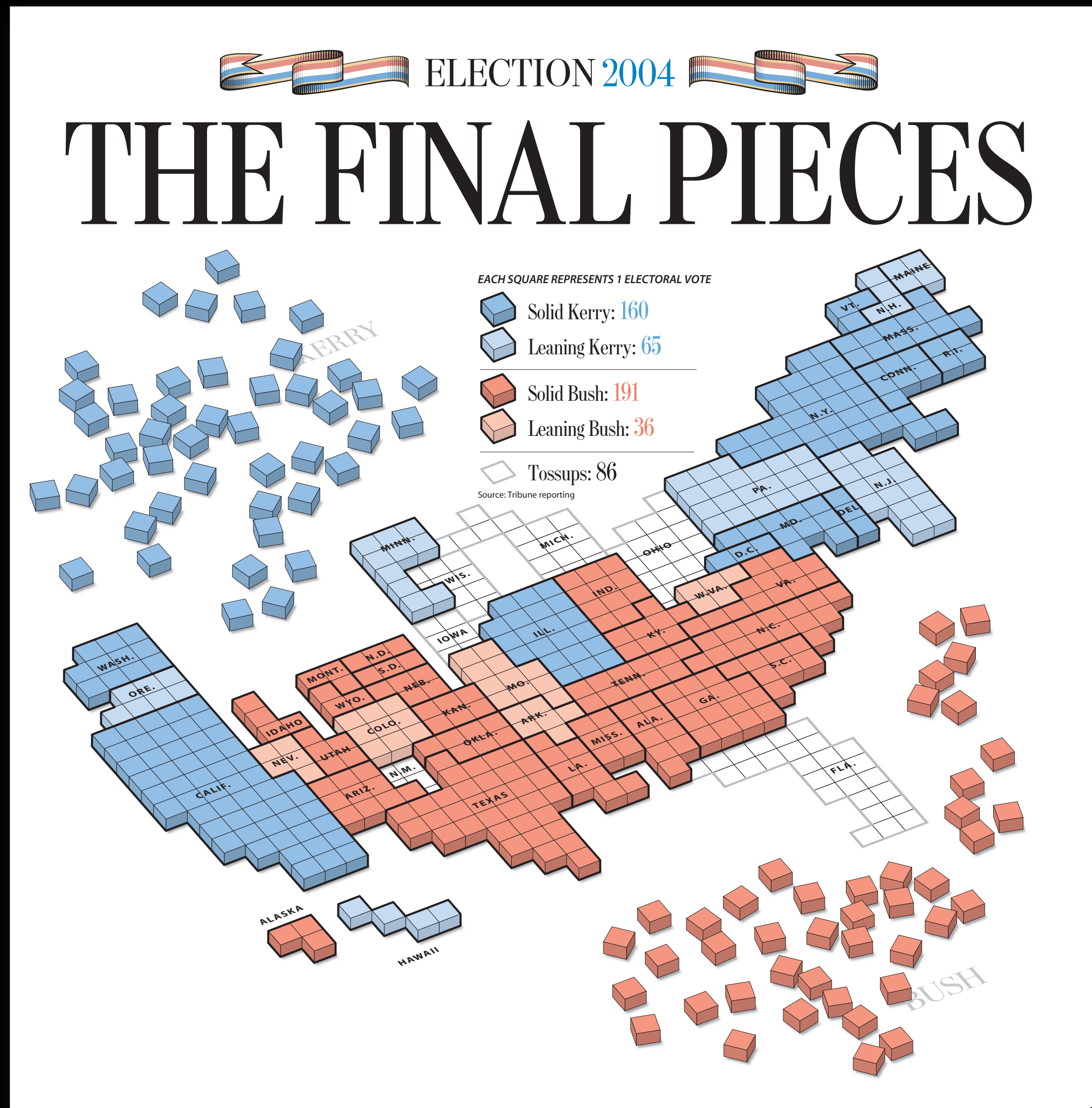
ELECTION 2004

THE FINAL PIECES

EACH SQUARE REPRESENTS 1 ELECTORAL VOTE

Solid Kerry: 160
Leaning Kerry: 65

Solid Bush: 191
Leaning Bush: 36

Tossups: 86

Source: Tribune reporting

Diagrams

Diagrams can be vitally important to stories. They let the reader know where, when and how something happened, explain complex processes, and take readers into places they otherwise wouldn't be able to go.
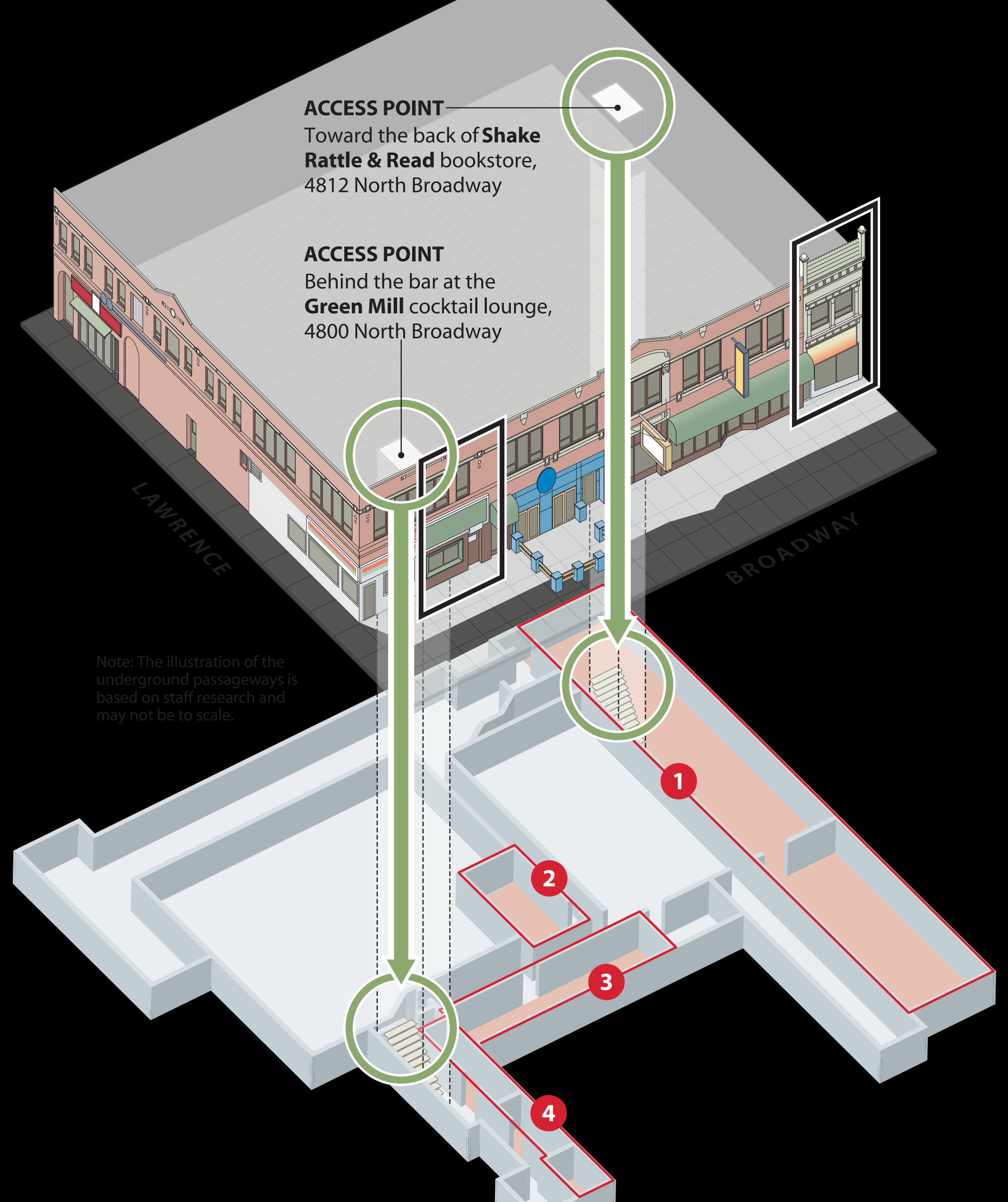
ACCESS POINT
Toward the back of **Shake Rattle & Read** bookstore, 4812 North Broadway

ACCESS POINT
Behind the bar at the **Green Mill** cocktail lounge, 4800 North Broadway

Note: The illustration of the underground passageways is based on staff research and may not be to scale.

LAWRENCE

BROADWAY

1

2

3

4

Diagrams

Diagrams can be vitally important to stories. They let the reader know where, when and how something happened, explain complex processes, and take readers into places they otherwise wouldn't be able to go.

Oil sands processes exact environmental toll

There are two primary methods of getting at oil sands: strip mining and in situ, or "in place," methods. The former requires laying bare large patches of earth, while the latter requires large quantities of water and a fuel supply such as natural gas to produce steam.

STRIP MINING

1 The top layer of soil is stripped away, followed by a layer of rocky clay beneath it, exposing the oil sands.

2 Mechanical shovels scoop up to 100 tons of oil sands at a time and deposit them into giant dump trucks that hold up to 400 tons.

3 The trucks carry the oil sands to facilities that crush them and extract bitumen, a thick form of crude oil.

IN SITU PROCESS

1 Two wells are drilled into the ground about 5 feet apart.

2 Steam is injected into the top well, heating and softening the bitumen in the oil sands and allowing it to flow into the lower well.

3 The bitumen is pumped to the surface and collected.

Sources: Syncrude, Oil Sands Discovery Center

Note: Another conventional hydrocarbon, **oil shale**, is plentiful in the Western U.S. but is very expensive to process, requires large amounts of water and faces prohibitive clean-air regulations.
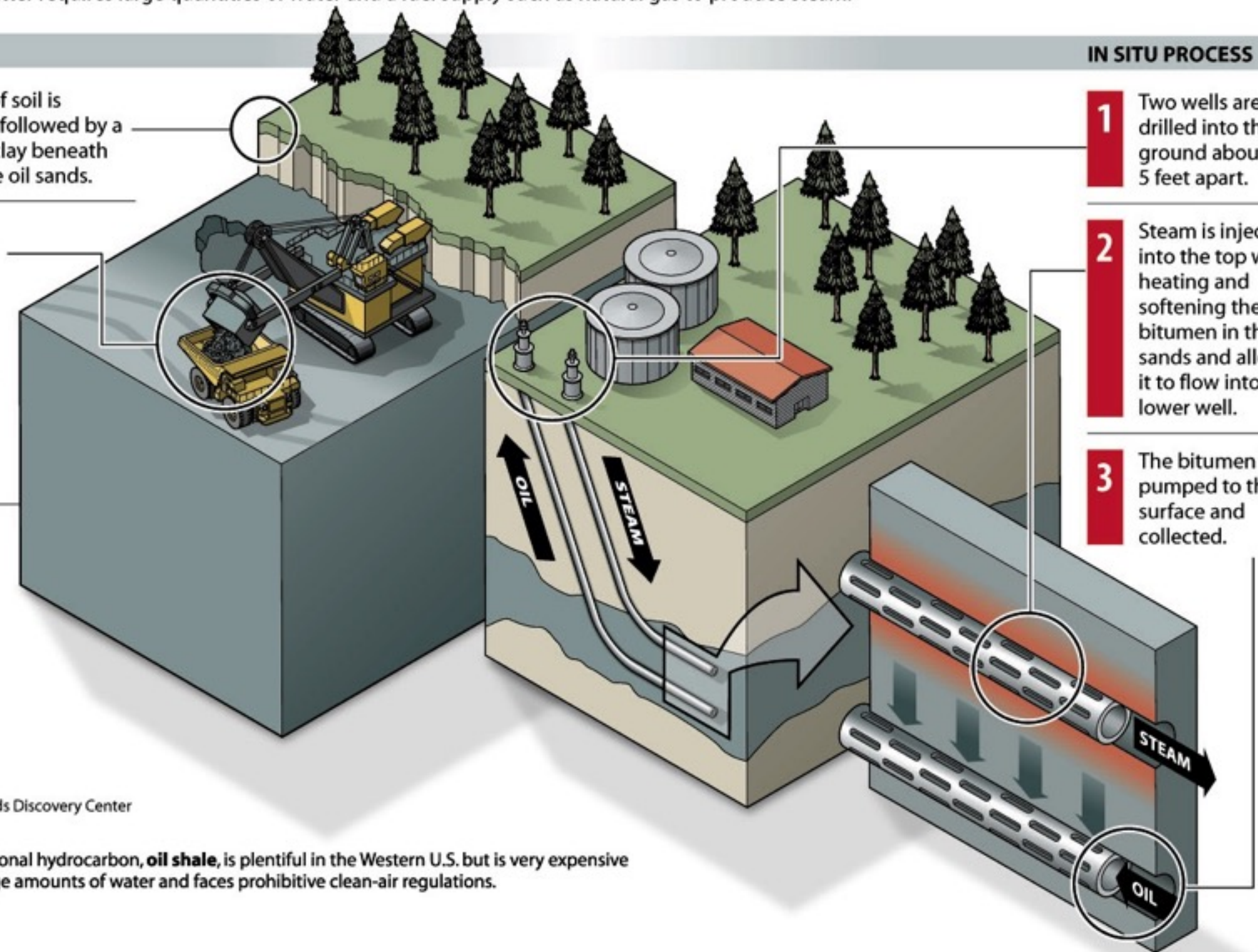
Diagrams

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Unleashing the atom

When Albert Einstein unveiled his theory of relativity in 1905, he set in motion mankind's ability to understand and exploit the power of the atom. In the decades that followed, scientists developed impressive applications for this power, from the promise of nuclear energy to the terrifying devastation of nuclear weapons.

How nuclear fission works

The entire process happens almost instantaneously.

Neutron

U-235 nucleus

Energy

1 A neutron is slammed into an atom's nucleus.

2 The impact splits the nucleus in two and releases at least two neutrons and energy.

3 The newly freed neutrons collide with other nuclei, splitting them the same way. The cycle produces a chain reaction, releasing exponentially larger quantities of energy.

Why uranium?

Uranium	92
U	
238.03	

Uranium, a silvery-white radioactive metal, is used in nuclear fission because one of its isotopes, known as U-235, is conducive to splitting in order to release energy.

U-235 This rare, volatile form of the element is the energy source behind nuclear power reactors

U-238 This more benign, and much more common, form is typically

Low-enriched uranium: Contains less than 20 percent U-235, with the rest U-238.
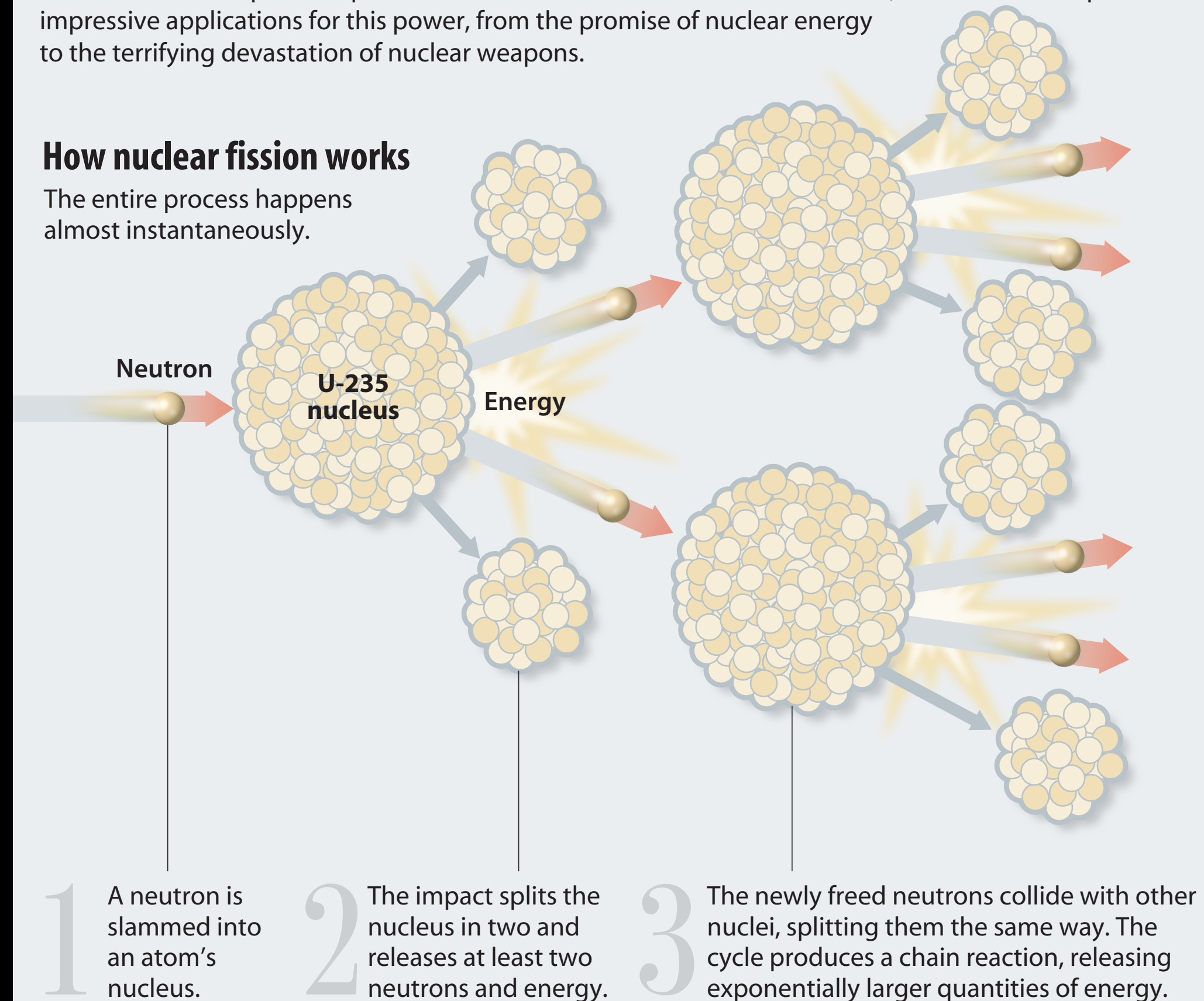
High-enriched uranium:

Diagrams

Diagrams can be vitally important to stories. They let the reader know where, when and how something happened, explain complex processes, and take readers into places they otherwise wouldn't be able to go.

Applications of nuclear fission

▶ NUCLEAR POWER

Fuel used:
Low-enriched uranium
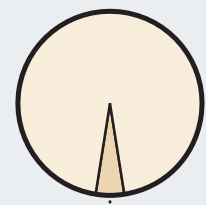
Up to 5% U-235

How it works: A controlled nuclear chain reaction provides heat that converts water into steam. The steam drives a generator, producing electricity. One key by-product of the uranium fission process is plutonium, which can be used in nuclear weapons.

▶ NUCLEAR RESEARCH

Fuel used:
Some reactors use high-enriched uranium
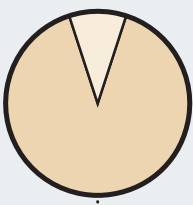
More than 90% U-235

(Others use low-enriched uranium)

How it works: A controlled nuclear chain reaction produces neutrons used for research. Sample uses:
● **Medicine:** Production of isotopes for nuclear medicine
● **Agriculture:** Developing methods of food irradiation and soil analysis
● **Manufacturing:** Determining the chemical properties of various materials

▶ NUCLEAR WEAPONS

Fuel used:
High-enriched uranium
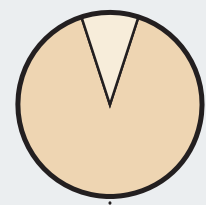
More than 90% U-235

How it works: Modern nuclear weapons are complicated and use nuclear fusion, not fission. Experts worry that terrorists able to procure high-enriched uranium, such as that used at some research reactors, might try to create a gun-type fission bomb, a simple, widely-available design and the type of bomb dropped on Hiroshima.

Gun-type fission bomb
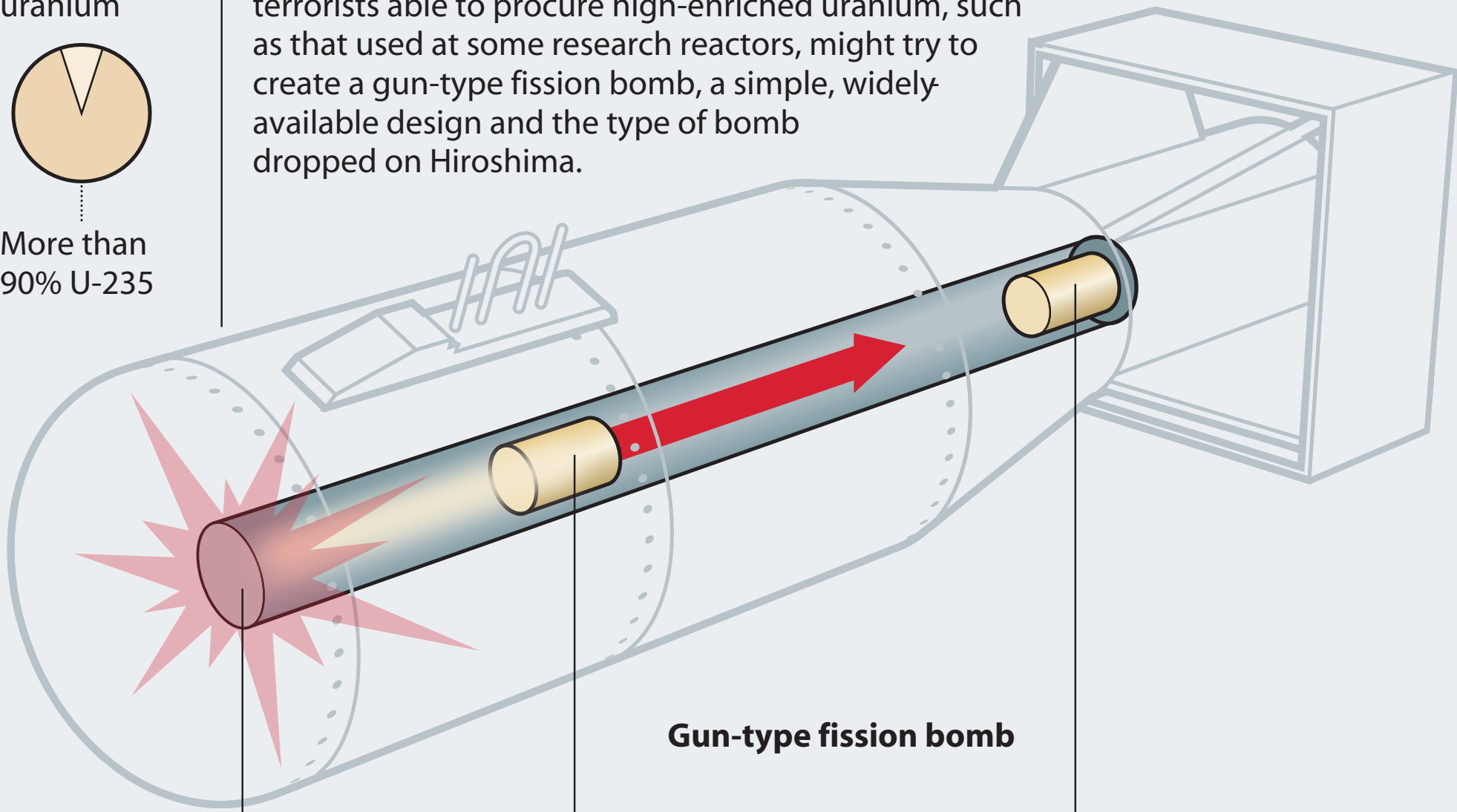
An **explosive detonates**, sending a **wedge** of U-235 down a shaft toward a **larger piece** of U-235. The impact causes a nuclear chain reaction and a large explosion.

Diagrams

Diagrams can be vitally important to stories. They let the reader know where, when and how something happened, explain complex processes, and take readers into places they otherwise wouldn't be able to go.

Fixing Fallingwater

After it became clear in 1996 that the projecting terraces of Frank Lloyd Wright's Fallingwater would eventually collapse, the terraces were braced with temporary steel supports and engineers devised a plan to reinforce the terraces. The $11.5 million project is nearly complete.

Master bedroom terrace (cutaway)

Main-floor west terrace (cutaway)

Floor

T-shaped mullions

Current temporary support structure

Main-floor east terrace (cutaway)

Cantilever beam

Cable

Concrete block

Cantilever beams
Horizontal concrete beams that support the main-floor terrace. They are reinforced with rods of steel and extend beyond their vertical supports, a structural technique called a cantilever.

Sagging terraces

THE PROBLEM
Even before Fallingwater was finished in 1938, its terraces sagged under the weight of their tremendous load—75 tons for the main-floor terrace and overhangs, and nearly 50 tons for the master bedroom terrace. Engineers say there was not enough steel reinforcement in the concrete beams of the main-floor terrace to support both.

THE SOLUTION
After sandstone floors were removed, steel cables were placed on the side of each beam and were anchored in concrete blocks next to the end of the beams. The cables were tightened with hydraulic jacks. The tension in the cables counteracts the sagging of the terraces.

Source: Robert Silman Associates; Scientific American

Chicago Tribune/Phil Geib

Diagrams

Diagrams can be vitally important to stories. They let the reader know where, when and how something happened, explain complex processes, and take readers into places they otherwise wouldn't be able to go.

BP's deep difficulty in the Gulf of Mexico

MISS.   ALA.   FLA.

LA.   New Orleans

Thunder Horse

FACTS
- Cost to build: $1 billion
- Can process 250,000 barrels of oil and 200 million cubic feet of gas per day
- Platform height equivalent to a 14-story building

The world's largest semisubmersible oil platform, BP's Thunder Horse, is undergoing repairs following major damage that occurred nearly two years ago. The company is losing an estimated $3.3 billion in potential revenue as the complex sits idle.

HOW IT WORKS

Piping carries oil and gas to the rig from 6,000 feet below the sea surface.

A NEAR-CATASTROPHE

1 In July 2005, Hurricane Dennis passed over the Thunder Horse platform.

2 During the storm, an incorrectly plumbed 6-inch piece of pipe allowed water to flow into two of the massive, hollow legs, causing the platform to list.

SIZE COMPARISON

The ocean depth at Thunder Horse is about four times the height of the 1,451-foot Sears Tower.

At the sea floor
The piping connects to giant metal transfer stations and other machinery in a vast network spread out over several square miles.

3 As repairs were being made to the platform, welds in giant metal transfer stations known as manifolds absorbed hydrogen and became brittle.

Drilling pipes
extend 20,000 feet from the sea floor into the oil reservoir.

Sources: BP, FMC Technologies

Thunder Horse's area under water

Chicago

BP is now repairing the stations, a massive task that involves reconfiguring miles of piping and replacing machinery across an area nearly spanning the width of Chicago's North Side.
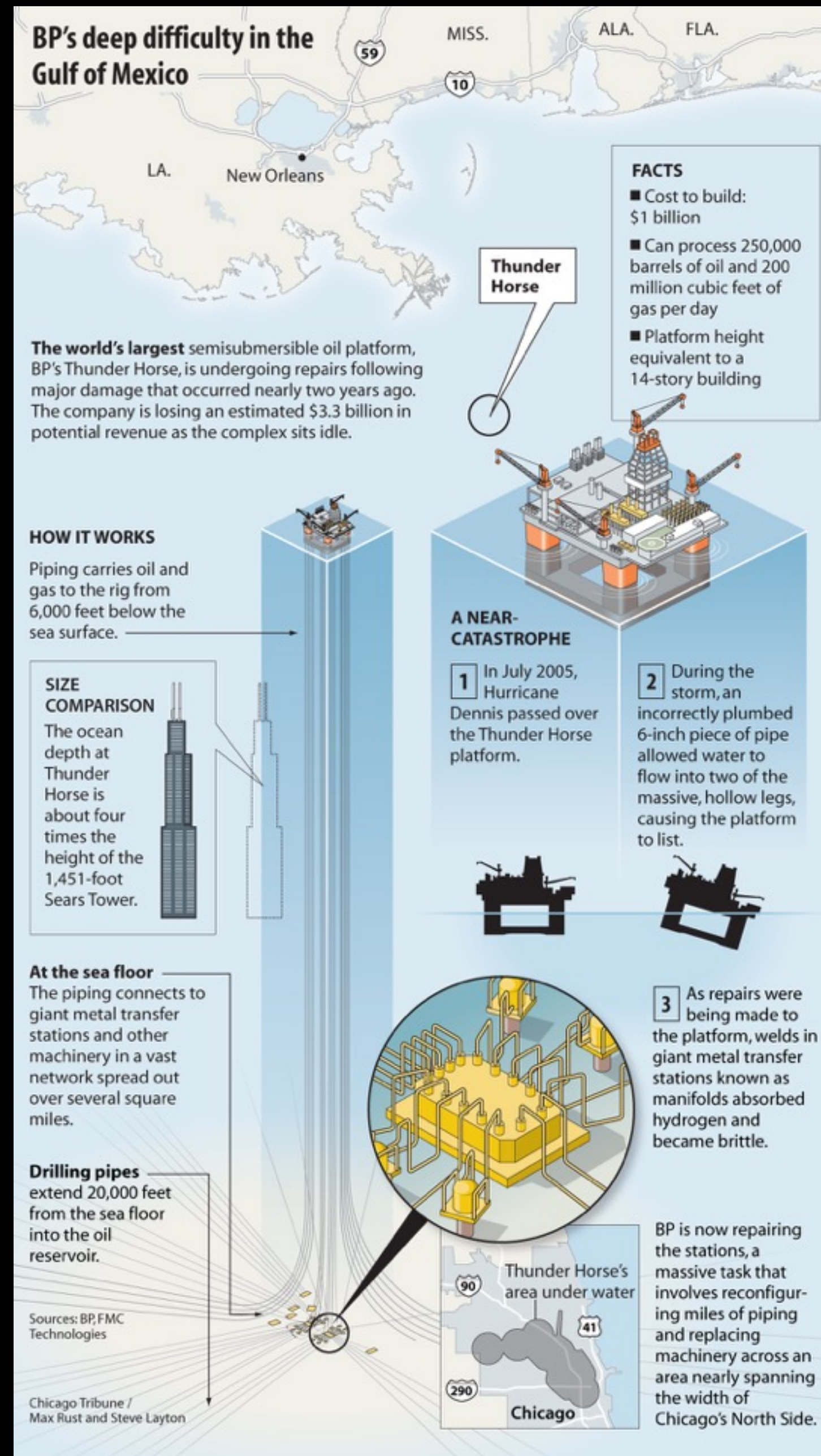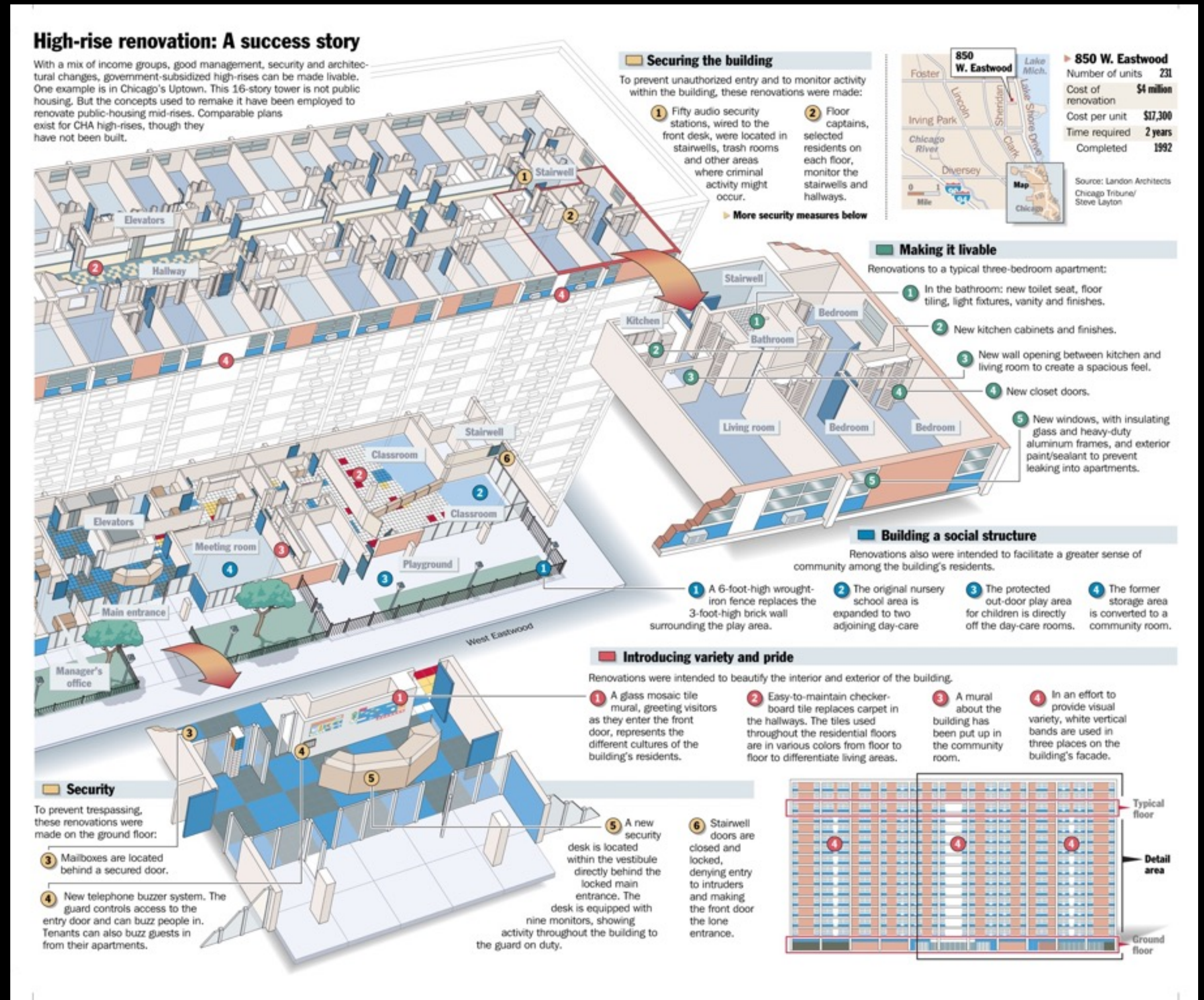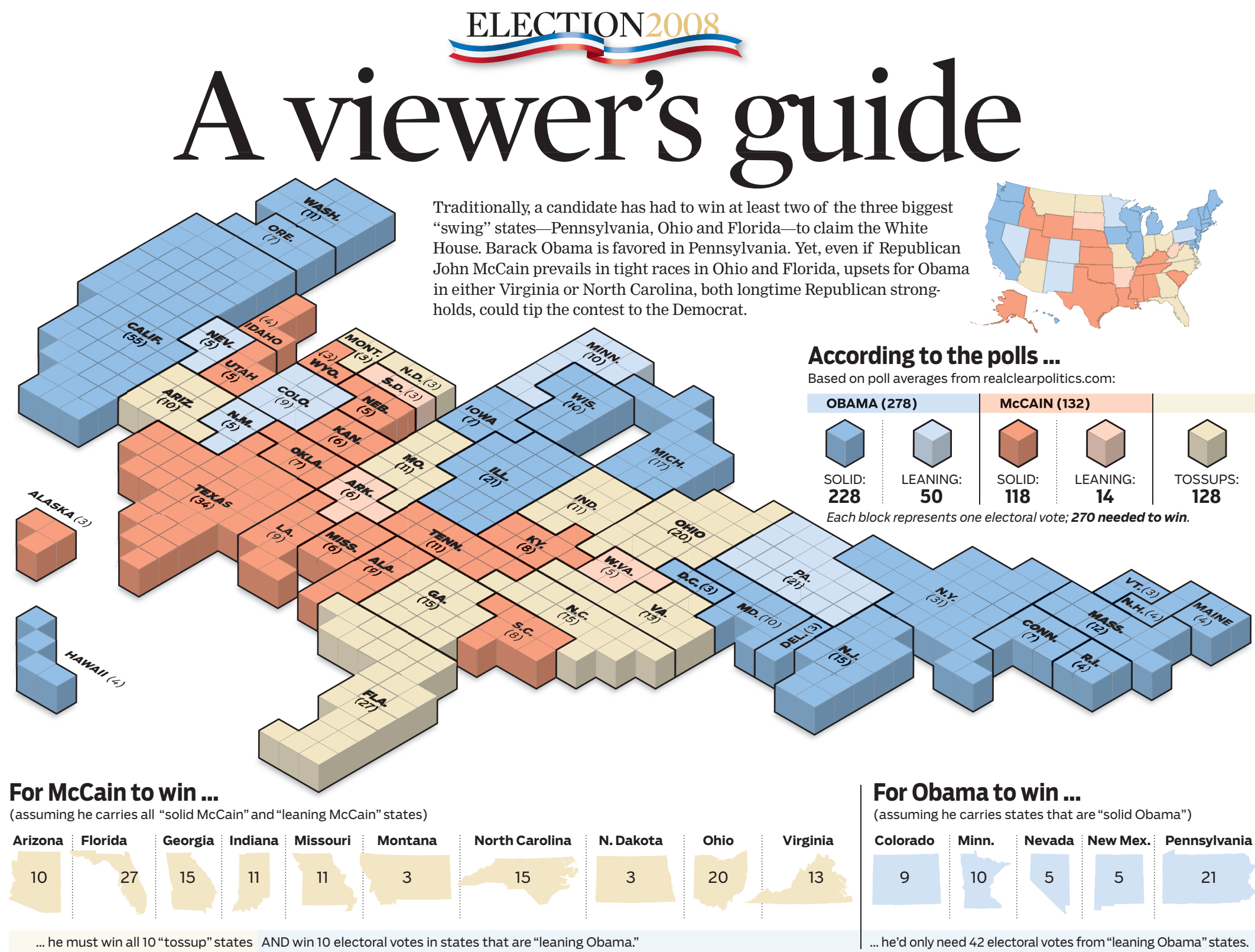
Chicago Tribune / Max Rust and Steve Layton

Diagrams

Diagrams can be vitally important to stories. They let the reader know where, when and how something happened, explain complex processes, and take readers into places they otherwise wouldn't be able to go.

High-rise renovation: A success story

Charts

The visual display of quantitative data remains the most significant aspect and role of the infographic. This can be done in a number of different ways — depending on the data.

A viewer's guide

Traditionally, a candidate has had to win at least two of the three biggest "swing" states—Pennsylvania, Ohio and Florida—to claim the White House. Barack Obama is favored in Pennsylvania. Yet, even if Republican John McCain prevails in tight races in Ohio and Florida, upsets for Obama in either Virginia or North Carolina, both longtime Republican strongholds, could tip the contest to the Democrat.

According to the polls …
Based on poll averages from realclearpolitics.com:

OBAMA (278) **McCAIN (132)**

SOLID:	LEANING:	SOLID:	LEANING:	TOSSUPS:
228	50	118	14	128

Each block represents one electoral vote; *270 needed to win*.

For McCain to win …
(assuming he carries all "solid McCain" and "leaning McCain" states)

Arizona	Florida	Georgia	Indiana	Missouri	Montana	North Carolina	N. Dakota	Ohio	Virginia
10	27	15	11	11	3	15	3	20	13

… he must win all 10 "tossup" states AND win 10 electoral votes in states that are "leaning Obama."

For Obama to win …
(assuming he carries states that are "solid Obama")

Colorado	Minn.	Nevada	New Mex.	Pennsylvania
9	10	5	5	21

… he'd only need 42 electoral votes from "leaning Obama" states.

Congressional races

Democrats are looking to expand majorities in the House and the Senate, where they hope to gain enough seats to reach a filibuster-proof 60.

THE U.S. SENATE
Current balance of power:

- Democrats 49
- Republicans 49
- Independents 2
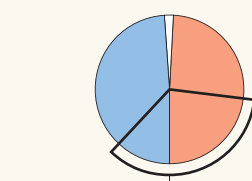
Seats up for election:

- Democrats 12
- Republicans 23

KEY RACES

■ **Georgia:** Incumbent Saxby Chambliss (R) faces a challenge from former state Rep. Jim Martin (D) in a state where Barack Obama's candidacy has helped expand Democratic voter registration, particularly among blacks.

■ **Minnesota:** Al Franken (D) is in a tight race with incumbent Norm Coleman

States to watch—and when

Watching the results in this historic presidential election will be much like watching the clock—with the most telling signs of who is winning rolling like the sunsets across the country.

Early, important states: Virginia and North Carolina. If Obama carries either, corks will start popping in Chicago. If McCain holds both, it's a longer night.

Missouri is the critical indicator in the Midwest results, and outcomes in Indiana and Iowa will reveal much about this contest. In the West, all eyes are on Colorado—though results there will be later in arriving.

POLL CLOSINGS *(all times CST)*

6 P.M.
Georgia
Indiana*
Kentucky*
South Carolina
Vermont
Virginia

6:30 P.M.
North Carolina
Ohio
West Virginia

7 P.M.
Alabama
Connecticut
Delaware
Dist. of Columbia
Florida*
Illinois
Maryland
Massachusetts
Mississippi
Missouri
New Hampshire
New Jersey
Oklahoma
Pennsylvania

INDIANA (11 ELECTORAL VOTES)
Long a Republican stronghold, Indiana has not backed a Democratic candidate for president since Lyndon Johnson in 1964. Yet the latest polling has portrayed a tossup.

OHIO (20 ELECTORAL VOTES)
No Republican has won the White House without winning Ohio, which has voted for the winner in nearly every election for the past 100 years. Obama held a 6-point advantage in the latest Ohio Poll (conducted by the University of Cincinnati).

VIRGINIA (13 ELECTORAL VOTES)
McCain's path to victory is difficult without Virginia. And, in a state that Republicans have counted on for years—the last Democrat to win there was Lyndon Johnson in 1964—Obama held an 8-point advantage in the last Washington Post survey. The state's 5 million voters now stand as a potential key to Obama's victory, one of a few places where McCain must block him to win.

NORTH CAROLINA (15 ELECTORAL VOTES)
Another Old South state that has trended Republican since Democrats became identified with the civil rights movement, North Carolina has not voted for a Democrat for president since 1976—Jimmy Carter, a Southerner. George W. Bush comfortably carried the state twice. Yet the latest polls show it as a tossup.

PENNSYLVANIA (21 ELECTORAL VOTES)
Pennsylvania has been a swing state for 70 years. Democrat John Kerry carried it with 51 percent of the vote in 2004, as did Democrat Al Gore in 2000. The latest polling there has shown Obama ahead by an average of 8 points. But McCain has fought hard for the state in the closing weeks of the campaign, counting on a base of conservative, working-class white voters.

FLORIDA (27 ELECTORAL VOTES)
Since the 1960s, only Southern Democrats have taken Florida—and not always. Johnson and Carter won there, but Carter also
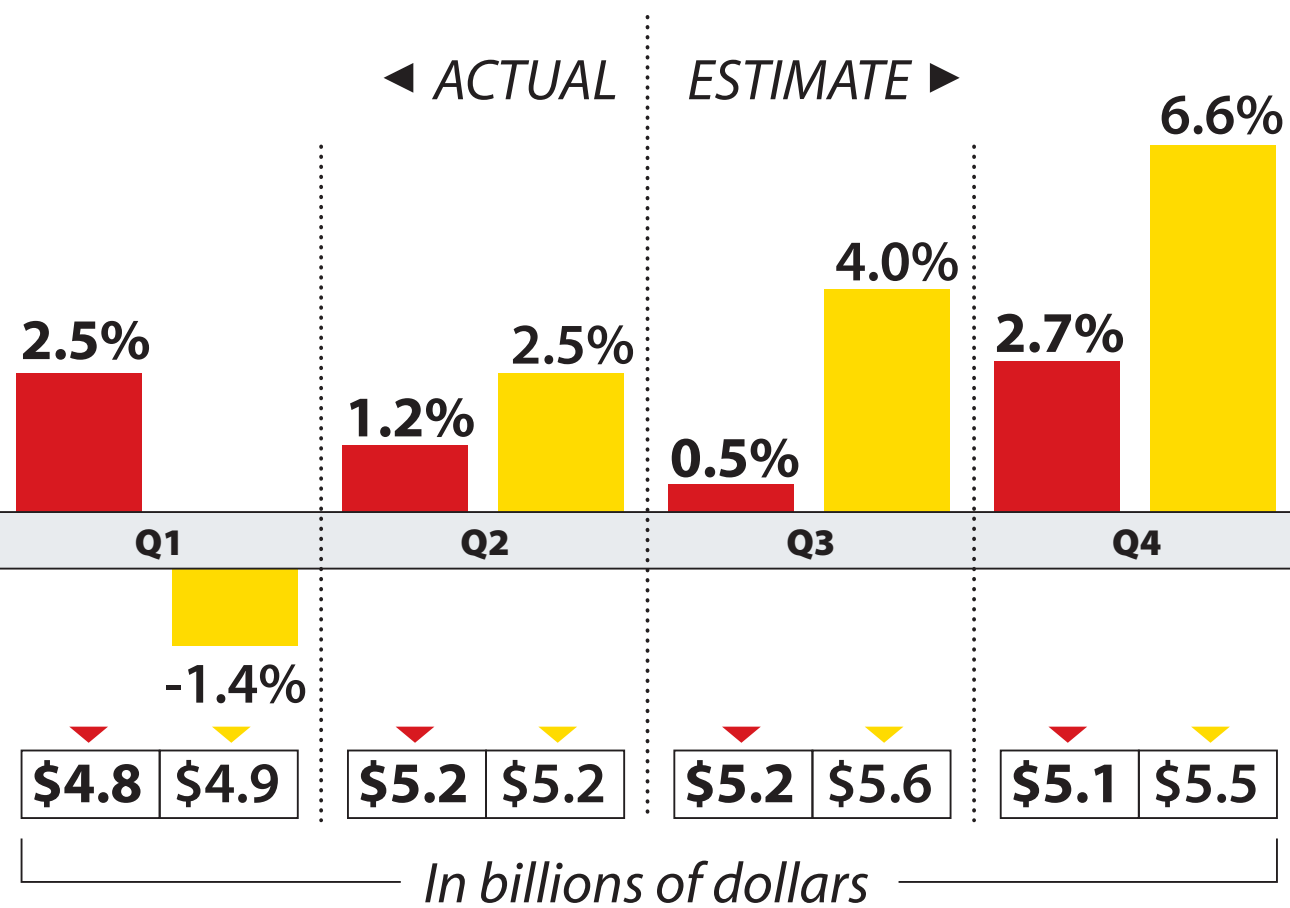
Charts

Golden Arches battles slide in U.S. sales and stock price

McDonald's stock has failed to keep pace with its peers, sinking nearly $11 per share since the second quarter ended in June. The stock's downward trend comes as the fast-food giant has posted small gains in its key U.S. restaurant business during the first half of this year.

RESTAURANT SALES

Percent change from year-earlier period

KEY: ■ U.S. ■ Non-U.S. ▭ Systewide sales

◀ *ACTUAL*   *ESTIMATE* ▶

	Q1	Q2	Q3	Q4
U.S.	2.5%	1.2%	0.5%	2.7%
Non-U.S.	-1.4%	2.5%	4.0%	6.6%

▼	▼	▼	▼	▼	▼	▼	▼
$4.8	$4.9	$5.2	$5.2	$5.2	$5.6	$5.1	$5.5

In billions of dollars

STOCK PRICE

— McDonald's Corp.   — S & P restaurant index

Oct. 4: **167.82**

50 — 350
40 — 280
30 — 210
20 — 140

Oct. 4: **$17.50**

1999   2000   2001   2002

U.S. RESTAURANT SALES

By restaurant operator (with change from year-earlier period)

Second quarter (2002): $5.25 billion

Franchisees: **$4.15 billion** (+1.1%)

Affiliates: **$281 million** (0%)

Company: **$816 million** (-5.6%)
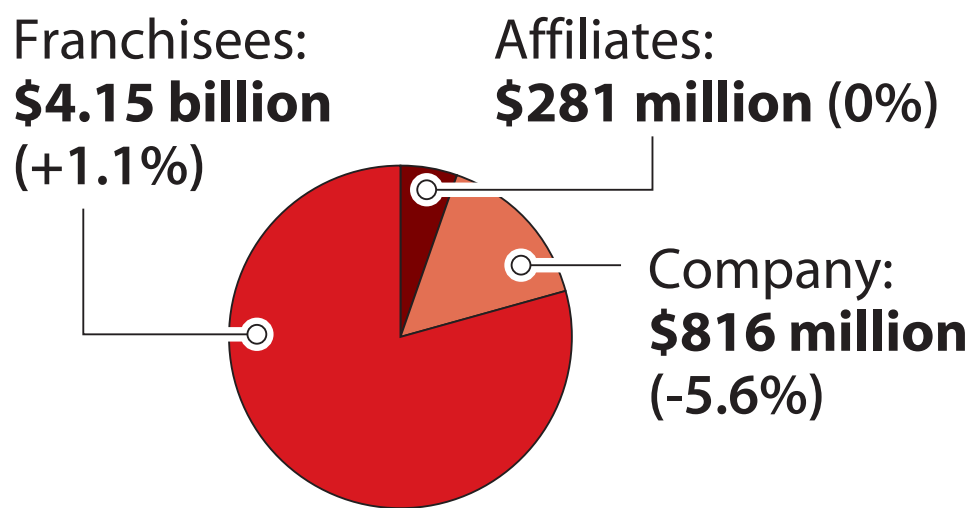
Sources: McDonald's Corp., Merrill Lynch

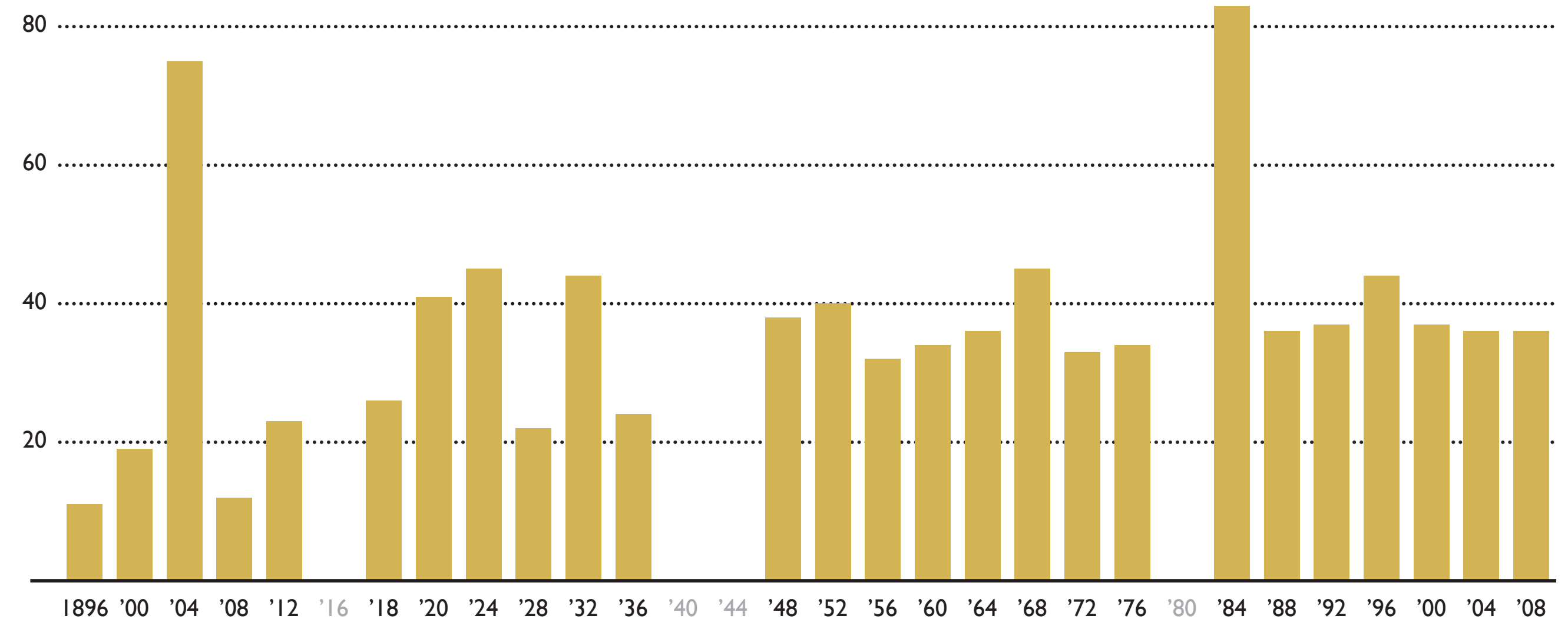CHICAGO TRIBUNE

Bar charts   Line charts   Pie charts

Bar charts

Generally, bars are best used when the items to be compared are:
• Discreet, whole amounts
• Relatively few in number
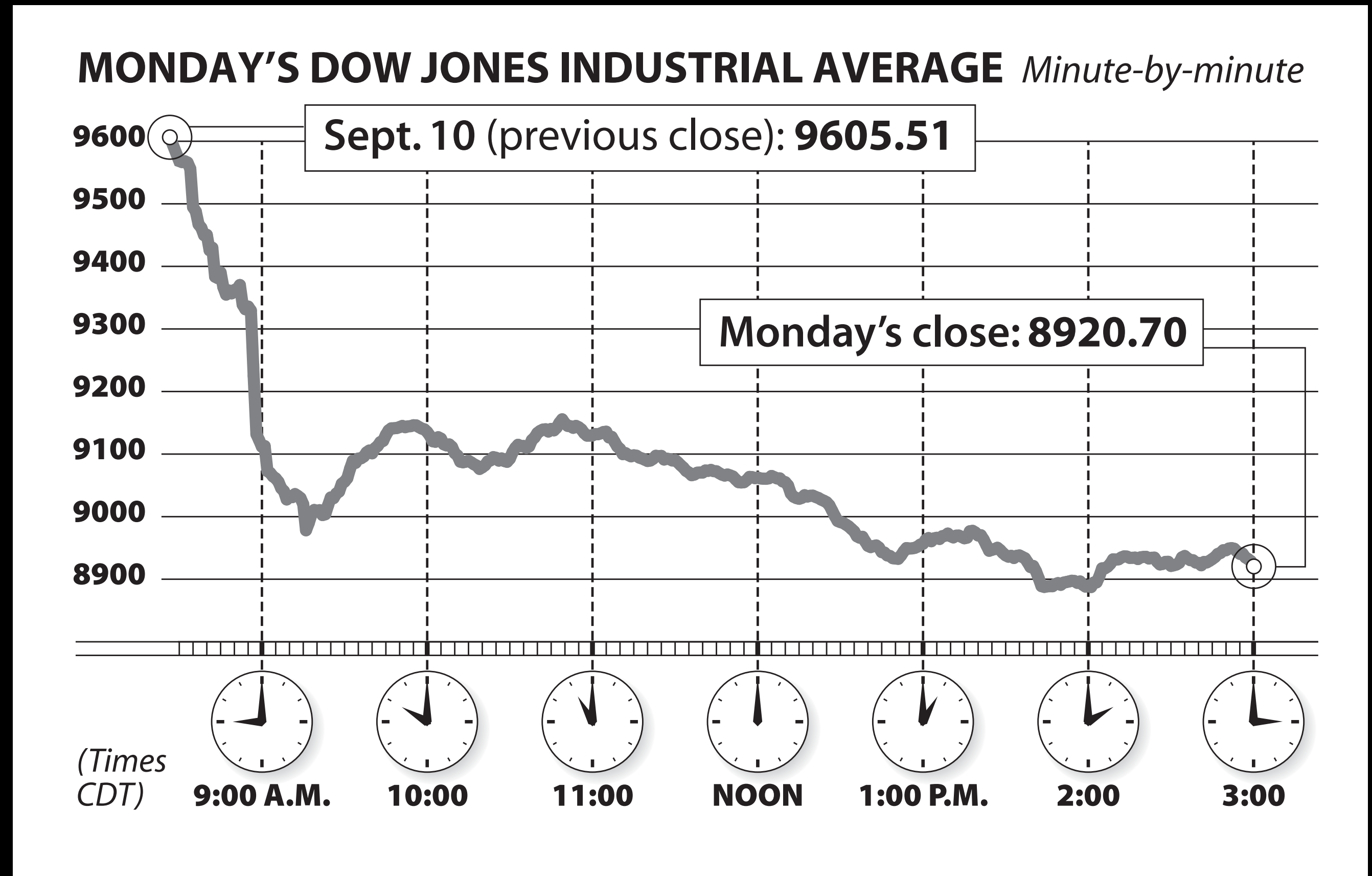• Relatively wide in range

Gold medals won by the United States during the Summer Olympic Games, 1896-2008

Line charts

Generally, line charts are a better choice when charting:
• Continuous amounts
• Rates
• Numbers with relatively small deviation

MONDAY'S DOW JONES INDUSTRIAL AVERAGE *Minute-by-minute*

Sept. 10 (previous close): **9605.51**

Monday's close: **8920.70**

9600
9500
9400
9300
9200
9100
9000
8900

(Times CDT) 9:00 A.M. 10:00 11:00 NOON 1:00 P.M. 2:00 3:00
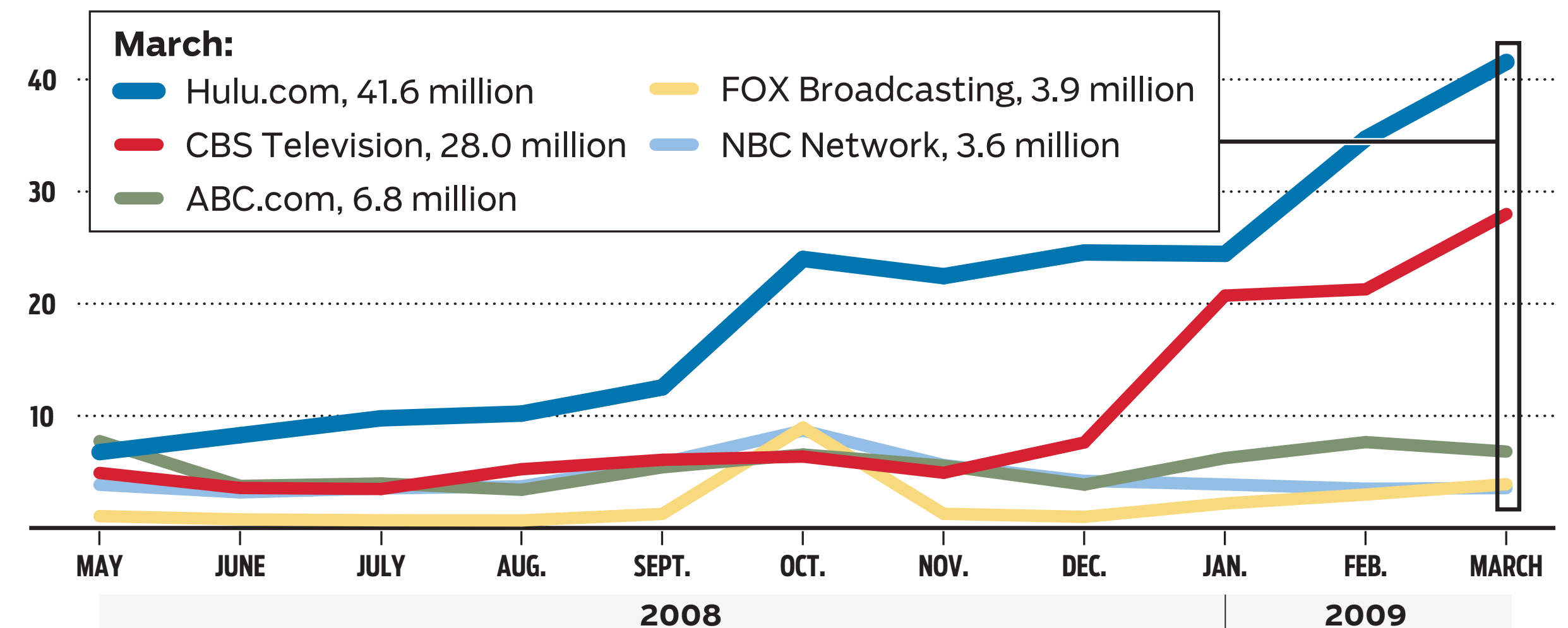
Line charts

Line charts are especially effective when comparing two or more data sets to each other on the same axis.

Web watching on the rise

Millions of unique online-video viewers, monthly

March:
- Hulu.com, 41.6 million
- CBS Television, 28.0 million
- ABC.com, 6.8 million
- FOX Broadcasting, 3.9 million
- NBC Network, 3.6 million

40
30
20
10

MAY   JUNE   JULY   AUG.   SEPT.   OCT.   NOV.   DEC.   JAN.   FEB.   MARCH

2008   2009

SOURCE: ComScore Video Metrix

TRIBUNE NEWSPAPERS

Pie charts

Pie charts are named for their shape, and the fact that the data appear as "wedges" of a pie.

THE PEROT EFFECT

The presence of a third-party candidate had a dramatic effect on the 1992 contest, won convincingly by Bill Clinton with significantly less than a majority of the vote.
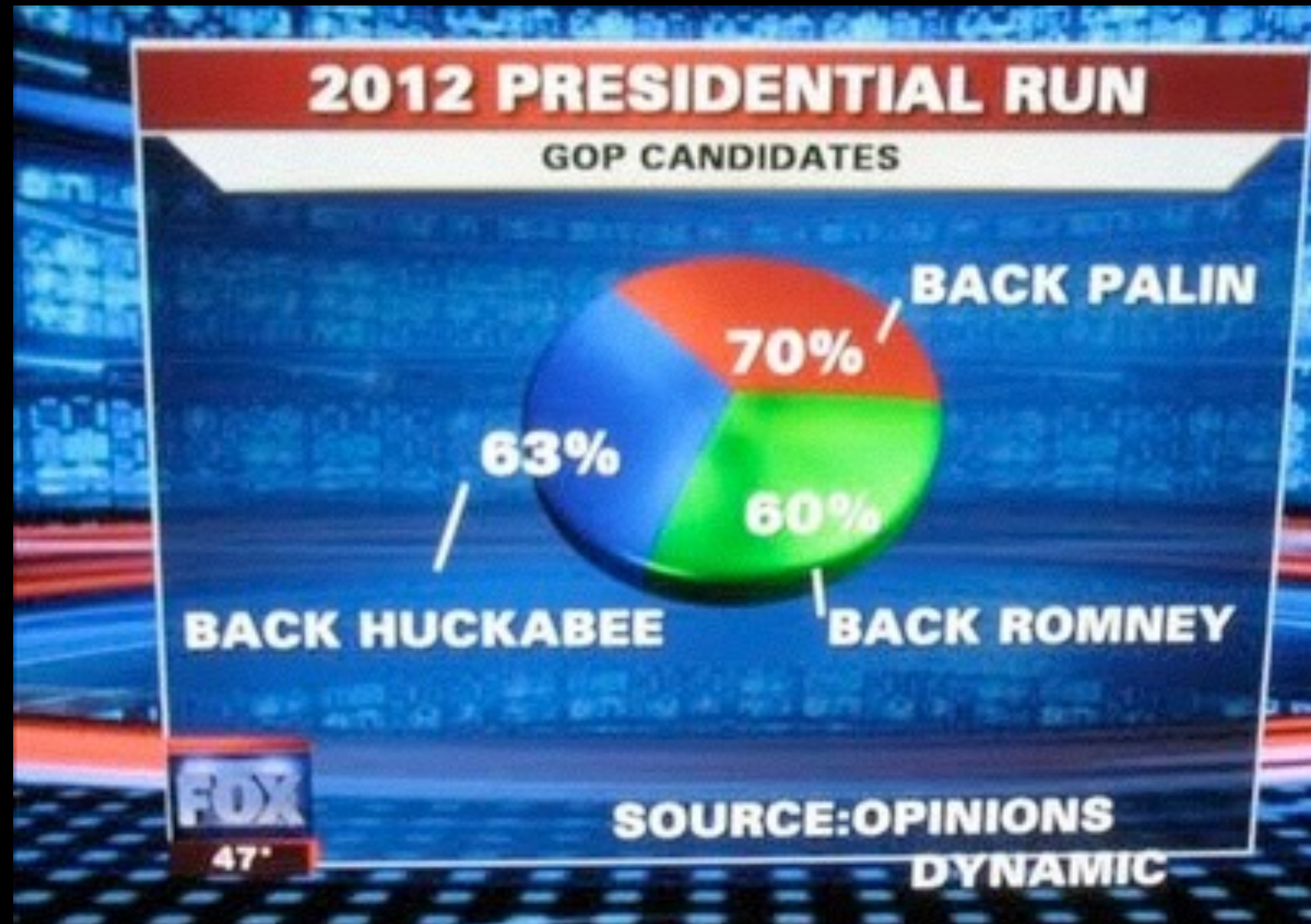
Percentage of the popular vote, 1992 Presidential election

Bill Clinton (D): **43.0%**

George H.W. Bush (R): **37.5%**

Ross Perot (I): **18.9%**
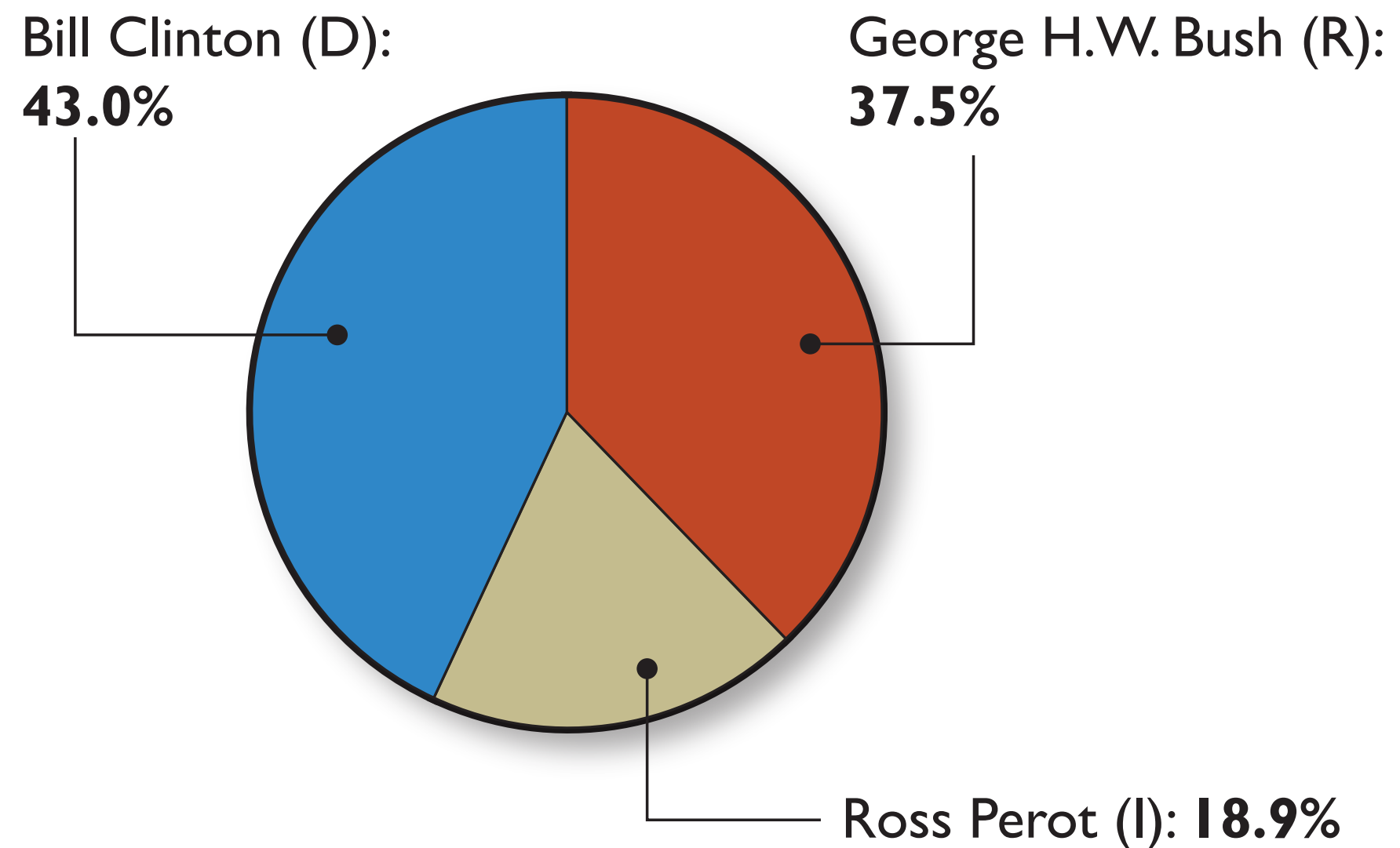
SOURCE: Federal Election Commission

Pie charts

The absolute rule of pie charts is that the numbers add up to a total, that percentages equal 100, that the "whole" amount is somehow a meaningful number.

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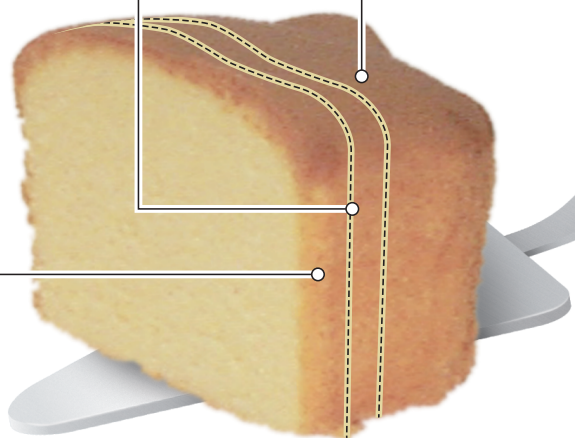

A slimmer Sara Lee

In an effort to reshape its portfolio, Chicago-based Sara Lee Corp. announced Tuesday that it plans to dispose of several components and focus on food and beverage, intimates and underwear, and household products.
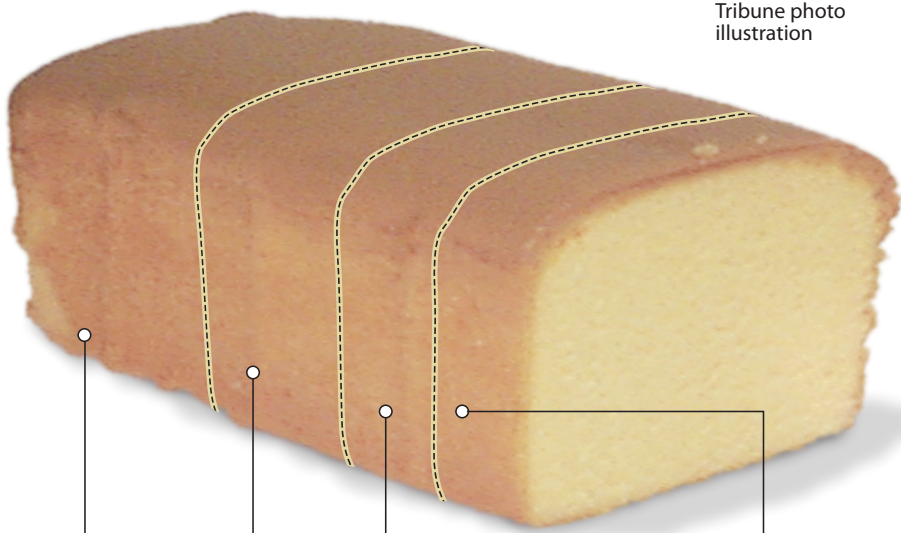
Sara Lee Corp.

1999 revenue: $20 billion

WHAT'S BEING CUT

Champion
Manufacturer, marketer and distributor of athletic and casual wear

Revenue:
$500 million

Pct. of total:
2.5 percent

Coach
Designer, producer and marketer of high-quality leather goods

Revenue:
$550 million

Pct. of total:
2.8 percent

PYA/Monarch
Regional food-service distributor (Southeastern U.S.)

Revenue:
$2.7 billion

Pct. of total:
13.5 percent

International Fabrics
Producer of material sold to makers of intimate apparel.

Revenue:
$400 million

Note: Recently acquired

Tribune photo illustration
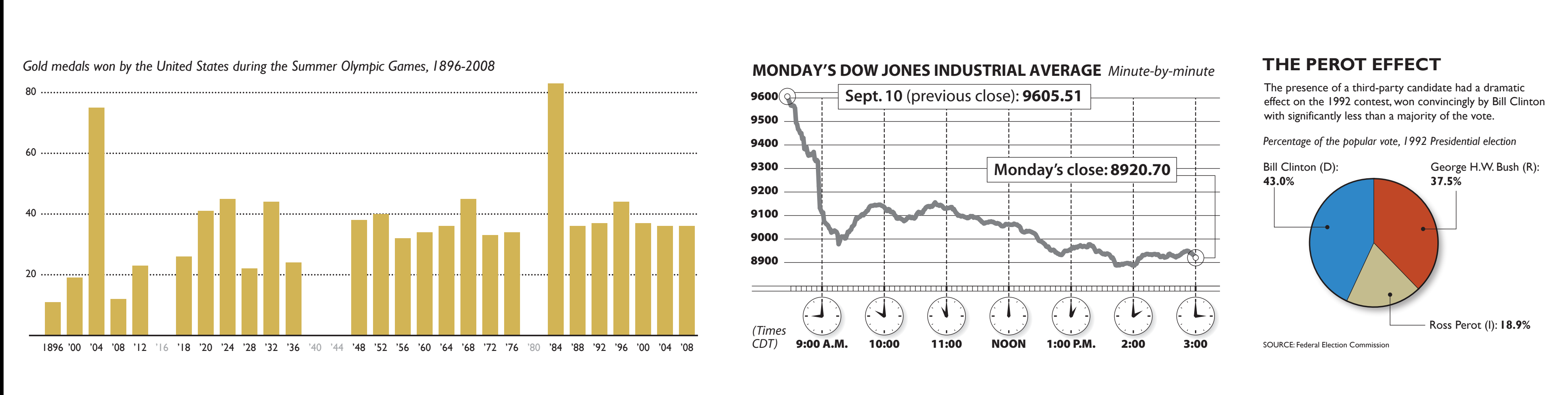
REMAINING COMPONENTS

Apparel
Brands include Hanes, Playtex, L'Eggs, DKNY

Revenue:
$6.4 billion

Pct. of total:
39.3 percent

Foods
Brands include Sara Lee, Ball Park, Hygrade

Revenue:
$4.2 billion

Pct. of total:
25.8 percent

Coffee and tea
Brands include Bravo, Pickwick, Douwe Egberts

Revenue:
$2.6 billion

Pct. of total:
16.0 percent

Household
Brands include Aqua Velva, Kiwi, Endust

Revenue:
$2.0 billion

Pct. of total:
12.3 percent

WHAT'S BEING ACQUIRED

The company announced several new acquisitions and investments in

Uniao's coffee business
The largest coffee roaster and seller in Brazil

Sol y Oro
The top intimate apparel company in Argentina

Jacksonville Sausage Co.*
A leading U.S. manufacturer of fresh premium sausage products

*Minority stake

Charts

Which of our three main charts — bar, line or pie — is the best choice for the following graphics?

Gold medals won by the United States during the Summer Olympic Games, 1896-2008

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SOURCE: Federal Election Commission

- Annual snowfall totals for Bloomington, Indiana

- IDV student breakdown: freshmen, sophomores, juniors, seniors

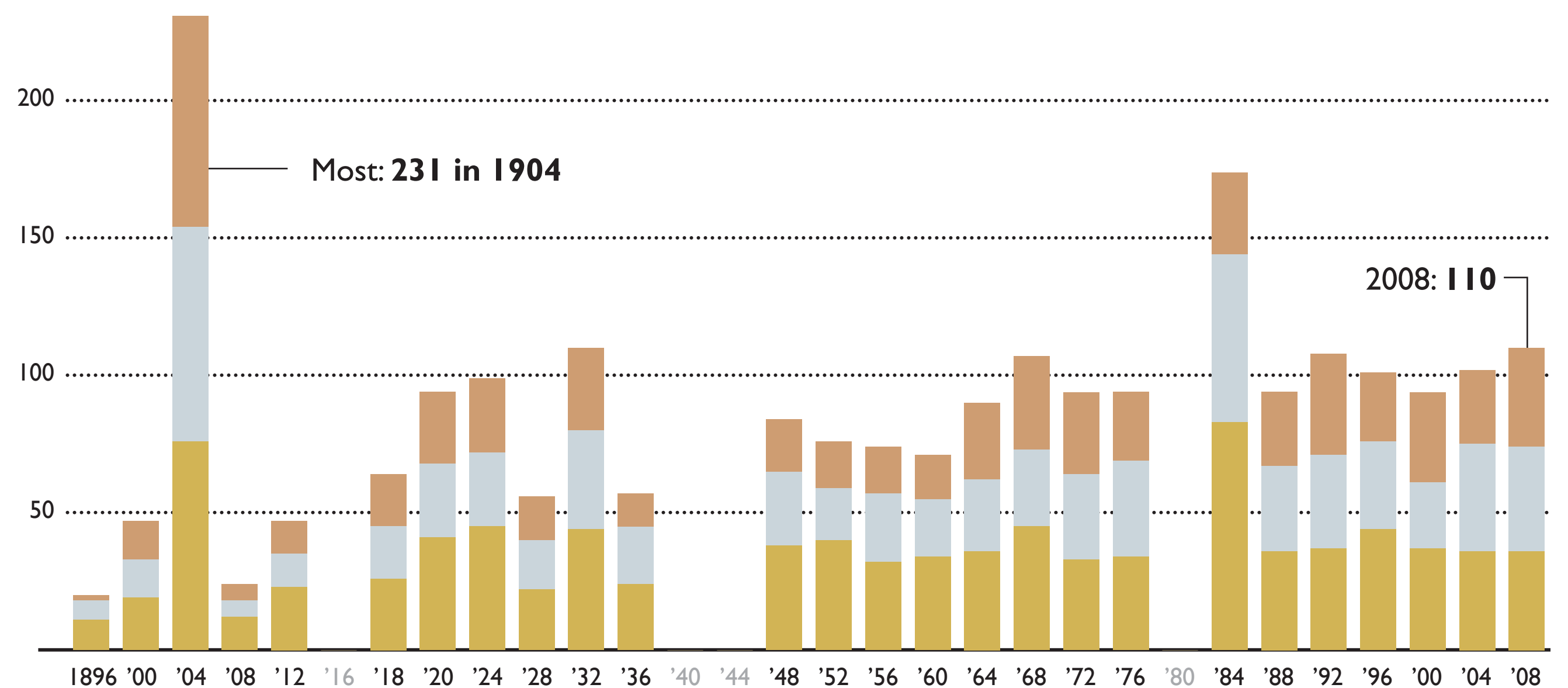- U.S. minimum wage in real dollars (adjusted for inflation)

Stacked

A variation — actually, a hybrid of the bar and pie charts — is the stacked column, where totals are brown down into subgroups, all of which can be compared.

GOING FOR GOLD

The 36 gold medals won by the United States at the 2008 Summer Games matched their total from 2004 and was good for second in the overall standings, behind host China's fifty-one.

Total medals won by the United States during the Summer Olympic Games, 1896-2008

KEY: ■ Gold   ■ Silver   ■ Bronze

Most: **231 in 1904**

2008: **110**

200 ·········
150 ·········
100 ·········
50 ·········

1896 '00 '04 '08 '12 '16 '18 '20 '24 '28 '32 '36 '40 '44 '48 '52 '56 '60 '64 '68 '72 '76 '80 '84 '88 '92 '96 '00 '04 '08

NOTE: The Summer Games were not held in 1916, 1940 or 1944 because of World Wars I and II. The U.S. led a boycott of the 1980 Moscow Games and did not participate.

SOURCE: International Olympic Committee

J464 GRAPHIC

Bubbles

Another variation is the proportional symbol chart — AKA the bubble chart (when they're circles), which uses a circle to compare discrete amounts.

High mercury levels in skin lighteners

The Tribune bought skin lightening creams throughout Chicago, sending 50 samples to Columbia Analytical Services Inc. in Kelso, Wash., to be tested for mercury content. Six were found to contain the toxic metal. Federal law bans mercury in skin lightening cream, though the metal is allowed in trace amounts — below 1 part per million — in other cosmetics.

MERCURY CONTENT OF TESTED PRODUCTS
in parts per million

Stillman's Skin Bleach Cream

29,600 ppm
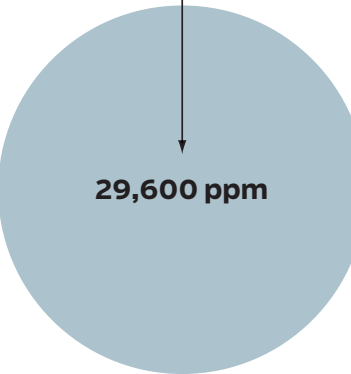
Bought from: Awami Bazaar & Zabiha Meat (Devon Avenue) Said pulled from shelves. Distributed by Detroit firm B.M. Trading. Said it would no longer sell.
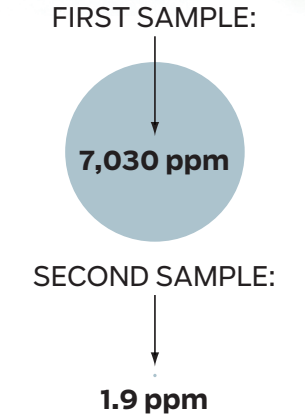
Manufacturer: Unknown. Label states "Manufactured under arrangement with The Stillman Company Inc. USA."

Made in: Pakistan

Top-Gel MCA Extra Pearl Cream

FIRST SAMPLE:
7,030 ppm

SECOND SAMPLE:
1.9 ppm

Bought from: T & A African Impact (South Side) Second sample bought from eyanghealth.com Both companies said would no longer sell.

Listed manufacturer: Zenna Chemical. Said product likely counterfeit; provided lab results indicating product meets compliance.

Made in: Taiwan

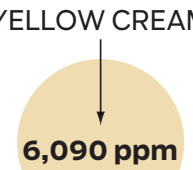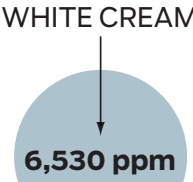**Creme Diana C.T.R.**

6,900 ppm
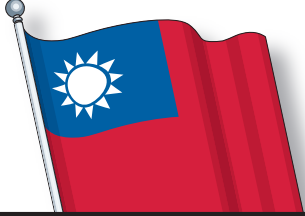
Bought from: Elim Wig & Beauty Supply (Uptown) Said pulled from shelves, would no longer sell.

Listed manufacturer: Diana de Beaute, S.A.L. Said product could be counterfeit.

Made in: Lebanon

Ling Ji Su

WHITE CREAM
6,530 ppm

YELLOW CREAM
6,090 ppm

Bought from: Nam Bac Hang (Chinatown) Said pulled from shelves, would no longer sell.

Listed manufacturer: Meng Di Cosmetic Co. Could not be reached for comment.

Made in: China

Lulanjina
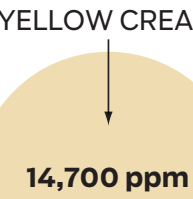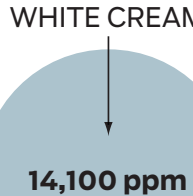
WHITE CREAM
14,100 ppm

YELLOW CREAM
14,700 ppm

Bought from: Nam Bac Hang (Chinatown) Said pulled from shelves, would no longer sell.

Listed manufacturer: Youxi Cosmetics Co. Ltd. Said product could be counterfeit.

Made in: China
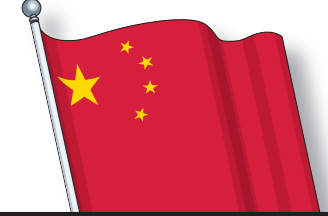
Shabright Clear and Bright Skin Formula

1.8 ppm

Bought from: Nikhar Beauty Salon (Devon Avenue) Said pulled from shelves, would no longer sell.

Listed manufacturer: Shahnaz Husain. Said product likely counterfeit; provided lab results indicating product meets compliance.
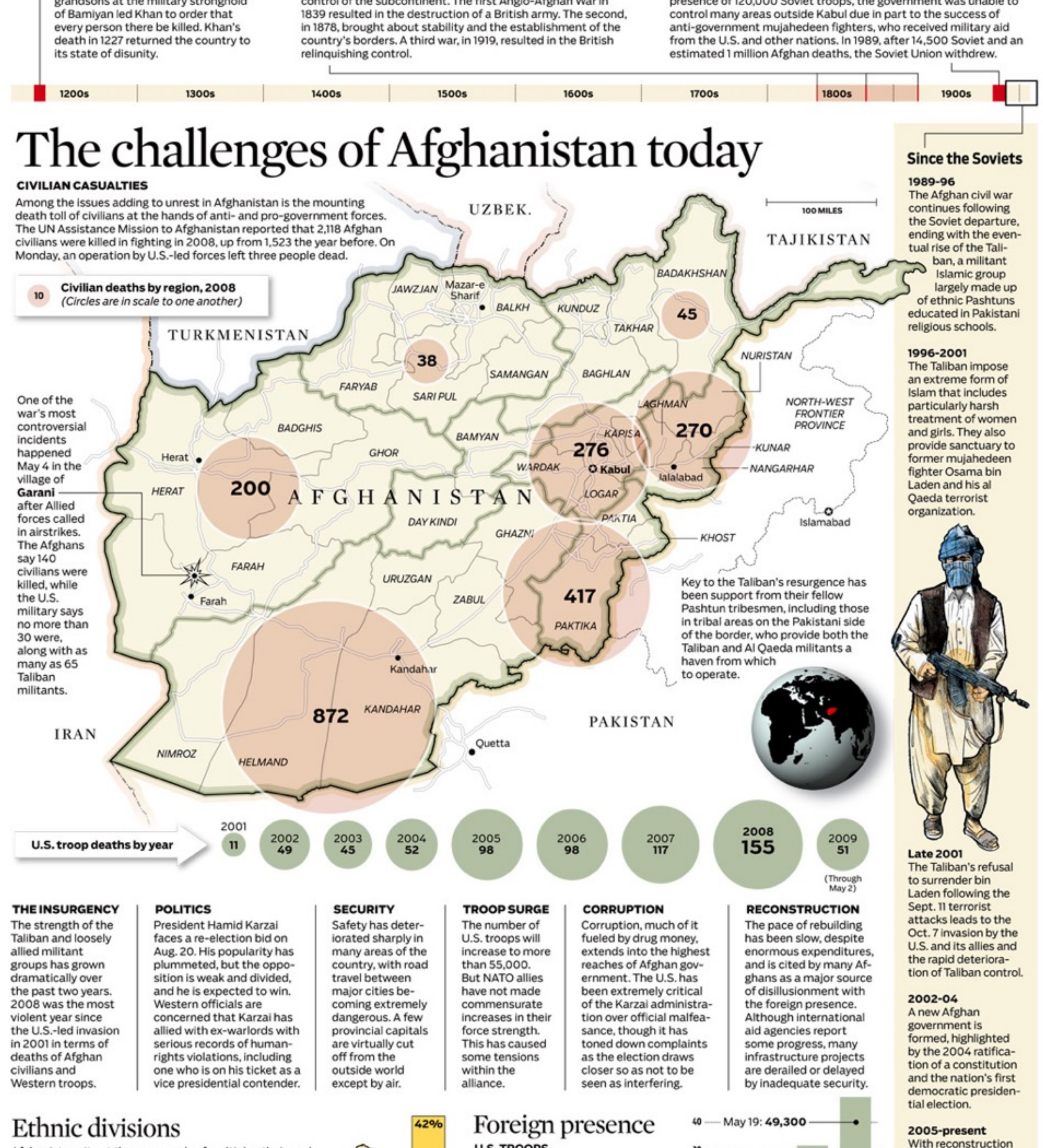
Made in: India

SOURCE: Tribune reporting

TRIBUNE

Bubbles

This type of representation is often used on maps, as the circles can help locate where certain information pertains.

...grandsons at the military stronghold of Bamiyan led Khan to order that every person there be killed. Khan's death in 1227 returned the country to its state of disunity.

...control of the subcontinent. The first Anglo-Afghan War in 1839 resulted in the destruction of a British army. The second, in 1878, brought about stability and the establishment of the country's borders. A third war, in 1919, resulted in the British relinquishing control.

...presence of 120,000 Soviet troops, the government was unable to control many areas outside Kabul due in part to the success of anti-government mujahedeen fighters, who received military aid from the U.S. and other nations. In 1989, after 14,500 Soviet and an estimated 1 million Afghan deaths, the Soviet Union withdrew.

The challenges of Afghanistan today

CIVILIAN CASUALTIES

Among the issues adding to unrest in Afghanistan is the mounting death toll of civilians at the hands of anti- and pro-government forces. The UN Assistance Mission to Afghanistan reported that 2,118 Afghan civilians were killed in fighting in 2008, up from 1,523 the year before. On Monday, an operation by U.S.-led forces left three people dead.

10 Civilian deaths by region, 2008
(Circles are in scale to one another)

100 MILES

UZBEK.
TAJIKISTAN

TURKMENISTAN

JAWZJAN · Mazar-e Sharif · BALKH · KUNDUZ · TAKHAR · BADAKHSHAN · 45

38 · SAMANGAN · BAGHLAN · NURISTAN

FARYAB · SARI PUL · LAGHMAN · NORTH-WEST FRONTIER PROVINCE

BADGHIS · GHOR · BAMYAN · KAPISA · **270** · KUNAR

Herat

200 · HERAT · AFGHANISTAN · WARDAK · ○ Kabul · **276** · Jalalabad · NANGARHAR

DAY KINDI · LOGAR · PAKTIA

One of the war's most controversial incidents happened May 4 in the village of **Garani** after Allied forces called in airstrikes. The Afghans say 140 civilians were killed, while the U.S. military says no more than 30 were, along with as many as 65 Taliban militants.

GHAZNI · KHOST · Islamabad

FARAH

URUZGAN · ZABUL · **417** · PAKTIKA

Farah

Kandahar

Key to the Taliban's resurgence has been support from their fellow Pashtun tribesmen, including those in tribal areas on the Pakistani side of the border, who provide both the Taliban and Al Qaeda militants a haven from which to operate.

IRAN · **872** · KANDAHAR · PAKISTAN

NIMROZ · HELMAND · Quetta

Since the Soviets

1989-96
The Afghan civil war continues following the Soviet departure, ending with the eventual rise of the Taliban, a militant Islamic group largely made up of ethnic Pashtuns educated in Pakistani religious schools.

1996-2001
The Taliban impose an extreme form of Islam that includes particularly harsh treatment of women and girls. They also provide sanctuary to former mujahedeen fighter Osama bin Laden and his al Qaeda terrorist organization.

Late 2001
The Taliban's refusal to surrender bin Laden following the Sept. 11 terrorist attacks leads to the Oct. 7 invasion by the U.S. and its allies and the rapid deterioration of Taliban control.

2002-04
A new Afghan government is formed, highlighted by the 2004 ratification of a constitution and the nation's first democratic presidential election.

2005-present
With reconstruction...

U.S. troop deaths by year

2001	2002	2003	2004	2005	2006	2007	2008	2009
11	49	45	52	98	98	117	155	51

(Through May 2)

THE INSURGENCY
The strength of the Taliban and loosely allied militant groups has grown dramatically over the past two years. 2008 was the most violent year since the U.S.-led invasion in 2001 in terms of deaths of Afghan civilians and Western troops.

POLITICS
President Hamid Karzai faces a re-election bid on Aug. 20. His popularity has plummeted, but the opposition is weak and divided, and he is expected to win. Western officials are concerned that Karzai has allied with ex-warlords with serious records of human-rights violations, including one who is on his ticket as a vice presidential contender.

SECURITY
Safety has deteriorated sharply in many areas of the country, with road travel between major cities becoming extremely dangerous. A few provincial capitals are virtually cut off from the outside world except by air.

TROOP SURGE
The number of U.S. troops will increase to more than 55,000. But NATO allies have not made commensurate increases in their force strength. This has caused some tensions within the alliance.

CORRUPTION
Corruption, much of it fueled by drug money, extends into the highest reaches of Afghan government. The U.S. has been extremely critical of the Karzai administration over official malfeasance, though it has toned down complaints as the election draws closer so as not to be seen as interfering.

RECONSTRUCTION
The pace of rebuilding has been slow, despite enormous expenditures, and is cited by many Afghans as a major source of disillusionment with the foreign presence. Although international aid agencies report some progress, many infrastructure projects are derailed or delayed by inadequate security.

Ethnic divisions

42%

Foreign presence
40 — May 19: 49,300
U.S. TROOPS

Balance of power

In class today, we will start work on a fairly simple infographic that would convey shifts in the balance of Congressional power over the previous three presidential administrations. What is the best approach to making this data visual?

| No. | Year | President | House: 435 Seats | | | | Senate: 100 Seats | | | |
			Dem	Rep	Ind	Margin	Dem	Rep	Ind	Margin
103rd	1993–95	Clinton (D)	258	176	1	82	57	43	0	14
104th	1995–97	Clinton (D)	206	228	1	22	48	52	0	4
105th	1997–99	Clinton (D)	207	226	2	19	45	55	0	10
106th	1999–01	Clinton (D)	211	223	1	12	45	55	0	10
107th	2001–03	Bush (R)	213	220	2	7	50	50	0	0
108th	2003–20	Bush (R)	205	229	1	24	48	51	1	3
109th	2005–07	Bush (R)	201	233	1	32	44	55	1	11
110th	2007–09	Bush (R)	232	203	0	29	49	49	2	0
111th	2009–11	Obama (D)	257	178	0	79	57	41	2	16
112th	2011–13	Obama (D)	193	242	0	49	51	47	2	4
113th	2013–15	Obama (D)	201	234	0	33	53	45	2	8
114th	2015–17	Obama (D)	188	247	0	59	44	54	2	10

Sources: United States House of Representatives, United States Senate

CHARTS IN ILLUSTRATOR

CHARTS IN ILLUSTRATOR

Chart tool

Adobe Illustrator features several chart tools. There are nine options for charts — you don't need to specify which your graphic will be before you create it, as you can always change the chart type once you have acquired the data.

Column Graph Tool		(J)
Stacked Column Graph Tool		
Bar Graph Tool		
Stacked Bar Graph Tool		
Line Graph Tool		
Area Graph Tool		
Scatter Graph Tool		
Pie Graph Tool		
Radar Graph Tool		
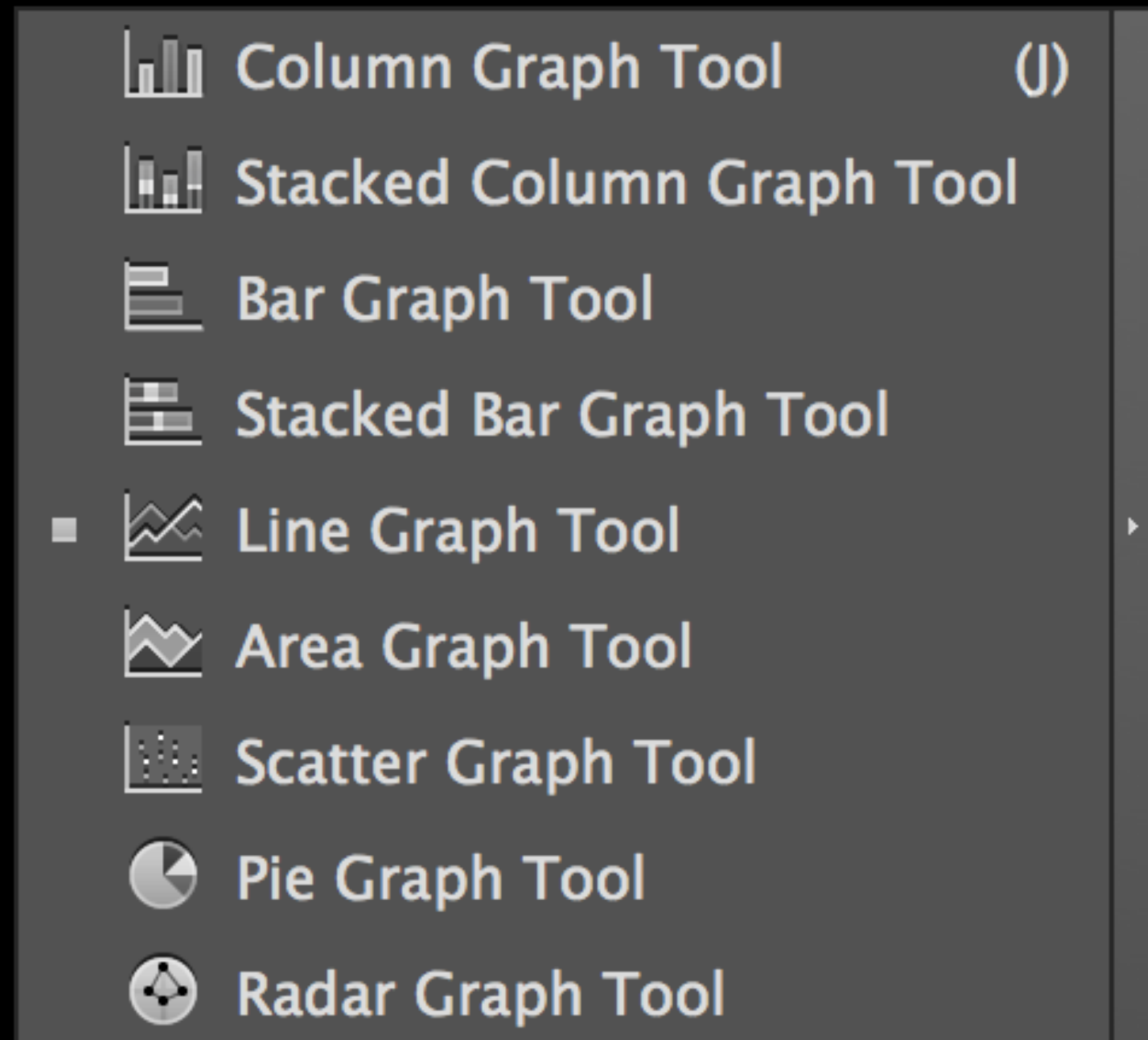
CHARTS IN ILLUSTRATOR

New document

Open Illustrator and make a new page (Command-N). For graphics on the web, you need to use RGB color. Remember, the width of our page-wrap div is 600 pixels, so that is how wide this graphic should be. You can make the page wider than this, though, and modify the size later.
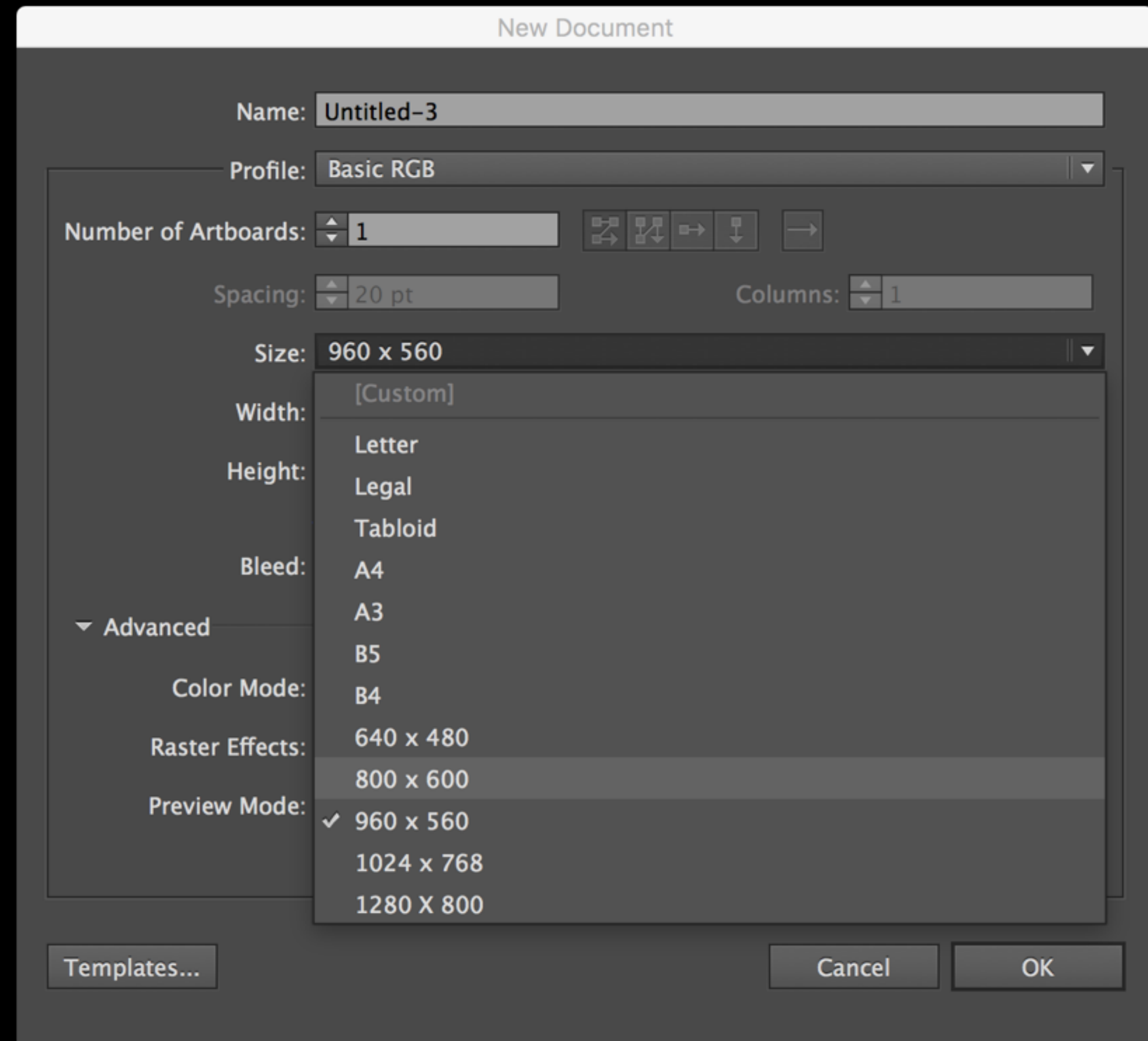
Getting started

There are a variety of ways to add data to Illustrator so that you can use one of the chart tools. Select one of the tools — the one you think you want to use to visualize the data about the balance of power in Congress. Use this tool to draw a box on your (blank) page.
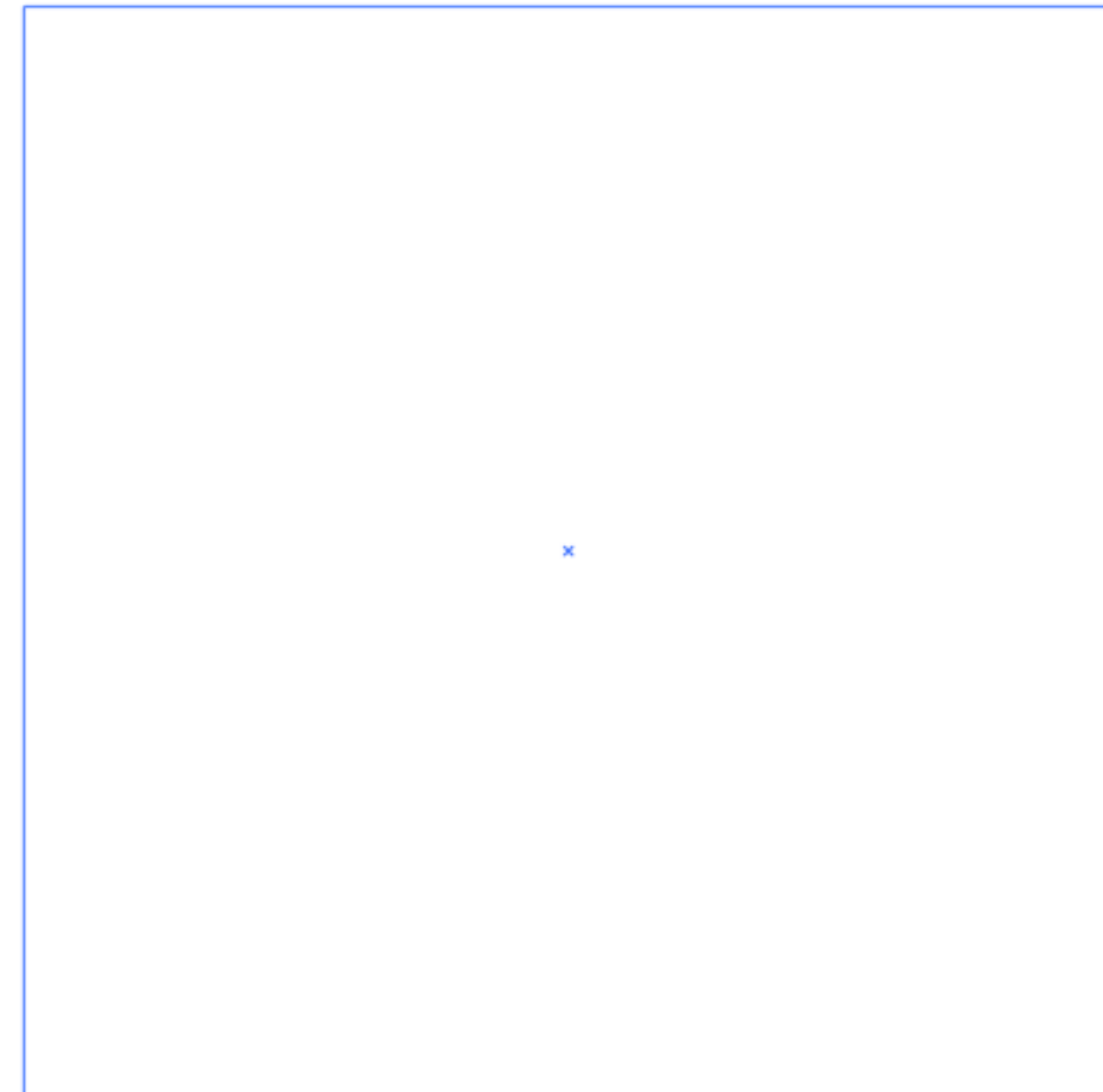
Getting started

An empty spreadsheet — well, nearly empty — will open, awaiting some input of data. For this exercise, we will copy and paste the information we need from an Excel document.
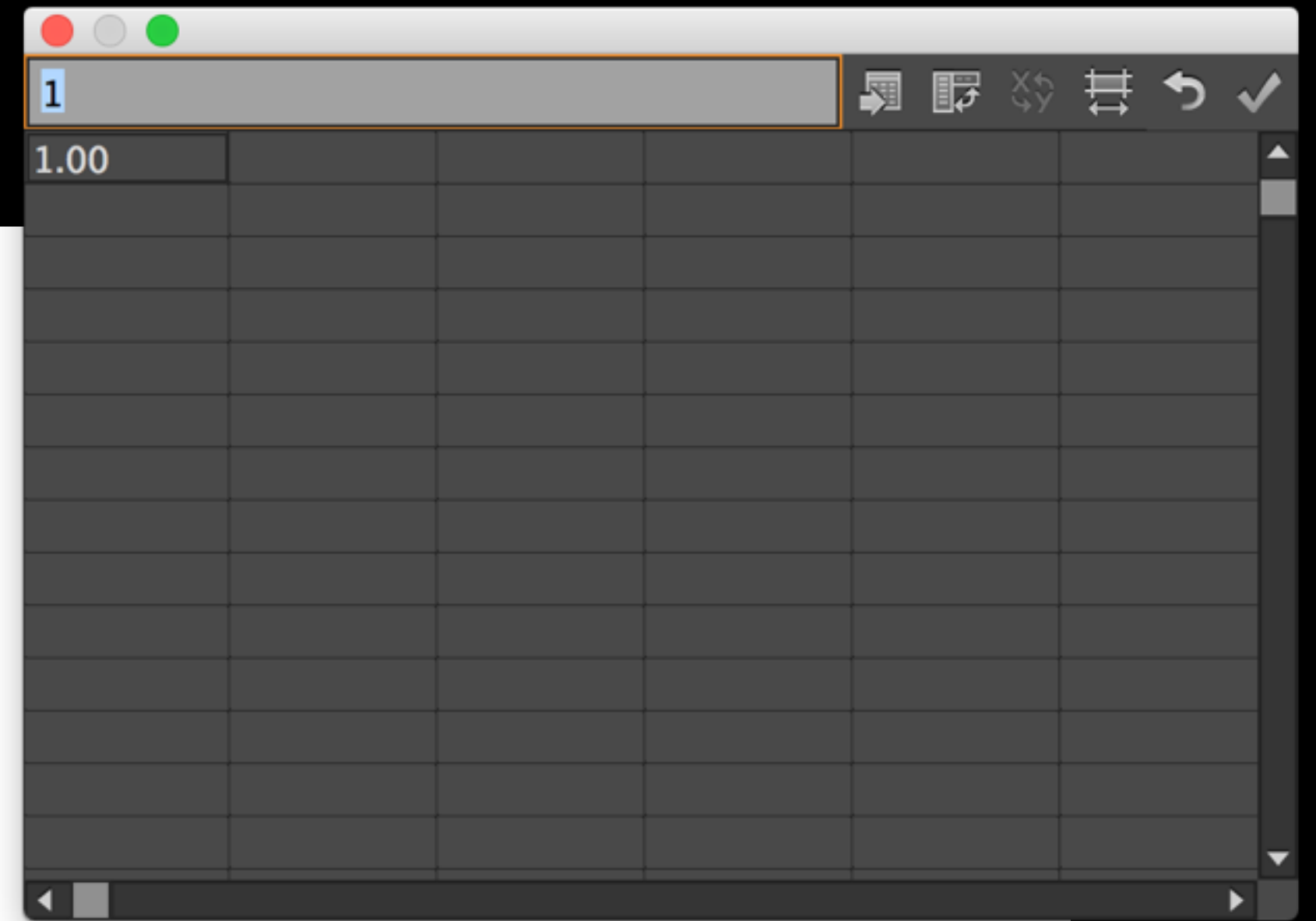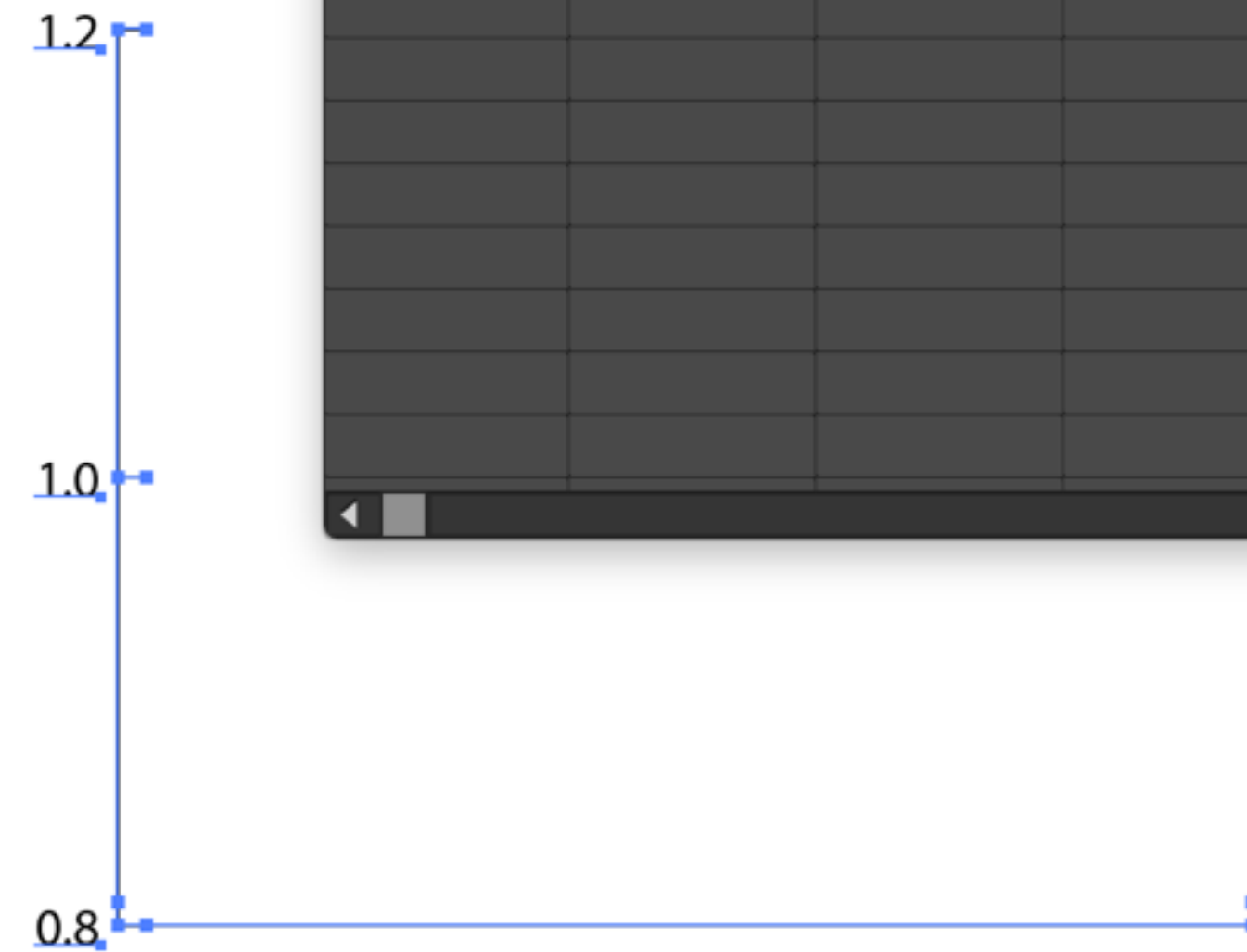
Getting data

The information for our graphic is in Excel format. You can find this in the Course Materials section (at the bottom) of the Links page on the syllabus website.

IDV460
INTERACTIVE DATA VIZ SPRING 16

THE SYLLABUS

Accounts you'll need

On the first day of class, you will create these two accounts (unless you have them already). The first will allow you to create your own website for our class, using the free web hosting available to you as an IU student. The second is a web-based code repository, where you can store and share your code. It is the largest host of source code in the world.

The Mercury server...	access.iu.edu/Accounts
For Pages info...	kb.iu.edu/d/alcr
For Pages problems...	www.iu.edu/~accrec/mypage_agreement
Code repository...	github.com

Course material

In this section, downloads of files we are using during in-class activities can be found. These files are in a variety of formats. Just click the link to download as needed!

Balance of power...	Excel data

IDV460
stlayton@indiana.edu

Getting started

Copy and past the data from Excel into your Illustrator chart spreadsheet. You can now see the visual representation of that data.
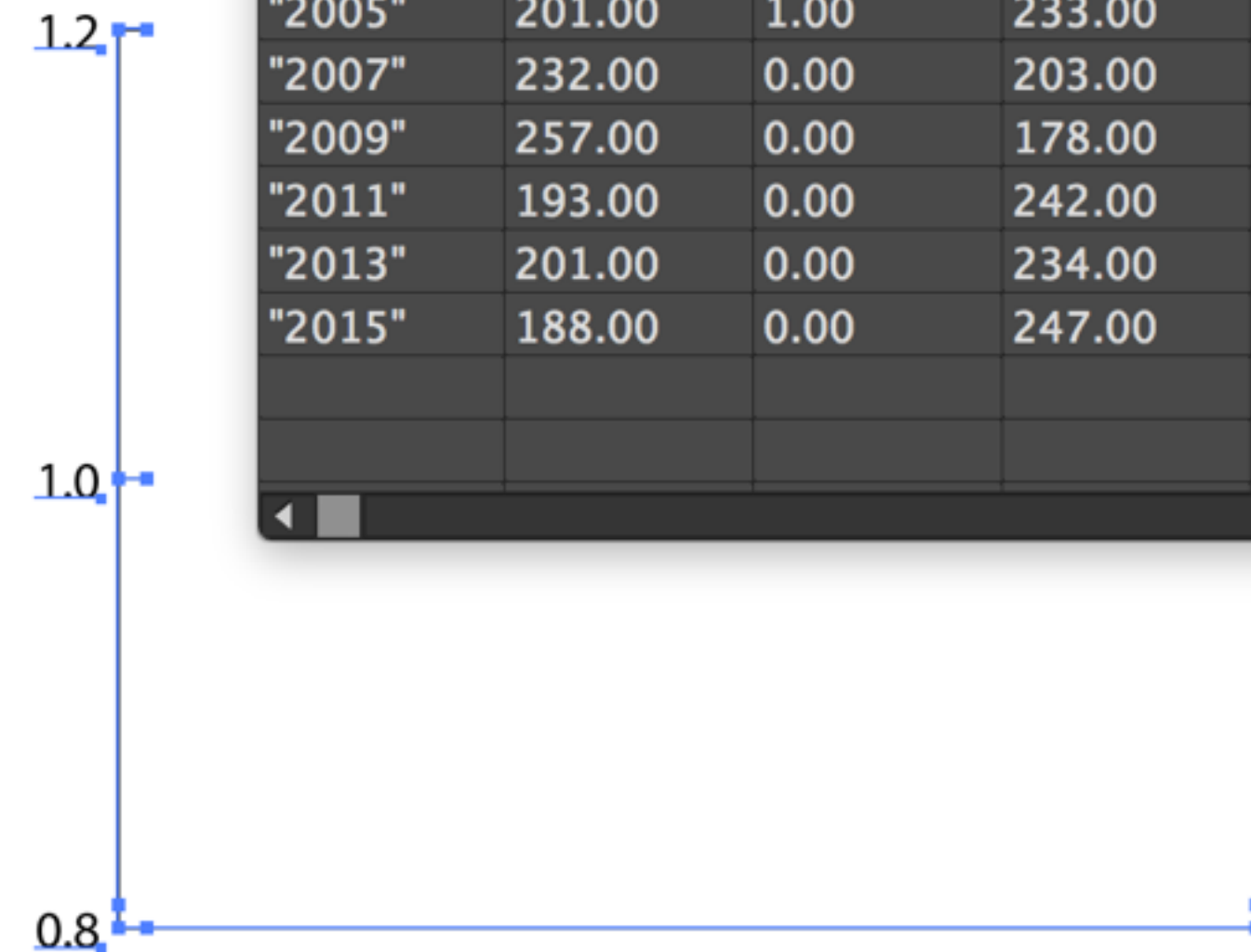
"1993"	258.00	1.00	176.00
"1995"	206.00	1.00	228.00
"1997"	207.00	2.00	226.00
"1999"	211.00	1.00	223.00
"2001"	213.00	2.00	220.00
"2003"	205.00	1.00	229.00
"2005"	201.00	1.00	233.00
"2007"	232.00	0.00	203.00
"2009"	257.00	0.00	178.00
"2011"	193.00	0.00	242.00
"2013"	201.00	0.00	234.00
"2015"	188.00	0.00	247.00

GRAPHIC ANATOMY

Headline

A good headline is written, like a story headline, to grab the reader's attention.
It should be relatively short — it needn't fill its horizontal space — and directly reflect the information imparted by the graphic.

GOING FOR GOLD

The 36 gold medals won by the United States at the 2008 Summer Games matched their total from 2004 and was good for second in the overall standings, behind host China's fifty-one.

Gold medals won by the United States during the Summer Olympic Games, 1896-2008

Most: **83 in 1984**

2008: **36**

1896 '00 '04 '08 '12 '16 '18 '20 '24 '28 '32 '36 '40 '44 '48 '52 '56 '60 '64 '68 '72 '76 '80 '84 '88 '92 '96 '00 '04 '08
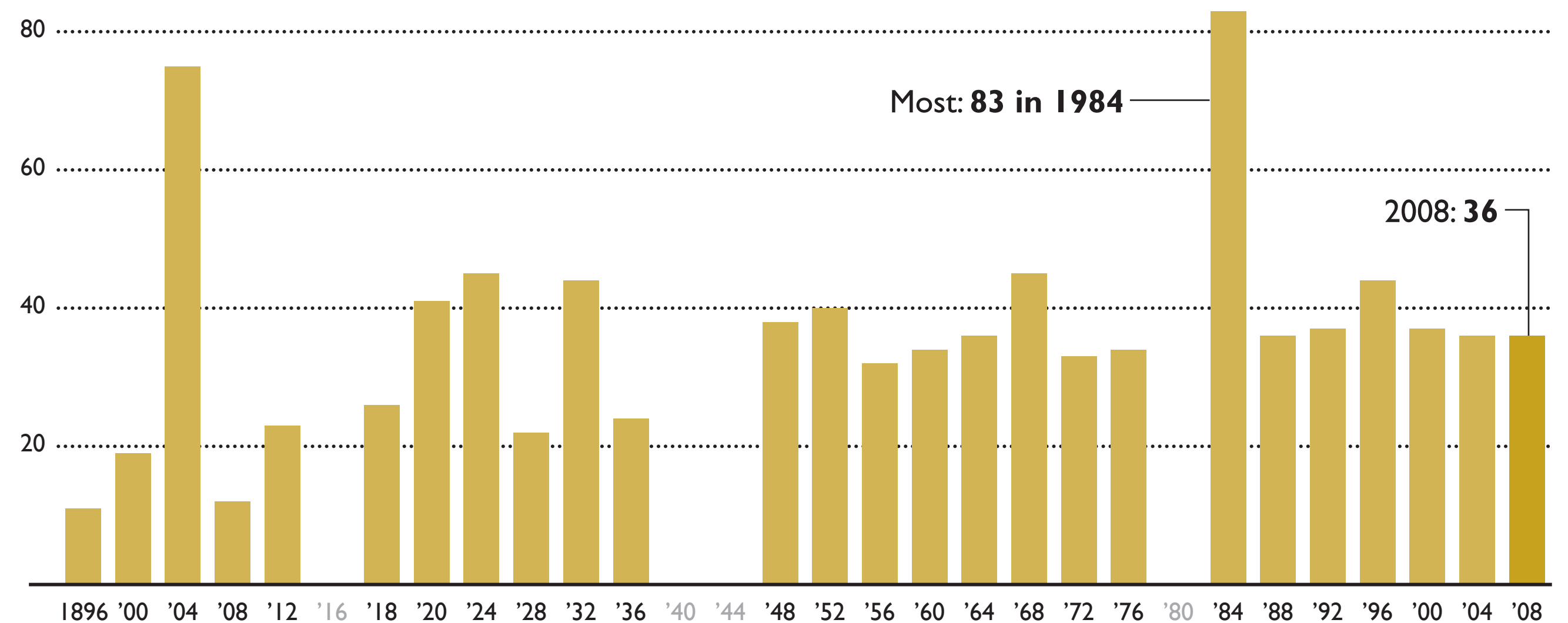
NOTE: The Summer Games were not held in 1916, 1940 or 1944 because of World Wars I and II. The U.S. led a boycott of the 1980 Moscow Games and did not participate.
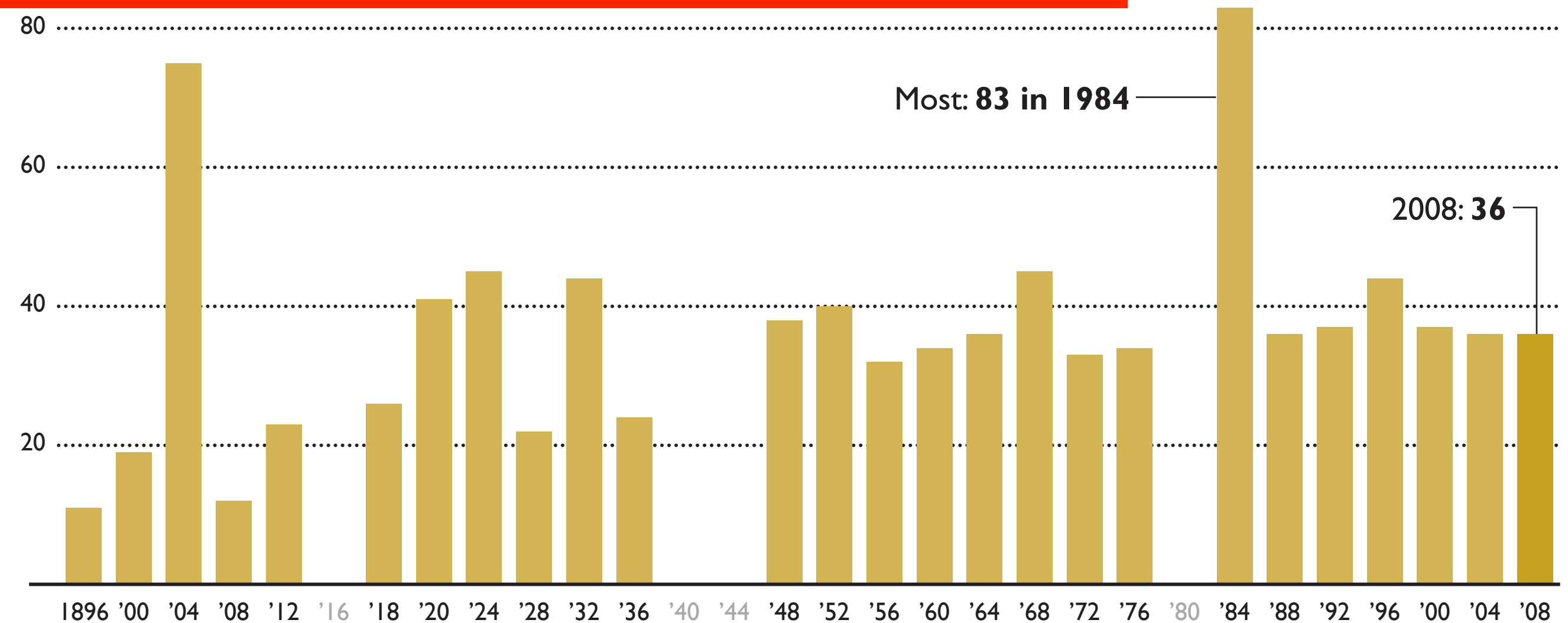SOURCE: International Olympic Committee

J464 GRAPHIC

Explainer

Sometimes called "chatter," this brief paragraph summarizes the main idea of the graphic and applies context. Often, an explainer will offer a level of detail not shown in the visual section (the chart in this case).

GOING FOR GOLD

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1896 '00 '04 '08 '12 '16 '18 '20 '24 '28 '32 '36 '40 '44 '48 '52 '56 '60 '64 '68 '72 '76 '80 '84 '88 '92 '96 '00 '04 '08
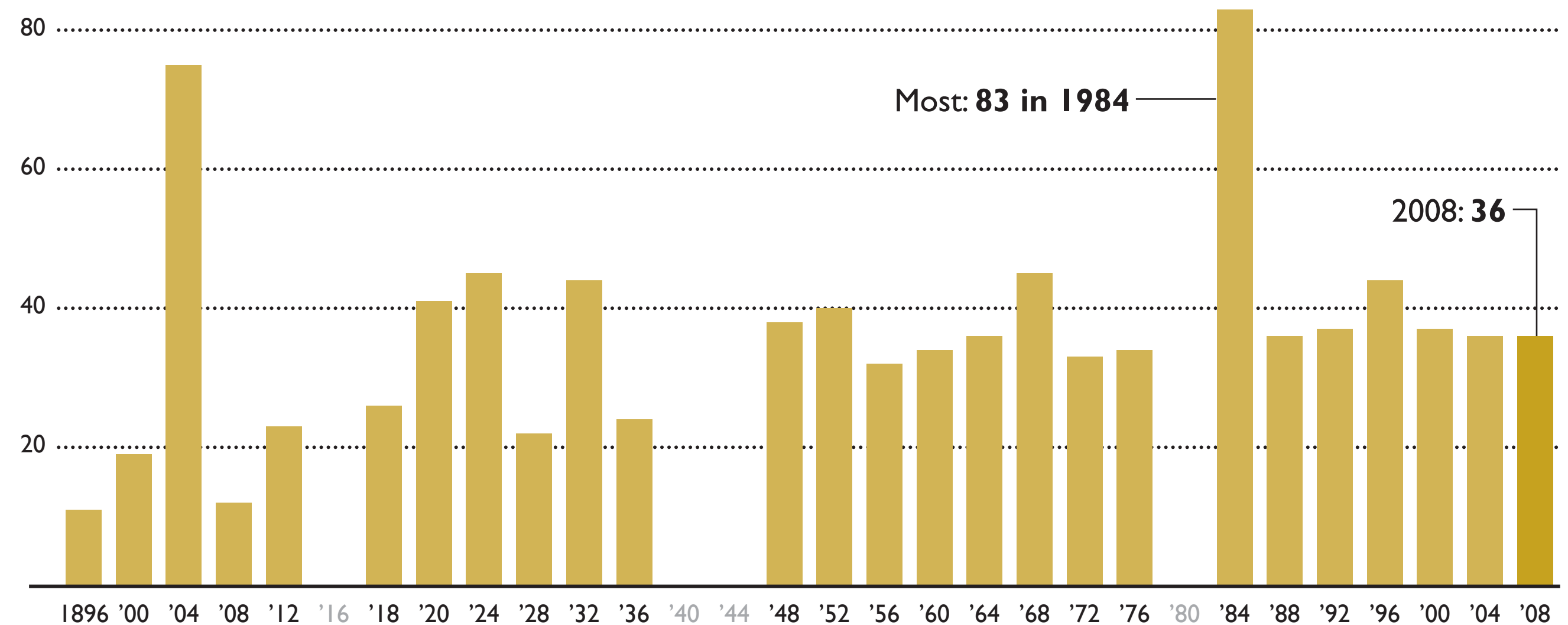
NOTE: The Summer Games were not held in 1916, 1940 or 1944 because of World Wars I and II. The U.S. led a boycott of the 1980 Moscow Games and did not participate.
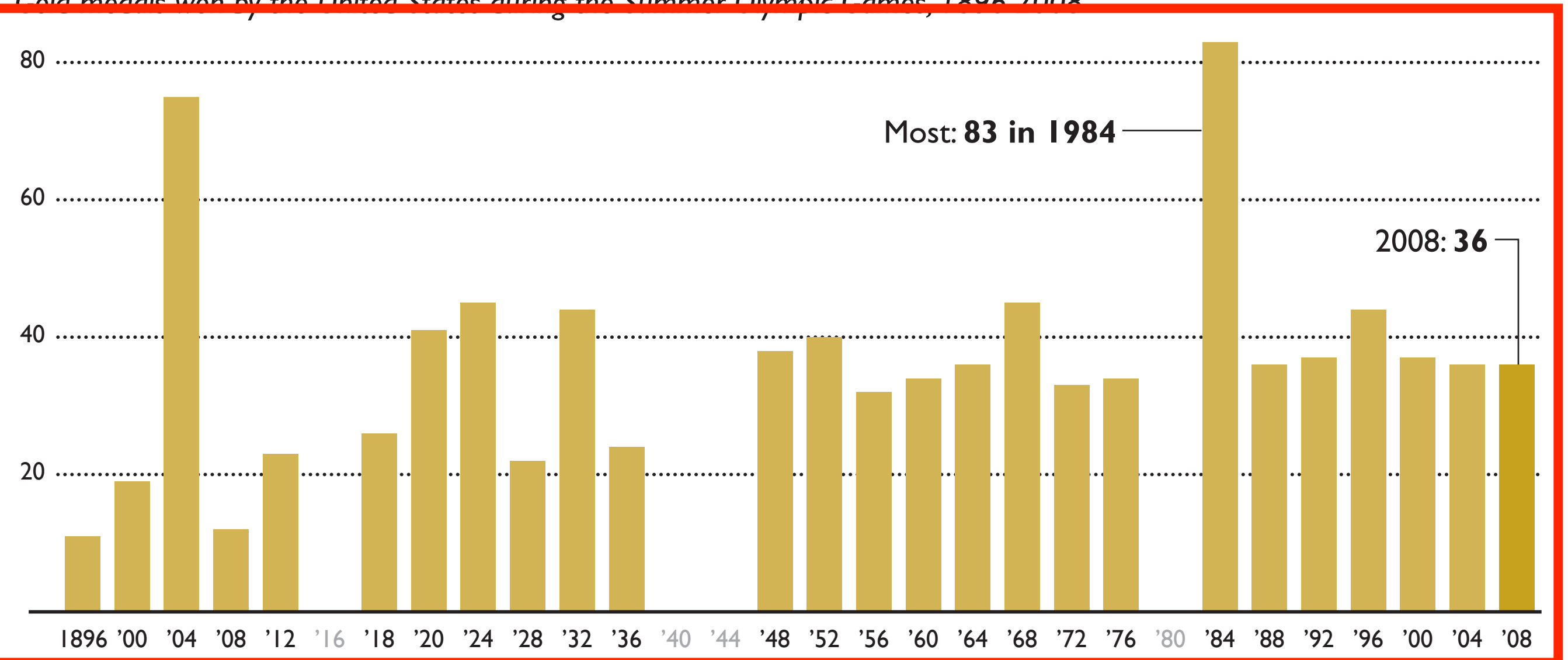SOURCE: International Olympic Committee

J464 **GRAPHIC**

Label

A label lists the pertinent information shown in a chart and is best placed directly adjacent to it. The label should not contain any extraneous information, but it should be thorough. Sometimes, the label includes a small headline (for example, "Gold medals") above the descriptive text.

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The 36 gold medals won by the United States at the 2008 Summer Games matched their total from 2004 and was good for second in the overall standings, behind host China's fifty-one.

Gold medals won by the United States during the Summer Olympic Games, 1896-2008

Most: **83 in 1984**

2008: **36**

80
60
40
20

1896 '00 '04 '08 '12 '16 '18 '20 '24 '28 '32 '36 '40 '44 '48 '52 '56 '60 '64 '68 '72 '76 '80 '84 '88 '92 '96 '00 '04 '08

NOTE: The Summer Games were not held in 1916, 1940 or 1944 because of World Wars I and II. The U.S. led a boycott of the 1980 Moscow Games and did not participate.
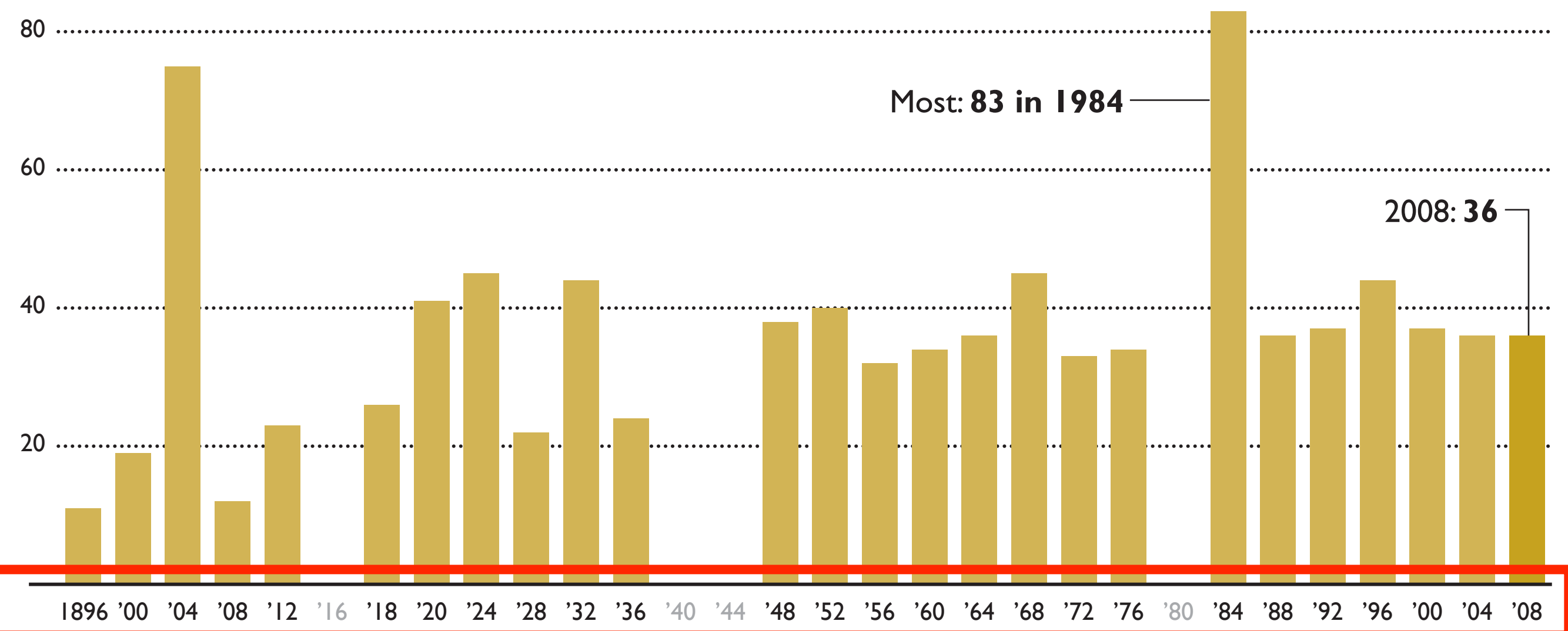SOURCE: International Olympic Committee

J464 **GRAPHIC**

Figure

The "figure" in any graphic needs to be the vital visual component. It must be the focus of the graphic as a whole, and the visual representation of the graphic's main point.

GOING FOR GOLD

The 36 gold medals won by the United States at the 2008 Summer Games matched their total from 2004 and was good for second in the overall standings, behind host China's fifty-one.

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1896 '00 '04 '08 '12 '16 '18 '20 '24 '28 '32 '36 '40 '44 '48 '52 '56 '60 '64 '68 '72 '76 '80 '84 '88 '92 '96 '00 '04 '08

NOTE: The Summer Games were not held in 1916, 1940 or 1944 because of World Wars I and II. The U.S. led a boycott of the 1980 Moscow Games and did not participate.
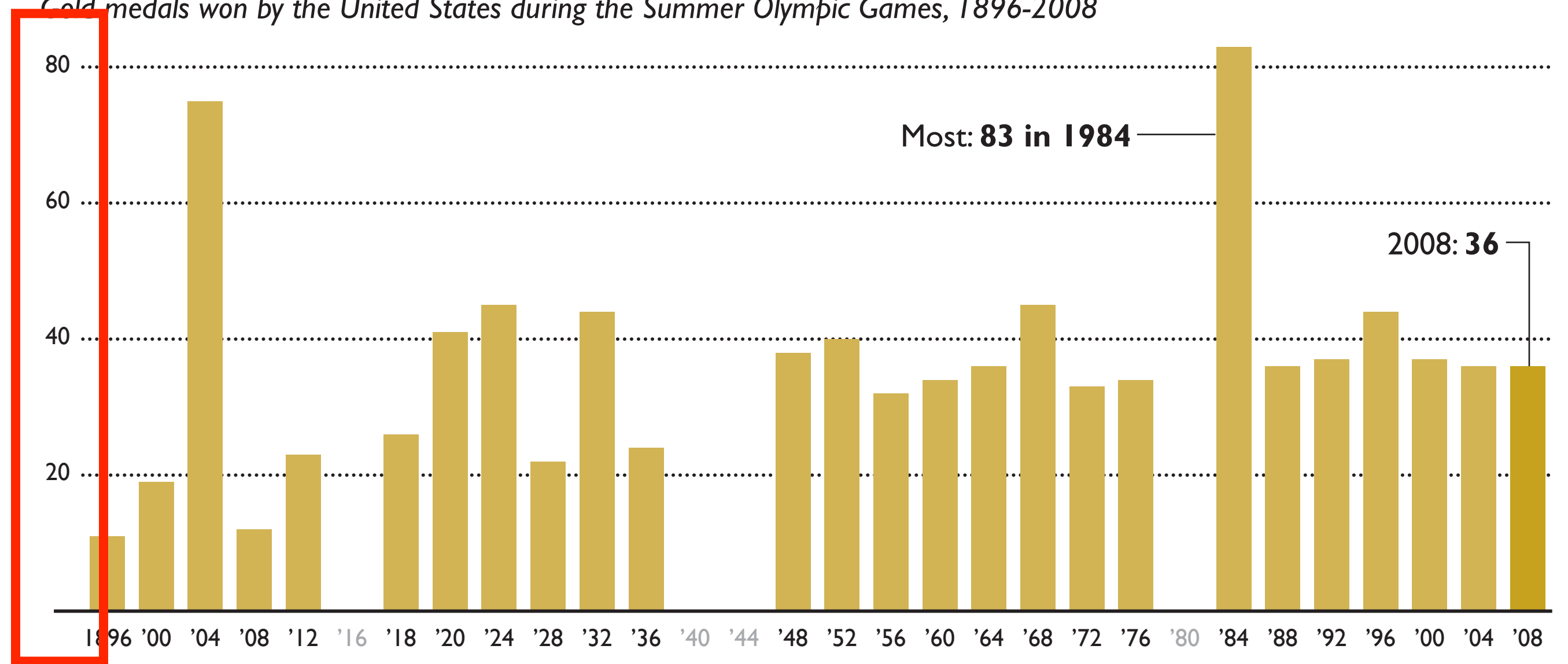
SOURCE: International Olympic Committee

J464 GRAPHIC

X-axis

Bar charts are usually made up of two axes: the X and the Y. The X-axis runs along the bottom of the chart, and is the label for what each bar represents — in this case, Olympic years. The X-axis is often, but not always, a time measurement.

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1896 '00 '04 '08 '12 '16 '18 '20 '24 '28 '32 '36 '40 '44 '48 '52 '56 '60 '64 '68 '72 '76 '80 '84 '88 '92 '96 '00 '04 '08

NOTE: The Summer Games were not held in 1916, 1940 or 1944 because of World Wars I and II. The U.S. led a boycott of the 1980 Moscow Games and did not participate.
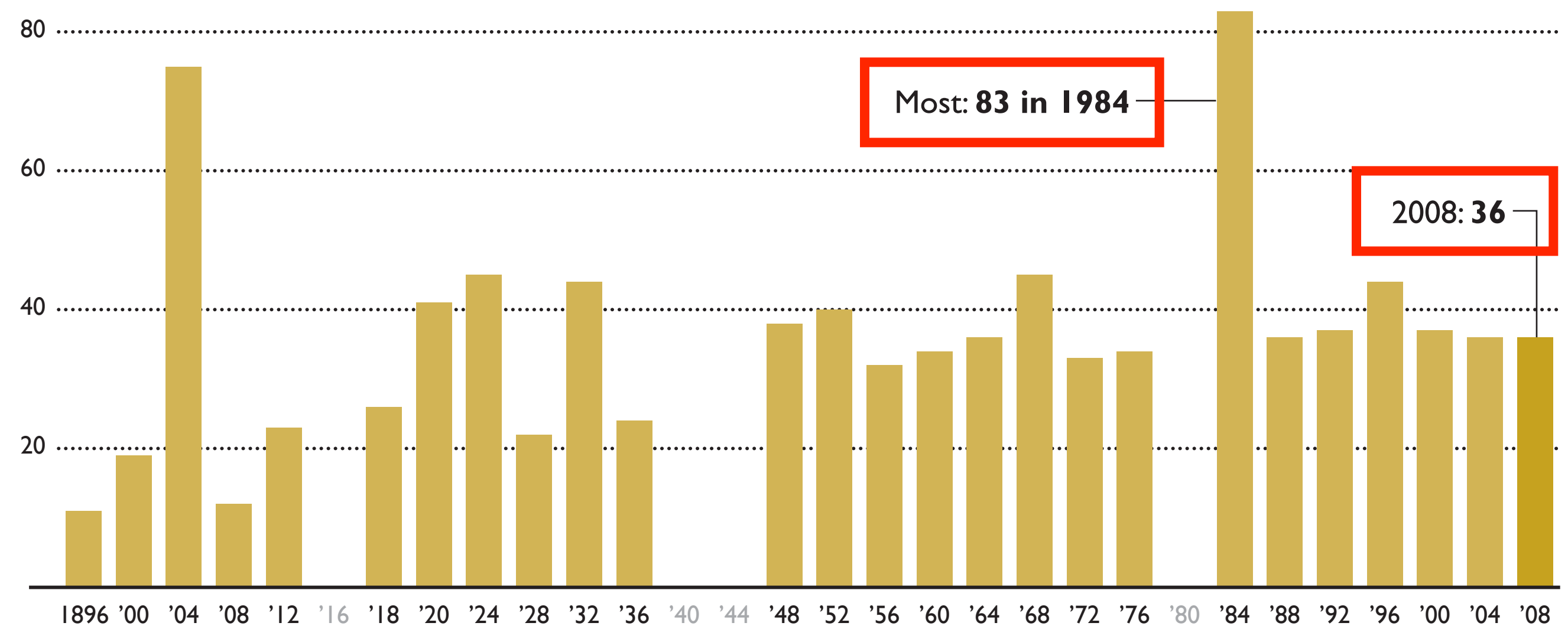SOURCE: International Olympic Committee

J464 GRAPHIC

Y axis

The Y axis tracks the incremental values between zero at the bottom and the maximum. The highest charted number can exceed the Y axis, though not by much. Y axis numbers should be regular, whole numbers. Lines connect the Y axis across the figure.

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1896 '00 '04 '08 '12 '16 '18 '20 '24 '28 '32 '36 '40 '44 '48 '52 '56 '60 '64 '68 '72 '76 '80 '84 '88 '92 '96 '00 '04 '08

NOTE: The Summer Games were not held in 1916, 1940 or 1944 because of World Wars I and II. The U.S. led a boycott of the 1980 Moscow Games and did not participate.

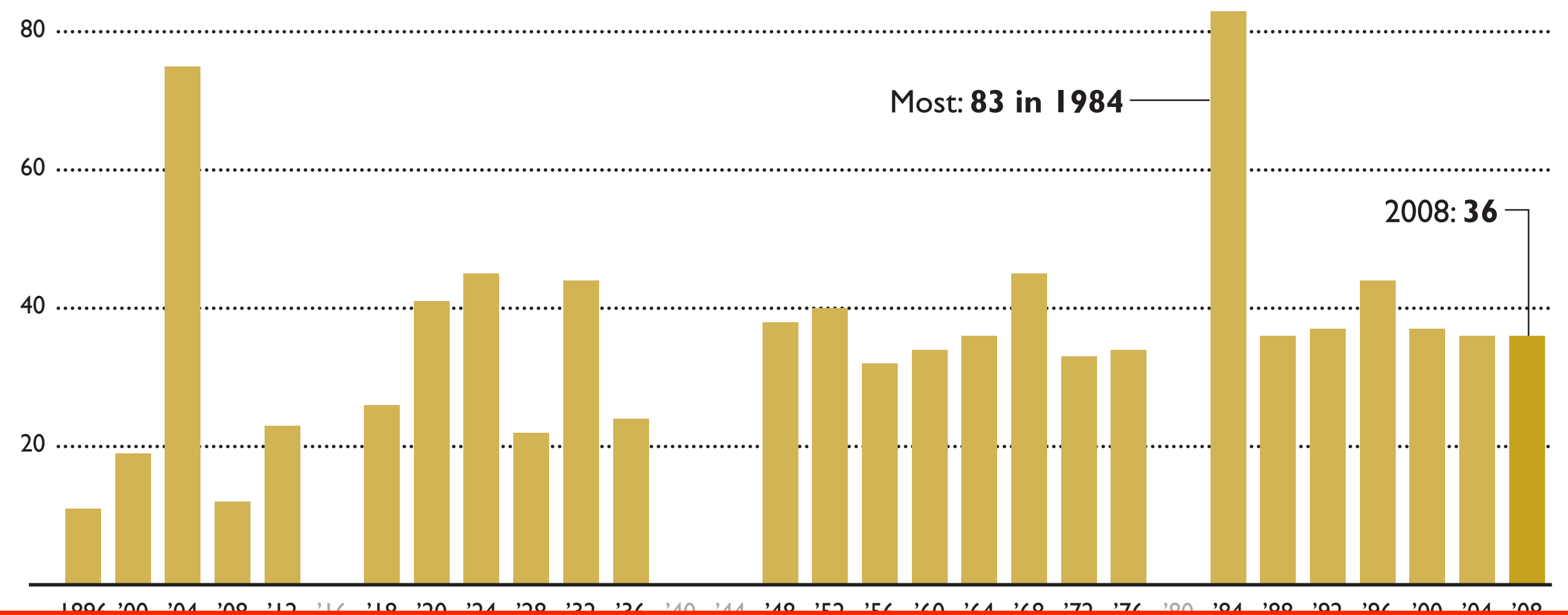SOURCE: International Olympic Committee

J464 GRAPHIC

Call-outs

Focal information needs to be brought forward in a graphic, highlighted in a pointer box or similar device so that it is seen and understood at a glance. Key data should be bold.

GOING FOR GOLD

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Gold medals won by the United States during the Summer Olympic Games, 1896-2008

Most: **83 in 1984**

2008: **36**

NOTE: The Summer Games were not held in 1916, 1940 or 1944 because of World Wars I and II. The U.S. led a boycott of the 1980 Moscow Games and did not participate.
SOURCE: International Olympic Committee

J464 GRAPHIC

Notes*

Additional chart information that helps explain gaps in the data, for example, or the methodology of poll data, is added at the bottom of the chart in small type (try 12 pixels or so).

GOING FOR GOLD

The 36 gold medals won by the United States at the 2008 Summer Games matched their total from 2004 and was good for second in the overall standings, behind host China's fifty-one.

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NOTE: The Summer Games were not held in 1916, 1940 or 1944 because of World Wars I and II. The U.S. led a boycott of the 1980 Moscow Games and did not participate.
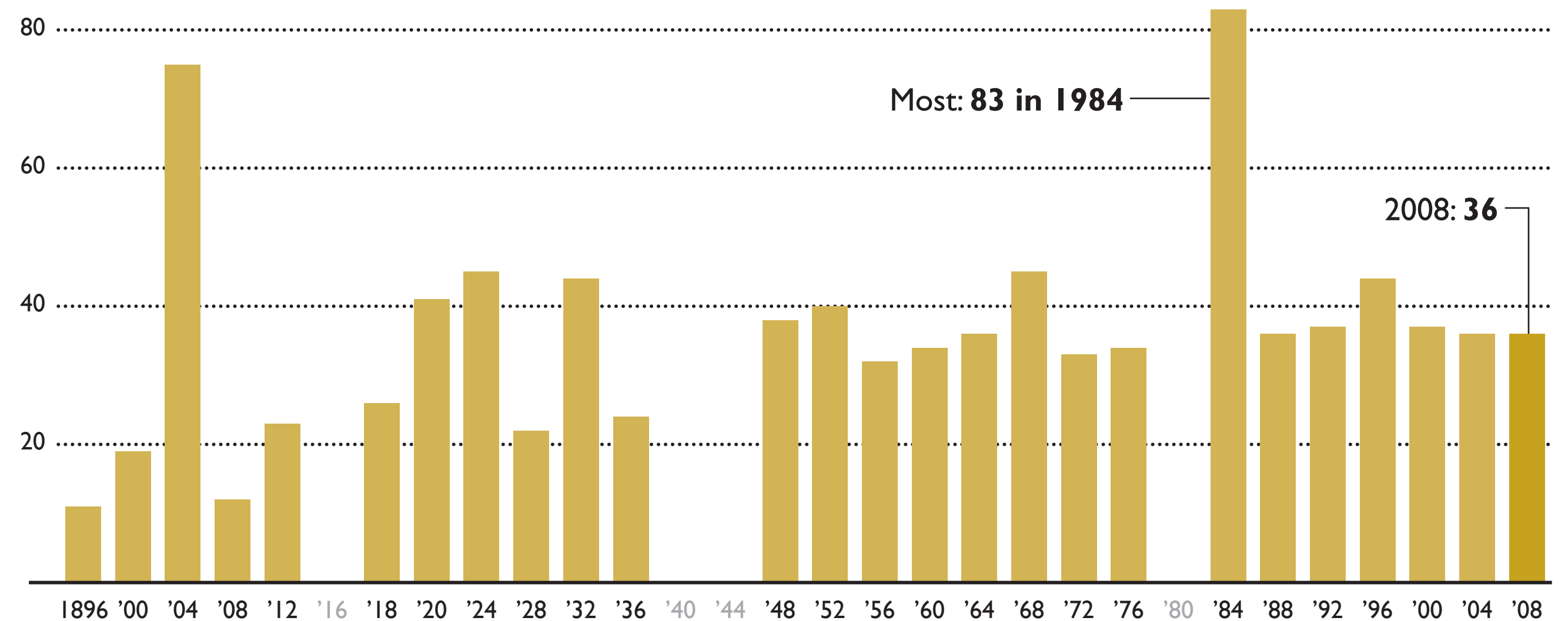SOURCE: International Olympic Committee

Source

Every graphic needs a source — the origin for the information represented in the graphic. Sources should be authoritative — not Wikipedia, for example — and they can, and often do, include multiple sources.

GOING FOR GOLD

The 36 gold medals won by the United States at the 2008 Summer Games matched their total from 2004 and was good for second in the overall standings, behind host China's fifty-one.

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NOTE: The Summer Games were not held in 1916, 1940 or 1944 because of World Wars I and II. The U.S. led a boycott of the 1980 Moscow Games and did not participate.

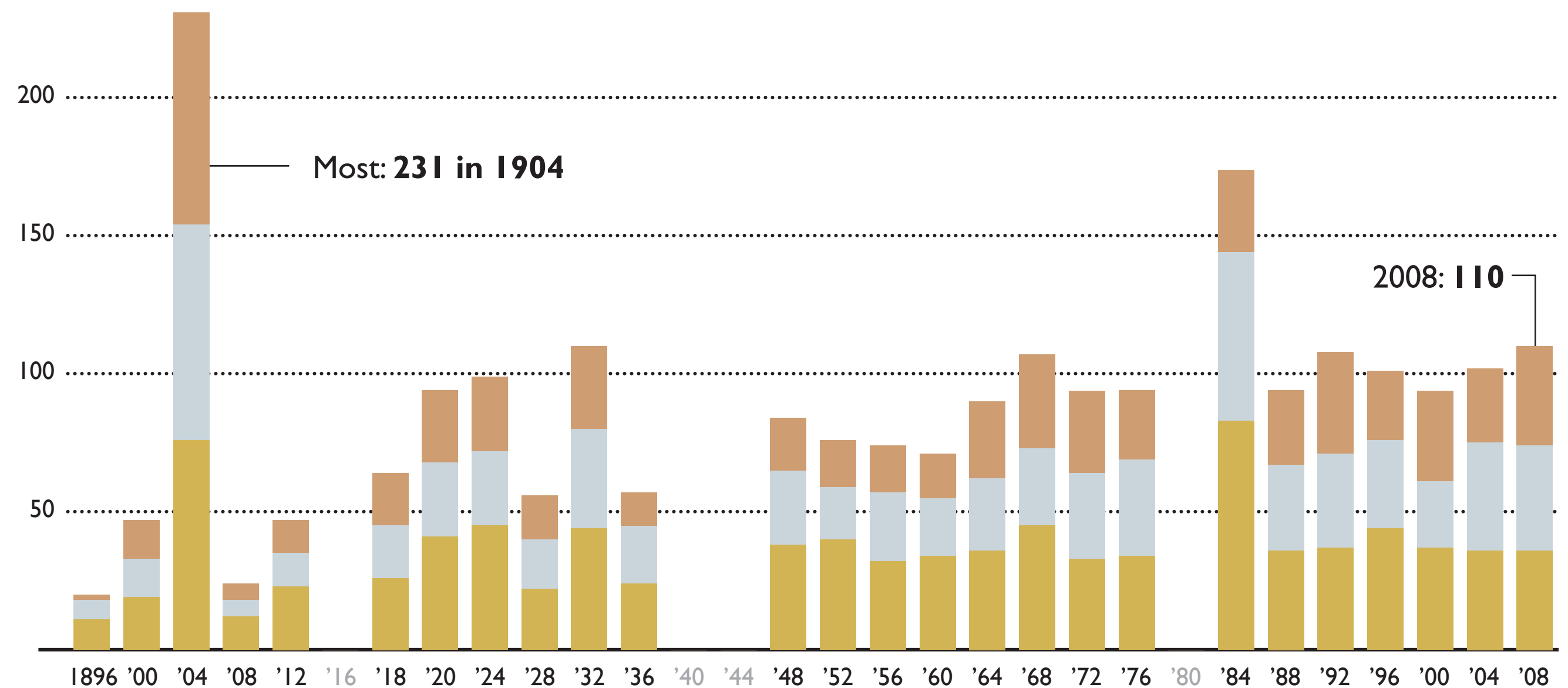SOURCE: International Olympic Committee

J464 GRAPHIC

The key

Many graphics chart more than one variable. In such cases, you often need a key to provide readers with quick-scan knowledge of what the bars mean. A key should be prominent, easy to find, and usually directly above the chart.

GOING FOR GOLD

The 36 gold medals won by the United States at the 2008 Summer Games matched their total from 2004 and was good for second in the overall standings, behind host China's fifty-one.

Total medals won by the United States during the Summer Olympic Games, 1896-2008

KEY: ■ Gold ■ Silver ■ Bronze

Most: **231 in 1904**

2008: **110**

200

150

100

50

1896 '00 '04 '08 '12 '16 '18 '20 '24 '28 '32 '36 '40 '44 '48 '52 '56 '60 '64 '68 '72 '76 '80 '84 '88 '92 '96 '00 '04 '08

NOTE: The Summer Games were not held in 1916, 1940 or 1944 because of World Wars I and II. The U.S. led a boycott of the 1980 Moscow Games and did not participate.

SOURCE: International Olympic Committee

J464 **GRAPHIC**

Choosing charts

For more on Illustrator's charting, go to https://helpx.adobe.com/illustrator/using/graphs.html