National Center for Science and Engineering Statistics

National Patterns of R&D Resources: 2022–23 Data Update

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General Notes

National Patterns of R&D Resources provides current data on the levels and key trends of the performance and funding of research and experimental development (R&D) in the United States. These detailed statistical tables supplement analytical InfoBriefs available at https://ncses.nsf.gov/data-collections/national-patterns/, from the National Center for Science and Engineering Statistics (NCSES).

The *National Patterns* statistics draw primarily from NCSES's national surveys of the R&D expenditures and funding of the organizations that perform the bulk of U.S. R&D—including businesses, federal and nonfederal government, higher education, and nonprofit organizations. Additional details on levels and trends are provided by type of R&D performed (i.e., basic research, applied research, and experimental development). The *National Patterns* data are reported in both current and inflation-adjusted dollars. These data along with gross domestic product (GDP), also reported in current and inflation-adjusted dollars, are presented back to 1953 to facilitate trend analysis and comparison of growth in R&D to overall U.S. economic growth.

The data for 2023 are estimates based mainly on findings from the 2022 sectoral R&D expenditure surveys, preliminary information from the 2023 sectoral R&D expenditure surveys, and evident recent trends. Data for 2022 were included in the previous edition (2020–21) of this report series but are now revised to reflect new, nearly final input from the sectoral surveys. The numbers for 1953–2021 reflect largely final survey data and, in general, exhibit minor revisions (if any).

The 2023 estimated business R&D expenditures in this report are based on 2023 projected R&D reported in the 2022 Business Enterprise Research and Development (BERD) Survey, preliminary information from the 2023 BERD Survey, and trends for business R&D performance. Some of the variation in BERD R&D estimates across survey years is due to changes in individual respondent reporting practices. During the 2023 BERD data collection, some respondents revised their reporting practices and eliminated expenditures that did not meet the BERD definition of R&D. This has resulted in a meaningful decrease in the estimated 2023 U.S. R&D performance compared to the amount of 2023 R&D performance that would have been estimated based on respondent reporting practices used in 2022 and earlier.

Revised respondent reporting practices will be reflected in the 2023 BERD R&D expenditure estimates to be published in 2025. Users should be aware that no revisions will be made to the R&D expenditure estimates published for the 2022 or earlier BERD Surveys. This change has affected the comparability of the 2023 estimates to those published for years prior to 2023.

The statistical tables are arranged to exhibit the U.S. R&D data from two differing perspectives. The first perspective (tables 2–5) is by type of R&D performer, with detailed breakouts by source of funds. The second perspective (tables 6–9) is by source of funds, with detailed breakouts by type of performer. The data in both groups of tables sum to the same overall U.S. R&D performance totals. Table 1 provides data mainly on the U.S. R&D-to–gross domestic product (GDP) ratio and its components. Table 10 presents state-level breakdowns of the U.S. R&D totals, by performing sector and source of funds, for 2021.

For trend comparisons, use only the historical data from the most recent publication, which incorporates the latest revisions and corrections. Do not use data published earlier.

NCSES has reviewed this product for unauthorized disclosure of confidential information and approved its release (NCSES-DRN25-009).

Data Tables

U.S. gross domestic product and R&D: 1953–2023

Table	Title
1	U.S. gross domestic product, R&D, and ratio of R&D to gross domestic product (and components): 1953–2023

U.S. R&D expenditures

Table	Title
2	U.S. R&D expenditures, by performing sector and source of funds: 1953–2023
3	U.S. basic research expenditures, by performing sector and source of funds: 1953–2023
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6	U.S. R&D expenditures, by source of funds and performing sector: 1953–2023
7	U.S. basic research expenditures, by source of funds and performing sector: 1953–2023
8	U.S. applied research expenditures, by source of funds and performing sectors: 1953–2023
9	U.S. experimental development expenditures, by source of funds and performing sector: 1953–2023

U.S. R&D expenditures, by state

Table	Title
10	U.S. R&D expenditures, by state, performing sector, and source of funds: 2022

TABLE 1

U.S. gross domestic product, R&D, and ratio of R&D to gross domestic product (and components): 1953–2023

(Billions of current and of constant 2017 dollars and R&D as a percentage of GDP)

Year	GDP			Total R&D		R&D/GDP (%)							
							R&D, by performer				R&D, by source of funding		
	Current $billions	Constant 2017 $billions	Deflator[a] (2017 = 1.00000)	Current $billions	Constant 2017 $billions	Total	Business	Federal[b]	Higher education	Other[c]	Business	Federal	Other[d]
1953	389.2	2,894.4	0.13447	5.2	38.4	1.33	0.93	0.29	0.07	0.03	0.58	0.71	0.03
1954	390.5	2,877.7	0.13570	5.6	41.4	1.44	1.04	0.29	0.08	0.03	0.61	0.79	0.04
1955	425.5	3,083.0	0.13801	6.2	44.8	1.45	1.04	0.30	0.08	0.03	0.59	0.82	0.04
1956	449.4	3,148.8	0.14272	8.5	59.6	1.89	1.40	0.38	0.09	0.03	0.74	1.11	0.04
1957	474.0	3,215.1	0.14743	9.9	67.2	2.09	1.55	0.42	0.09	0.04	0.73	1.31	0.04
1958	481.2	3,191.2	0.15079	10.9	72.4	2.27	1.68	0.45	0.10	0.04	0.77	1.45	0.05
1959	521.7	3,412.4	0.15288	12.5	81.7	2.39	1.76	0.47	0.11	0.04	0.78	1.57	0.05
1960	542.4	3,500.3	0.15496	13.7	88.5	2.53	1.85	0.50	0.13	0.05	0.83	1.64	0.05
1961	562.2	3,590.1	0.15660	14.6	93.0	2.59	1.84	0.55	0.15	0.05	0.85	1.69	0.06
1962	603.9	3,810.1	0.15850	15.6	98.6	2.59	1.83	0.54	0.16	0.06	0.85	1.68	0.06
1963	637.5	3,976.1	0.16033	17.5	109.3	2.75	1.92	0.58	0.18	0.06	0.86	1.83	0.07
1964	684.5	4,205.3	0.16277	19.1	117.4	2.79	1.91	0.62	0.20	0.06	0.86	1.86	0.07
1965	742.3	4,478.6	0.16574	20.3	122.2	2.73	1.86	0.59	0.21	0.06	0.88	1.78	0.07
1966	813.4	4,773.9	0.17038	22.1	129.5	2.71	1.87	0.56	0.22	0.07	0.90	1.74	0.07
1967	860.0	4,904.9	0.17533	23.3	133.2	2.71	1.86	0.56	0.24	0.07	0.95	1.69	0.07
1968	940.7	5,145.9	0.18281	24.7	134.9	2.62	1.81	0.52	0.23	0.06	0.96	1.59	0.07
1969	1,017.6	5,306.6	0.19176	26.0	135.6	2.55	1.75	0.51	0.22	0.06	0.98	1.50	0.07
1970	1,073.3	5,316.4	0.20188	26.3	130.1	2.45	1.64	0.52	0.23	0.06	0.97	1.40	0.08
1971	1,164.9	5,491.4	0.21213	27.0	127.1	2.31	1.53	0.50	0.22	0.06	0.93	1.31	0.08
1972	1,279.1	5,780.0	0.22130	28.7	129.9	2.25	1.49	0.49	0.22	0.06	0.92	1.25	0.08
1973	1,425.4	6,106.4	0.23343	31.0	132.6	2.17	1.45	0.45	0.21	0.06	0.93	1.16	0.07
1974	1,545.2	6,073.4	0.25442	33.4	131.1	2.16	1.44	0.45	0.21	0.06	0.96	1.12	0.08
1975	1,684.9	6,060.9	0.27800	35.7	128.3	2.12	1.39	0.45	0.21	0.06	0.94	1.10	0.08
1976	1,873.4	6,387.4	0.29330	39.4	134.5	2.10	1.39	0.44	0.21	0.06	0.94	1.08	0.08
1977	2,081.8	6,682.8	0.31152	43.3	139.1	2.08	1.39	0.43	0.21	0.06	0.94	1.06	0.08
1978	2,351.6	7,052.7	0.33343	48.7	146.1	2.07	1.37	0.43	0.21	0.06	0.95	1.04	0.08
1979	2,627.3	7,276.0	0.36109	55.4	153.4	2.11	1.41	0.42	0.22	0.06	0.99	1.04	0.08
1980	2,857.3	7,257.3	0.39371	63.2	160.6	2.21	1.51	0.42	0.23	0.06	1.08	1.05	0.08
1981	3,207.0	7,441.5	0.43096	72.3	167.7	2.25	1.57	0.41	0.22	0.06	1.12	1.05	0.08
1982	3,343.8	7,307.3	0.45760	80.7	176.5	2.41	1.71	0.42	0.23	0.06	1.22	1.11	0.09
1983	3,634.0	7,642.3	0.47551	89.9	189.2	2.48	1.75	0.44	0.23	0.06	1.25	1.14	0.09
1984	4,037.6	8,195.3	0.49267	102.2	207.5	2.53	1.81	0.43	0.23	0.06	1.29	1.15	0.09
1985	4,339.0	8,537.0	0.50826	114.7	225.6	2.64	1.90	0.44	0.24	0.06	1.34	1.21	0.09

TABLE 1

U.S. gross domestic product, R&D, and ratio of R&D to gross domestic product (and components): 1953–2023

(Billions of current and of constant 2017 dollars and R&D as a percentage of GDP)

Year	GDP			Total R&D		R&D/GDP (%)							
							R&D, by performer				R&D, by source of funding		
	Current $billions	Constant 2017 $billions	Deflator[a] (2017 = 1.00000)	Current $billions	Constant 2017 $billions	Total	Business	Federal[b]	Higher education	Other[c]	Business	Federal	Other[d]
1986	4,579.6	8,832.6	0.51849	120.2	231.9	2.63	1.88	0.43	0.25	0.06	1.33	1.19	0.10
1987	4,855.2	9,137.7	0.53134	126.4	237.8	2.60	1.86	0.42	0.26	0.06	1.29	1.21	0.11
1988	5,236.4	9,519.4	0.55008	133.9	243.4	2.56	1.81	0.41	0.27	0.06	1.30	1.15	0.11
1989	5,641.6	9,869.0	0.57165	141.9	248.2	2.52	1.77	0.40	0.28	0.07	1.33	1.07	0.11
1990	5,963.1	10,055.1	0.59304	152.0	256.3	2.55	1.80	0.39	0.28	0.07	1.40	1.03	0.12
1991	6,158.1	10,044.2	0.61310	160.9	262.4	2.61	1.86	0.38	0.30	0.08	1.50	0.99	0.13
1992	6,520.3	10,398.0	0.62707	165.4	263.7	2.54	1.79	0.37	0.30	0.08	1.48	0.93	0.13
1993	6,858.6	10,684.2	0.64194	165.7	258.2	2.42	1.68	0.36	0.30	0.08	1.41	0.88	0.13
1994	7,287.2	11,114.6	0.65564	169.2	258.1	2.32	1.61	0.34	0.30	0.08	1.36	0.83	0.13
1995	7,639.7	11,413.0	0.66939	183.6	274.3	2.40	1.70	0.33	0.30	0.08	1.45	0.82	0.13
1996	8,073.1	11,843.6	0.68164	197.3	289.5	2.44	1.76	0.31	0.29	0.08	1.53	0.79	0.13
1997	8,577.6	12,370.3	0.69340	211.9	305.6	2.47	1.81	0.29	0.29	0.08	1.59	0.75	0.13
1998	9,062.8	12,924.9	0.70119	225.8	322.0	2.49	1.84	0.29	0.28	0.08	1.63	0.73	0.13
1999	9,631.2	13,543.8	0.71112	244.5	343.8	2.54	1.89	0.28	0.29	0.08	1.71	0.69	0.14
2000	10,251.0	14,096.0	0.72723	267.9	368.5	2.61	1.95	0.28	0.29	0.09	1.81	0.66	0.14
2001	10,581.9	14,230.7	0.74360	278.5	374.6	2.63	1.91	0.31	0.31	0.10	1.78	0.70	0.15
2002	10,929.1	14,472.7	0.75515	277.9	368.0	2.54	1.77	0.32	0.34	0.11	1.65	0.72	0.17
2003	11,456.5	14,877.3	0.77007	291.4	378.4	2.54	1.75	0.33	0.35	0.11	1.63	0.74	0.18
2004	12,217.2	15,449.8	0.79077	302.7	382.8	2.48	1.70	0.31	0.35	0.11	1.57	0.74	0.17
2005	13,039.2	15,988.0	0.81556	325.3	398.9	2.49	1.73	0.30	0.35	0.11	1.59	0.73	0.17
2006	13,815.6	16,433.1	0.84072	350.9	417.4	2.54	1.79	0.30	0.34	0.10	1.64	0.72	0.17
2007	14,474.2	16,762.4	0.86349	377.9	437.6	2.61	1.86	0.30	0.34	0.10	1.71	0.73	0.18
2008	14,769.9	16,781.5	0.88013	404.8	459.9	2.74	1.97	0.31	0.35	0.11	1.75	0.80	0.20
2009	14,478.1	16,349.1	0.88556	402.9	455.0	2.78	1.95	0.33	0.38	0.12	1.70	0.87	0.21
2010	15,049.0	16,789.8	0.89632	406.6	453.6	2.70	1.85	0.34	0.39	0.12	1.65	0.84	0.21
2011	15,599.7	17,052.4	0.91481	426.2	465.9	2.73	1.89	0.34	0.39	0.12	1.71	0.81	0.21
2012	16,254.0	17,442.8	0.93185	433.7	465.4	2.67	1.86	0.32	0.37	0.11	1.70	0.76	0.21
2013	16,880.7	17,812.2	0.94770	454.2	479.3	2.69	1.91	0.30	0.36	0.11	1.76	0.71	0.22
2014	17,608.1	18,261.7	0.96421	475.9	493.6	2.70	1.94	0.30	0.35	0.11	1.81	0.67	0.22
2015	18,295.0	18,799.6	0.97316	494.5	508.1	2.70	1.94	0.29	0.35	0.12	1.82	0.65	0.23
2016	18,804.9	19,141.7	0.98240	521.7	531.0	2.77	2.02	0.27	0.36	0.12	1.92	0.63	0.23
2017	19,612.1	19,612.1	1.00000	553.5	553.5	2.82	2.07	0.27	0.36	0.12	1.97	0.62	0.23
2018	20,656.5	20,193.9	1.02291	603.8	590.3	2.92	2.16	0.28	0.36	0.12	2.06	0.63	0.22

TABLE 1

U.S. gross domestic product, R&D, and ratio of R&D to gross domestic product (and components): 1953–2023

(Billions of current and of constant 2017 dollars and R&D as a percentage of GDP)

Year	GDP			Total R&D		R&D/GDP (%)							
							R&D, by performer				R&D, by source of funding		
	Current $billions	Constant 2017 $billions	Deflator[a] (2017 = 1.00000)	Current $billions	Constant 2017 $billions	Total	Business	Federal[b]	Higher education	Other[c]	Business	Federal	Other[d]
2019	21,540.0	20,715.7	1.03979	665.3	639.8	3.09	2.31	0.29	0.36	0.12	2.24	0.63	0.22
2020	21,354.1	20,267.6	1.05361	716.5	680.0	3.36	2.54	0.30	0.38	0.13	2.44	0.69	0.23
2021	23,681.2	21,494.8	1.10172	788.7	715.9	3.33	2.57	0.28	0.36	0.12	2.50	0.62	0.21
2022[e]	26,006.9	22,034.8	1.18026	891.8	755.6	3.43	2.68	0.28	0.36	0.11	2.59	0.63	0.21
2023[f]	27,720.7	22,671.1	1.22273	939.6	768.4	3.39	2.65	0.27	0.37	0.10	2.56	0.62	0.21

GDP = gross domestic product.

[a] 2017 = 1.00000 is the implicit price deflator for GDP.
[b] Federal includes federal intramural R&D and R&D by federally funded R&D centers.
[c] Other R&D performer includes R&D in the United States performed by nonfederal government and nonprofit organizations.
[d] Other R&D funding source includes funding for U.S. R&D by nonfederal government, higher education, and nonprofit organizations.
[e] Some data for 2022 are preliminary and may be revised later.
[f] Data for 2023 include estimates and are likely to be revised later.

Note(s):
Detail may not add to total because of rounding. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised.

Source(s):
GDP data from Bureau of Economic Analysis, Gross Domestic Product, https://www.bea.gov/national/, accessed 4 October 2024; R&D data from National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

TABLE 2

U.S. R&D expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs[b]		Nonfederal government[c]		Business[d]							Higher education[e]						NPOs[f]			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
Current $millions																								
1953	5,160	1,146	1,015	131	131	NA	NA	3,630	2,200	1,430	NA	NA	NA	NA	273	149	40	21	37	27	112	58	26	28
1954	5,621	1,127	963	165	165	NA	NA	4,070	2,320	1,750	NA	NA	NA	NA	301	165	45	24	40	29	123	61	31	31
1955	6,185	1,292	973	319	319	NA	NA	4,420	2,460	1,960	NA	NA	NA	NA	342	191	50	27	42	32	132	65	35	32
1956	8,501	1,692	1,131	561	561	NA	NA	6,272	3,277	2,995	NA	NA	NA	NA	391	221	57	32	46	36	146	71	37	38
1957	9,908	1,985	1,297	688	688	NA	NA	7,324	3,396	3,928	NA	NA	NA	NA	433	242	64	37	51	40	167	79	37	51
1958	10,915	2,163	1,507	657	657	NA	NA	8,066	3,630	4,436	NA	NA	NA	NA	491	280	72	39	56	45	195	95	38	62
1959	12,490	2,470	1,681	789	789	NA	NA	9,200	3,983	5,217	NA	NA	NA	NA	586	356	81	40	61	50	234	125	42	67
1960	13,711	2,711	1,801	910	910	NA	NA	10,032	4,428	5,604	NA	NA	NA	NA	705	453	90	40	67	55	264	148	48	68
1961	14,564	3,074	1,987	1,087	1,087	NA	NA	10,353	4,668	5,685	NA	NA	NA	NA	834	557	101	40	75	62	304	169	49	86
1962	15,636	3,244	2,188	1,056	1,056	NA	NA	11,037	5,029	6,008	NA	NA	NA	NA	993	687	112	41	84	70	363	200	54	109
1963	17,519	3,717	2,559	1,159	1,159	NA	NA	12,216	5,360	6,856	NA	NA	NA	NA	1,178	839	125	41	96	78	408	234	55	119
1964	19,103	4,263	2,966	1,297	1,297	NA	NA	13,049	5,792	7,257	NA	NA	NA	NA	1,375	995	138	41	114	88	417	250	55	112
1965	20,253	4,374	3,157	1,218	1,218	NA	NA	13,812	6,445	7,367	NA	NA	NA	NA	1,595	1,167	150	42	136	101	472	286	62	124
1966	22,072	4,525	3,308	1,217	1,217	NA	NA	15,193	7,216	7,977	NA	NA	NA	NA	1,818	1,335	160	45	165	114	537	329	70	138
1967	23,347	4,785	3,445	1,340	1,340	NA	NA	15,966	8,020	7,946	NA	NA	NA	NA	2,035	1,491	168	52	200	126	561	342	74	145
1968	24,667	4,870	3,498	1,372	1,372	NA	NA	17,014	8,869	8,145	NA	NA	NA	NA	2,187	1,586	185	58	221	139	596	364	81	151
1969	25,996	5,230	3,790	1,440	1,440	NA	NA	17,844	9,857	7,987	NA	NA	NA	NA	2,280	1,624	208	61	233	155	642	388	93	161
1970	26,271	5,583	4,154	1,430	1,430	NA	NA	17,594	10,288	7,306	NA	NA	NA	NA	2,418	1,686	237	66	259	171	677	410	95	172
1971	26,952	5,849	4,409	1,441	1,441	NA	NA	17,829	10,654	7,175	NA	NA	NA	NA	2,565	1,760	262	72	290	182	709	427	98	184
1972	28,740	6,209	4,676	1,533	1,533	NA	NA	19,004	11,535	7,469	NA	NA	NA	NA	2,757	1,890	282	79	312	195	771	472	101	198
1973	30,952	6,413	4,837	1,576	1,576	NA	NA	20,704	13,104	7,600	NA	NA	NA	NA	2,954	2,009	301	90	344	210	882	566	105	211
1974	33,359	6,916	5,132	1,784	1,784	NA	NA	22,239	14,667	7,572	NA	NA	NA	NA	3,216	2,160	320	105	394	239	988	639	114	235
1975	35,671	7,580	5,561	2,019	2,019	NA	NA	23,460	15,582	7,878	NA	NA	NA	NA	3,570	2,400	348	118	432	272	1,062	675	124	262
1976	39,435	8,291	5,890	2,401	2,401	NA	NA	26,107	17,436	8,671	NA	NA	NA	NA	3,899	2,619	369	131	480	300	1,139	711	135	292
1977	43,338	8,916	6,211	2,704	2,704	NA	NA	28,863	19,340	9,523	NA	NA	NA	NA	4,346	2,893	394	155	569	337	1,213	740	147	326
1978	48,719	10,148	6,962	3,186	3,186	NA	NA	32,222	22,115	10,107	NA	NA	NA	NA	4,996	3,329	443	182	679	364	1,353	830	160	363
1979	55,379	11,038	7,471	3,567	3,567	NA	NA	37,062	25,708	11,354	NA	NA	NA	NA	5,715	3,848	482	215	785	386	1,564	985	174	405
1980	63,224	11,882	7,831	4,052	4,052	NA	NA	43,228	30,476	12,752	NA	NA	NA	NA	6,455	4,335	519	264	920	419	1,658	1,017	189	452
1981	72,292	12,998	8,605	4,393	4,393	NA	NA	50,425	35,428	14,997	NA	NA	NA	NA	7,085	4,670	581	314	1,058	463	1,784	1,075	206	504
1982	80,748	14,065	9,501	4,563	4,563	NA	NA	57,166	40,105	17,061	NA	NA	NA	NA	7,603	4,879	621	363	1,207	534	1,915	1,129	224	561
1983	89,949	15,840	10,830	5,011	5,011	NA	NA	63,683	44,588	19,095	NA	NA	NA	NA	8,251	5,210	658	432	1,357	595	2,175	1,306	244	626
1984	102,244	17,518	11,916	5,602	5,602	NA	NA	73,061	51,404	21,657	NA	NA	NA	NA	9,154	5,748	721	518	1,514	654	2,511	1,548	265	698

TABLE 2

U.S. R&D expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs[b]		Nonfederal government[c]		Business[d]							Higher education[e]						NPOs[f]			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1985	114,671	19,227	13,093	6,134	6,134	NA	NA	82,376	57,043	25,333	NA	NA	NA	NA	10,308	6,388	834	630	1,743	713	2,761	1,694	289	778
1986	120,249	19,909	13,505	6,405	6,405	NA	NA	85,932	59,932	26,000	NA	NA	NA	NA	11,540	7,028	969	745	2,019	780	2,867	1,686	314	867
1987	126,360	20,380	13,588	6,792	6,792	NA	NA	90,160	61,403	28,757	NA	NA	NA	NA	12,807	7,768	1,065	831	2,262	882	3,013	1,704	342	967
1988	133,881	21,555	14,342	7,212	7,212	NA	NA	94,893	66,672	28,221	NA	NA	NA	NA	14,221	8,593	1,165	933	2,527	1,003	3,212	1,762	372	1,078
1989	141,891	22,728	15,231	7,497	7,497	NA	NA	99,860	73,501	26,359	NA	NA	NA	NA	15,634	9,317	1,274	1,061	2,852	1,131	3,669	2,062	405	1,202
1990	151,993	23,524	15,671	7,853	7,853	NA	NA	107,404	81,602	25,802	NA	NA	NA	NA	16,939	9,939	1,399	1,166	3,187	1,249	4,126	2,346	440	1,340
1991	160,876	23,343	15,249	8,093	8,093	NA	NA	114,675	90,580	24,095	NA	NA	NA	NA	18,206	10,667	1,483	1,242	3,458	1,358	4,652	2,679	479	1,494
1992	165,350	24,212	15,853	8,360	8,360	NA	NA	116,757	94,388	22,369	NA	NA	NA	NA	19,388	11,528	1,525	1,320	3,569	1,448	4,993	2,806	521	1,666
1993	165,730	24,534	16,531	8,003	8,003	NA	NA	115,435	94,591	20,844	NA	NA	NA	NA	20,495	12,307	1,557	1,392	3,709	1,531	5,267	2,843	567	1,857
1994	169,207	24,610	16,355	8,254	8,254	NA	NA	117,392	97,131	20,261	NA	NA	NA	NA	21,607	12,996	1,623	1,456	3,938	1,595	5,599	2,911	617	2,071
1995	183,625	25,352	16,904	8,448	8,448	NA	NA	129,830	108,652	21,178	NA	NA	NA	NA	22,617	13,592	1,751	1,548	4,110	1,617	5,827	2,847	671	2,308
1996	197,346	25,049	16,585	8,464	8,464	NA	NA	142,371	121,015	21,356	NA	NA	NA	NA	23,718	14,084	1,861	1,672	4,436	1,666	6,209	2,905	730	2,574
1997	211,894	25,232	16,819	8,413	8,413	NA	NA	155,409	133,611	21,798	NA	NA	NA	NA	24,627	14,317	1,902	1,788	4,852	1,767	6,626	3,014	809	2,804
1998	225,759	25,843	17,362	8,480	8,480	NA	NA	167,102	145,016	22,086	NA	NA	NA	NA	25,583	14,699	1,920	1,898	5,193	1,871	7,232	3,281	859	3,092
1999	244,451	26,846	18,142	8,704	8,704	NA	NA	182,090	161,594	20,496	NA	NA	NA	NA	27,475	15,714	2,036	2,020	5,654	2,050	8,040	3,761	931	3,349
2000	267,950	28,516	19,247	9,269	9,269	NA	NA	199,961	182,844	17,117	NA	NA	NA	NA	29,916	17,095	2,182	2,112	6,270	2,258	9,557	4,510	1,020	4,027
2001	278,539	32,812	22,374	10,438	10,056	NA	NA	202,017	185,118	16,899	NA	NA	NA	NA	32,750	18,976	2,319	2,120	6,874	2,461	10,960	5,488	1,029	4,443
2002	277,911	35,482	23,798	11,684	11,242	NA	NA	193,868	177,467	16,401	NA	NA	NA	NA	36,684	21,655	2,521	2,103	7,673	2,732	11,878	5,778	998	5,102
2003	291,365	37,235	24,982	12,253	11,841	NA	NA	200,724	182,926	17,798	NA	NA	NA	NA	40,577	24,567	2,756	2,090	8,286	2,879	12,829	5,945	1,020	5,864
2004	302,731	37,685	24,898	12,788	12,471	NA	NA	208,301	188,035	20,266	NA	NA	NA	NA	43,296	26,624	2,896	2,148	8,637	2,993	13,448	6,537	1,041	5,870
2005	325,288	39,568	26,322	13,246	12,894	NA	NA	226,159	204,250	21,909	NA	NA	NA	NA	45,490	27,743	2,945	2,279	9,353	3,170	14,072	6,545	1,107	6,420
2006	350,908	41,610	28,240	13,370	12,969	309	105	247,669	223,365	24,304	NA	NA	NA	NA	47,369	28,277	3,059	2,464	10,176	3,394	13,952	6,044	1,182	6,726
2007	377,890	44,132	29,859	14,273	13,845	388	135	269,267	242,682	26,585	NA	NA	NA	NA	49,430	28,725	3,308	2,697	10,933	3,767	14,674	5,980	1,257	7,438
2008	404,777	45,649	29,839	15,810	15,369	491	176	290,680	225,848	36,360	306	12,181	15,533	452	52,054	29,635	3,567	2,954	11,738	4,161	15,903	6,236	1,305	8,362
2009	402,931	47,572	30,560	17,013	16,571	606	224	282,393	221,104	39,573	195	9,567	11,464	490	54,909	31,740	3,680	3,032	12,057	4,400	17,452	7,097	1,258	9,097
2010	406,599	50,798	31,970	18,828	18,409	691	264	278,977	218,187	34,199	156	11,013	14,534	888	58,083	34,681	3,674	2,953	12,262	4,515	18,050	7,093	1,266	9,691
2011	426,214	53,524	34,950	18,574	18,176	694	273	294,092	235,426	31,309	321	11,124	15,349	563	60,087	35,742	3,615	2,999	13,103	4,629	17,817	6,564	1,340	9,913
2012	433,698	52,144	34,017	18,128	17,727	665	266	302,251	242,674	30,621	157	11,624	16,699	476	60,876	34,967	3,561	3,170	14,282	4,898	17,762	6,239	1,376	10,147
2013	454,232	51,086	33,406	17,680	17,296	620	257	322,528	259,908	29,362	194	13,450	18,796	818	61,511	33,840	3,643	3,376	15,341	5,313	18,487	5,970	1,464	11,053
2014	475,938	52,687	34,783	17,903	17,523	583	247	340,728	277,272	26,554	138	13,227	22,544	993	62,318	33,124	3,714	3,602	16,176	5,702	19,622	6,135	1,548	11,939
2015	494,471	52,847	34,199	18,649	18,287	595	246	355,821	289,892	26,990	127	14,595	23,102	1,115	64,605	33,563	3,782	3,844	17,260	6,156	20,604	6,247	1,605	12,751
2016	521,686	51,187	31,762	19,424	19,059	620	255	379,529	310,391	24,154	195	14,649	29,017	1,123	67,778	34,687	3,936	4,050	18,398	6,707	22,573	8,257	1,993	11,517
2017	553,530	52,553	32,231	20,322	19,943	632	258	405,792	324,177	24,974	142	17,729	37,913	856	71,108	36,000	4,057	4,283	19,553	7,217	23,445	9,030	2,220	11,375

TABLE 2

U.S. R&D expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs[b]		Nonfederal government[c]		Business[d]							Higher education[e]						NPOs[f]			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
2018	603,844	58,356	36,793	21,563	21,163	643	269	445,563	357,862	25,192	120	19,283	42,057	1,049	74,863	37,726	4,224	4,581	20,667	7,666	24,419	9,875	2,473	11,234
2019	665,267	62,802	39,870	22,932	22,538	675	290	498,175	405,960	22,653	169	21,673	46,809	911	78,113	39,497	4,363	4,800	21,569	7,885	25,503	10,799	2,756	11,096
2020	716,479	65,093	41,227	23,866	23,478	683	298	543,220	443,398	29,772	241	21,775	47,051	982	80,775	41,402	4,471	4,831	22,251	7,820	26,709	11,809	3,070	10,959
2021	788,718	66,662	41,469	25,193	24,784	685	305	608,625	500,300	24,587	392	26,858	55,507	981	85,717	44,633	4,622	5,073	23,509	7,881	27,030	11,481	2,994	11,953
2022[g]	891,834	71,533	44,699	26,834	26,424	719	321	697,256	582,295	32,321	244	27,422	53,999	974	94,275	49,059	4,945	5,590	26,121	8,560	28,052	11,648	3,593	11,959
2023[h]	939,561	73,621	44,161	29,460	29,021	742	330	734,959	612,365	34,363	260	29,526	57,399	1,046	102,044	52,762	5,287	6,019	28,601	9,375	28,195	11,708	3,611	12,020
Constant 2017 $millions																								
1953	38,374	8,523	7,548	974	974	NA	NA	26,996	16,361	10,635	NA	NA	NA	NA	2,027	1,108	294	152	271	201	829	428	193	208
1954	41,419	8,305	7,093	1,212	1,212	NA	NA	29,993	17,097	12,896	NA	NA	NA	NA	2,218	1,212	328	173	291	214	903	446	228	228
1955	44,814	9,358	7,050	2,308	2,308	NA	NA	32,026	17,824	14,201	NA	NA	NA	NA	2,478	1,384	362	196	304	232	953	467	254	232
1956	59,560	11,852	7,921	3,931	3,931	NA	NA	43,946	22,961	20,985	NA	NA	NA	NA	2,740	1,548	396	221	322	252	1,023	497	259	266
1957	67,205	13,461	8,797	4,663	4,663	NA	NA	49,678	23,035	26,643	NA	NA	NA	NA	2,937	1,638	434	248	346	271	1,129	532	251	346
1958	72,386	14,344	9,991	4,354	4,354	NA	NA	53,492	24,073	29,418	NA	NA	NA	NA	3,256	1,857	477	259	368	295	1,293	630	252	411
1959	81,693	16,156	10,995	5,161	5,161	NA	NA	60,176	26,052	34,124	NA	NA	NA	NA	3,833	2,325	527	258	399	324	1,527	814	275	438
1960	88,482	17,492	11,619	5,873	5,873	NA	NA	64,740	28,575	36,165	NA	NA	NA	NA	4,546	2,920	581	258	432	355	1,704	955	310	439
1961	93,003	19,627	12,689	6,938	6,938	NA	NA	66,112	29,809	36,303	NA	NA	NA	NA	5,323	3,554	642	255	476	396	1,941	1,079	313	549
1962	98,650	20,464	13,801	6,662	6,662	NA	NA	69,634	31,729	37,905	NA	NA	NA	NA	6,262	4,331	707	256	530	438	2,290	1,262	341	688
1963	109,266	23,183	15,957	7,226	7,226	NA	NA	76,191	33,430	42,761	NA	NA	NA	NA	7,347	5,230	780	253	599	486	2,545	1,459	343	742
1964	117,361	26,187	18,219	7,968	7,968	NA	NA	80,168	35,584	44,584	NA	NA	NA	NA	8,444	6,113	845	249	697	541	2,562	1,536	338	688
1965	122,192	26,390	19,044	7,346	7,346	NA	NA	83,333	38,885	44,448	NA	NA	NA	NA	9,620	7,041	902	250	821	606	2,848	1,726	374	748
1966	129,542	26,555	19,415	7,140	7,140	NA	NA	89,169	42,351	46,818	NA	NA	NA	NA	10,670	7,835	939	264	965	666	3,149	1,928	411	810
1967	133,157	27,291	19,648	7,643	7,643	NA	NA	91,060	45,741	45,319	NA	NA	NA	NA	11,606	8,501	958	294	1,138	716	3,200	1,951	422	827
1968	134,933	26,638	19,132	7,505	7,505	NA	NA	93,071	48,516	44,555	NA	NA	NA	NA	11,964	8,676	1,009	315	1,206	758	3,260	1,991	443	826
1969	135,563	27,274	19,765	7,509	7,509	NA	NA	93,053	51,402	41,651	NA	NA	NA	NA	11,890	8,466	1,085	315	1,215	808	3,345	2,021	485	840
1970	130,130	27,656	20,575	7,081	7,081	NA	NA	87,149	50,960	36,189	NA	NA	NA	NA	11,975	8,349	1,174	324	1,280	847	3,351	2,028	471	852
1971	127,052	27,574	20,783	6,791	6,791	NA	NA	84,047	50,224	33,823	NA	NA	NA	NA	12,092	8,294	1,235	339	1,365	858	3,340	2,011	462	867
1972	129,871	28,056	21,128	6,927	6,927	NA	NA	85,875	52,124	33,751	NA	NA	NA	NA	12,458	8,541	1,274	357	1,408	879	3,482	2,131	456	895
1973	132,598	27,471	20,720	6,752	6,752	NA	NA	88,696	56,137	32,558	NA	NA	NA	NA	12,653	8,604	1,289	386	1,474	900	3,778	2,425	450	904
1974	131,119	27,185	20,173	7,012	7,012	NA	NA	87,410	57,649	29,762	NA	NA	NA	NA	12,640	8,490	1,256	411	1,547	937	3,883	2,510	449	925
1975	128,317	27,268	20,005	7,263	7,263	NA	NA	84,390	56,051	28,339	NA	NA	NA	NA	12,840	8,633	1,252	424	1,552	978	3,819	2,428	447	943
1976	134,454	28,267	20,083	8,185	8,185	NA	NA	89,012	59,448	29,564	NA	NA	NA	NA	13,292	8,930	1,258	447	1,637	1,021	3,882	2,424	461	997
1977	139,119	28,620	19,939	8,681	8,681	NA	NA	92,653	62,083	30,570	NA	NA	NA	NA	13,951	9,285	1,265	496	1,825	1,080	3,895	2,376	472	1,046

TABLE 2

U.S. R&D expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs[b]		Nonfederal government[c]		Business[d]							Higher education[e]						NPOs[f]			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1978	146,114	30,436	20,880	9,555	9,555	NA	NA	96,637	66,325	30,312	NA	NA	NA	NA	14,982	9,983	1,329	544	2,036	1,090	4,059	2,489	480	1,090
1979	153,365	30,568	20,691	9,878	9,878	NA	NA	102,639	71,195	31,444	NA	NA	NA	NA	15,826	10,657	1,333	594	2,174	1,068	4,332	2,728	482	1,122
1980	160,583	30,180	19,889	10,291	10,291	NA	NA	109,795	77,406	32,389	NA	NA	NA	NA	16,395	11,009	1,317	669	2,335	1,064	4,212	2,584	481	1,147
1981	167,746	30,160	19,966	10,194	10,194	NA	NA	117,006	82,207	34,799	NA	NA	NA	NA	16,440	10,835	1,348	729	2,454	1,074	4,140	2,493	478	1,169
1982	176,461	30,736	20,763	9,972	9,972	NA	NA	124,926	87,643	37,284	NA	NA	NA	NA	16,614	10,661	1,357	793	2,637	1,166	4,185	2,467	490	1,227
1983	189,164	33,312	22,774	10,537	10,537	NA	NA	133,925	93,769	40,157	NA	NA	NA	NA	17,352	10,957	1,384	908	2,853	1,250	4,575	2,745	513	1,316
1984	207,528	35,557	24,186	11,371	11,371	NA	NA	148,295	104,337	43,958	NA	NA	NA	NA	18,579	11,666	1,463	1,050	3,073	1,326	5,097	3,141	539	1,417
1985	225,615	37,828	25,760	12,068	12,068	NA	NA	162,075	112,232	49,843	NA	NA	NA	NA	20,280	12,568	1,640	1,240	3,429	1,403	5,431	3,332	568	1,531
1986	231,921	38,399	26,046	12,353	12,353	NA	NA	165,736	115,590	50,146	NA	NA	NA	NA	22,257	13,554	1,869	1,437	3,893	1,504	5,530	3,251	606	1,673
1987	237,816	38,356	25,574	12,782	12,782	NA	NA	169,685	115,563	54,122	NA	NA	NA	NA	24,103	14,620	2,003	1,564	4,257	1,659	5,671	3,208	643	1,820
1988	243,386	39,185	26,073	13,112	13,112	NA	NA	172,509	121,205	51,304	NA	NA	NA	NA	25,853	15,621	2,118	1,696	4,594	1,823	5,840	3,204	676	1,960
1989	248,213	39,759	26,643	13,115	13,115	NA	NA	174,688	128,577	46,110	NA	NA	NA	NA	27,349	16,298	2,229	1,855	4,989	1,978	6,418	3,607	708	2,103
1990	256,293	39,666	26,425	13,241	13,241	NA	NA	181,107	137,599	43,508	NA	NA	NA	NA	28,563	16,759	2,359	1,965	5,373	2,106	6,957	3,955	742	2,260
1991	262,397	38,073	24,872	13,200	13,200	NA	NA	187,041	147,741	39,300	NA	NA	NA	NA	29,695	17,398	2,418	2,025	5,639	2,215	7,588	4,370	781	2,437
1992	263,686	38,612	25,281	13,331	13,331	NA	NA	186,194	150,522	35,672	NA	NA	NA	NA	30,918	18,383	2,432	2,104	5,691	2,308	7,962	4,474	831	2,656
1993	258,172	38,218	25,751	12,467	12,467	NA	NA	179,823	147,352	32,470	NA	NA	NA	NA	31,926	19,172	2,425	2,168	5,777	2,384	8,205	4,429	883	2,893
1994	258,078	37,535	24,945	12,590	12,590	NA	NA	179,049	148,146	30,903	NA	NA	NA	NA	32,955	19,821	2,475	2,221	6,006	2,432	8,539	4,440	941	3,158
1995	274,319	37,873	25,253	12,620	12,620	NA	NA	193,954	162,316	31,638	NA	NA	NA	NA	33,788	20,305	2,616	2,312	6,140	2,415	8,705	4,254	1,003	3,449
1996	289,516	36,747	24,331	12,417	12,417	NA	NA	208,865	177,534	31,330	NA	NA	NA	NA	34,795	20,662	2,730	2,452	6,507	2,443	9,109	4,262	1,071	3,776
1997	305,586	36,389	24,256	12,133	12,133	NA	NA	224,125	192,689	31,436	NA	NA	NA	NA	35,516	20,648	2,743	2,579	6,997	2,549	9,556	4,347	1,166	4,043
1998	321,966	36,855	24,761	12,094	12,094	NA	NA	238,312	206,814	31,498	NA	NA	NA	NA	36,485	20,963	2,739	2,708	7,406	2,669	10,313	4,679	1,225	4,409
1999	343,757	37,752	25,512	12,240	12,240	NA	NA	256,063	227,240	28,822	NA	NA	NA	NA	38,636	22,098	2,864	2,841	7,950	2,883	11,307	5,288	1,309	4,710
2000	368,454	39,211	26,466	12,746	12,746	NA	NA	274,963	251,426	23,537	NA	NA	NA	NA	41,137	23,507	3,001	2,904	8,621	3,105	13,142	6,202	1,402	5,538
2001	374,584	44,126	30,090	14,037	13,523	NA	NA	271,676	248,950	22,726	NA	NA	NA	NA	44,042	25,520	3,119	2,851	9,244	3,310	14,740	7,380	1,384	5,975
2002	368,020	46,986	31,514	15,472	14,887	NA	NA	256,727	235,008	21,719	NA	NA	NA	NA	48,578	28,676	3,338	2,785	10,161	3,618	15,729	7,651	1,322	6,756
2003	378,364	48,353	32,442	15,912	15,377	NA	NA	260,658	237,546	23,112	NA	NA	NA	NA	52,693	31,902	3,578	2,715	10,759	3,738	16,660	7,720	1,325	7,615
2004	382,831	47,657	31,485	16,171	15,770	NA	NA	263,416	237,788	25,628	NA	NA	NA	NA	54,752	33,668	3,662	2,716	10,922	3,784	17,006	8,266	1,317	7,424
2005	398,852	48,516	32,275	16,241	15,810	NA	NA	277,305	250,441	26,864	NA	NA	NA	NA	55,777	34,017	3,611	2,794	11,468	3,887	17,254	8,025	1,357	7,872
2006	417,391	49,493	33,590	15,903	15,426	367	125	294,592	265,684	28,909	NA	NA	NA	NA	56,343	33,634	3,639	2,930	12,103	4,037	16,596	7,189	1,406	8,001
2007	437,630	51,108	34,579	16,529	16,034	449	156	311,835	281,047	30,788	NA	NA	NA	NA	57,244	33,266	3,832	3,123	12,661	4,362	16,993	6,925	1,455	8,613
2008	459,906	51,866	33,903	17,963	17,462	558	200	330,269	256,608	41,312	348	13,840	17,649	514	59,144	33,671	4,053	3,356	13,336	4,728	18,069	7,085	1,483	9,501
2009	455,002	53,720	34,509	19,211	18,712	684	253	318,887	249,677	44,687	220	10,803	12,945	774	62,004	35,842	4,155	3,424	13,615	4,969	19,707	8,014	1,420	10,273
2010	453,633	56,674	35,668	21,006	20,539	771	295	311,248	243,426	38,155	174	12,287	16,215	1,165	64,802	38,693	4,098	3,294	13,680	5,037	20,138	7,914	1,412	10,812

TABLE 2

U.S. R&D expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs[b]		Nonfederal government[c]		Business[d]							Higher education[e]						NPOs[f]			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
2011	465,904	58,508	38,205	20,303	19,868	758	299	321,479	257,350	34,225	351	12,160	16,778	966	65,682	39,070	3,952	3,278	14,323	5,060	19,476	7,175	1,465	10,836
2012	465,418	55,958	36,504	19,453	19,024	713	286	324,357	260,423	32,861	168	12,474	17,920	679	65,328	37,524	3,821	3,401	15,326	5,256	19,061	6,695	1,477	10,889
2013	479,297	53,905	35,250	18,656	18,251	654	271	340,326	274,250	30,982	205	14,192	19,833	1,068	64,905	35,707	3,843	3,562	16,188	5,606	19,507	6,299	1,544	11,663
2014	493,604	54,643	36,074	18,568	18,173	605	256	353,376	287,564	27,540	143	13,718	23,381	1,173	64,631	34,354	3,852	3,735	16,776	5,914	20,350	6,363	1,605	12,383
2015	508,109	54,305	35,142	19,163	18,791	611	253	365,635	297,888	27,734	131	14,998	23,739	1,276	66,386	34,489	3,886	3,950	17,736	6,326	21,172	6,420	1,650	13,103
2016	531,030	52,103	32,331	19,772	19,400	631	259	386,327	315,950	24,587	198	14,912	29,536	1,342	68,991	35,308	4,006	4,122	18,728	6,827	22,977	8,405	2,028	11,723
2017	553,530	52,553	32,231	20,322	19,943	632	258	405,792	324,177	24,974	142	17,729	37,913	998	71,108	36,000	4,057	4,283	19,553	7,217	23,445	9,030	2,220	11,375
2018	590,321	57,049	35,969	21,080	20,689	629	263	435,585	349,847	24,628	117	18,851	41,115	1,143	73,186	36,881	4,129	4,478	20,204	7,494	23,872	9,653	2,418	10,983
2019	639,808	60,398	38,344	22,054	21,675	649	279	479,111	390,425	21,786	162	20,843	45,017	1,039	75,123	37,985	4,196	4,616	20,743	7,583	24,527	10,386	2,650	10,671
2020	680,024	61,781	39,129	22,652	22,283	648	283	515,581	420,838	28,257	229	20,667	44,657	932	76,665	39,295	4,243	4,585	21,119	7,422	25,350	11,209	2,914	10,401
2021	715,899	60,507	37,640	22,867	22,495	622	277	552,433	454,109	22,317	356	24,378	50,382	891	77,803	40,512	4,195	4,605	21,338	7,153	24,534	10,421	2,718	10,850
2022[g]	755,622	60,608	37,872	22,736	22,388	609	272	590,762	493,360	27,384	207	23,234	45,752	826	79,876	41,566	4,190	4,736	22,131	7,253	23,768	9,869	3,044	10,133
2023[h]	768,410	60,210	36,116	24,094	23,735	607	270	601,079	500,816	28,103	213	24,148	46,943	856	83,456	43,151	4,324	4,922	23,391	7,668	23,059	9,575	2,953	9,831

NA = not available.

FFRDC = federally funded research and development center; NPO = nonprofit organization.

[a] Federal intramural includes expenditures for federal intramural R&D as well as costs associated with administering extramural R&D procurements. Beginning in 2016, the data on federal intramural R&D explicitly exclude expenditures for preproduction development. (Preproduction development is nonexperimental work on a product or system before it goes into full production. For example, activities and programs that are categorized as Operational Systems Development in the Department of Defense's Research, Development, Test and Evaluation [RDT&E] budget activity structure.) This change aligns the federal intramural R&D data with the U.S. Office of Management and Budget's recent clarification of its definition of R&D. In 2016–18, this intramural preproduction development totaled in the range of $5 billion to $7 billion each year.

[b] The R&D expenditures of FFRDCs are chiefly federally funded; the small remainder ($410 million of the $26.8 billion total in 2022) reflects funding from state or local government, businesses, NPOs, and other sources. Prior to 2001, the data did not distinguish federal and nonfederal funding for FFRDC R&D and are reported as all federal funding; in 2001 and forward, the data provide detail on federal and nonfederal sources of funding (see table 6). The data for 1953–54 reflect the R&D performance of only university-administered FFRDCs. In 1953–54, the R&D performance and funding of industry-administered FFRDCs were not separately reported but are included instead in the business R&D data for these years. Similarly, in 1953–54, the R&D performance and funding for nonprofit-administered FFRDCs were not separately reported but are included instead in the NPO R&D data for these years.

[c] Nonfederal government is state intramural R&D performance, including state agency and department employees and services performed by others in support of internal R&D projects. Data on state government intramural R&D became available starting in 2006. Funding for this R&D is mainly states' own funds ($362 million of the $719 million total in 2022) or from the federal government ($321 million in 2022), but other sources include other nonfederal governments ($7 million), businesses ($16 million), higher education ($3 million), or NPOs ($11 million).

[d] Business is R&D performed by companies in the domestic United States. Business R&D data for 2017–22 come from the NCSES annual Business Enterprise Research and Development (BERD) Survey and its predecessor, the Business Research and Development Survey (BRDS), which cover all publicly or privately held companies with 10 or more employees, plus the Annual Business Survey (ABS), which covers the R&D activities of businesses with 1–9 employees. Data for 2023 are estimates, based on the 2022 data from these surveys. Data for 2008–15 come from the NCSES annual Business Research and Development and Innovation Survey (BRDIS), which covered all publicly or privately held companies with 5 or more employees. Data for 2016 included the BRDIS data for that year plus the data from the 2016 Business R&D and Innovation Survey–Microbusiness (BRDI-M), which collected statistics on the R&D activities of companies with 1–4 employees. BERD, ABS, BRDIS, BRDS, and BRDI-M distinguish R&D performed and paid for by the company from R&D performed by the company but paid for by one or more others (i.e., the federal government, state or local government, domestic companies, foreign companies, foreign governments, other organizations inside or outside the United States). Prior to 2008, the data collected by the Survey of Industrial Research and Development distinguished only federally and nonfederally funded business R&D, and, for these years, the own-funding data column includes all nonfederal sources of funding. Some business R&D performance in the United States paid for by other domestic businesses ($27.4 billion in 2022) and foreign businesses includes funding from both parent or unaffiliated businesses outside the United States ($23.8 billion in 2022) and funding from U.S. businesses' foreign subsidiaries ($30.2 billion in 2022). Business R&D performance funded by other sources includes state government, foreign governments, domestic and foreign academic institutions, and all other sources in the United States and abroad.

[e] Before 2003, higher education R&D covered only science and engineering (S&E) fields; in 2003 and later years, R&D in non-S&E fields is also included. (Non-S&E R&D was $1.4 billion in FY 2003 and $5.9 billion in FY 2022.) In 1998 and later years, the higher education R&D data have been adjusted to eliminate double counting of R&D funds passed through from academic institutions to other academic and nonacademic (business, NPO, other) subrecipients. (In FY 1998, the total of pass-through funds reported was $994 million, with $479 million to other academic recipients and $337 million

nonacademic recipients. In FY 2022, total pass-through was $8.5 billion, with $4.7 billion to other academic recipients and $3.8 billion to nonacademic recipients.) The nonfederal government funding category includes support from state and local government. The other nonprofit funding category includes support from NPOs and other sources not elsewhere classified (in FY 2022, $5.5 billion was from NPOs, and $2.5 billion was from these unclassified other sources).

[f] The most recent data on NPO R&D come from two sources: the annual Nonprofit Research Activities (NPRA) modules (2020–22) of the Annual Business Survey and the 2016 NPRA Survey. Data for 2023 are estimated based on the 2022 survey. Data for 2017–2019 are estimated based on the 2016 and 2020 surveys. The 1998–2015 data for NPO R&D funded by the federal government come from the NCSES annual Survey of Federal Funds for Research and Development; NPO R&D funded by businesses and by the nonprofit sector itself for that period are estimated, based on parameters from the 1996–97 Survey of Research and Development Funding and Performance by Nonprofit Organizations.

[g] Some data for 2022 are preliminary and may be revised later.

[h] The data for 2023 include estimates and are likely to be revised later.

Note(s):
Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised. Data are based on reports by performers in the NCSES annual surveys on R&D expenditures: BERD, ABS (which includes modules on micro-BERD and NPRA), Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—were collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers in 1977 and afterward, the approximation equals 75% of the amount reported in the same fiscal year plus 25% of the amount reported in the subsequent fiscal year. Prior to 1977, the federal fiscal year began on 1 July, not 1 October, and the approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year. The fiscal year for higher education performers and state government performers generally begins 1 July, and the calendar year approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year.

Source(s):
National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

TABLE 3

U.S. basic research expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs[b]		Nonfederal government[c]		Business[d]							Higher education[e]						NPOs[f]			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
Current $millions																								
1953	460	138	102	36	36	NA	NA	151	132	19	NA	NA	NA	NA	123	82	7	13	6	16	48	27	9	12
1954	509	141	96	45	45	NA	NA	166	143	23	NA	NA	NA	NA	148	97	10	15	8	18	55	31	11	13
1955	570	160	98	62	62	NA	NA	169	162	7	NA	NA	NA	NA	180	117	14	17	12	21	62	35	13	14
1956	718	203	114	89	89	NA	NA	223	216	7	NA	NA	NA	NA	220	143	19	20	15	24	73	41	15	17
1957	813	234	124	110	110	NA	NA	234	230	4	NA	NA	NA	NA	261	167	25	23	20	27	86	48	15	23
1958	943	264	149	115	115	NA	NA	266	252	14	NA	NA	NA	NA	312	202	31	24	24	31	102	58	16	28
1959	1,087	298	165	134	134	NA	NA	282	248	34	NA	NA	NA	NA	388	263	38	24	28	36	119	71	18	30
1960	1,286	334	184	150	150	NA	NA	333	297	36	NA	NA	NA	NA	485	341	45	25	33	41	135	84	21	30
1961	1,511	407	230	177	177	NA	NA	344	314	30	NA	NA	NA	NA	598	432	54	25	40	48	163	104	22	37
1962	1,824	441	252	189	189	NA	NA	449	345	104	NA	NA	NA	NA	737	546	64	25	48	55	198	128	24	46
1963	2,115	501	285	216	216	NA	NA	484	375	109	NA	NA	NA	NA	909	689	75	25	58	63	222	147	25	50
1964	2,396	584	339	245	245	NA	NA	507	384	123	NA	NA	NA	NA	1,071	824	84	25	70	68	235	163	25	47
1965	2,664	625	375	250	250	NA	NA	563	406	157	NA	NA	NA	NA	1,221	944	94	27	86	70	256	175	29	52
1966	2,930	683	410	273	273	NA	NA	593	451	142	NA	NA	NA	NA	1,380	1,066	104	29	106	75	274	184	32	58
1967	3,168	735	434	301	301	NA	NA	595	427	168	NA	NA	NA	NA	1,554	1,188	114	34	136	83	285	190	34	61
1968	3,376	797	482	315	315	NA	NA	607	462	145	NA	NA	NA	NA	1,681	1,265	131	38	156	91	292	192	37	63
1969	3,491	858	545	313	313	NA	NA	581	458	123	NA	NA	NA	NA	1,754	1,288	153	40	171	103	298	188	43	67
1970	3,594	866	562	304	304	NA	NA	566	444	122	NA	NA	NA	NA	1,855	1,323	179	43	196	115	307	191	44	72
1971	3,720	870	581	289	289	NA	NA	557	456	101	NA	NA	NA	NA	1,968	1,385	194	50	214	127	326	204	45	77
1972	3,850	915	603	313	313	NA	NA	554	463	91	NA	NA	NA	NA	2,038	1,437	195	55	216	134	344	213	47	84
1973	4,099	1,034	652	382	382	NA	NA	595	499	96	NA	NA	NA	NA	2,103	1,489	196	59	223	137	368	229	49	90
1974	4,511	1,182	715	467	467	NA	NA	650	536	114	NA	NA	NA	NA	2,282	1,609	204	66	250	153	397	242	54	102
1975	4,875	1,292	760	533	533	NA	NA	677	573	104	NA	NA	NA	NA	2,480	1,768	212	72	264	164	426	251	59	116
1976	5,373	1,479	850	629	629	NA	NA	750	634	116	NA	NA	NA	NA	2,675	1,924	218	75	283	175	470	274	65	131
1977	6,008	1,689	943	746	746	NA	NA	836	701	135	NA	NA	NA	NA	2,967	2,114	232	89	334	198	517	297	72	148
1978	6,959	2,049	1,044	1,005	1,005	NA	NA	941	785	156	NA	NA	NA	NA	3,376	2,399	260	107	398	213	593	346	79	168
1979	7,836	2,272	1,112	1,160	1,160	NA	NA	1,054	893	161	NA	NA	NA	NA	3,828	2,719	286	128	466	229	683	406	87	190
1980	8,747	2,506	1,212	1,294	1,294	NA	NA	1,205	1,035	170	NA	NA	NA	NA	4,315	3,061	307	156	544	248	721	411	95	215
1981	9,658	2,773	1,343	1,430	1,430	NA	NA	1,477	1,313	164	NA	NA	NA	NA	4,737	3,331	338	183	615	269	671	324	105	243
1982	10,651	3,025	1,522	1,503	1,503	NA	NA	1,776	1,523	253	NA	NA	NA	NA	5,091	3,475	368	215	716	317	759	369	115	275
1983	11,880	3,393	1,733	1,661	1,661	NA	NA	2,106	1,760	346	NA	NA	NA	NA	5,518	3,689	396	260	816	358	863	426	127	311
1984	13,332	3,731	1,877	1,854	1,854	NA	NA	2,472	2,132	340	NA	NA	NA	NA	6,145	4,087	436	313	915	395	984	494	139	351

TABLE 3

U.S. basic research expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs[b]		Nonfederal government[c]		Business[d]							Higher education[e]						NPOs[f]			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1985	14,748	3,884	1,947	1,936	1,936	NA	NA	2,731	2,373	358	NA	NA	NA	NA	7,024	4,606	514	389	1,075	440	1,110	560	153	397
1986	17,154	4,071	2,026	2,045	2,045	NA	NA	3,930	3,496	434	NA	NA	NA	NA	7,943	5,122	606	466	1,262	488	1,210	594	168	449
1987	18,481	4,290	2,047	2,242	2,242	NA	NA	4,181	3,583	598	NA	NA	NA	NA	8,644	5,527	659	514	1,399	545	1,367	675	185	507
1988	19,787	4,749	2,116	2,633	2,633	NA	NA	4,163	3,507	656	NA	NA	NA	NA	9,344	5,937	705	565	1,530	607	1,531	756	203	573
1989	21,891	5,124	2,309	2,815	2,815	NA	NA	4,818	3,832	986	NA	NA	NA	NA	10,219	6,422	766	637	1,714	680	1,730	860	223	647
1990	23,029	5,352	2,319	3,033	3,033	NA	NA	4,629	3,760	869	NA	NA	NA	NA	11,126	6,889	847	705	1,929	756	1,922	947	245	730
1991	27,140	5,573	2,378	3,195	3,195	NA	NA	7,376	6,125	1,251	NA	NA	NA	NA	12,062	7,423	912	764	2,127	836	2,129	1,036	269	825
1992	27,604	5,826	2,419	3,408	3,408	NA	NA	6,528	5,816	712	NA	NA	NA	NA	12,910	8,058	941	814	2,203	893	2,340	1,114	295	931
1993	28,743	6,138	2,621	3,517	3,517	NA	NA	6,427	5,961	466	NA	NA	NA	NA	13,646	8,638	952	851	2,268	936	2,532	1,157	324	1,051
1994	29,651	6,058	2,547	3,512	3,512	NA	NA	6,514	6,078	436	NA	NA	NA	NA	14,401	9,139	992	890	2,406	974	2,678	1,137	356	1,186
1995	29,610	5,996	2,689	3,307	3,307	NA	NA	5,569	5,379	190	NA	NA	NA	NA	15,146	9,634	1,070	945	2,511	987	2,899	1,170	390	1,338
1996	32,799	6,073	2,680	3,393	3,393	NA	NA	7,498	6,848	650	NA	NA	NA	NA	16,042	10,092	1,149	1,032	2,740	1,028	3,187	1,248	428	1,510
1997	36,717	6,150	2,746	3,404	3,404	NA	NA	9,795	8,766	1,029	NA	NA	NA	NA	17,449	10,758	1,233	1,161	3,150	1,147	3,322	1,317	449	1,557
1998	34,842	6,444	3,003	3,441	3,441	NA	NA	5,853	4,851	1,002	NA	NA	NA	NA	18,891	11,567	1,292	1,278	3,495	1,259	3,654	1,461	477	1,717
1999	38,282	7,066	3,347	3,719	3,719	NA	NA	6,645	5,537	1,108	NA	NA	NA	NA	20,462	12,456	1,386	1,375	3,848	1,396	4,110	1,734	517	1,860
2000	42,033	7,801	3,765	4,037	4,037	NA	NA	7,040	6,115	925	NA	NA	NA	NA	22,290	13,469	1,501	1,453	4,314	1,553	4,902	2,099	566	2,236
2001	46,363	8,353	4,260	4,092	3,925	NA	NA	8,053	7,299	754	NA	NA	NA	NA	24,455	14,919	1,606	1,467	4,759	1,704	5,503	2,464	571	2,467
2002	50,400	9,349	4,511	4,839	4,612	NA	NA	7,547	6,659	888	NA	NA	NA	NA	27,543	17,139	1,745	1,456	5,311	1,891	5,962	2,575	554	2,833
2003	54,823	9,739	4,664	5,074	4,858	NA	NA	8,330	6,944	1,386	NA	NA	NA	NA	30,217	19,220	1,893	1,436	5,692	1,978	6,537	2,714	567	3,256
2004	56,379	9,673	4,697	4,976	4,837	NA	NA	7,835	6,763	1,072	NA	NA	NA	NA	32,246	20,730	2,000	1,483	5,965	2,067	6,626	2,788	578	3,259
2005	59,899	9,902	4,770	5,132	4,995	NA	NA	8,667	7,559	1,108	NA	NA	NA	NA	34,248	21,786	2,068	1,600	6,568	2,226	7,082	2,902	614	3,565
2006	61,552	9,938	4,716	5,222	5,074	46	16	8,384	6,940	1,444	NA	NA	NA	NA	35,944	22,270	2,191	1,765	7,288	2,431	7,240	2,849	656	3,735
2007	66,488	9,938	4,621	5,317	5,166	58	20	11,268	8,488	2,780	NA	NA	NA	NA	37,568	22,546	2,400	1,956	7,932	2,733	7,656	2,829	698	4,130
2008	70,468	10,459	4,957	5,502	5,336	73	26	12,369	9,741	1,475	12	484	639	18	39,127	22,954	2,573	2,131	8,467	3,002	8,441	3,073	724	4,643
2009	74,409	11,508	5,441	6,067	5,907	90	33	14,784	11,999	1,340	13	662	736	34	38,780	23,034	2,457	1,996	8,258	3,035	9,248	3,498	698	5,051
2010	76,475	11,747	5,111	6,637	6,475	103	39	16,371	13,239	1,406	10	722	935	58	38,756	23,690	2,277	1,785	8,016	2,989	9,498	3,414	703	5,381
2011	73,691	11,522	5,047	6,475	6,333	103	41	13,020	10,585	677	21	745	954	38	39,717	24,111	2,245	1,807	8,512	3,043	9,329	3,081	744	5,504
2012	73,992	11,150	5,489	5,661	5,530	99	40	13,294	10,955	644	10	710	946	29	39,959	23,432	2,202	1,869	9,257	3,200	9,490	3,092	764	5,634
2013	79,255	9,519	5,330	4,188	4,085	92	38	19,508	14,986	1,196	21	1,446	1,771	88	40,156	22,602	2,208	1,979	9,927	3,442	9,981	3,031	813	6,137
2014	82,894	9,875	5,705	4,170	4,077	99	42	21,936	15,805	2,044	17	1,584	2,367	119	40,406	22,085	2,242	2,091	10,352	3,637	10,579	3,090	859	6,629
2015	84,428	10,017	5,890	4,127	4,043	100	42	21,792	15,933	2,038	14	1,565	2,123	120	41,514	22,193	2,299	2,211	10,985	3,826	11,005	3,034	891	7,080
2016	87,494	10,315	6,119	4,196	4,112	93	38	25,053	18,792	2,037	20	1,535	2,551	117	42,897	22,588	2,359	2,296	11,606	4,050	9,135	3,988	716	4,141
2017	90,118	10,388	6,259	4,128	4,054	100	41	25,617	18,299	1,853	17	2,085	3,260	103	44,811	23,345	2,392	2,417	12,278	4,379	9,204	3,726	844	4,322

TABLE 3

U.S. basic research expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs[b]		Nonfederal government[c]		Business[d]							Higher education[e]						NPOs[f]			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
2018	97,803	11,096	6,827	4,269	4,188	107	45	29,204	21,100	2,535	12	2,069	3,377	112	47,305	24,487	2,454	2,605	13,001	4,758	10,092	4,274	989	4,494
2019	104,880	11,932	7,352	4,580	4,501	120	52	32,582	24,558	2,349	15	2,062	3,513	86	49,309	25,467	2,535	2,731	13,627	4,950	10,936	4,760	1,157	4,660
2020	111,637	12,105	7,316	4,789	4,714	125	54	36,371	27,909	2,200	23	2,311	3,827	101	50,821	26,499	2,624	2,744	14,061	4,894	12,215	5,169	1,452	5,183
2021	118,624	11,683	6,610	5,074	4,999	120	53	40,845	31,364	2,404	39	2,643	4,297	97	54,042	28,673	2,737	2,883	14,855	4,895	11,934	4,645	1,404	5,604
2022[g]	130,252	13,247	7,859	5,388	5,312	121	54	43,355	34,448	2,480	21	2,428	3,893	86	59,619	31,605	2,948	3,139	16,609	5,320	13,910	5,556	1,829	6,090
2023[h]	138,161	13,850	7,966	5,885	5,799	121	54	45,735	36,224	2,637	22	2,613	4,146	92	64,474	33,957	3,148	3,333	18,212	5,823	13,981	5,585	1,839	6,121
Constant 2017 $millions																								
1953	3,417	1,023	755	268	268	NA	NA	1,123	982	141	NA	NA	NA	NA	915	606	48	97	45	119	357	201	67	89
1954	3,747	1,035	707	328	328	NA	NA	1,223	1,054	169	NA	NA	NA	NA	1,087	711	70	111	62	133	402	225	81	96
1955	4,130	1,156	706	449	449	NA	NA	1,224	1,174	51	NA	NA	NA	NA	1,301	844	101	123	84	149	449	254	94	101
1956	5,029	1,419	795	624	624	NA	NA	1,560	1,513	47	NA	NA	NA	NA	1,541	998	133	137	108	165	508	284	105	119
1957	5,518	1,584	841	743	743	NA	NA	1,587	1,560	27	NA	NA	NA	NA	1,767	1,129	168	153	134	183	580	322	102	156
1958	6,254	1,751	988	763	763	NA	NA	1,761	1,671	90	NA	NA	NA	NA	2,069	1,340	206	159	159	206	673	381	106	186
1959	7,110	1,949	1,076	873	873	NA	NA	1,844	1,622	222	NA	NA	NA	NA	2,538	1,717	246	157	186	232	778	464	118	196
1960	8,296	2,152	1,184	968	968	NA	NA	2,146	1,917	230	NA	NA	NA	NA	3,127	2,197	290	158	216	265	871	542	136	194
1961	9,649	2,596	1,466	1,130	1,130	NA	NA	2,200	2,005	195	NA	NA	NA	NA	3,816	2,755	343	160	254	303	1,038	661	140	236
1962	11,509	2,782	1,590	1,192	1,192	NA	NA	2,834	2,177	658	NA	NA	NA	NA	4,647	3,442	402	158	302	344	1,246	804	151	290
1963	13,193	3,122	1,774	1,347	1,347	NA	NA	3,021	2,339	682	NA	NA	NA	NA	5,666	4,297	467	153	359	390	1,385	917	156	312
1964	14,720	3,588	2,083	1,505	1,505	NA	NA	3,115	2,359	756	NA	NA	NA	NA	6,577	5,059	518	154	428	418	1,441	998	154	289
1965	16,073	3,768	2,260	1,508	1,508	NA	NA	3,397	2,450	947	NA	NA	NA	NA	7,364	5,693	570	160	519	422	1,545	1,056	175	314
1966	17,196	4,009	2,406	1,602	1,602	NA	NA	3,480	2,647	833	NA	NA	NA	NA	8,099	6,256	608	170	625	440	1,608	1,080	188	340
1967	18,065	4,189	2,472	1,717	1,717	NA	NA	3,394	2,435	958	NA	NA	NA	NA	8,860	6,773	649	191	774	473	1,623	1,081	194	348
1968	18,468	4,357	2,637	1,720	1,720	NA	NA	3,320	2,527	793	NA	NA	NA	NA	9,193	6,920	715	205	855	498	1,597	1,050	202	345
1969	18,203	4,475	2,843	1,632	1,632	NA	NA	3,030	2,388	641	NA	NA	NA	NA	9,144	6,714	797	206	893	535	1,554	980	224	349
1970	17,802	4,289	2,783	1,506	1,506	NA	NA	2,804	2,199	604	NA	NA	NA	NA	9,188	6,551	888	213	969	567	1,521	946	218	357
1971	17,537	4,100	2,740	1,360	1,360	NA	NA	2,626	2,150	476	NA	NA	NA	NA	9,277	6,527	913	233	1,008	596	1,534	959	212	363
1972	17,397	4,135	2,723	1,412	1,412	NA	NA	2,503	2,092	411	NA	NA	NA	NA	9,207	6,494	883	249	976	606	1,552	960	212	380
1973	17,562	4,430	2,793	1,636	1,636	NA	NA	2,549	2,138	411	NA	NA	NA	NA	9,009	6,377	841	251	956	585	1,574	979	210	386
1974	17,729	4,645	2,809	1,836	1,836	NA	NA	2,555	2,107	448	NA	NA	NA	NA	8,967	6,324	801	259	983	599	1,562	949	212	401
1975	17,535	4,649	2,733	1,916	1,916	NA	NA	2,435	2,061	374	NA	NA	NA	NA	8,919	6,360	764	257	948	590	1,532	903	213	416
1976	18,320	5,043	2,898	2,145	2,145	NA	NA	2,557	2,162	396	NA	NA	NA	NA	9,119	6,560	742	256	966	595	1,601	933	222	446
1977	19,287	5,421	3,027	2,395	2,395	NA	NA	2,684	2,250	433	NA	NA	NA	NA	9,523	6,786	744	286	1,073	634	1,659	953	230	476

TABLE 3

U.S. basic research expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs[b]		Nonfederal government[c]		Business[d]							Higher education[e]						NPOs[f]			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1978	20,870	6,146	3,132	3,014	3,014	NA	NA	2,822	2,354	468	NA	NA	NA	NA	10,125	7,195	779	319	1,194	637	1,777	1,038	237	503
1979	21,702	6,293	3,081	3,212	3,212	NA	NA	2,919	2,473	446	NA	NA	NA	NA	10,600	7,530	792	353	1,291	634	1,891	1,125	240	526
1980	22,216	6,366	3,079	3,286	3,286	NA	NA	3,061	2,629	432	NA	NA	NA	NA	10,960	7,773	779	396	1,381	630	1,830	1,043	242	545
1981	22,409	6,434	3,116	3,318	3,318	NA	NA	3,427	3,047	381	NA	NA	NA	NA	10,991	7,729	784	424	1,428	625	1,558	751	243	564
1982	23,275	6,610	3,325	3,285	3,285	NA	NA	3,881	3,328	553	NA	NA	NA	NA	11,126	7,593	804	471	1,565	692	1,659	807	252	600
1983	24,984	7,136	3,644	3,492	3,492	NA	NA	4,429	3,701	728	NA	NA	NA	NA	11,604	7,757	832	546	1,716	752	1,815	895	266	653
1984	27,060	7,572	3,809	3,763	3,763	NA	NA	5,018	4,327	690	NA	NA	NA	NA	12,472	8,295	884	635	1,857	801	1,998	1,003	282	713
1985	29,017	7,641	3,831	3,810	3,810	NA	NA	5,373	4,669	704	NA	NA	NA	NA	13,820	9,061	1,012	765	2,116	865	2,183	1,102	301	781
1986	33,084	7,852	3,907	3,945	3,945	NA	NA	7,580	6,743	837	NA	NA	NA	NA	15,319	9,878	1,168	898	2,434	940	2,334	1,145	324	865
1987	34,782	8,073	3,853	4,220	4,220	NA	NA	7,869	6,743	1,125	NA	NA	NA	NA	16,267	10,401	1,239	967	2,634	1,026	2,572	1,271	347	954
1988	35,971	8,633	3,847	4,786	4,786	NA	NA	7,568	6,375	1,193	NA	NA	NA	NA	16,986	10,792	1,282	1,027	2,781	1,104	2,784	1,375	369	1,041
1989	38,294	8,964	4,039	4,925	4,925	NA	NA	8,428	6,703	1,725	NA	NA	NA	NA	17,876	11,234	1,339	1,115	2,999	1,189	3,026	1,505	389	1,131
1990	38,832	9,025	3,910	5,115	5,115	NA	NA	7,806	6,340	1,465	NA	NA	NA	NA	18,761	11,616	1,428	1,190	3,253	1,275	3,241	1,597	412	1,232
1991	44,266	9,090	3,879	5,211	5,211	NA	NA	12,031	9,990	2,040	NA	NA	NA	NA	19,673	12,107	1,487	1,246	3,470	1,363	3,473	1,690	438	1,345
1992	44,020	9,291	3,857	5,434	5,434	NA	NA	10,410	9,275	1,135	NA	NA	NA	NA	20,587	12,850	1,501	1,299	3,513	1,425	3,732	1,777	470	1,485
1993	44,775	9,561	4,083	5,479	5,479	NA	NA	10,012	9,286	726	NA	NA	NA	NA	21,257	13,456	1,484	1,326	3,534	1,458	3,944	1,802	504	1,637
1994	45,225	9,240	3,884	5,356	5,356	NA	NA	9,935	9,270	665	NA	NA	NA	NA	21,964	13,938	1,512	1,357	3,670	1,486	4,085	1,734	542	1,809
1995	44,235	8,958	4,018	4,940	4,940	NA	NA	8,320	8,036	284	NA	NA	NA	NA	22,627	14,392	1,598	1,412	3,751	1,475	4,330	1,748	583	2,000
1996	48,118	8,909	3,931	4,978	4,978	NA	NA	11,000	10,046	954	NA	NA	NA	NA	23,534	14,805	1,686	1,514	4,019	1,509	4,675	1,831	629	2,215
1997	52,951	8,869	3,960	4,909	4,909	NA	NA	14,126	12,642	1,484	NA	NA	NA	NA	25,165	15,515	1,779	1,674	4,542	1,655	4,791	1,899	648	2,245
1998	49,690	9,190	4,282	4,907	4,907	NA	NA	8,347	6,918	1,429	NA	NA	NA	NA	26,941	16,496	1,843	1,822	4,984	1,796	5,212	2,083	680	2,448
1999	53,834	9,936	4,706	5,229	5,229	NA	NA	9,344	7,786	1,558	NA	NA	NA	NA	28,774	17,517	1,949	1,934	5,412	1,963	5,780	2,438	727	2,615
2000	57,800	10,727	5,177	5,551	5,551	NA	NA	9,681	8,409	1,272	NA	NA	NA	NA	30,651	18,521	2,064	1,998	5,932	2,136	6,740	2,887	779	3,075
2001	62,350	11,233	5,729	5,503	5,279	NA	NA	10,830	9,816	1,014	NA	NA	NA	NA	32,888	20,063	2,159	1,973	6,400	2,292	7,400	3,314	768	3,318
2002	66,742	12,380	5,973	6,407	6,108	NA	NA	9,994	8,818	1,176	NA	NA	NA	NA	36,473	22,696	2,311	1,929	7,033	2,504	7,894	3,410	734	3,751
2003	71,193	12,647	6,057	6,589	6,308	NA	NA	10,817	9,017	1,800	NA	NA	NA	NA	39,240	24,958	2,458	1,865	7,391	2,568	8,489	3,525	736	4,228
2004	71,297	12,232	5,940	6,292	6,117	NA	NA	9,908	8,552	1,356	NA	NA	NA	NA	40,778	26,215	2,529	1,876	7,544	2,614	8,379	3,526	731	4,122
2005	73,445	12,142	5,849	6,292	6,124	NA	NA	10,627	9,268	1,359	NA	NA	NA	NA	41,994	26,713	2,536	1,962	8,054	2,730	8,683	3,559	753	4,371
2006	73,214	11,820	5,609	6,211	6,035	55	19	9,972	8,255	1,718	NA	NA	NA	NA	42,754	26,489	2,606	2,099	8,669	2,891	8,612	3,389	781	4,442
2007	76,998	11,509	5,352	6,157	5,982	67	23	13,049	9,830	3,219	NA	NA	NA	NA	43,507	26,110	2,780	2,266	9,186	3,165	8,867	3,276	808	4,782
2008	80,066	11,883	5,632	6,251	6,063	83	30	14,054	11,068	1,676	14	549	727	20	44,456	26,080	2,924	2,421	9,620	3,410	9,591	3,492	823	5,275
2009	84,025	12,995	6,144	6,851	6,671	102	38	16,695	13,550	1,513	15	747	831	38	43,791	26,011	2,774	2,253	9,326	3,427	10,443	3,950	789	5,704
2010	85,321	13,106	5,702	7,404	7,224	115	44	18,265	14,771	1,569	11	805	1,044	65	43,239	26,430	2,540	1,991	8,943	3,334	10,597	3,809	784	6,003

TABLE 3

U.S. basic research expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs[b]		Nonfederal government[c]		Business[d]							Higher education[e]						NPOs[f]			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
2011	80,553	12,595	5,517	7,078	6,922	113	44	14,232	11,570	740	23	814	1,043	41	43,416	26,356	2,454	1,975	9,304	3,326	10,198	3,368	813	6,017
2012	79,404	11,966	5,890	6,075	5,934	106	42	14,266	11,756	691	10	762	1,016	31	42,882	25,146	2,363	2,006	9,934	3,434	10,184	3,318	820	6,046
2013	83,628	10,044	5,624	4,419	4,311	97	40	20,584	15,813	1,262	22	1,526	1,869	93	42,371	23,849	2,329	2,088	10,474	3,631	10,532	3,198	857	6,476
2014	85,971	10,242	5,917	4,325	4,228	102	43	22,750	16,392	2,120	17	1,643	2,455	123	41,906	22,905	2,325	2,169	10,736	3,771	10,971	3,205	891	6,875
2015	86,757	10,293	6,053	4,240	4,155	103	43	22,393	16,373	2,094	14	1,608	2,181	123	42,658	22,805	2,362	2,272	11,288	3,932	11,309	3,118	916	7,275
2016	89,061	10,500	6,229	4,271	4,185	95	39	25,502	19,129	2,074	20	1,562	2,597	119	43,665	22,992	2,401	2,337	11,814	4,122	9,299	4,059	729	4,215
2017	90,118	10,388	6,259	4,128	4,054	100	41	25,617	18,299	1,853	17	2,085	3,260	103	44,811	23,345	2,392	2,417	12,278	4,379	9,204	3,726	844	4,322
2018	95,613	10,847	6,674	4,173	4,094	104	44	28,550	20,628	2,479	12	2,022	3,301	109	46,245	23,939	2,399	2,547	12,710	4,651	9,866	4,178	967	4,393
2019	100,866	11,476	7,071	4,405	4,328	116	50	31,336	23,618	2,259	15	1,983	3,378	83	47,422	24,492	2,438	2,626	13,105	4,761	10,517	4,578	1,113	4,482
2020	105,957	11,489	6,944	4,546	4,474	118	52	34,521	26,489	2,088	22	2,193	3,632	96	48,235	25,151	2,490	2,604	13,345	4,645	11,594	4,906	1,378	4,919
2021	107,672	10,605	5,999	4,605	4,537	109	49	37,074	28,469	2,182	36	2,399	3,900	88	49,052	26,025	2,484	2,616	13,483	4,443	10,832	4,216	1,274	5,086
2022[g]	110,358	11,224	6,659	4,565	4,501	103	46	36,733	29,187	2,101	18	2,057	3,298	73	50,513	26,777	2,498	2,659	14,072	4,507	11,785	4,708	1,550	5,160
2023[h]	112,993	11,327	6,515	4,813	4,743	99	44	37,404	29,626	2,157	18	2,137	3,391	75	52,729	27,772	2,575	2,726	14,894	4,763	11,434	4,567	1,504	5,006

NA = not available.

FFRDC = federally funded research and development center; NPO = nonprofit organization.

[a] See table 2, footnotes a–f, for details on sectoral R&D.

[b] Type-of-R&D data for FFRDC R&D in 1953–63 reflect the R&D performance of only university-administered FFRDCs. In 1953–63, the R&D performance and funding of industry-administered FFRDCs were not separately reported but are included instead in the business R&D data for these years. Similarly, in 1953–63, the R&D performance and funding for nonprofit-administered FFRDCs were not separately reported but are included instead in the NPO R&D data for these years. The data for 1964–80 reflect the R&D performance of only university-administered FFRDCs and industry-administered FFRDCs; the R&D performance for nonprofit-administered FFRDCs is included in the NPO R&D data for these years. Starting in 2001, type-of-R&D data provide detail on federal and nonfederal sources of funding for FFRDC R&D. (See also table 2, footnote b.)

[c] Type-of-R&D data for state intramural R&D became available in 2016. These data prior to 2016 are estimated. (See also table 2, footnote c.)

[d] Type-of-R&D data for business R&D in 1998–2007 were revised in response to data quality review considerations and are not directly comparable with the data for 1997 and earlier years. For 2008 and later years, the type-of-R&D splits for other than total, own-funded, and federally funded R&D are estimated. (See also table 2, footnote d.)

[e] The type-of-R&D estimation procedure for higher education R&D was revised in 1998 and again in 2010; hence, these data are not directly comparable with data reported for earlier years. The pass-through adjusted data on higher education R&D, applied in 1998 and forward, reflect institution-specific detail on the type-of-R&D performed. Type-of-R&D splits besides total and federally funded are estimated. (See also table 2, footnote e.)

[f] Type-of-R&D data for R&D by NPOs in 1998 and later years are estimated, except for the R&D that is federally funded. (See also table 2, footnote f.)

[g] Some data for 2022 are preliminary and may be revised later.

[h] The data for 2023 include estimates and are likely to be revised later.

Note(s):
Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised. Data are based on reports by performers in the National Center for Science and Engineering Statistics annual surveys on R&D expenditures: Business Enterprise Research and Development Survey, Annual Business Survey, Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—were collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers in 1977 and afterward, the approximation equals 75% of the amount reported in the same fiscal year plus 25% of the amount reported in the subsequent fiscal year. Prior to 1977, the federal fiscal year began on 1 July, not 1 October, and the approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year. The fiscal year for higher education performers and state government performers generally begins 1 July, and the calendar year approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year.

Source(s):
National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

TABLE 4

U.S. applied research expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs		Nonfederal government		Business							Higher education						NPOs			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
Current $millions																								
1953	1,289	395	347	48	48	NA	NA	726	438	288	NA	NA	NA	NA	134	59	30	7	28	10	35	14	11	10
1954	1,378	388	330	59	59	NA	NA	814	492	322	NA	NA	NA	NA	137	60	32	8	28	10	40	16	13	11
1955	1,502	419	333	86	86	NA	NA	899	560	339	NA	NA	NA	NA	142	63	32	9	27	11	43	18	14	11
1956	1,929	511	387	125	125	NA	NA	1,224	794	430	NA	NA	NA	NA	146	65	33	10	27	11	48	20	14	14
1957	2,413	595	446	149	149	NA	NA	1,616	992	624	NA	NA	NA	NA	147	63	34	12	27	11	57	23	14	20
1958	2,759	672	516	156	156	NA	NA	1,868	1,137	731	NA	NA	NA	NA	152	66	35	12	27	12	68	29	14	25
1959	2,940	756	577	179	179	NA	NA	1,935	1,178	757	NA	NA	NA	NA	167	78	37	13	28	12	82	40	15	27
1960	3,065	816	615	201	201	NA	NA	1,965	1,196	769	NA	NA	NA	NA	186	93	39	13	29	12	99	54	17	28
1961	3,123	908	668	240	240	NA	NA	1,903	1,165	738	NA	NA	NA	NA	199	104	40	13	30	13	114	62	17	35
1962	3,698	958	709	249	249	NA	NA	2,392	1,438	954	NA	NA	NA	NA	216	119	41	14	30	13	132	68	19	45
1963	3,864	1,084	809	275	275	NA	NA	2,402	1,450	952	NA	NA	NA	NA	230	128	42	14	32	14	150	82	19	49
1964	4,201	1,260	947	313	313	NA	NA	2,538	1,560	978	NA	NA	NA	NA	256	142	45	14	37	18	148	82	19	47
1965	4,374	1,287	994	294	294	NA	NA	2,612	1,620	992	NA	NA	NA	NA	304	176	46	13	42	27	171	98	21	52
1966	4,653	1,302	1,012	290	290	NA	NA	2,790	1,804	986	NA	NA	NA	NA	351	208	47	14	48	34	210	129	24	57
1967	4,848	1,402	1,069	334	334	NA	NA	2,832	1,849	983	NA	NA	NA	NA	389	238	46	16	54	36	226	141	25	60
1968	5,137	1,446	1,112	334	334	NA	NA	3,037	2,081	956	NA	NA	NA	NA	405	250	46	16	55	39	250	160	28	62
1969	5,454	1,565	1,229	336	336	NA	NA	3,192	2,272	920	NA	NA	NA	NA	417	257	48	16	54	43	281	183	32	66
1970	5,752	1,670	1,334	336	336	NA	NA	3,330	2,378	952	NA	NA	NA	NA	451	280	51	18	56	47	302	199	33	70
1971	5,833	1,666	1,355	312	312	NA	NA	3,348	2,441	907	NA	NA	NA	NA	499	306	61	19	67	47	320	212	34	74
1972	6,147	1,792	1,434	358	358	NA	NA	3,407	2,562	845	NA	NA	NA	NA	619	391	74	21	82	52	330	216	35	79
1973	6,655	1,861	1,527	334	334	NA	NA	3,715	2,832	883	NA	NA	NA	NA	725	450	88	26	100	62	355	236	36	83
1974	7,344	1,987	1,652	335	335	NA	NA	4,168	3,263	905	NA	NA	NA	NA	794	477	96	32	118	72	396	266	39	91
1975	8,091	2,295	1,912	384	384	NA	NA	4,431	3,440	991	NA	NA	NA	NA	934	550	113	39	141	92	431	290	42	100
1976	8,976	2,525	2,068	457	457	NA	NA	4,945	3,912	1,033	NA	NA	NA	NA	1,042	596	127	45	166	109	464	310	45	109
1977	9,662	2,621	2,081	540	540	NA	NA	5,424	4,311	1,113	NA	NA	NA	NA	1,126	626	134	51	194	121	492	324	48	120
1978	10,704	2,838	2,242	597	597	NA	NA	6,065	4,870	1,195	NA	NA	NA	NA	1,247	676	151	61	232	128	554	371	52	132
1979	12,097	3,069	2,415	654	654	NA	NA	6,975	5,670	1,305	NA	NA	NA	NA	1,418	793	161	71	263	129	635	436	55	144
1980	13,729	3,295	2,546	749	749	NA	NA	8,175	6,550	1,625	NA	NA	NA	NA	1,622	912	174	88	308	140	637	420	60	158
1981	16,329	3,520	2,731	788	788	NA	NA	10,401	8,359	2,042	NA	NA	NA	NA	1,781	953	199	108	363	159	628	391	64	173
1982	18,218	3,692	2,802	890	890	NA	NA	11,956	9,363	2,593	NA	NA	NA	NA	1,915	1,007	207	121	402	178	655	398	69	189
1983	20,298	3,956	2,991	965	965	NA	NA	13,513	10,286	3,227	NA	NA	NA	NA	2,116	1,122	215	141	443	194	713	433	74	207
1984	22,451	4,137	2,961	1,176	1,176	NA	NA	15,218	11,541	3,677	NA	NA	NA	NA	2,332	1,226	234	168	491	212	764	459	79	226

TABLE 4

U.S. applied research expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs		Nonfederal government		Business							Higher education						NPOs			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1985	25,401	4,427	3,135	1,292	1,292	NA	NA	17,625	12,908	4,717	NA	NA	NA	NA	2,527	1,296	262	198	547	224	822	490	85	247
1986	27,240	4,462	3,204	1,258	1,258	NA	NA	19,131	15,082	4,049	NA	NA	NA	NA	2,780	1,393	298	229	620	240	867	506	91	270
1987	27,951	4,594	3,366	1,228	1,228	NA	NA	19,190	15,153	4,037	NA	NA	NA	NA	3,219	1,643	333	260	707	276	948	555	98	295
1988	29,528	4,346	3,362	984	984	NA	NA	20,377	16,531	3,846	NA	NA	NA	NA	3,779	1,958	377	302	818	325	1,026	599	105	322
1989	32,277	4,613	3,566	1,047	1,047	NA	NA	22,317	17,993	4,324	NA	NA	NA	NA	4,188	2,121	417	347	933	370	1,159	695	112	352
1990	34,897	4,808	3,652	1,156	1,156	NA	NA	24,399	18,432	5,967	NA	NA	NA	NA	4,406	2,140	453	377	1,031	404	1,284	780	120	384
1991	38,631	5,539	4,093	1,446	1,446	NA	NA	27,013	21,425	5,588	NA	NA	NA	NA	4,611	2,232	468	392	1,091	428	1,468	921	129	419
1992	37,936	5,866	4,337	1,529	1,529	NA	NA	25,660	21,184	4,476	NA	NA	NA	NA	4,882	2,415	479	414	1,120	454	1,528	933	138	456
1993	37,283	6,338	4,838	1,500	1,500	NA	NA	24,251	19,956	4,295	NA	NA	NA	NA	5,149	2,542	496	443	1,181	487	1,544	900	148	497
1994	36,618	6,581	4,985	1,596	1,596	NA	NA	22,988	19,372	3,616	NA	NA	NA	NA	5,390	2,644	517	464	1,256	509	1,659	960	158	541
1995	40,936	6,666	4,952	1,714	1,714	NA	NA	26,919	23,755	3,164	NA	NA	NA	NA	5,659	2,779	559	494	1,311	516	1,692	934	170	589
1996	43,170	6,495	4,872	1,623	1,623	NA	NA	29,010	25,370	3,640	NA	NA	NA	NA	5,885	2,864	584	524	1,390	522	1,781	960	182	640
1997	46,516	6,675	4,997	1,679	1,679	NA	NA	32,430	29,782	2,648	NA	NA	NA	NA	5,485	2,518	548	515	1,396	508	1,926	1,011	205	711
1998	46,247	6,871	5,146	1,725	1,725	NA	NA	32,208	29,576	2,632	NA	NA	NA	NA	5,108	2,189	515	509	1,393	502	2,061	1,060	218	784
1999	51,853	7,181	5,530	1,651	1,651	NA	NA	36,638	33,821	2,817	NA	NA	NA	NA	5,650	2,571	533	529	1,480	537	2,384	1,300	236	849
2000	56,503	7,856	6,105	1,750	1,750	NA	NA	39,176	36,494	2,682	NA	NA	NA	NA	6,361	3,081	558	540	1,604	578	3,110	1,831	258	1,021
2001	64,201	9,766	7,052	2,714	2,564	NA	NA	44,012	40,409	3,603	NA	NA	NA	NA	6,886	3,411	585	535	1,734	621	3,537	2,150	261	1,126
2002	50,540	10,525	7,487	3,038	2,867	NA	NA	28,533	26,081	2,452	NA	NA	NA	NA	7,670	3,877	636	531	1,937	689	3,812	2,267	253	1,293
2003	60,983	10,857	7,672	3,186	3,020	NA	NA	37,334	32,861	4,473	NA	NA	NA	NA	8,560	4,450	708	537	2,127	739	4,232	2,487	259	1,486
2004	69,322	10,779	7,455	3,325	3,180	NA	NA	45,432	40,657	4,775	NA	NA	NA	NA	8,911	4,682	735	545	2,190	759	4,200	2,448	264	1,488
2005	69,768	11,001	7,557	3,444	3,288	NA	NA	45,284	39,995	5,289	NA	NA	NA	NA	9,144	4,810	719	557	2,283	774	4,339	2,432	280	1,627
2006	76,499	10,952	7,435	3,518	3,348	255	87	51,173	45,033	6,140	NA	NA	NA	NA	9,522	5,080	712	573	2,368	789	4,596	2,592	300	1,705
2007	83,662	11,040	7,222	3,819	3,643	321	111	57,570	48,625	8,945	NA	NA	NA	NA	9,945	5,284	745	607	2,461	848	4,786	2,583	318	1,885
2008	74,729	11,446	7,316	4,130	3,955	407	146	46,864	35,382	5,397	71	2,815	3,094	105	10,962	5,840	815	675	2,682	951	5,050	2,600	331	2,119
2009	72,577	12,581	7,874	4,707	4,517	502	186	41,055	29,264	7,797	38	1,865	1,996	96	12,767	7,161	941	755	2,907	1,003	5,673	3,049	319	2,305
2010	78,886	13,203	8,016	5,187	5,025	572	219	44,906	34,912	4,705	32	2,256	2,819	182	14,387	8,539	1,000	760	3,060	1,028	5,818	3,041	321	2,456
2011	81,718	13,251	8,024	5,227	5,057	575	226	47,186	37,047	4,404	70	2,413	3,130	122	15,162	9,031	979	776	3,311	1,066	5,545	2,693	340	2,512
2012	86,627	14,328	8,587	5,741	5,566	550	220	50,755	38,891	4,137	45	3,336	4,209	137	15,446	8,909	991	856	3,570	1,120	5,549	2,629	349	2,571
2013	87,979	15,132	8,309	6,823	6,639	513	213	51,013	37,385	6,028	47	3,275	4,078	199	15,684	8,646	1,049	914	3,823	1,253	5,637	2,465	371	2,801
2014	91,601	15,728	8,775	6,952	6,766	471	200	53,415	38,281	6,445	35	3,331	5,074	250	15,996	8,477	1,073	974	4,098	1,374	5,992	2,574	392	3,026
2015	97,059	16,698	9,347	7,351	7,182	481	199	56,472	43,330	6,102	24	2,735	4,072	209	16,980	8,838	1,083	1,079	4,425	1,557	6,429	2,791	407	3,231
2016	109,463	17,433	9,805	7,628	7,469	509	209	62,871	48,543	5,327	45	3,174	5,536	245	18,503	9,520	1,158	1,192	4,836	1,797	10,147	3,749	891	5,147
2017	113,296	18,170	10,124	8,046	7,868	510	208	64,040	47,727	5,386	33	3,852	6,849	193	19,556	9,985	1,219	1,259	5,184	1,911	11,020	4,678	977	5,005

TABLE 4

U.S. applied research expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs		Nonfederal government		Business							Higher education						NPOs			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
2018	118,236	19,704	11,111	8,593	8,407	514	215	66,587	50,898	5,355	23	3,469	6,651	191	20,553	10,443	1,286	1,351	5,475	1,998	10,877	4,623	1,064	4,831
2019	130,098	20,523	11,264	9,258	9,075	523	225	76,176	57,549	5,246	42	4,907	8,223	209	21,522	10,956	1,338	1,436	5,732	2,062	11,354	5,325	1,130	4,549
2020	132,351	21,117	11,554	9,563	9,384	514	224	78,371	58,766	5,906	84	5,135	8,218	262	22,268	11,514	1,357	1,429	5,925	2,045	10,081	4,816	1,085	3,872
2021	143,711	21,187	11,132	10,056	9,870	521	232	88,707	66,451	3,491	142	7,556	10,775	292	23,470	12,313	1,385	1,471	6,226	2,076	9,827	4,947	940	3,752
2022[b]	161,628	23,502	12,745	10,757	10,568	557	248	102,688	78,473	5,614	71	7,622	10,633	276	25,605	13,410	1,473	1,632	6,832	2,259	9,277	4,724	997	3,320
2023[c]	170,419	24,532	12,552	11,980	11,772	577	257	108,334	82,470	5,966	75	8,190	11,336	295	27,652	14,389	1,573	1,782	7,441	2,468	9,324	4,748	1,002	3,336
Constant 2017 $millions																								
1953	9,586	2,934	2,581	353	353	NA	NA	5,399	3,257	2,142	NA	NA	NA	NA	993	439	224	48	207	74	260	104	82	74
1954	10,155	2,859	2,428	431	431	NA	NA	5,999	3,626	2,373	NA	NA	NA	NA	1,006	438	232	55	206	74	291	114	96	81
1955	10,880	3,036	2,413	623	623	NA	NA	6,511	4,058	2,454	NA	NA	NA	NA	1,025	456	234	62	197	76	308	127	101	80
1956	13,513	3,580	2,708	872	872	NA	NA	8,573	5,563	3,010	NA	NA	NA	NA	1,023	455	232	70	189	77	336	140	98	98
1957	16,369	4,032	3,022	1,011	1,011	NA	NA	10,959	6,729	4,231	NA	NA	NA	NA	994	427	230	78	184	75	383	153	95	136
1958	18,296	4,457	3,422	1,035	1,035	NA	NA	12,388	7,540	4,847	NA	NA	NA	NA	1,005	434	234	80	180	76	448	189	93	166
1959	19,229	4,942	3,771	1,171	1,171	NA	NA	12,658	7,705	4,953	NA	NA	NA	NA	1,092	507	242	82	183	78	536	262	98	177
1960	19,782	5,263	3,966	1,297	1,297	NA	NA	12,683	7,718	4,965	NA	NA	NA	NA	1,197	600	250	84	186	77	639	348	110	181
1961	19,943	5,795	4,266	1,529	1,529	NA	NA	12,152	7,439	4,712	NA	NA	NA	NA	1,268	661	255	83	189	80	728	396	109	224
1962	23,329	6,041	4,470	1,571	1,571	NA	NA	15,093	9,073	6,020	NA	NA	NA	NA	1,363	748	256	85	192	82	833	429	120	284
1963	24,102	6,758	5,046	1,712	1,712	NA	NA	14,980	9,044	5,936	NA	NA	NA	NA	1,431	795	263	87	202	84	932	508	119	306
1964	25,809	7,738	5,815	1,923	1,923	NA	NA	15,592	9,584	6,008	NA	NA	NA	NA	1,570	872	278	83	229	108	909	504	117	289
1965	26,387	7,765	5,994	1,771	1,771	NA	NA	15,759	9,774	5,985	NA	NA	NA	NA	1,831	1,059	280	78	254	160	1,032	591	127	314
1966	27,306	7,642	5,939	1,702	1,702	NA	NA	16,375	10,588	5,787	NA	NA	NA	NA	2,060	1,221	276	82	284	197	1,230	754	141	335
1967	27,650	7,996	6,094	1,902	1,902	NA	NA	16,152	10,546	5,606	NA	NA	NA	NA	2,216	1,355	260	88	307	205	1,286	801	143	342
1968	28,101	7,907	6,080	1,827	1,827	NA	NA	16,613	11,384	5,230	NA	NA	NA	NA	2,215	1,365	252	88	301	211	1,365	873	153	339
1969	28,443	8,160	6,410	1,750	1,750	NA	NA	16,646	11,848	4,798	NA	NA	NA	NA	2,175	1,338	251	83	281	222	1,463	952	167	344
1970	28,494	8,272	6,608	1,664	1,664	NA	NA	16,495	11,779	4,716	NA	NA	NA	NA	2,231	1,384	254	87	276	230	1,496	986	163	347
1971	27,497	7,856	6,387	1,468	1,468	NA	NA	15,783	11,507	4,276	NA	NA	NA	NA	2,352	1,443	285	87	316	222	1,506	997	160	349
1972	27,777	8,097	6,480	1,618	1,618	NA	NA	15,396	11,577	3,818	NA	NA	NA	NA	2,795	1,765	335	93	370	233	1,489	974	158	357
1973	28,511	7,974	6,543	1,431	1,431	NA	NA	15,915	12,132	3,783	NA	NA	NA	NA	3,104	1,926	375	111	428	263	1,519	1,009	154	356
1974	28,866	7,809	6,494	1,315	1,315	NA	NA	16,382	12,825	3,557	NA	NA	NA	NA	3,119	1,873	378	124	463	281	1,556	1,046	152	358
1975	29,105	8,256	6,877	1,380	1,380	NA	NA	15,939	12,374	3,565	NA	NA	NA	NA	3,359	1,977	408	138	505	331	1,550	1,041	150	359
1976	30,606	8,610	7,052	1,558	1,558	NA	NA	16,860	13,338	3,522	NA	NA	NA	NA	3,552	2,030	434	152	564	372	1,583	1,057	152	373
1977	31,017	8,412	6,679	1,733	1,733	NA	NA	17,412	13,839	3,573	NA	NA	NA	NA	3,613	2,008	432	164	623	387	1,580	1,041	154	385

TABLE 4

U.S. applied research expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs		Nonfederal government		Business							Higher education						NPOs			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1978	32,104	8,512	6,723	1,789	1,789	NA	NA	18,190	14,606	3,584	NA	NA	NA	NA	3,739	2,027	454	181	695	382	1,663	1,113	155	394
1979	33,501	8,500	6,688	1,811	1,811	NA	NA	19,316	15,702	3,614	NA	NA	NA	NA	3,926	2,195	447	198	729	357	1,759	1,207	154	399
1980	34,871	8,369	6,467	1,902	1,902	NA	NA	20,764	16,636	4,127	NA	NA	NA	NA	4,120	2,317	441	224	782	356	1,618	1,066	151	401
1981	37,890	8,167	6,338	1,829	1,829	NA	NA	24,134	19,396	4,738	NA	NA	NA	NA	4,132	2,210	462	250	841	368	1,457	907	148	401
1982	39,812	8,068	6,122	1,946	1,946	NA	NA	26,128	20,461	5,667	NA	NA	NA	NA	4,184	2,200	453	264	878	388	1,432	869	150	413
1983	42,687	8,319	6,290	2,029	2,029	NA	NA	28,418	21,631	6,786	NA	NA	NA	NA	4,449	2,360	452	297	932	408	1,500	910	155	435
1984	45,569	8,397	6,010	2,387	2,387	NA	NA	30,889	23,425	7,463	NA	NA	NA	NA	4,733	2,489	475	341	997	430	1,551	932	160	459
1985	49,976	8,709	6,168	2,541	2,541	NA	NA	34,677	25,397	9,281	NA	NA	NA	NA	4,972	2,551	515	389	1,077	441	1,617	963	167	487
1986	52,536	8,606	6,180	2,426	2,426	NA	NA	36,898	29,088	7,809	NA	NA	NA	NA	5,361	2,686	574	442	1,197	462	1,672	975	176	521
1987	52,605	8,646	6,334	2,312	2,312	NA	NA	36,116	28,519	7,598	NA	NA	NA	NA	6,058	3,092	627	489	1,331	519	1,784	1,045	184	556
1988	53,679	7,900	6,112	1,788	1,788	NA	NA	37,044	30,052	6,992	NA	NA	NA	NA	6,871	3,560	685	549	1,487	590	1,865	1,088	190	586
1989	56,463	8,070	6,239	1,831	1,831	NA	NA	39,040	31,476	7,564	NA	NA	NA	NA	7,326	3,711	729	607	1,632	647	2,027	1,215	196	616
1990	58,843	8,108	6,158	1,949	1,949	NA	NA	41,142	31,080	10,062	NA	NA	NA	NA	7,429	3,609	763	636	1,739	682	2,165	1,314	203	647
1991	63,010	9,035	6,677	2,358	2,358	NA	NA	44,060	34,945	9,114	NA	NA	NA	NA	7,520	3,640	763	639	1,779	699	2,395	1,502	210	683
1992	60,496	9,354	6,916	2,438	2,438	NA	NA	40,920	33,782	7,138	NA	NA	NA	NA	7,786	3,851	763	661	1,786	725	2,436	1,489	220	727
1993	58,078	9,874	7,537	2,336	2,336	NA	NA	37,778	31,087	6,691	NA	NA	NA	NA	8,021	3,959	772	690	1,840	759	2,406	1,401	230	774
1994	55,850	10,037	7,604	2,434	2,434	NA	NA	35,062	29,547	5,515	NA	NA	NA	NA	8,221	4,032	789	708	1,916	776	2,530	1,463	242	825
1995	61,155	9,959	7,398	2,560	2,560	NA	NA	40,214	35,488	4,727	NA	NA	NA	NA	8,454	4,152	835	738	1,959	771	2,528	1,395	253	879
1996	63,333	9,528	7,147	2,380	2,380	NA	NA	42,559	37,219	5,340	NA	NA	NA	NA	8,633	4,201	856	769	2,040	766	2,613	1,408	266	939
1997	67,084	9,627	7,206	2,421	2,421	NA	NA	46,769	42,951	3,819	NA	NA	NA	NA	7,910	3,631	791	742	2,013	733	2,778	1,458	296	1,025
1998	65,956	9,798	7,338	2,460	2,460	NA	NA	45,933	42,180	3,754	NA	NA	NA	NA	7,284	3,122	735	726	1,986	716	2,940	1,512	310	1,118
1999	72,918	10,098	7,776	2,321	2,321	NA	NA	51,522	47,561	3,961	NA	NA	NA	NA	7,946	3,616	750	744	2,081	755	3,353	1,828	332	1,194
2000	77,696	10,802	8,395	2,407	2,407	NA	NA	53,870	50,182	3,688	NA	NA	NA	NA	8,747	4,237	768	743	2,205	794	4,277	2,518	355	1,403
2001	86,338	13,133	9,484	3,649	3,448	NA	NA	59,188	54,343	4,845	NA	NA	NA	NA	9,260	4,588	787	719	2,332	835	4,756	2,891	351	1,514
2002	66,927	13,938	9,915	4,023	3,796	NA	NA	37,784	34,537	3,247	NA	NA	NA	NA	10,156	5,134	842	703	2,565	913	5,049	3,002	335	1,712
2003	79,192	14,099	9,962	4,137	3,921	NA	NA	48,482	42,673	5,809	NA	NA	NA	NA	11,116	5,779	919	697	2,762	960	5,495	3,230	336	1,930
2004	87,664	13,631	9,427	4,205	4,021	NA	NA	57,453	51,415	6,038	NA	NA	NA	NA	11,268	5,921	929	689	2,770	960	5,311	3,096	334	1,881
2005	85,546	13,489	9,266	4,223	4,032	NA	NA	55,525	49,040	6,485	NA	NA	NA	NA	11,212	5,898	882	682	2,799	949	5,320	2,981	344	1,995
2006	90,993	13,027	8,843	4,184	3,983	304	103	60,868	53,565	7,303	NA	NA	NA	NA	11,327	6,042	847	682	2,816	939	5,467	3,083	356	2,028
2007	96,888	12,786	8,363	4,422	4,219	372	129	66,671	56,312	10,359	NA	NA	NA	NA	11,517	6,119	862	703	2,850	982	5,543	2,991	369	2,183
2008	84,907	13,005	8,313	4,693	4,494	462	166	53,247	40,201	6,132	80	3,199	3,516	119	12,455	6,635	926	767	3,047	1,080	5,738	2,954	376	2,408
2009	81,956	14,206	8,892	5,315	5,101	566	210	46,361	33,046	8,805	43	2,106	2,254	108	14,416	8,086	1,062	853	3,282	1,133	6,406	3,443	360	2,603
2010	88,011	14,730	8,943	5,787	5,606	638	244	50,101	38,950	5,249	36	2,517	3,146	203	16,051	9,527	1,116	847	3,414	1,147	6,491	3,393	358	2,740

TABLE 4

U.S. applied research expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs		Nonfederal government		Business							Higher education						NPOs			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
2011	89,328	14,485	8,771	5,713	5,528	628	247	51,580	40,497	4,814	76	2,638	3,422	133	16,574	9,872	1,070	848	3,619	1,165	6,061	2,944	371	2,746
2012	92,963	15,375	9,215	6,161	5,973	591	237	54,467	41,735	4,440	48	3,580	4,517	147	16,575	9,561	1,063	918	3,831	1,202	5,955	2,821	374	2,760
2013	92,834	15,967	8,767	7,200	7,005	541	225	53,828	39,448	6,361	50	3,456	4,303	210	16,549	9,123	1,106	964	4,034	1,322	5,949	2,601	391	2,956
2014	95,001	16,311	9,101	7,210	7,017	489	207	55,398	39,701	6,684	36	3,454	5,262	259	16,589	8,792	1,113	1,010	4,250	1,425	6,214	2,669	407	3,138
2015	99,736	17,159	9,605	7,553	7,380	494	204	58,030	44,525	6,270	24	2,811	4,184	215	17,448	9,081	1,112	1,108	4,547	1,599	6,607	2,868	418	3,321
2016	111,423	17,745	9,981	7,765	7,603	518	213	63,997	49,413	5,422	46	3,231	5,635	250	18,834	9,691	1,179	1,213	4,922	1,829	10,329	3,816	906	5,240
2017	113,296	18,170	10,124	8,046	7,868	510	208	64,040	47,727	5,386	33	3,852	6,849	193	19,556	9,985	1,219	1,259	5,184	1,911	11,020	4,678	977	5,005
2018	115,588	19,263	10,862	8,401	8,219	502	210	65,096	49,758	5,236	23	3,392	6,502	186	20,093	10,209	1,257	1,321	5,352	1,953	10,634	4,520	1,040	4,723
2019	125,119	19,737	10,833	8,904	8,727	503	216	73,261	55,347	5,045	40	4,719	7,908	201	20,698	10,537	1,286	1,381	5,512	1,983	10,919	5,121	1,087	4,375
2020	125,617	20,042	10,967	9,076	8,907	488	213	74,383	55,776	5,606	79	4,874	7,800	249	21,135	10,928	1,287	1,356	5,623	1,940	9,568	4,571	1,030	3,675
2021	130,443	19,231	10,104	9,127	8,959	473	210	80,517	60,316	3,169	129	6,859	9,780	265	21,303	11,176	1,257	1,335	5,651	1,884	8,920	4,490	853	3,405
2022[b]	136,942	19,912	10,798	9,114	8,953	472	210	87,004	66,487	4,756	60	6,458	9,009	234	21,694	11,361	1,248	1,383	5,788	1,914	7,860	4,002	845	2,813
2023[c]	139,375	20,063	10,265	9,798	9,628	472	210	88,600	67,447	4,880	62	6,698	9,271	241	22,615	11,768	1,286	1,457	6,085	2,018	7,626	3,883	820	2,729

NA = not available.

FFRDC = federally funded research and development center; NPO = nonprofit organization.

[a] See table 2, footnotes a–f, for details on sectoral R&D.

[b] Some data for 2022 are preliminary and may be revised later.

[c] The data for 2023 include estimates and are likely to be revised later.

Note(s):

For detail on type-of-R&D data, see table 3, footnotes b–f. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised. Data are based on reports by performers in the National Center for Science and Engineering Statistics annual surveys on R&D expenditures: Business Enterprise Research and Development Survey, Annual Business Survey, Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—were collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers in 1977 and afterward, the approximation equals 75% of the amount reported in the same fiscal year plus 25% of the amount reported in the subsequent fiscal year. Prior to 1977, the federal fiscal year began on 1 July, not 1 October, and the approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year. The fiscal year for higher education performers and state government performers generally begins 1 July, and the calendar year approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year.

Source(s):

National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

TABLE 5

U.S. experimental development expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs		Nonfederal government		Business							Higher education						NPOs			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
Current $millions																								
1953	3,412	614	567	48	48	NA	NA	2,753	1,630	1,123	NA	NA	NA	NA	16	9	3	1	3	1	29	17	6	6
1954	3,734	599	537	62	62	NA	NA	3,090	1,685	1,405	NA	NA	NA	NA	17	9	3	1	3	1	29	15	7	7
1955	4,113	713	543	171	171	NA	NA	3,352	1,738	1,614	NA	NA	NA	NA	21	12	4	2	3	1	27	12	8	7
1956	5,854	978	631	348	348	NA	NA	4,826	2,267	2,559	NA	NA	NA	NA	25	14	4	2	4	2	26	11	8	7
1957	6,681	1,157	728	429	429	NA	NA	5,474	2,174	3,300	NA	NA	NA	NA	26	12	5	3	4	2	25	9	8	8
1958	7,213	1,227	842	386	386	NA	NA	5,932	2,241	3,691	NA	NA	NA	NA	28	13	6	3	4	2	26	9	8	9
1959	8,463	1,417	940	477	477	NA	NA	6,983	2,557	4,426	NA	NA	NA	NA	31	16	6	3	5	2	33	14	9	10
1960	9,360	1,562	1,003	559	559	NA	NA	7,734	2,935	4,799	NA	NA	NA	NA	35	19	6	3	5	2	30	10	10	10
1961	9,930	1,760	1,090	670	670	NA	NA	8,106	3,189	4,917	NA	NA	NA	NA	37	22	7	2	5	2	28	4	10	14
1962	10,114	1,845	1,227	618	618	NA	NA	8,196	3,246	4,950	NA	NA	NA	NA	40	23	8	2	6	2	34	5	11	18
1963	11,539	2,133	1,465	668	668	NA	NA	9,330	3,535	5,795	NA	NA	NA	NA	40	22	8	2	6	2	37	6	11	20
1964	12,506	2,419	1,680	739	739	NA	NA	10,004	3,848	6,156	NA	NA	NA	NA	49	30	8	2	7	3	35	6	11	18
1965	13,215	2,463	1,789	674	674	NA	NA	10,637	4,419	6,218	NA	NA	NA	NA	71	48	9	2	8	4	45	13	12	20
1966	14,490	2,540	1,886	654	654	NA	NA	11,810	4,961	6,849	NA	NA	NA	NA	87	61	9	2	10	5	53	16	14	23
1967	15,332	2,649	1,943	706	706	NA	NA	12,539	5,744	6,795	NA	NA	NA	NA	93	66	9	3	10	7	51	12	15	24
1968	16,154	2,628	1,904	724	724	NA	NA	13,370	6,326	7,044	NA	NA	NA	NA	102	72	8	4	9	9	55	13	16	26
1969	17,051	2,807	2,016	792	792	NA	NA	14,071	7,127	6,944	NA	NA	NA	NA	110	80	7	5	8	10	63	17	18	28
1970	16,925	3,047	2,258	790	790	NA	NA	13,698	7,466	6,232	NA	NA	NA	NA	112	84	6	5	7	10	68	20	18	30
1971	17,399	3,313	2,473	841	841	NA	NA	13,924	7,757	6,167	NA	NA	NA	NA	98	69	8	4	9	9	64	12	19	33
1972	18,743	3,502	2,639	863	863	NA	NA	15,043	8,510	6,533	NA	NA	NA	NA	101	63	12	4	14	9	98	44	19	35
1973	20,197	3,517	2,657	860	860	NA	NA	16,394	9,773	6,621	NA	NA	NA	NA	126	71	18	5	20	13	160	102	20	38
1974	21,504	3,748	2,765	983	983	NA	NA	17,421	10,868	6,553	NA	NA	NA	NA	141	75	20	7	25	15	195	131	22	42
1975	22,706	3,993	2,890	1,103	1,103	NA	NA	18,352	11,569	6,783	NA	NA	NA	NA	156	83	22	8	27	16	205	135	23	47
1976	25,085	4,286	2,972	1,315	1,315	NA	NA	20,412	12,890	7,522	NA	NA	NA	NA	182	100	24	12	31	16	205	128	25	52
1977	27,667	4,606	3,188	1,418	1,418	NA	NA	22,603	14,328	8,275	NA	NA	NA	NA	254	153	28	15	40	19	204	119	27	58
1978	31,056	5,261	3,676	1,584	1,584	NA	NA	25,216	16,460	8,756	NA	NA	NA	NA	373	254	32	15	49	24	207	113	30	64
1979	35,445	5,697	3,944	1,753	1,753	NA	NA	29,033	19,145	9,888	NA	NA	NA	NA	469	336	34	16	56	28	246	143	32	71
1980	40,748	6,081	4,072	2,009	2,009	NA	NA	33,848	22,891	10,957	NA	NA	NA	NA	518	362	38	19	68	31	301	187	35	79
1981	46,305	6,705	4,530	2,175	2,175	NA	NA	38,547	25,756	12,791	NA	NA	NA	NA	568	386	44	24	80	35	485	360	37	88
1982	51,879	7,348	5,178	2,170	2,170	NA	NA	43,434	29,219	14,215	NA	NA	NA	NA	597	397	46	27	88	39	500	362	40	98
1983	57,771	8,491	6,106	2,385	2,385	NA	NA	48,064	32,542	15,522	NA	NA	NA	NA	617	399	47	31	97	43	599	447	44	109
1984	66,461	9,651	7,078	2,572	2,572	NA	NA	55,371	37,731	17,640	NA	NA	NA	NA	677	435	51	37	108	47	762	594	47	120

TABLE 5

U.S. experimental development expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs		Nonfederal government		Business							Higher education						NPOs			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1985	74,522	10,916	8,011	2,906	2,906	NA	NA	62,020	41,762	20,258	NA	NA	NA	NA	756	486	57	43	120	49	829	644	51	134
1986	75,855	11,376	8,275	3,101	3,101	NA	NA	62,871	41,354	21,517	NA	NA	NA	NA	818	513	65	50	136	53	790	587	55	149
1987	79,929	11,496	8,176	3,321	3,321	NA	NA	66,789	42,667	24,122	NA	NA	NA	NA	945	599	73	57	155	61	698	474	60	165
1988	84,567	12,460	8,864	3,596	3,596	NA	NA	70,353	46,634	23,719	NA	NA	NA	NA	1,098	698	83	66	180	71	655	407	65	183
1989	87,723	12,991	9,355	3,635	3,635	NA	NA	72,725	51,676	21,049	NA	NA	NA	NA	1,227	773	91	76	205	81	780	507	70	203
1990	94,067	13,363	9,700	3,663	3,663	NA	NA	78,376	59,410	18,966	NA	NA	NA	NA	1,407	910	99	83	226	89	920	619	75	226
1991	95,105	12,230	8,778	3,452	3,452	NA	NA	80,286	63,030	17,256	NA	NA	NA	NA	1,534	1,012	103	86	239	94	1,054	722	82	251
1992	99,811	12,521	9,098	3,423	3,423	NA	NA	84,569	67,388	17,181	NA	NA	NA	NA	1,596	1,055	105	91	246	100	1,125	758	88	279
1993	99,705	12,058	9,071	2,986	2,986	NA	NA	84,757	68,674	16,083	NA	NA	NA	NA	1,700	1,127	109	97	259	107	1,191	787	95	309
1994	102,938	11,970	8,823	3,147	3,147	NA	NA	87,890	71,681	16,209	NA	NA	NA	NA	1,816	1,213	114	102	276	112	1,261	815	103	343
1995	113,079	12,689	9,262	3,427	3,427	NA	NA	97,342	79,518	17,824	NA	NA	NA	NA	1,812	1,180	123	108	288	113	1,236	744	111	381
1996	121,377	12,481	9,033	3,448	3,448	NA	NA	105,863	88,797	17,066	NA	NA	NA	NA	1,791	1,128	128	115	305	115	1,241	698	120	423
1997	128,661	12,407	9,077	3,331	3,331	NA	NA	113,184	95,063	18,121	NA	NA	NA	NA	1,693	1,041	120	113	306	112	1,378	687	155	536
1998	144,669	12,528	9,214	3,314	3,314	NA	NA	129,041	110,589	18,452	NA	NA	NA	NA	1,584	943	113	112	306	110	1,516	760	164	592
1999	154,315	12,600	9,265	3,335	3,335	NA	NA	138,807	122,236	16,571	NA	NA	NA	NA	1,362	686	117	116	325	118	1,546	727	178	641
2000	169,414	12,859	9,377	3,482	3,482	NA	NA	153,745	140,235	13,510	NA	NA	NA	NA	1,265	545	123	119	352	127	1,545	580	195	771
2001	167,975	14,693	11,062	3,631	3,566	NA	NA	149,952	137,410	12,542	NA	NA	NA	NA	1,409	646	128	117	381	136	1,921	874	197	850
2002	176,971	15,607	11,800	3,807	3,763	NA	NA	157,788	144,727	13,061	NA	NA	NA	NA	1,472	639	140	116	425	151	2,104	937	191	976
2003	175,559	16,639	12,646	3,993	3,964	NA	NA	155,060	143,121	11,939	NA	NA	NA	NA	1,799	897	155	118	467	162	2,060	743	195	1,122
2004	177,030	17,233	12,746	4,487	4,454	NA	NA	155,034	140,615	14,419	NA	NA	NA	NA	2,140	1,211	161	120	481	167	2,623	1,300	199	1,123
2005	195,621	18,664	13,994	4,670	4,611	NA	NA	172,208	156,696	15,512	NA	NA	NA	NA	2,098	1,146	158	122	501	170	2,651	1,211	212	1,228
2006	212,857	20,720	16,089	4,630	4,547	7	2	188,112	171,392	16,720	NA	NA	NA	NA	1,902	927	156	126	520	173	2,116	603	226	1,287
2007	227,740	23,154	18,016	5,137	5,037	9	3	200,429	185,569	14,860	NA	NA	NA	NA	1,917	894	163	133	540	186	2,231	568	240	1,423
2008	259,579	23,743	17,566	6,177	6,078	11	4	231,447	180,724	29,488	223	8,882	11,799	330	1,965	841	179	148	589	209	2,412	562	250	1,600
2009	255,945	23,484	17,245	6,239	6,147	14	5	226,554	179,841	30,435	144	7,041	8,732	361	3,362	1,545	283	281	892	362	2,531	550	241	1,740
2010	251,239	25,848	18,844	7,004	6,909	16	6	217,700	170,036	28,089	114	8,035	10,779	647	4,941	2,452	397	408	1,186	498	2,734	638	242	1,854
2011	270,804	28,751	21,879	6,872	6,786	16	6	233,886	187,794	26,228	230	7,966	11,264	403	5,208	2,600	392	416	1,280	521	2,943	790	256	1,897
2012	273,078	26,666	19,941	6,725	6,632	15	6	238,202	192,828	25,840	102	7,578	11,543	310	5,472	2,626	368	445	1,455	579	2,723	518	263	1,941
2013	286,998	26,436	19,767	6,668	6,572	14	6	252,007	207,537	22,137	126	8,729	12,947	532	5,672	2,592	387	484	1,592	619	2,869	474	280	2,115
2014	301,441	27,084	20,303	6,781	6,681	13	6	265,377	223,186	18,065	87	8,312	15,103	624	5,916	2,562	400	537	1,726	692	3,052	471	296	2,284
2015	312,983	26,132	18,961	7,171	7,063	14	6	277,557	230,629	18,850	90	10,295	16,907	786	6,112	2,533	401	555	1,850	774	3,169	422	307	2,440
2016	324,729	23,438	15,838	7,600	7,479	18	7	291,605	243,056	16,790	129	9,940	20,930	760	6,378	2,580	420	562	1,957	861	3,290	520	386	2,228
2017	350,115	23,995	15,848	8,147	8,021	22	9	316,136	258,151	17,736	92	11,792	27,805	560	6,742	2,670	447	607	2,091	927	3,221	626	400	2,047

TABLE 5

U.S. experimental development expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs		Nonfederal government		Business							Higher education						NPOs			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
2018	387,805	27,556	18,856	8,701	8,567	23	9	349,771	285,863	17,301	85	13,745	32,029	748	7,006	2,796	485	625	2,191	910	3,450	977	420	1,910
2019	430,291	30,347	21,253	9,094	8,962	31	13	389,418	323,854	15,058	112	14,704	35,073	617	7,282	3,074	491	634	2,211	874	3,214	714	468	1,886
2020	472,492	31,870	22,356	9,514	9,379	44	19	428,479	356,724	21,666	134	14,329	35,007	618	7,686	3,389	491	659	2,266	882	4,413	1,824	533	1,904
2021	526,382	33,791	23,728	10,064	9,915	44	20	479,072	402,485	18,690	211	16,658	40,435	592	8,206	3,647	501	720	2,429	911	5,269	1,890	651	2,598
2022[b]	599,959	34,785	24,095	10,690	10,544	42	19	551,217	469,375	24,227	152	17,373	39,474	616	9,051	4,045	525	820	2,681	982	4,865	1,368	766	2,550
2023[c]	630,985	35,239	23,643	11,595	11,450	43	19	580,894	493,671	25,759	162	18,723	41,917	662	9,919	4,416	566	904	2,949	1,084	4,890	1,375	770	2,563
Constant 2017 $millions																								
1953	25,371	4,566	4,213	353	353	NA	NA	20,473	12,122	8,352	NA	NA	NA	NA	119	63	21	7	20	7	212	123	45	45
1954	27,517	4,411	3,957	453	453	NA	NA	22,771	12,417	10,354	NA	NA	NA	NA	125	63	25	7	23	7	210	107	52	52
1955	29,804	5,166	3,931	1,235	1,235	NA	NA	24,290	12,593	11,697	NA	NA	NA	NA	152	83	28	11	23	7	196	87	58	51
1956	41,019	6,853	4,418	2,435	2,435	NA	NA	33,812	15,884	17,928	NA	NA	NA	NA	175	95	31	14	25	11	179	74	56	49
1957	45,319	7,844	4,935	2,910	2,910	NA	NA	37,132	14,746	22,386	NA	NA	NA	NA	176	81	36	17	29	14	166	58	54	54
1958	47,835	8,137	5,581	2,557	2,557	NA	NA	39,343	14,862	24,481	NA	NA	NA	NA	182	83	37	20	29	13	172	60	53	60
1959	55,355	9,265	6,148	3,117	3,117	NA	NA	45,674	16,725	28,949	NA	NA	NA	NA	203	101	39	20	30	13	213	88	59	65
1960	60,404	10,077	6,469	3,607	3,607	NA	NA	49,911	18,941	30,970	NA	NA	NA	NA	223	123	41	16	30	13	194	65	65	65
1961	63,411	11,236	6,957	4,278	4,278	NA	NA	51,760	20,364	31,396	NA	NA	NA	NA	239	137	44	13	33	13	176	22	64	89
1962	63,811	11,640	7,741	3,899	3,899	NA	NA	51,707	20,480	31,228	NA	NA	NA	NA	252	142	49	13	37	13	211	28	69	114
1963	71,971	13,304	9,137	4,166	4,166	NA	NA	58,191	22,048	36,143	NA	NA	NA	NA	249	137	49	12	38	12	228	34	69	125
1964	76,832	14,861	10,321	4,540	4,540	NA	NA	61,461	23,641	37,820	NA	NA	NA	NA	298	181	49	12	40	15	212	34	68	111
1965	79,732	14,857	10,791	4,067	4,067	NA	NA	64,177	26,662	37,516	NA	NA	NA	NA	425	290	52	12	47	24	272	78	72	121
1966	85,040	14,904	11,069	3,835	3,835	NA	NA	69,314	29,116	40,197	NA	NA	NA	NA	511	358	55	12	57	29	311	94	82	135
1967	87,441	15,105	11,082	4,024	4,024	NA	NA	71,515	32,760	38,754	NA	NA	NA	NA	530	374	48	14	57	37	291	68	86	137
1968	88,364	14,373	10,415	3,958	3,958	NA	NA	73,138	34,605	38,533	NA	NA	NA	NA	555	391	42	22	51	49	298	68	88	142
1969	88,916	14,639	10,512	4,128	4,128	NA	NA	73,378	37,166	36,212	NA	NA	NA	NA	571	415	37	26	41	52	329	89	94	146
1970	83,834	15,095	11,184	3,911	3,911	NA	NA	67,851	36,981	30,869	NA	NA	NA	NA	555	414	32	25	35	50	334	97	89	149
1971	82,018	15,618	11,656	3,962	3,962	NA	NA	65,638	36,567	29,072	NA	NA	NA	NA	462	325	37	19	41	40	299	54	90	156
1972	84,697	15,824	11,926	3,897	3,897	NA	NA	67,976	38,455	29,521	NA	NA	NA	NA	456	282	56	16	61	41	441	197	86	158
1973	86,522	15,068	11,383	3,684	3,684	NA	NA	70,232	41,867	28,364	NA	NA	NA	NA	538	302	75	21	86	54	685	437	86	163
1974	84,522	14,731	10,870	3,862	3,862	NA	NA	68,473	42,717	25,757	NA	NA	NA	NA	552	293	79	26	96	59	766	515	85	166
1975	81,677	14,363	10,395	3,968	3,968	NA	NA	66,016	41,616	24,400	NA	NA	NA	NA	561	297	80	29	99	58	737	484	84	169
1976	85,529	14,614	10,132	4,482	4,482	NA	NA	69,595	43,949	25,646	NA	NA	NA	NA	621	339	82	39	106	55	698	435	86	178
1977	88,815	14,786	10,234	4,553	4,553	NA	NA	72,558	45,994	26,564	NA	NA	NA	NA	815	491	89	47	129	59	655	382	88	186

TABLE 5

U.S. experimental development expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs		Nonfederal government		Business							Higher education						NPOs			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1978	93,140	15,777	11,026	4,752	4,752	NA	NA	75,625	49,365	26,260	NA	NA	NA	NA	1,118	761	96	43	147	70	619	338	89	193
1979	98,162	15,776	10,922	4,855	4,855	NA	NA	80,403	53,020	27,384	NA	NA	NA	NA	1,300	932	95	43	155	76	682	396	89	198
1980	103,496	15,446	10,344	5,103	5,103	NA	NA	85,971	58,141	27,830	NA	NA	NA	NA	1,315	919	97	49	172	78	764	475	88	201
1981	107,446	15,559	10,512	5,047	5,047	NA	NA	89,444	59,764	29,680	NA	NA	NA	NA	1,317	895	101	55	185	81	1,126	835	87	204
1982	113,373	16,058	11,316	4,742	4,742	NA	NA	94,918	63,853	31,064	NA	NA	NA	NA	1,304	869	100	58	193	85	1,094	792	88	214
1983	121,493	17,856	12,840	5,016	5,016	NA	NA	101,079	68,436	32,643	NA	NA	NA	NA	1,298	840	99	65	205	90	1,261	940	92	228
1984	134,899	19,588	14,367	5,221	5,221	NA	NA	112,389	76,584	35,805	NA	NA	NA	NA	1,375	882	104	75	219	94	1,547	1,207	96	245
1985	146,621	21,478	15,761	5,717	5,717	NA	NA	122,025	82,167	39,858	NA	NA	NA	NA	1,488	956	113	85	236	97	1,631	1,267	101	263
1986	146,301	21,941	15,959	5,982	5,982	NA	NA	121,258	79,759	41,499	NA	NA	NA	NA	1,577	990	126	97	263	102	1,524	1,131	107	287
1987	150,429	21,637	15,387	6,250	6,250	NA	NA	125,700	80,301	45,399	NA	NA	NA	NA	1,778	1,127	138	107	292	114	1,315	892	112	311
1988	153,736	22,652	16,114	6,538	6,538	NA	NA	127,897	84,777	43,119	NA	NA	NA	NA	1,996	1,269	150	120	326	130	1,191	741	117	333
1989	153,456	22,725	16,366	6,359	6,359	NA	NA	127,220	90,398	36,822	NA	NA	NA	NA	2,147	1,353	160	133	358	142	1,365	887	122	356
1990	158,618	22,534	16,357	6,177	6,177	NA	NA	132,159	100,178	31,981	NA	NA	NA	NA	2,373	1,534	168	140	382	150	1,552	1,044	127	381
1991	155,121	19,948	14,317	5,631	5,631	NA	NA	130,951	102,805	28,145	NA	NA	NA	NA	2,502	1,650	168	140	391	153	1,720	1,178	133	409
1992	159,169	19,967	14,508	5,459	5,459	NA	NA	134,863	107,464	27,399	NA	NA	NA	NA	2,546	1,682	168	145	392	159	1,794	1,209	140	444
1993	155,319	18,783	14,131	4,652	4,652	NA	NA	132,033	106,979	25,054	NA	NA	NA	NA	2,648	1,756	170	152	404	167	1,856	1,225	148	482
1994	157,003	18,258	13,457	4,800	4,800	NA	NA	134,052	109,329	24,722	NA	NA	NA	NA	2,770	1,850	173	155	420	170	1,924	1,243	157	524
1995	168,929	18,956	13,837	5,120	5,120	NA	NA	145,420	118,792	26,627	NA	NA	NA	NA	2,706	1,762	183	162	430	169	1,847	1,111	166	570
1996	178,066	18,311	13,252	5,059	5,059	NA	NA	155,306	130,269	25,037	NA	NA	NA	NA	2,628	1,655	188	169	448	168	1,821	1,023	176	621
1997	185,551	17,893	13,090	4,803	4,803	NA	NA	163,230	137,096	26,133	NA	NA	NA	NA	2,441	1,502	174	163	442	161	1,987	990	223	774
1998	206,320	17,867	13,141	4,727	4,727	NA	NA	184,032	157,716	26,315	NA	NA	NA	NA	2,259	1,345	161	159	436	157	2,162	1,084	234	844
1999	217,005	17,719	13,029	4,690	4,690	NA	NA	195,196	171,893	23,303	NA	NA	NA	NA	1,916	965	165	163	457	166	2,174	1,022	250	901
2000	232,958	17,682	12,894	4,788	4,788	NA	NA	211,412	192,835	18,577	NA	NA	NA	NA	1,739	749	168	163	484	174	2,125	797	268	1,060
2001	225,895	19,760	14,876	4,883	4,796	NA	NA	201,658	184,791	16,867	NA	NA	NA	NA	1,894	869	173	158	512	183	2,583	1,175	265	1,143
2002	234,351	20,668	15,626	5,042	4,983	NA	NA	208,948	191,653	17,296	NA	NA	NA	NA	1,949	846	185	154	563	200	2,786	1,240	253	1,293
2003	227,980	21,608	16,422	5,185	5,148	NA	NA	201,359	185,856	15,504	NA	NA	NA	NA	2,337	1,165	202	153	606	211	2,676	965	254	1,457
2004	223,871	21,793	16,119	5,674	5,632	NA	NA	196,055	177,821	18,234	NA	NA	NA	NA	2,706	1,532	204	151	608	211	3,317	1,645	252	1,420
2005	239,860	22,885	17,159	5,726	5,654	NA	NA	211,153	192,133	19,020	NA	NA	NA	NA	2,572	1,406	194	150	614	208	3,250	1,484	260	1,506
2006	253,184	24,645	19,138	5,508	5,408	9	3	223,752	203,864	19,888	NA	NA	NA	NA	2,262	1,102	186	150	618	206	2,517	717	269	1,531
2007	263,743	26,814	20,864	5,950	5,833	10	4	232,114	214,905	17,209	NA	NA	NA	NA	2,221	1,036	189	154	626	216	2,584	657	278	1,648
2008	294,933	26,977	19,959	7,019	6,906	13	5	262,969	205,338	33,504	254	10,092	13,406	375	2,233	956	203	168	669	237	2,740	639	284	1,818
2009	289,021	26,519	19,474	7,045	6,941	16	6	255,831	203,082	34,368	162	7,951	9,861	408	3,797	1,745	319	318	1,007	408	2,858	621	272	1,965
2010	280,301	28,837	21,023	7,814	7,708	18	7	242,883	189,705	31,338	127	8,965	12,026	722	5,513	2,736	443	455	1,323	556	3,050	711	270	2,069

TABLE 5

U.S. experimental development expenditures, by performing sector and source of funds: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All performers	All federal	Federal intramural[a]	FFRDCs		Nonfederal government		Business							Higher education						NPOs			
	All funding sources	Total	Federal	Total	Federal	Total	Federal	Total	Own domestic	Federal	Nonfederal government	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
2011	296,022	31,429	23,917	7,512	7,418	18	7	255,666	205,282	28,670	251	8,708	12,313	441	5,692	2,842	428	455	1,399	569	3,217	864	280	2,073
2012	293,051	28,617	21,400	7,217	7,117	17	7	255,624	206,931	27,730	110	8,132	12,388	333	5,872	2,818	395	478	1,561	621	2,922	556	283	2,083
2013	302,835	27,894	20,858	7,036	6,935	15	6	265,913	218,989	23,359	133	9,211	13,661	561	5,985	2,735	408	510	1,679	653	3,027	500	295	2,232
2014	312,631	28,089	21,056	7,033	6,929	14	6	275,228	231,471	18,736	90	8,621	15,663	647	6,136	2,657	414	557	1,790	717	3,165	489	307	2,369
2015	321,615	26,853	19,484	7,369	7,258	14	6	285,212	236,990	19,370	92	10,579	17,374	808	6,280	2,602	412	570	1,901	795	3,256	434	316	2,507
2016	330,545	23,858	16,122	7,736	7,612	18	7	296,828	247,410	17,090	132	10,118	21,305	773	6,492	2,626	427	572	1,992	876	3,349	529	392	2,268
2017	350,115	23,995	15,848	8,147	8,021	22	9	316,136	258,151	17,736	92	11,792	27,805	560	6,742	2,670	447	607	2,091	927	3,221	626	400	2,047
2018	379,120	26,939	18,433	8,506	8,375	22	9	341,938	279,461	16,914	83	13,437	31,312	731	6,849	2,733	474	611	2,142	889	3,372	955	411	1,867
2019	413,824	29,186	20,440	8,746	8,619	30	13	374,515	311,461	14,482	107	14,141	33,731	593	7,003	2,956	472	609	2,126	840	3,091	687	451	1,814
2020	448,452	30,249	21,219	9,030	8,902	42	18	406,678	338,574	20,564	128	13,600	33,226	587	7,295	3,217	466	625	2,151	837	4,189	1,732	506	1,807
2021	477,783	30,671	21,537	9,134	8,999	40	18	434,841	365,325	16,965	191	15,120	36,702	537	7,448	3,310	454	653	2,204	826	4,783	1,715	591	2,358
2022[b]	508,326	29,472	20,415	9,057	8,934	35	16	467,028	397,686	20,527	129	14,719	33,445	522	7,669	3,427	444	694	2,271	832	4,122	1,159	649	2,160
2023[c]	516,045	28,820	19,336	9,483	9,364	35	16	475,078	403,744	21,067	133	15,312	34,281	542	8,112	3,612	463	740	2,411	887	3,999	1,125	630	2,096

NA = not available.

FFRDC = federally funded research and development center; NPO = nonprofit organization.

[a] See table 2, footnote a–f, for details on sectoral R&D.
[b] Some data for 2022 are preliminary and may be revised later.
[c] The data for 2023 include estimates and are likely to be revised later.

Note(s):
For detail on type-of-R&D data, see table 3, footnotes b–f. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised. Data are based on reports by performers in the National Center for Science and Engineering Statistics annual surveys on R&D expenditures: Business Enterprise Research and Development Survey, Annual Business Survey, Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—were collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers in 1977 and afterward, the approximation equals 75% of the amount reported in the same fiscal year plus 25% of the amount reported in the subsequent fiscal year. Prior to 1977, the federal fiscal year began on 1 July, not 1 October, and the approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year. The fiscal year for higher education performers and state government performers generally begins 1 July, and the calendar year approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year.

Source(s):
National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

TABLE 6

U.S. R&D expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
Current $millions																									
1953	5,160	2,783	1,015	131	NA	1,430	149	58	40	NA	NA	NA	40	2,247	NA	2,200	21	26	37	37	55	NA	NA	27	28
1954	5,621	3,102	963	165	NA	1,750	165	61	45	NA	NA	NA	45	2,375	NA	2,320	24	31	40	40	60	NA	NA	29	31
1955	6,185	3,507	973	319	NA	1,960	191	65	50	NA	NA	NA	50	2,522	NA	2,460	27	35	42	42	64	NA	NA	32	32
1956	8,501	4,979	1,131	561	NA	2,995	221	71	57	NA	NA	NA	57	3,346	NA	3,277	32	37	46	46	74	NA	NA	36	38
1957	9,908	6,233	1,297	688	NA	3,928	242	79	64	NA	NA	NA	64	3,470	NA	3,396	37	37	51	51	91	NA	NA	40	51
1958	10,915	6,974	1,507	657	NA	4,436	280	95	72	NA	NA	NA	72	3,707	NA	3,630	39	38	56	56	107	NA	NA	45	62
1959	12,490	8,167	1,681	789	NA	5,217	356	125	81	NA	NA	NA	81	4,065	NA	3,983	40	42	61	61	117	NA	NA	50	67
1960	13,711	8,915	1,801	910	NA	5,604	453	148	90	NA	NA	NA	90	4,516	NA	4,428	40	48	67	67	123	NA	NA	55	68
1961	14,564	9,484	1,987	1,087	NA	5,685	557	169	101	NA	NA	NA	101	4,757	NA	4,668	40	49	75	75	148	NA	NA	62	86
1962	15,636	10,138	2,188	1,056	NA	6,008	687	200	112	NA	NA	NA	112	5,124	NA	5,029	41	54	84	84	179	NA	NA	70	109
1963	17,519	11,646	2,559	1,159	NA	6,856	839	234	125	NA	NA	NA	125	5,456	NA	5,360	41	55	96	96	197	NA	NA	78	119
1964	19,103	12,765	2,966	1,297	NA	7,257	995	250	138	NA	NA	NA	138	5,888	NA	5,792	41	55	114	114	200	NA	NA	88	112
1965	20,253	13,194	3,157	1,218	NA	7,367	1,167	286	150	NA	NA	NA	150	6,549	NA	6,445	42	62	136	136	225	NA	NA	101	124
1966	22,072	14,165	3,308	1,217	NA	7,977	1,335	329	160	NA	NA	NA	160	7,331	NA	7,216	45	70	165	165	252	NA	NA	114	138
1967	23,347	14,564	3,445	1,340	NA	7,946	1,491	342	168	NA	NA	NA	168	8,146	NA	8,020	52	74	200	200	271	NA	NA	126	145
1968	24,667	14,965	3,498	1,372	NA	8,145	1,586	364	185	NA	NA	NA	185	9,008	NA	8,869	58	81	221	221	290	NA	NA	139	151
1969	25,996	15,228	3,790	1,440	NA	7,987	1,624	388	208	NA	NA	NA	208	10,011	NA	9,857	61	93	233	233	316	NA	NA	155	161
1970	26,271	14,984	4,154	1,430	NA	7,306	1,686	410	237	NA	NA	NA	237	10,449	NA	10,288	66	95	259	259	343	NA	NA	171	172
1971	26,952	15,210	4,409	1,441	NA	7,175	1,760	427	262	NA	NA	NA	262	10,824	NA	10,654	72	98	290	290	366	NA	NA	182	184
1972	28,740	16,039	4,676	1,533	NA	7,469	1,890	472	282	NA	NA	NA	282	11,715	NA	11,535	79	101	312	312	393	NA	NA	195	198
1973	30,952	16,587	4,837	1,576	NA	7,600	2,009	566	301	NA	NA	NA	301	13,299	NA	13,104	90	105	344	344	421	NA	NA	210	211
1974	33,359	17,287	5,132	1,784	NA	7,572	2,160	639	320	NA	NA	NA	320	14,886	NA	14,667	105	114	394	394	474	NA	NA	239	235
1975	35,671	18,533	5,561	2,019	NA	7,878	2,400	675	348	NA	NA	NA	348	15,824	NA	15,582	118	124	432	432	534	NA	NA	272	262
1976	39,435	20,292	5,890	2,401	NA	8,671	2,619	711	369	NA	NA	NA	369	17,702	NA	17,436	131	135	480	480	592	NA	NA	300	292
1977	43,338	22,071	6,211	2,704	NA	9,523	2,893	740	394	NA	NA	NA	394	19,642	NA	19,340	155	147	569	569	662	NA	NA	337	326
1978	48,719	24,414	6,962	3,186	NA	10,107	3,329	830	443	NA	NA	NA	443	22,457	NA	22,115	182	160	679	679	727	NA	NA	364	363
1979	55,379	27,225	7,471	3,567	NA	11,354	3,848	985	482	NA	NA	NA	482	26,097	NA	25,708	215	174	785	785	791	NA	NA	386	405
1980	63,224	29,986	7,831	4,052	NA	12,752	4,335	1,017	519	NA	NA	NA	519	30,929	NA	30,476	264	189	920	920	871	NA	NA	419	452
1981	72,292	33,739	8,605	4,393	NA	14,997	4,670	1,075	581	NA	NA	NA	581	35,948	NA	35,428	314	206	1,058	1,058	967	NA	NA	463	504
1982	80,748	37,133	9,501	4,563	NA	17,061	4,879	1,129	621	NA	NA	NA	621	40,692	NA	40,105	363	224	1,207	1,207	1,095	NA	NA	534	561
1983	89,949	41,451	10,830	5,011	NA	19,095	5,210	1,306	658	NA	NA	NA	658	45,264	NA	44,588	432	244	1,357	1,357	1,220	NA	NA	595	626
1984	102,244	46,470	11,916	5,602	NA	21,657	5,748	1,548	721	NA	NA	NA	721	52,187	NA	51,404	518	265	1,514	1,514	1,351	NA	NA	654	698
1985	114,671	52,641	13,093	6,134	NA	25,333	6,388	1,694	834	NA	NA	NA	834	57,962	NA	57,043	630	289	1,743	1,743	1,491	NA	NA	713	778

TABLE 6

U.S. R&D expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
1986	120,249	54,622	13,505	6,405	NA	26,000	7,028	1,686	969	NA	NA	NA	969	60,991	NA	59,932	745	314	2,019	2,019	1,647	NA	NA	780	867
1987	126,360	58,609	13,588	6,792	NA	28,757	7,768	1,704	1,065	NA	NA	NA	1,065	62,576	NA	61,403	831	342	2,262	2,262	1,849	NA	NA	882	967
1988	133,881	60,131	14,342	7,212	NA	28,221	8,593	1,762	1,165	NA	NA	NA	1,165	67,977	NA	66,672	933	372	2,527	2,527	2,081	NA	NA	1,003	1,078
1989	141,891	60,465	15,231	7,497	NA	26,359	9,317	2,062	1,274	NA	NA	NA	1,274	74,966	NA	73,501	1,061	405	2,852	2,852	2,333	NA	NA	1,131	1,202
1990	151,993	61,610	15,671	7,853	NA	25,802	9,939	2,346	1,399	NA	NA	NA	1,399	83,208	NA	81,602	1,166	440	3,187	3,187	2,589	NA	NA	1,249	1,340
1991	160,876	60,783	15,249	8,093	NA	24,095	10,667	2,679	1,483	NA	NA	NA	1,483	92,300	NA	90,580	1,242	479	3,458	3,458	2,852	NA	NA	1,358	1,494
1992	165,350	60,915	15,853	8,360	NA	22,369	11,528	2,806	1,525	NA	NA	NA	1,525	96,229	NA	94,388	1,320	521	3,569	3,569	3,113	NA	NA	1,448	1,666
1993	165,730	60,528	16,531	8,003	NA	20,844	12,307	2,843	1,557	NA	NA	NA	1,557	96,549	NA	94,591	1,392	567	3,709	3,709	3,388	NA	NA	1,531	1,857
1994	169,207	60,777	16,355	8,254	NA	20,261	12,996	2,911	1,623	NA	NA	NA	1,623	99,204	NA	97,131	1,456	617	3,938	3,938	3,665	NA	NA	1,595	2,071
1995	183,625	62,969	16,904	8,448	NA	21,178	13,592	2,847	1,751	NA	NA	NA	1,751	110,871	NA	108,652	1,548	671	4,110	4,110	3,925	NA	NA	1,617	2,308
1996	197,346	63,394	16,585	8,464	NA	21,356	14,084	2,905	1,861	NA	NA	NA	1,861	123,417	NA	121,015	1,672	730	4,436	4,436	4,239	NA	NA	1,666	2,574
1997	211,894	64,362	16,819	8,413	NA	21,798	14,317	3,014	1,902	NA	NA	NA	1,902	136,208	NA	133,611	1,788	809	4,852	4,852	4,571	NA	NA	1,767	2,804
1998	225,759	65,908	17,362	8,480	NA	22,086	14,699	3,281	1,920	NA	NA	NA	1,920	147,774	NA	145,016	1,898	859	5,193	5,193	4,963	NA	NA	1,871	3,092
1999	244,451	66,817	18,142	8,704	NA	20,496	15,714	3,761	2,036	NA	NA	NA	2,036	164,545	NA	161,594	2,020	931	5,654	5,654	5,399	NA	NA	2,050	3,349
2000	267,950	67,238	19,247	9,269	NA	17,117	17,095	4,510	2,182	NA	NA	NA	2,182	185,975	NA	182,844	2,112	1,020	6,270	6,270	6,285	NA	NA	2,258	4,027
2001	278,539	73,793	22,374	10,056	NA	16,899	18,976	5,488	2,341	22	NA	NA	2,319	188,408	142	185,118	2,120	1,029	6,874	6,874	7,122	218	NA	2,461	4,443
2002	277,911	78,873	23,798	11,242	NA	16,401	21,655	5,778	2,553	32	NA	NA	2,521	180,704	135	177,467	2,103	998	7,673	7,673	8,109	275	NA	2,732	5,102
2003	291,365	85,133	24,982	11,841	NA	17,798	24,567	5,945	2,788	32	NA	NA	2,756	186,171	134	182,926	2,090	1,020	8,286	8,286	8,988	245	NA	2,879	5,864
2004	302,731	90,795	24,898	12,471	NA	20,266	26,624	6,537	2,926	31	NA	NA	2,896	191,346	122	188,035	2,148	1,041	8,637	8,637	9,028	165	NA	2,993	5,870
2005	325,288	95,413	26,322	12,894	NA	21,909	27,743	6,545	2,977	32	NA	NA	2,945	207,775	139	204,250	2,279	1,107	9,353	9,353	9,771	180	NA	3,170	6,420
2006	350,908	99,938	28,240	12,969	105	24,304	28,277	6,044	3,293	31	204	NA	3,059	227,182	171	223,365	2,464	1,182	10,176	10,176	10,320	200	NA	3,394	6,726
2007	377,890	105,128	29,859	13,845	135	26,585	28,725	5,980	3,594	32	253	NA	3,308	246,815	180	242,682	2,697	1,257	10,933	10,933	11,420	216	NA	3,767	7,438
2008	404,777	117,615	29,839	15,369	176	36,360	29,635	6,236	4,221	33	315	306	3,567	258,020	199	253,562	2,954	1,305	11,738	11,738	13,184	209	452	4,161	8,362
2009	402,931	125,765	30,560	16,571	224	39,573	31,740	7,097	4,296	40	381	195	3,680	246,609	184	242,135	3,032	1,258	12,057	12,057	14,205	218	490	4,400	9,097
2010	406,599	126,617	31,970	18,409	264	34,199	34,681	7,093	4,303	46	427	156	3,674	248,126	174	243,734	2,953	1,266	12,262	12,262	15,292	199	888	4,515	9,691
2011	426,214	127,014	34,950	18,176	273	31,309	35,742	6,564	4,386	30	421	321	3,615	266,426	189	261,899	2,999	1,340	13,103	13,103	15,284	179	563	4,629	9,913
2012	433,698	123,837	34,017	17,727	266	30,621	34,967	6,239	4,158	42	398	157	3,561	275,728	185	270,997	3,170	1,376	14,282	14,282	15,694	173	476	4,898	10,147
2013	454,232	120,131	33,406	17,296	257	29,362	33,840	5,970	4,244	45	362	194	3,643	297,188	195	292,154	3,376	1,464	15,341	15,341	17,327	144	818	5,313	11,053
2014	475,938	118,367	34,783	17,523	247	26,554	33,124	6,135	4,214	26	336	138	3,714	318,410	218	313,043	3,602	1,548	16,176	16,176	18,771	137	993	5,702	11,939
2015	494,471	119,532	34,199	18,287	246	26,990	33,563	6,247	4,277	19	348	127	3,782	333,243	205	327,589	3,844	1,605	17,260	17,260	20,160	138	1,115	6,156	12,751
2016	521,686	118,174	31,762	19,059	255	24,154	34,687	8,257	4,995	23	365	195	3,936	360,291	192	354,057	4,050	1,993	18,729	18,398	19,497	150	1,123	6,707	11,517
2017	553,530	122,435	32,231	19,943	258	24,974	36,000	9,030	5,075	33	346	142	4,057	386,533	194	379,820	4,283	2,220	19,878	19,553	19,608	152	856	7,217	11,375
2018	603,844	131,017	36,793	21,163	269	25,192	37,726	9,875	5,251	45	341	120	4,224	426,472	194	419,202	4,581	2,473	20,987	20,667	20,118	162	1,049	7,666	11,234
2019	665,267	135,646	39,870	22,538	290	22,653	39,497	10,799	5,471	49	346	169	4,363	482,199	179	474,442	4,800	2,756	21,882	21,569	20,070	166	911	7,885	11,096

TABLE 6

U.S. R&D expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
2020	716,479	147,985	41,227	23,478	298	29,772	41,402	11,809	5,672	44	348	241	4,471	520,324	179	512,224	4,831	3,070	22,557	22,251	19,940	166	982	7,820	10,959
2021	788,718	147,258	41,469	24,784	305	24,587	44,633	11,481	5,733	42	349	392	4,622	590,946	199	582,664	5,073	2,994	23,786	23,509	20,996	168	981	7,881	11,953
2022[a]	891,834	164,471	44,699	26,424	321	32,321	49,059	11,648	6,010	38	369	244	4,945	673,127	212	663,717	5,590	3,593	26,560	26,121	21,665	161	974	8,560	11,959
2023[b]	939,561	172,345	44,161	29,021	330	34,363	52,762	11,708	6,382	36	382	260	5,287	709,161	225	699,290	6,019	3,611	29,043	28,601	22,629	178	1,046	9,375	12,020
Constant 2017 $millions																									
1953	38,374	20,693	7,548	974	NA	10,635	1,108	428	294	NA	NA	NA	294	16,707	NA	16,361	152	193	271	271	409	NA	NA	201	208
1954	41,419	22,859	7,093	1,212	NA	12,896	1,212	446	328	NA	NA	NA	328	17,498	NA	17,097	173	228	291	291	442	NA	NA	214	228
1955	44,814	25,410	7,050	2,308	NA	14,201	1,384	467	362	NA	NA	NA	362	18,273	NA	17,824	196	254	304	304	464	NA	NA	232	232
1956	59,560	34,883	7,921	3,931	NA	20,985	1,548	497	396	NA	NA	NA	396	23,441	NA	22,961	221	259	322	322	518	NA	NA	252	266
1957	67,205	42,274	8,797	4,663	NA	26,643	1,638	532	434	NA	NA	NA	434	23,533	NA	23,035	248	251	346	346	617	NA	NA	271	346
1958	72,386	46,250	9,991	4,354	NA	29,418	1,857	630	477	NA	NA	NA	477	24,584	NA	24,073	259	252	368	368	706	NA	NA	295	411
1959	81,693	53,420	10,995	5,161	NA	34,124	2,325	814	527	NA	NA	NA	527	26,586	NA	26,052	258	275	399	399	762	NA	NA	324	438
1960	88,482	57,532	11,619	5,873	NA	36,165	2,920	955	581	NA	NA	NA	581	29,143	NA	28,575	258	310	432	432	794	NA	NA	355	439
1961	93,003	60,563	12,689	6,938	NA	36,303	3,554	1,079	642	NA	NA	NA	642	30,377	NA	29,809	255	313	476	476	945	NA	NA	396	549
1962	98,650	63,962	13,801	6,662	NA	37,905	4,331	1,262	707	NA	NA	NA	707	32,325	NA	31,729	256	341	530	530	1,126	NA	NA	438	688
1963	109,266	72,633	15,957	7,226	NA	42,761	5,230	1,459	780	NA	NA	NA	780	34,026	NA	33,430	253	343	599	599	1,229	NA	NA	486	742
1964	117,361	78,420	18,219	7,968	NA	44,584	6,113	1,536	845	NA	NA	NA	845	36,170	NA	35,584	249	338	697	697	1,229	NA	NA	541	688
1965	122,192	79,605	19,044	7,346	NA	44,448	7,041	1,726	902	NA	NA	NA	902	39,510	NA	38,885	250	374	821	821	1,355	NA	NA	606	748
1966	129,542	83,135	19,415	7,140	NA	46,818	7,835	1,928	939	NA	NA	NA	939	43,026	NA	42,351	264	411	965	965	1,476	NA	NA	666	810
1967	133,157	83,061	19,648	7,643	NA	45,319	8,501	1,951	958	NA	NA	NA	958	46,457	NA	45,741	294	422	1,138	1,138	1,543	NA	NA	716	827
1968	134,933	81,860	19,132	7,505	NA	44,555	8,676	1,991	1,009	NA	NA	NA	1,009	49,274	NA	48,516	315	443	1,206	1,206	1,584	NA	NA	758	826
1969	135,563	79,412	19,765	7,509	NA	41,651	8,466	2,021	1,085	NA	NA	NA	1,085	52,203	NA	51,402	315	485	1,215	1,215	1,648	NA	NA	808	840
1970	130,130	74,222	20,575	7,081	NA	36,189	8,349	2,028	1,174	NA	NA	NA	1,174	51,755	NA	50,960	324	471	1,280	1,280	1,699	NA	NA	847	852
1971	127,052	71,702	20,783	6,791	NA	33,823	8,294	2,011	1,235	NA	NA	NA	1,235	51,025	NA	50,224	339	462	1,365	1,365	1,725	NA	NA	858	867
1972	129,871	72,478	21,128	6,927	NA	33,751	8,541	2,131	1,274	NA	NA	NA	1,274	52,938	NA	52,124	357	456	1,408	1,408	1,774	NA	NA	879	895
1973	132,598	71,059	20,720	6,752	NA	32,558	8,604	2,425	1,289	NA	NA	NA	1,289	56,973	NA	56,137	386	450	1,474	1,474	1,804	NA	NA	900	904
1974	131,119	67,946	20,173	7,012	NA	29,762	8,490	2,510	1,256	NA	NA	NA	1,256	58,508	NA	57,649	411	449	1,547	1,547	1,862	NA	NA	937	925
1975	128,317	66,668	20,005	7,263	NA	28,339	8,633	2,428	1,252	NA	NA	NA	1,252	56,923	NA	56,051	424	447	1,552	1,552	1,922	NA	NA	978	943
1976	134,454	69,185	20,083	8,185	NA	29,564	8,930	2,424	1,258	NA	NA	NA	1,258	60,356	NA	59,448	447	461	1,637	1,637	2,018	NA	NA	1,021	997
1977	139,119	70,851	19,939	8,681	NA	30,570	9,285	2,376	1,265	NA	NA	NA	1,265	63,052	NA	62,083	496	472	1,825	1,825	2,127	NA	NA	1,080	1,046
1978	146,114	73,219	20,880	9,555	NA	30,312	9,983	2,489	1,329	NA	NA	NA	1,329	67,350	NA	66,325	544	480	2,036	2,036	2,180	NA	NA	1,090	1,090
1979	153,365	75,396	20,691	9,878	NA	31,444	10,657	2,728	1,333	NA	NA	NA	1,333	72,272	NA	71,195	594	482	2,174	2,174	2,190	NA	NA	1,068	1,122
1980	160,583	76,162	19,889	10,291	NA	32,389	11,009	2,584	1,317	NA	NA	NA	1,317	78,557	NA	77,406	669	481	2,335	2,335	2,212	NA	NA	1,064	1,147

TABLE 6

U.S. R&D expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
1981	167,746	78,287	19,966	10,194	NA	34,799	10,835	2,493	1,348	NA	NA	NA	1,348	83,414	NA	82,207	729	478	2,454	2,454	2,243	NA	NA	1,074	1,169
1982	176,461	81,148	20,763	9,972	NA	37,284	10,661	2,467	1,357	NA	NA	NA	1,357	88,926	NA	87,643	793	490	2,637	2,637	2,393	NA	NA	1,166	1,227
1983	189,164	87,170	22,774	10,537	NA	40,157	10,957	2,745	1,384	NA	NA	NA	1,384	95,190	NA	93,769	908	513	2,853	2,853	2,567	NA	NA	1,250	1,316
1984	207,528	94,323	24,186	11,371	NA	43,958	11,666	3,141	1,463	NA	NA	NA	1,463	105,926	NA	104,337	1,050	539	3,073	3,073	2,743	NA	NA	1,326	1,417
1985	225,615	103,572	25,760	12,068	NA	49,843	12,568	3,332	1,640	NA	NA	NA	1,640	114,040	NA	112,232	1,240	568	3,429	3,429	2,934	NA	NA	1,403	1,531
1986	231,921	105,349	26,046	12,353	NA	50,146	13,554	3,251	1,869	NA	NA	NA	1,869	117,633	NA	115,590	1,437	606	3,893	3,893	3,177	NA	NA	1,504	1,673
1987	237,816	110,305	25,574	12,782	NA	54,122	14,620	3,208	2,003	NA	NA	NA	2,003	117,771	NA	115,563	1,564	643	4,257	4,257	3,479	NA	NA	1,659	1,820
1988	243,386	109,314	26,073	13,112	NA	51,304	15,621	3,204	2,118	NA	NA	NA	2,118	123,577	NA	121,205	1,696	676	4,594	4,594	3,784	NA	NA	1,823	1,960
1989	248,213	105,774	26,643	13,115	NA	46,110	16,298	3,607	2,229	NA	NA	NA	2,229	131,140	NA	128,577	1,855	708	4,989	4,989	4,081	NA	NA	1,978	2,103
1990	256,293	103,889	26,425	13,241	NA	43,508	16,759	3,955	2,359	NA	NA	NA	2,359	140,307	NA	137,599	1,965	742	5,373	5,373	4,366	NA	NA	2,106	2,260
1991	262,397	99,140	24,872	13,200	NA	39,300	17,398	4,370	2,418	NA	NA	NA	2,418	150,547	NA	147,741	2,025	781	5,639	5,639	4,652	NA	NA	2,215	2,437
1992	263,686	97,141	25,281	13,331	NA	35,672	18,383	4,474	2,432	NA	NA	NA	2,432	153,457	NA	150,522	2,104	831	5,691	5,691	4,965	NA	NA	2,308	2,656
1993	258,172	94,289	25,751	12,467	NA	32,470	19,172	4,429	2,425	NA	NA	NA	2,425	150,403	NA	147,352	2,168	883	5,777	5,777	5,277	NA	NA	2,384	2,893
1994	258,078	92,699	24,945	12,590	NA	30,903	19,821	4,440	2,475	NA	NA	NA	2,475	151,308	NA	148,146	2,221	941	6,006	6,006	5,590	NA	NA	2,432	3,158
1995	274,319	94,070	25,253	12,620	NA	31,638	20,305	4,254	2,616	NA	NA	NA	2,616	165,630	NA	162,316	2,312	1,003	6,140	6,140	5,863	NA	NA	2,415	3,449
1996	289,516	93,002	24,331	12,417	NA	31,330	20,662	4,262	2,730	NA	NA	NA	2,730	181,058	NA	177,534	2,452	1,071	6,507	6,507	6,219	NA	NA	2,443	3,776
1997	305,586	92,820	24,256	12,133	NA	31,436	20,648	4,347	2,743	NA	NA	NA	2,743	196,434	NA	192,689	2,579	1,166	6,997	6,997	6,592	NA	NA	2,549	4,043
1998	321,966	93,995	24,761	12,094	NA	31,498	20,963	4,679	2,739	NA	NA	NA	2,739	210,747	NA	206,814	2,708	1,225	7,406	7,406	7,078	NA	NA	2,669	4,409
1999	343,757	93,961	25,512	12,240	NA	28,822	22,098	5,288	2,864	NA	NA	NA	2,864	231,390	NA	227,240	2,841	1,309	7,950	7,950	7,593	NA	NA	2,883	4,710
2000	368,454	92,458	26,466	12,746	NA	23,537	23,507	6,202	3,001	NA	NA	NA	3,001	255,732	NA	251,426	2,904	1,402	8,621	8,621	8,642	NA	NA	3,105	5,538
2001	374,584	99,239	30,090	13,523	NA	22,726	25,520	7,380	3,149	30	NA	NA	3,119	253,375	190	248,950	2,851	1,384	9,244	9,244	9,578	293	NA	3,310	5,975
2002	368,020	104,446	31,514	14,887	NA	21,719	28,676	7,651	3,381	42	NA	NA	3,338	239,294	179	235,008	2,785	1,322	10,161	10,161	10,738	364	NA	3,618	6,756
2003	378,364	110,553	32,442	15,377	NA	23,112	31,902	7,720	3,620	42	NA	NA	3,578	241,760	174	237,546	2,715	1,325	10,759	10,759	11,672	319	NA	3,738	7,615
2004	382,831	114,818	31,485	15,770	NA	25,628	33,668	8,266	3,700	39	NA	NA	3,662	241,975	154	237,788	2,716	1,317	10,922	10,922	11,416	208	NA	3,784	7,424
2005	398,852	116,990	32,275	15,810	NA	26,864	34,017	8,025	3,650	39	NA	NA	3,611	254,763	171	250,441	2,794	1,357	11,468	11,468	11,981	221	NA	3,887	7,872
2006	417,391	118,872	33,590	15,426	125	28,909	33,634	7,189	3,917	36	242	NA	3,639	270,224	204	265,684	2,930	1,406	12,103	12,103	12,275	237	NA	4,037	8,001
2007	437,630	121,747	34,579	16,034	156	30,788	33,266	6,925	4,162	37	293	NA	3,832	285,834	209	281,047	3,123	1,455	12,661	12,661	13,225	250	NA	4,362	8,613
2008	459,906	133,633	33,903	17,462	200	41,312	33,671	7,085	4,796	37	358	348	4,053	293,161	226	288,096	3,356	1,483	13,336	13,336	14,980	237	514	4,728	9,501
2009	455,002	142,017	34,509	18,712	253	44,687	35,842	8,014	4,851	45	430	220	4,155	278,478	208	273,426	3,424	1,420	13,615	13,615	16,041	246	553	4,969	10,273
2010	453,633	141,263	35,668	20,539	295	38,155	38,693	7,914	4,800	52	476	174	4,098	276,828	194	271,928	3,294	1,412	13,680	13,680	17,061	222	991	5,037	10,812
2011	465,904	138,842	38,205	19,868	299	34,225	39,070	7,175	4,795	33	460	351	3,952	291,237	206	286,288	3,278	1,465	14,323	14,323	16,707	196	615	5,060	10,836
2012	465,418	132,894	36,504	19,024	286	32,861	37,524	6,695	4,462	45	428	168	3,821	295,894	199	290,817	3,401	1,477	15,326	15,326	16,841	186	511	5,256	10,889
2013	479,297	126,760	35,250	18,251	271	30,982	35,707	6,299	4,478	47	382	205	3,843	313,588	206	308,275	3,562	1,544	16,188	16,188	18,284	151	863	5,606	11,663
2014	493,604	122,760	36,074	18,173	256	27,540	34,354	6,363	4,370	27	348	143	3,852	330,229	226	324,663	3,735	1,605	16,776	16,776	19,468	142	1,030	5,914	12,383

TABLE 6

U.S. R&D expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
2015	508,109	122,829	35,142	18,791	253	27,734	34,489	6,420	4,394	20	358	131	3,886	342,434	210	336,624	3,950	1,650	17,736	17,736	20,716	142	1,146	6,326	13,103
2016	531,030	120,290	32,331	19,400	259	24,587	35,308	8,405	5,084	24	372	198	4,006	366,744	196	360,398	4,122	2,028	19,064	18,728	19,846	153	1,143	6,827	11,723
2017	553,530	122,435	32,231	19,943	258	24,974	36,000	9,030	5,075	33	346	142	4,057	386,533	194	379,820	4,283	2,220	19,878	19,553	19,608	152	856	7,217	11,375
2018	590,321	128,082	35,969	20,689	263	24,628	36,881	9,653	5,133	44	334	117	4,129	416,921	189	409,814	4,478	2,418	20,517	20,204	19,668	158	1,026	7,494	10,983
2019	639,808	130,455	38,344	21,675	279	21,786	37,985	10,386	5,262	47	333	162	4,196	463,746	172	456,286	4,616	2,650	21,044	20,743	19,302	160	876	7,583	10,671
2020	680,024	140,456	39,129	22,283	283	28,257	39,295	11,209	5,384	42	330	229	4,243	493,850	170	486,162	4,585	2,914	21,409	21,119	18,925	157	932	7,422	10,401
2021	715,899	133,662	37,640	22,495	277	22,317	40,512	10,421	5,204	39	317	356	4,195	536,386	180	528,869	4,605	2,718	21,590	21,338	19,057	152	891	7,153	10,850
2022[a]	755,622	139,351	37,872	22,388	272	27,384	41,566	9,869	5,092	32	312	207	4,190	570,319	179	562,346	4,736	3,044	22,504	22,131	18,356	136	826	7,253	10,133
2023[b]	768,410	140,950	36,116	23,735	270	28,103	43,151	9,575	5,219	29	312	213	4,324	579,981	184	571,907	4,922	2,953	23,753	23,391	18,507	146	856	7,668	9,831

NA = not available.

FFRDC = federally funded research and development center; NPO = nonprofit organization.

[a] Some data for 2022 are preliminary and may be revised later.
[b] The data for 2023 are estimates and are likely to be revised later.

Note(s):
This table reaggregates the R&D performer data in table 2 according to major categories of R&D funding: federal government, nonfederal government (state and local), business, higher education, and NPOs. Business sources of R&D funding in this table include the own funds of domestic R&D-performing businesses, funds from other domestic businesses, and funds from foreign businesses. For further detail on the R&D performers listed, see table 2, footnotes a–f. For detail on type-of-R&D data, see table 3, footnotes b–f. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised. Data are based on reports by performers in the National Center for Science and Engineering Statistics annual surveys on R&D expenditures: Business Enterprise Research and Development Survey, Annual Business Survey, Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—were collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. (See table 2, general notes.)

Source(s):
National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

TABLE 7

U.S. basic research expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
Current $millions																									
1953	460	265	102	36	NA	19	82	27	7	NA	NA	NA	7	154	NA	132	13	9	6	6	28	NA	NA	16	12
1954	509	291	96	45	NA	23	97	31	10	NA	NA	NA	10	169	NA	143	15	11	8	8	31	NA	NA	18	13
1955	570	318	98	62	NA	7	117	35	14	NA	NA	NA	14	192	NA	162	17	13	12	12	35	NA	NA	21	14
1956	718	392	114	89	NA	7	143	41	19	NA	NA	NA	19	251	NA	216	20	15	15	15	41	NA	NA	24	17
1957	813	451	124	110	NA	4	167	48	25	NA	NA	NA	25	268	NA	230	23	15	20	20	50	NA	NA	27	23
1958	943	537	149	115	NA	14	202	58	31	NA	NA	NA	31	292	NA	252	24	16	24	24	59	NA	NA	31	28
1959	1,087	665	165	134	NA	34	263	71	38	NA	NA	NA	38	290	NA	248	24	18	28	28	66	NA	NA	36	30
1960	1,286	794	184	150	NA	36	341	84	45	NA	NA	NA	45	343	NA	297	25	21	33	33	71	NA	NA	41	30
1961	1,511	972	230	177	NA	30	432	104	54	NA	NA	NA	54	361	NA	314	25	22	40	40	85	NA	NA	48	37
1962	1,824	1,218	252	189	NA	104	546	128	64	NA	NA	NA	64	394	NA	345	25	24	48	48	101	NA	NA	55	46
1963	2,115	1,446	285	216	NA	109	689	147	75	NA	NA	NA	75	425	NA	375	25	25	58	58	113	NA	NA	63	50
1964	2,396	1,693	339	245	NA	123	824	163	84	NA	NA	NA	84	434	NA	384	25	25	70	70	115	NA	NA	68	47
1965	2,664	1,900	375	250	NA	157	944	175	94	NA	NA	NA	94	462	NA	406	27	29	86	86	122	NA	NA	70	52
1966	2,930	2,075	410	273	NA	142	1,066	184	104	NA	NA	NA	104	512	NA	451	29	32	106	106	133	NA	NA	75	58
1967	3,168	2,280	434	301	NA	168	1,188	190	114	NA	NA	NA	114	495	NA	427	34	34	136	136	144	NA	NA	83	61
1968	3,376	2,399	482	315	NA	145	1,265	192	131	NA	NA	NA	131	537	NA	462	38	37	156	156	154	NA	NA	91	63
1969	3,491	2,457	545	313	NA	123	1,288	188	153	NA	NA	NA	153	541	NA	458	40	43	171	171	170	NA	NA	103	67
1970	3,594	2,501	562	304	NA	122	1,323	191	179	NA	NA	NA	179	531	NA	444	43	44	196	196	187	NA	NA	115	72
1971	3,720	2,559	581	289	NA	101	1,385	204	194	NA	NA	NA	194	551	NA	456	50	45	214	214	204	NA	NA	127	77
1972	3,850	2,656	603	313	NA	91	1,437	213	195	NA	NA	NA	195	565	NA	463	55	47	216	216	218	NA	NA	134	84
1973	4,099	2,847	652	382	NA	96	1,489	229	196	NA	NA	NA	196	607	NA	499	59	49	223	223	227	NA	NA	137	90
1974	4,511	3,146	715	467	NA	114	1,609	242	204	NA	NA	NA	204	656	NA	536	66	54	250	250	254	NA	NA	153	102
1975	4,875	3,415	760	533	NA	104	1,768	251	212	NA	NA	NA	212	704	NA	573	72	59	264	264	280	NA	NA	164	116
1976	5,373	3,793	850	629	NA	116	1,924	274	218	NA	NA	NA	218	774	NA	634	75	65	283	283	305	NA	NA	175	131
1977	6,008	4,235	943	746	NA	135	2,114	297	232	NA	NA	NA	232	862	NA	701	89	72	334	334	346	NA	NA	198	148
1978	6,959	4,950	1,044	1,005	NA	156	2,399	346	260	NA	NA	NA	260	970	NA	785	107	79	398	398	380	NA	NA	213	168
1979	7,836	5,558	1,112	1,160	NA	161	2,719	406	286	NA	NA	NA	286	1,107	NA	893	128	87	466	466	419	NA	NA	229	190
1980	8,747	6,147	1,212	1,294	NA	170	3,061	411	307	NA	NA	NA	307	1,286	NA	1,035	156	95	544	544	463	NA	NA	248	215
1981	9,658	6,591	1,343	1,430	NA	164	3,331	324	338	NA	NA	NA	338	1,600	NA	1,313	183	105	615	615	512	NA	NA	269	243
1982	10,651	7,121	1,522	1,503	NA	253	3,475	369	368	NA	NA	NA	368	1,854	NA	1,523	215	115	716	716	591	NA	NA	317	275
1983	11,880	7,853	1,733	1,661	NA	346	3,689	426	396	NA	NA	NA	396	2,146	NA	1,760	260	127	816	816	668	NA	NA	358	311
1984	13,332	8,651	1,877	1,854	NA	340	4,087	494	436	NA	NA	NA	436	2,584	NA	2,132	313	139	915	915	746	NA	NA	395	351
1985	14,748	9,407	1,947	1,936	NA	358	4,606	560	514	NA	NA	NA	514	2,915	NA	2,373	389	153	1,075	1,075	837	NA	NA	440	397

TABLE 7

U.S. basic research expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
1986	17,154	10,220	2,026	2,045	NA	434	5,122	594	606	NA	NA	NA	606	4,130	NA	3,496	466	168	1,262	1,262	936	NA	NA	488	449
1987	18,481	11,090	2,047	2,242	NA	598	5,527	675	659	NA	NA	NA	659	4,282	NA	3,583	514	185	1,399	1,399	1,052	NA	NA	545	507
1988	19,787	12,097	2,116	2,633	NA	656	5,937	756	705	NA	NA	NA	705	4,275	NA	3,507	565	203	1,530	1,530	1,180	NA	NA	607	573
1989	21,891	13,392	2,309	2,815	NA	986	6,422	860	766	NA	NA	NA	766	4,692	NA	3,832	637	223	1,714	1,714	1,327	NA	NA	680	647
1990	23,029	14,057	2,319	3,033	NA	869	6,889	947	847	NA	NA	NA	847	4,710	NA	3,760	705	245	1,929	1,929	1,486	NA	NA	756	730
1991	27,140	15,283	2,378	3,195	NA	1,251	7,423	1,036	912	NA	NA	NA	912	7,157	NA	6,125	764	269	2,127	2,127	1,660	NA	NA	836	825
1992	27,604	15,710	2,419	3,408	NA	712	8,058	1,114	941	NA	NA	NA	941	6,925	NA	5,816	814	295	2,203	2,203	1,824	NA	NA	893	931
1993	28,743	16,399	2,621	3,517	NA	466	8,638	1,157	952	NA	NA	NA	952	7,136	NA	5,961	851	324	2,268	2,268	1,987	NA	NA	936	1,051
1994	29,651	16,770	2,547	3,512	NA	436	9,139	1,137	992	NA	NA	NA	992	7,323	NA	6,078	890	356	2,406	2,406	2,160	NA	NA	974	1,186
1995	29,610	16,990	2,689	3,307	NA	190	9,634	1,170	1,070	NA	NA	NA	1,070	6,715	NA	5,379	945	390	2,511	2,511	2,326	NA	NA	987	1,338
1996	32,799	18,063	2,680	3,393	NA	650	10,092	1,248	1,149	NA	NA	NA	1,149	8,309	NA	6,848	1,032	428	2,740	2,740	2,539	NA	NA	1,028	1,510
1997	36,717	19,254	2,746	3,404	NA	1,029	10,758	1,317	1,233	NA	NA	NA	1,233	10,376	NA	8,766	1,161	449	3,150	3,150	2,704	NA	NA	1,147	1,557
1998	34,842	20,473	3,003	3,441	NA	1,002	11,567	1,461	1,292	NA	NA	NA	1,292	6,606	NA	4,851	1,278	477	3,495	3,495	2,976	NA	NA	1,259	1,717
1999	38,282	22,364	3,347	3,719	NA	1,108	12,456	1,734	1,386	NA	NA	NA	1,386	7,429	NA	5,537	1,375	517	3,848	3,848	3,255	NA	NA	1,396	1,860
2000	42,033	24,295	3,765	4,037	NA	925	13,469	2,099	1,501	NA	NA	NA	1,501	8,134	NA	6,115	1,453	566	4,314	4,314	3,790	NA	NA	1,553	2,236
2001	46,363	26,323	4,260	3,925	NA	754	14,919	2,464	1,615	10	NA	NA	1,606	9,400	62	7,299	1,467	571	4,759	4,759	4,267	95	NA	1,704	2,467
2002	50,400	29,724	4,511	4,612	NA	888	17,139	2,575	1,761	16	NA	NA	1,745	8,739	69	6,659	1,456	554	5,311	5,311	4,865	141	NA	1,891	2,833
2003	54,823	32,842	4,664	4,858	NA	1,386	19,220	2,714	1,910	17	NA	NA	1,893	9,017	70	6,944	1,436	567	5,692	5,692	5,363	129	NA	1,978	3,256
2004	56,379	34,124	4,697	4,837	NA	1,072	20,730	2,788	2,013	13	NA	NA	2,000	8,878	54	6,763	1,483	578	5,965	5,965	5,399	72	NA	2,067	3,259
2005	59,899	35,561	4,770	4,995	NA	1,108	21,786	2,902	2,080	12	NA	NA	2,068	9,828	54	7,559	1,600	614	6,568	6,568	5,861	70	NA	2,226	3,565
2006	61,552	36,368	4,716	5,074	16	1,444	22,270	2,849	2,232	11	30	NA	2,191	9,424	63	6,940	1,765	656	7,288	7,288	6,239	74	NA	2,431	3,735
2007	66,488	37,962	4,621	5,166	20	2,780	22,546	2,829	2,449	11	38	NA	2,400	11,206	64	8,488	1,956	698	7,932	7,932	6,939	76	NA	2,733	4,130
2008	70,468	37,821	4,957	5,336	26	1,475	22,954	3,073	2,645	12	47	12	2,573	13,794	75	10,864	2,131	724	8,467	8,467	7,741	79	18	3,002	4,643
2009	74,409	39,254	5,441	5,907	33	1,340	23,034	3,498	2,541	14	57	13	2,457	16,157	67	13,397	1,996	698	8,258	8,258	8,199	79	34	3,035	5,051
2010	76,475	40,135	5,111	6,475	39	1,406	23,690	3,414	2,368	18	63	10	2,277	17,452	67	14,897	1,785	703	8,016	8,016	8,504	77	58	2,989	5,381
2011	73,691	39,289	5,047	6,333	41	677	24,111	3,081	2,339	11	62	21	2,245	14,902	67	12,284	1,807	744	8,512	8,512	8,649	64	38	3,043	5,504
2012	73,992	38,227	5,489	5,530	40	644	23,432	3,092	2,284	14	59	10	2,202	15,305	61	12,611	1,869	764	9,257	9,257	8,919	57	29	3,200	5,634
2013	79,255	36,282	5,330	4,085	38	1,196	22,602	3,031	2,294	12	54	21	2,208	21,047	53	18,203	1,979	813	9,927	9,927	9,705	39	88	3,442	6,137
2014	82,894	37,043	5,705	4,077	42	2,044	22,085	3,090	2,321	6	57	17	2,242	22,760	53	19,757	2,091	859	10,352	10,352	10,418	34	119	3,637	6,629
2015	84,428	37,240	5,890	4,043	42	2,038	22,193	3,034	2,375	4	59	14	2,299	22,770	47	19,621	2,211	891	10,985	10,985	11,057	32	120	3,826	7,080
2016	87,494	38,882	6,119	4,112	38	2,037	22,588	3,988	2,610	5	55	20	2,359	25,935	44	22,879	2,296	716	11,725	11,606	8,342	35	117	4,050	4,141
2017	90,118	39,277	6,259	4,054	41	1,853	23,345	3,726	2,659	6	55	17	2,392	26,945	38	23,644	2,417	844	12,401	12,278	8,835	30	103	4,379	4,322
2018	97,803	42,356	6,827	4,188	45	2,535	24,487	4,274	2,739	9	57	12	2,454	30,183	39	26,545	2,605	989	13,128	13,001	9,397	33	112	4,758	4,494
2019	104,880	44,480	7,352	4,501	52	2,349	25,467	4,760	2,850	10	62	15	2,535	34,060	36	30,132	2,731	1,157	13,757	13,627	9,732	33	86	4,950	4,660

TABLE 7

U.S. basic research expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
2020	111,637	45,952	7,316	4,714	54	2,200	26,499	5,169	2,988	9	64	23	2,624	38,281	35	34,047	2,744	1,452	14,204	14,061	10,212	32	101	4,894	5,183
2021	118,624	47,383	6,610	4,999	53	2,404	28,673	4,645	2,999	8	61	39	2,737	42,630	37	38,305	2,883	1,404	14,984	14,855	10,628	31	97	4,895	5,604
2022[a]	130,252	52,866	7,859	5,312	54	2,480	31,605	5,556	3,249	7	62	21	2,948	45,778	39	40,768	3,139	1,829	16,831	16,609	11,527	30	86	5,320	6,090
2023[b]	138,161	55,998	7,966	5,799	54	2,637	33,957	5,585	3,452	7	62	22	3,148	48,202	44	42,984	3,333	1,839	18,436	18,212	12,073	35	92	5,823	6,121
Constant 2017 $millions																									
1953	3,417	1,971	755	268	NA	141	606	201	48	NA	NA	NA	48	1,145	NA	982	97	67	45	45	208	NA	NA	119	89
1954	3,747	2,141	707	328	NA	169	711	225	70	NA	NA	NA	70	1,245	NA	1,054	111	81	62	62	228	NA	NA	133	96
1955	4,130	2,304	706	449	NA	51	844	254	101	NA	NA	NA	101	1,391	NA	1,174	123	94	84	84	250	NA	NA	149	101
1956	5,029	2,748	795	624	NA	47	998	284	133	NA	NA	NA	133	1,755	NA	1,513	137	105	108	108	284	NA	NA	165	119
1957	5,518	3,062	841	743	NA	27	1,129	322	168	NA	NA	NA	168	1,814	NA	1,560	153	102	134	134	339	NA	NA	183	156
1958	6,254	3,562	988	763	NA	90	1,340	381	206	NA	NA	NA	206	1,936	NA	1,671	159	106	159	159	391	NA	NA	206	186
1959	7,110	4,353	1,076	873	NA	222	1,717	464	246	NA	NA	NA	246	1,897	NA	1,622	157	118	186	186	428	NA	NA	232	196
1960	8,296	5,121	1,184	968	NA	230	2,197	542	290	NA	NA	NA	290	2,210	NA	1,917	158	136	216	216	458	NA	NA	265	194
1961	9,649	6,207	1,466	1,130	NA	195	2,755	661	343	NA	NA	NA	343	2,305	NA	2,005	160	140	254	254	540	NA	NA	303	236
1962	11,509	7,686	1,590	1,192	NA	658	3,442	804	402	NA	NA	NA	402	2,486	NA	2,177	158	151	302	302	634	NA	NA	344	290
1963	13,193	9,018	1,774	1,347	NA	682	4,297	917	467	NA	NA	NA	467	2,648	NA	2,339	153	156	359	359	702	NA	NA	390	312
1964	14,720	10,401	2,083	1,505	NA	756	5,059	998	518	NA	NA	NA	518	2,666	NA	2,359	154	154	428	428	707	NA	NA	418	289
1965	16,073	11,463	2,260	1,508	NA	947	5,693	1,056	570	NA	NA	NA	570	2,784	NA	2,450	160	175	519	519	736	NA	NA	422	314
1966	17,196	12,178	2,406	1,602	NA	833	6,256	1,080	608	NA	NA	NA	608	3,005	NA	2,647	170	188	625	625	781	NA	NA	440	340
1967	18,065	13,001	2,472	1,717	NA	958	6,773	1,081	649	NA	NA	NA	649	2,820	NA	2,435	191	194	774	774	821	NA	NA	473	348
1968	18,468	13,120	2,637	1,720	NA	793	6,920	1,050	715	NA	NA	NA	715	2,935	NA	2,527	205	202	855	855	842	NA	NA	498	345
1969	18,203	12,811	2,843	1,632	NA	641	6,714	980	797	NA	NA	NA	797	2,819	NA	2,388	206	224	893	893	884	NA	NA	535	349
1970	17,802	12,390	2,783	1,506	NA	604	6,551	946	888	NA	NA	NA	888	2,630	NA	2,199	213	218	969	969	924	NA	NA	567	357
1971	17,537	12,062	2,740	1,360	NA	476	6,527	959	913	NA	NA	NA	913	2,595	NA	2,150	233	212	1,008	1,008	959	NA	NA	596	363
1972	17,397	12,000	2,723	1,412	NA	411	6,494	960	883	NA	NA	NA	883	2,553	NA	2,092	249	212	976	976	985	NA	NA	606	380
1973	17,562	12,196	2,793	1,636	NA	411	6,377	979	841	NA	NA	NA	841	2,598	NA	2,138	251	210	956	956	970	NA	NA	585	386
1974	17,729	12,366	2,809	1,836	NA	448	6,324	949	801	NA	NA	NA	801	2,578	NA	2,107	259	212	983	983	1,000	NA	NA	599	401
1975	17,535	12,285	2,733	1,916	NA	374	6,360	903	764	NA	NA	NA	764	2,532	NA	2,061	257	213	948	948	1,005	NA	NA	590	416
1976	18,320	12,931	2,898	2,145	NA	396	6,560	933	742	NA	NA	NA	742	2,640	NA	2,162	256	222	966	966	1,041	NA	NA	595	446
1977	19,287	13,594	3,027	2,395	NA	433	6,786	953	744	NA	NA	NA	744	2,766	NA	2,250	286	230	1,073	1,073	1,110	NA	NA	634	476
1978	20,870	14,846	3,132	3,014	NA	468	7,195	1,038	779	NA	NA	NA	779	2,910	NA	2,354	319	237	1,194	1,194	1,140	NA	NA	637	503
1979	21,702	15,394	3,081	3,212	NA	446	7,530	1,125	792	NA	NA	NA	792	3,066	NA	2,473	353	240	1,291	1,291	1,160	NA	NA	634	526
1980	22,216	15,613	3,079	3,286	NA	432	7,773	1,043	779	NA	NA	NA	779	3,267	NA	2,629	396	242	1,381	1,381	1,175	NA	NA	630	545

TABLE 7

U.S. basic research expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
1981	22,409	15,295	3,116	3,318	NA	381	7,729	751	784	NA	NA	NA	784	3,714	NA	3,047	424	243	1,428	1,428	1,189	NA	NA	625	564
1982	23,275	15,562	3,325	3,285	NA	553	7,593	807	804	NA	NA	NA	804	4,051	NA	3,328	471	252	1,565	1,565	1,292	NA	NA	692	600
1983	24,984	16,515	3,644	3,492	NA	728	7,757	895	832	NA	NA	NA	832	4,514	NA	3,701	546	266	1,716	1,716	1,406	NA	NA	752	653
1984	27,060	17,560	3,809	3,763	NA	690	8,295	1,003	884	NA	NA	NA	884	5,245	NA	4,327	635	282	1,857	1,857	1,514	NA	NA	801	713
1985	29,017	18,508	3,831	3,810	NA	704	9,061	1,102	1,012	NA	NA	NA	1,012	5,735	NA	4,669	765	301	2,116	2,116	1,646	NA	NA	865	781
1986	33,084	19,711	3,907	3,945	NA	837	9,878	1,145	1,168	NA	NA	NA	1,168	7,965	NA	6,743	898	324	2,434	2,434	1,806	NA	NA	940	865
1987	34,782	20,871	3,853	4,220	NA	1,125	10,401	1,271	1,239	NA	NA	NA	1,239	8,058	NA	6,743	967	347	2,634	2,634	1,980	NA	NA	1,026	954
1988	35,971	21,992	3,847	4,786	NA	1,193	10,792	1,375	1,282	NA	NA	NA	1,282	7,771	NA	6,375	1,027	369	2,781	2,781	2,145	NA	NA	1,104	1,041
1989	38,294	23,428	4,039	4,925	NA	1,725	11,234	1,505	1,339	NA	NA	NA	1,339	8,208	NA	6,703	1,115	389	2,999	2,999	2,320	NA	NA	1,189	1,131
1990	38,832	23,703	3,910	5,115	NA	1,465	11,616	1,597	1,428	NA	NA	NA	1,428	7,942	NA	6,340	1,190	412	3,253	3,253	2,506	NA	NA	1,275	1,232
1991	44,266	24,927	3,879	5,211	NA	2,040	12,107	1,690	1,487	NA	NA	NA	1,487	11,674	NA	9,990	1,246	438	3,470	3,470	2,708	NA	NA	1,363	1,345
1992	44,020	25,054	3,857	5,434	NA	1,135	12,850	1,777	1,501	NA	NA	NA	1,501	11,044	NA	9,275	1,299	470	3,513	3,513	2,909	NA	NA	1,425	1,485
1993	44,775	25,546	4,083	5,479	NA	726	13,456	1,802	1,484	NA	NA	NA	1,484	11,116	NA	9,286	1,326	504	3,534	3,534	3,095	NA	NA	1,458	1,637
1994	45,225	25,577	3,884	5,356	NA	665	13,938	1,734	1,512	NA	NA	NA	1,512	11,170	NA	9,270	1,357	542	3,670	3,670	3,295	NA	NA	1,486	1,809
1995	44,235	25,381	4,018	4,940	NA	284	14,392	1,748	1,598	NA	NA	NA	1,598	10,031	NA	8,036	1,412	583	3,751	3,751	3,475	NA	NA	1,475	2,000
1996	48,118	26,499	3,931	4,978	NA	954	14,805	1,831	1,686	NA	NA	NA	1,686	12,189	NA	10,046	1,514	629	4,019	4,019	3,724	NA	NA	1,509	2,215
1997	52,951	27,767	3,960	4,909	NA	1,484	15,515	1,899	1,779	NA	NA	NA	1,779	14,964	NA	12,642	1,674	648	4,542	4,542	3,900	NA	NA	1,655	2,245
1998	49,690	29,198	4,282	4,907	NA	1,429	16,496	2,083	1,843	NA	NA	NA	1,843	9,421	NA	6,918	1,822	680	4,984	4,984	4,244	NA	NA	1,796	2,448
1999	53,834	31,449	4,706	5,229	NA	1,558	17,517	2,438	1,949	NA	NA	NA	1,949	10,447	NA	7,786	1,934	727	5,412	5,412	4,578	NA	NA	1,963	2,615
2000	57,800	33,407	5,177	5,551	NA	1,272	18,521	2,887	2,064	NA	NA	NA	2,064	11,185	NA	8,409	1,998	779	5,932	5,932	5,211	NA	NA	2,136	3,075
2001	62,350	35,399	5,729	5,279	NA	1,014	20,063	3,314	2,172	13	NA	NA	2,159	12,641	83	9,816	1,973	768	6,400	6,400	5,738	128	NA	2,292	3,318
2002	66,742	39,362	5,973	6,108	NA	1,176	22,696	3,410	2,333	22	NA	NA	2,311	11,572	92	8,818	1,929	734	7,033	7,033	6,442	186	NA	2,504	3,751
2003	71,193	42,648	6,057	6,308	NA	1,800	24,958	3,525	2,480	22	NA	NA	2,458	11,709	92	9,017	1,865	736	7,391	7,391	6,964	168	NA	2,568	4,228
2004	71,297	43,153	5,940	6,117	NA	1,356	26,215	3,526	2,546	17	NA	NA	2,529	11,227	68	8,552	1,876	731	7,544	7,544	6,827	91	NA	2,614	4,122
2005	73,445	43,604	5,849	6,124	NA	1,359	26,713	3,559	2,551	15	NA	NA	2,536	12,051	67	9,268	1,962	753	8,054	8,054	7,187	86	NA	2,730	4,371
2006	73,214	43,258	5,609	6,035	19	1,718	26,489	3,389	2,655	13	36	NA	2,606	11,210	75	8,255	2,099	781	8,669	8,669	7,421	88	NA	2,891	4,442
2007	76,998	43,963	5,352	5,982	23	3,219	26,110	3,276	2,837	13	44	NA	2,780	12,977	74	9,830	2,266	808	9,186	9,186	8,036	88	NA	3,165	4,782
2008	80,066	42,972	5,632	6,063	30	1,676	26,080	3,492	3,005	14	53	14	2,924	15,673	85	12,343	2,421	823	9,620	9,620	8,796	89	20	3,410	5,275
2009	84,025	44,327	6,144	6,671	38	1,513	26,011	3,950	2,869	16	64	15	2,774	18,245	75	15,128	2,253	789	9,326	9,326	9,258	89	38	3,427	5,704
2010	85,321	44,778	5,702	7,224	44	1,569	26,430	3,809	2,642	20	71	11	2,540	19,470	75	16,620	1,991	784	8,943	8,943	9,488	86	65	3,334	6,003
2011	80,553	42,948	5,517	6,922	44	740	26,356	3,368	2,557	12	68	23	2,454	16,290	74	13,428	1,975	813	9,304	9,304	9,454	70	41	3,326	6,017
2012	79,404	41,023	5,890	5,934	42	691	25,146	3,318	2,451	15	64	10	2,363	16,425	65	13,534	2,006	820	9,934	9,934	9,571	61	31	3,434	6,046
2013	83,628	38,284	5,624	4,311	40	1,262	23,849	3,198	2,421	13	57	22	2,329	22,208	55	19,208	2,088	857	10,474	10,474	10,241	41	93	3,631	6,476
2014	85,971	38,418	5,917	4,228	43	2,120	22,905	3,205	2,407	7	59	17	2,325	23,605	55	20,490	2,169	891	10,736	10,736	10,805	35	123	3,771	6,875

TABLE 7

U.S. basic research expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
2015	86,757	38,267	6,053	4,155	43	2,094	22,805	3,118	2,441	5	60	14	2,362	23,399	49	20,162	2,272	916	11,288	11,288	11,362	33	123	3,932	7,275
2016	89,061	39,579	6,229	4,185	39	2,074	22,992	4,059	2,657	5	56	20	2,401	26,399	45	23,288	2,337	729	11,935	11,814	8,492	35	119	4,122	4,215
2017	90,118	39,277	6,259	4,054	41	1,853	23,345	3,726	2,659	6	55	17	2,392	26,945	38	23,644	2,417	844	12,401	12,278	8,835	30	103	4,379	4,322
2018	95,613	41,407	6,674	4,094	44	2,479	23,939	4,178	2,678	9	55	12	2,399	29,507	38	25,951	2,547	967	12,834	12,710	9,187	32	109	4,651	4,393
2019	100,866	42,778	7,071	4,328	50	2,259	24,492	4,578	2,741	10	59	15	2,438	32,757	35	28,979	2,626	1,113	13,231	13,105	9,360	32	83	4,761	4,482
2020	105,957	43,614	6,944	4,474	52	2,088	25,151	4,906	2,836	8	60	22	2,490	36,333	33	32,314	2,604	1,378	13,482	13,345	9,693	30	96	4,645	4,919
2021	107,672	43,008	5,999	4,537	49	2,182	26,025	4,216	2,722	7	56	36	2,484	38,694	33	34,768	2,616	1,274	13,600	13,483	9,647	28	88	4,443	5,086
2022[a]	110,358	44,791	6,659	4,501	46	2,101	26,777	4,708	2,753	6	53	18	2,498	38,786	33	34,542	2,659	1,550	14,261	14,072	9,766	25	73	4,507	5,160
2023[b]	112,993	45,797	6,515	4,743	44	2,157	27,772	4,567	2,824	6	51	18	2,575	39,421	36	35,154	2,726	1,504	15,077	14,894	9,874	28	75	4,763	5,006

NA = not available.

FFRDC = federally funded research and development center; NPO = nonprofit organization.

[a] Some data for 2022 are preliminary and may be revised later.
[b] The data for 2023 include estimates and are likely to be revised later.

Note(s):
This table reaggregates the R&D performer data in table 3 according to major categories of R&D funding: federal government, nonfederal government (state and local), business, higher education, and NPOs. Business sources of R&D funding in this table include the own funds of domestic R&D-performing businesses, funds from other domestic businesses, and funds from foreign businesses. For further detail on the R&D performers listed, see table 2, footnotes a–f. For detail on type-of-R&D data, see table 3, footnotes b–f. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised. Data are based on reports by performers in the National Center for Science and Engineering Statistics annual surveys on R&D expenditures: Business Enterprise Research and Development Survey, Annual Business Survey, Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—were collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. (See also table 3, general notes.)

Source(s):
National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

TABLE 8

U.S. applied research expenditures, by source of funds and performing sectors: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
Current $millions																									
1953	1,289	756	347	48	NA	288	59	14	30	NA	NA	NA	30	456	NA	438	7	11	28	28	20	NA	NA	10	10
1954	1,378	785	330	59	NA	322	60	16	32	NA	NA	NA	32	513	NA	492	8	13	28	28	21	NA	NA	10	11
1955	1,502	838	333	86	NA	339	63	18	32	NA	NA	NA	32	583	NA	560	9	14	27	27	22	NA	NA	11	11
1956	1,929	1,026	387	125	NA	430	65	20	33	NA	NA	NA	33	818	NA	794	10	14	27	27	25	NA	NA	11	14
1957	2,413	1,304	446	149	NA	624	63	23	34	NA	NA	NA	34	1,018	NA	992	12	14	27	27	31	NA	NA	11	20
1958	2,759	1,497	516	156	NA	731	66	29	35	NA	NA	NA	35	1,163	NA	1,137	12	14	27	27	37	NA	NA	12	25
1959	2,940	1,630	577	179	NA	757	78	40	37	NA	NA	NA	37	1,206	NA	1,178	13	15	28	28	39	NA	NA	12	27
1960	3,065	1,732	615	201	NA	769	93	54	39	NA	NA	NA	39	1,226	NA	1,196	13	17	29	29	40	NA	NA	12	28
1961	3,123	1,811	668	240	NA	738	104	62	40	NA	NA	NA	40	1,195	NA	1,165	13	17	30	30	48	NA	NA	13	35
1962	3,698	2,098	709	249	NA	954	119	68	41	NA	NA	NA	41	1,471	NA	1,438	14	19	30	30	58	NA	NA	13	45
1963	3,864	2,244	809	275	NA	952	128	82	42	NA	NA	NA	42	1,483	NA	1,450	14	19	32	32	63	NA	NA	14	49
1964	4,201	2,462	947	313	NA	978	142	82	45	NA	NA	NA	45	1,593	NA	1,560	14	19	37	37	65	NA	NA	18	47
1965	4,374	2,553	994	294	NA	992	176	98	46	NA	NA	NA	46	1,654	NA	1,620	13	21	42	42	79	NA	NA	27	52
1966	4,653	2,625	1,012	290	NA	986	208	129	47	NA	NA	NA	47	1,842	NA	1,804	14	24	48	48	91	NA	NA	34	57
1967	4,848	2,763	1,069	334	NA	983	238	141	46	NA	NA	NA	46	1,890	NA	1,849	16	25	54	54	96	NA	NA	36	60
1968	5,137	2,811	1,112	334	NA	956	250	160	46	NA	NA	NA	46	2,125	NA	2,081	16	28	55	55	101	NA	NA	39	62
1969	5,454	2,924	1,229	336	NA	920	257	183	48	NA	NA	NA	48	2,320	NA	2,272	16	32	54	54	109	NA	NA	43	66
1970	5,752	3,100	1,334	336	NA	952	280	199	51	NA	NA	NA	51	2,429	NA	2,378	18	33	56	56	117	NA	NA	47	70
1971	5,833	3,091	1,355	312	NA	907	306	212	61	NA	NA	NA	61	2,494	NA	2,441	19	34	67	67	121	NA	NA	47	74
1972	6,147	3,243	1,434	358	NA	845	391	216	74	NA	NA	NA	74	2,618	NA	2,562	21	35	82	82	131	NA	NA	52	79
1973	6,655	3,429	1,527	334	NA	883	450	236	88	NA	NA	NA	88	2,894	NA	2,832	26	36	100	100	145	NA	NA	62	83
1974	7,344	3,634	1,652	335	NA	905	477	266	96	NA	NA	NA	96	3,333	NA	3,263	32	39	118	118	163	NA	NA	72	91
1975	8,091	4,125	1,912	384	NA	991	550	290	113	NA	NA	NA	113	3,520	NA	3,440	39	42	141	141	192	NA	NA	92	100
1976	8,976	4,464	2,068	457	NA	1,033	596	310	127	NA	NA	NA	127	4,001	NA	3,912	45	45	166	166	218	NA	NA	109	109
1977	9,662	4,683	2,081	540	NA	1,113	626	324	134	NA	NA	NA	134	4,410	NA	4,311	51	48	194	194	241	NA	NA	121	120
1978	10,704	5,080	2,242	597	NA	1,195	676	371	151	NA	NA	NA	151	4,982	NA	4,870	61	52	232	232	259	NA	NA	128	132
1979	12,097	5,602	2,415	654	NA	1,305	793	436	161	NA	NA	NA	161	5,797	NA	5,670	71	55	263	263	273	NA	NA	129	144
1980	13,729	6,252	2,546	749	NA	1,625	912	420	174	NA	NA	NA	174	6,698	NA	6,550	88	60	308	308	298	NA	NA	140	158
1981	16,329	6,905	2,731	788	NA	2,042	953	391	199	NA	NA	NA	199	8,531	NA	8,359	108	64	363	363	332	NA	NA	159	173
1982	18,218	7,689	2,802	890	NA	2,593	1,007	398	207	NA	NA	NA	207	9,553	NA	9,363	121	69	402	402	367	NA	NA	178	189
1983	20,298	8,738	2,991	965	NA	3,227	1,122	433	215	NA	NA	NA	215	10,501	NA	10,286	141	74	443	443	401	NA	NA	194	207
1984	22,451	9,499	2,961	1,176	NA	3,677	1,226	459	234	NA	NA	NA	234	11,788	NA	11,541	168	79	491	491	438	NA	NA	212	226
1985	25,401	10,930	3,135	1,292	NA	4,717	1,296	490	262	NA	NA	NA	262	13,191	NA	12,908	198	85	547	547	471	NA	NA	224	247

TABLE 8

U.S. applied research expenditures, by source of funds and performing sectors: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
1986	27,240	10,409	3,204	1,258	NA	4,049	1,393	506	298	NA	NA	NA	298	15,402	NA	15,082	229	91	620	620	510	NA	NA	240	270
1987	27,951	10,829	3,366	1,228	NA	4,037	1,643	555	333	NA	NA	NA	333	15,511	NA	15,153	260	98	707	707	571	NA	NA	276	295
1988	29,528	10,749	3,362	984	NA	3,846	1,958	599	377	NA	NA	NA	377	16,938	NA	16,531	302	105	818	818	647	NA	NA	325	322
1989	32,277	11,753	3,566	1,047	NA	4,324	2,121	695	417	NA	NA	NA	417	18,452	NA	17,993	347	112	933	933	722	NA	NA	370	352
1990	34,897	13,695	3,652	1,156	NA	5,967	2,140	780	453	NA	NA	NA	453	18,930	NA	18,432	377	120	1,031	1,031	788	NA	NA	404	384
1991	38,631	14,280	4,093	1,446	NA	5,588	2,232	921	468	NA	NA	NA	468	21,946	NA	21,425	392	129	1,091	1,091	847	NA	NA	428	419
1992	37,936	13,690	4,337	1,529	NA	4,476	2,415	933	479	NA	NA	NA	479	21,736	NA	21,184	414	138	1,120	1,120	911	NA	NA	454	456
1993	37,283	14,075	4,838	1,500	NA	4,295	2,542	900	496	NA	NA	NA	496	20,547	NA	19,956	443	148	1,181	1,181	984	NA	NA	487	497
1994	36,618	13,800	4,985	1,596	NA	3,616	2,644	960	517	NA	NA	NA	517	19,995	NA	19,372	464	158	1,256	1,256	1,049	NA	NA	509	541
1995	40,936	13,543	4,952	1,714	NA	3,164	2,779	934	559	NA	NA	NA	559	24,418	NA	23,755	494	170	1,311	1,311	1,104	NA	NA	516	589
1996	43,170	13,958	4,872	1,623	NA	3,640	2,864	960	584	NA	NA	NA	584	26,076	NA	25,370	524	182	1,390	1,390	1,162	NA	NA	522	640
1997	46,516	12,852	4,997	1,679	NA	2,648	2,518	1,011	548	NA	NA	NA	548	30,502	NA	29,782	515	205	1,396	1,396	1,219	NA	NA	508	711
1998	46,247	12,751	5,146	1,725	NA	2,632	2,189	1,060	515	NA	NA	NA	515	30,303	NA	29,576	509	218	1,393	1,393	1,285	NA	NA	502	784
1999	51,853	13,869	5,530	1,651	NA	2,817	2,571	1,300	533	NA	NA	NA	533	34,586	NA	33,821	529	236	1,480	1,480	1,385	NA	NA	537	849
2000	56,503	15,450	6,105	1,750	NA	2,682	3,081	1,831	558	NA	NA	NA	558	37,293	NA	36,494	540	258	1,604	1,604	1,598	NA	NA	578	1,021
2001	64,201	18,781	7,052	2,564	NA	3,603	3,411	2,150	594	9	NA	NA	585	41,260	55	40,409	535	261	1,734	1,734	1,832	85	NA	621	1,126
2002	50,540	18,949	7,487	2,867	NA	2,452	3,877	2,267	649	12	NA	NA	636	26,917	52	26,081	531	253	1,937	1,937	2,089	106	NA	689	1,293
2003	60,983	22,101	7,672	3,020	NA	4,473	4,450	2,487	721	13	NA	NA	708	33,710	54	32,861	537	259	2,127	2,127	2,324	99	NA	739	1,486
2004	69,322	22,540	7,455	3,180	NA	4,775	4,682	2,448	749	14	NA	NA	735	41,521	56	40,657	545	264	2,190	2,190	2,322	75	NA	759	1,488
2005	69,768	23,376	7,557	3,288	NA	5,289	4,810	2,432	734	14	NA	NA	719	40,894	62	39,995	557	280	2,283	2,283	2,481	80	NA	774	1,627
2006	76,499	24,682	7,435	3,348	87	6,140	5,080	2,592	894	13	169	NA	712	45,978	72	45,033	573	300	2,368	2,368	2,579	84	NA	789	1,705
2007	83,662	27,788	7,222	3,643	111	8,945	5,284	2,583	968	13	210	NA	745	49,625	74	48,625	607	318	2,461	2,461	2,821	89	NA	848	1,885
2008	74,729	25,254	7,316	3,955	146	5,397	5,840	2,600	1,160	13	261	71	815	42,377	79	41,292	675	331	2,682	2,682	3,258	83	105	951	2,119
2009	72,577	30,584	7,874	4,517	186	7,797	7,161	3,049	1,311	17	316	38	941	34,277	79	33,124	755	319	2,907	2,907	3,498	93	96	1,003	2,305
2010	78,886	29,544	8,016	5,025	219	4,705	8,539	3,041	1,403	18	354	32	1,000	41,135	67	39,987	760	321	3,060	3,060	3,743	77	182	1,028	2,456
2011	81,718	29,435	8,024	5,057	226	4,404	9,031	2,693	1,410	13	348	70	979	43,786	80	42,590	776	340	3,311	3,311	3,776	76	122	1,066	2,512
2012	86,627	30,047	8,587	5,566	220	4,137	8,909	2,629	1,385	18	330	45	991	47,722	81	46,436	856	349	3,570	3,570	3,904	76	137	1,120	2,571
2013	87,979	32,300	8,309	6,639	213	6,028	8,646	2,465	1,417	22	300	47	1,049	46,117	94	44,738	914	371	3,823	3,823	4,322	69	199	1,253	2,801
2014	91,601	33,237	8,775	6,766	200	6,445	8,477	2,574	1,392	13	271	35	1,073	48,158	107	46,685	974	392	4,098	4,098	4,717	67	250	1,374	3,026
2015	97,059	34,459	9,347	7,182	199	6,102	8,838	2,791	1,397	9	282	24	1,083	51,718	96	50,137	1,079	407	4,425	4,425	5,062	65	209	1,557	3,231
2016	109,463	36,079	9,805	7,469	209	5,327	9,520	3,749	1,726	10	300	45	1,158	59,420	84	57,253	1,192	891	4,983	4,836	7,255	66	245	1,797	5,147
2017	113,296	38,248	10,124	7,868	208	5,386	9,985	4,678	1,765	15	279	33	1,219	60,769	91	58,429	1,259	977	5,327	5,184	7,188	72	193	1,911	5,005
2018	118,236	40,155	11,111	8,407	215	5,355	10,443	4,623	1,826	21	273	23	1,286	63,540	90	61,018	1,351	1,064	5,614	5,475	7,101	75	191	1,998	4,831
2019	130,098	42,091	11,264	9,075	225	5,246	10,956	5,325	1,894	23	269	42	1,338	73,345	83	70,679	1,436	1,130	5,861	5,732	6,906	77	209	2,062	4,549

TABLE 8

U.S. applied research expenditures, by source of funds and performing sectors: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
2020	132,351	43,399	11,554	9,384	224	5,906	11,514	4,816	1,923	20	262	84	1,357	74,729	82	72,119	1,429	1,085	6,034	5,925	6,265	76	262	2,045	3,872
2021	143,711	41,984	11,132	9,870	232	3,491	12,313	4,947	1,914	19	266	142	1,385	87,295	90	84,782	1,471	940	6,314	6,226	6,204	76	292	2,076	3,752
2022[a]	161,628	47,307	12,745	10,568	248	5,614	13,410	4,724	1,961	17	285	71	1,473	99,467	98	96,727	1,632	997	6,955	6,832	5,937	74	276	2,259	3,320
2023[b]	170,419	49,684	12,552	11,772	257	5,966	14,389	4,748	2,078	17	297	75	1,573	104,900	107	101,997	1,782	1,002	7,565	7,441	6,191	84	295	2,468	3,336
Constant 2017 $millions																									
1953	9,586	5,618	2,581	353	NA	2,142	439	104	224	NA	NA	NA	224	3,387	NA	3,257	48	82	207	207	149	NA	NA	74	74
1954	10,155	5,785	2,428	431	NA	2,373	438	114	232	NA	NA	NA	232	3,777	NA	3,626	55	96	206	206	155	NA	NA	74	81
1955	10,880	6,073	2,413	623	NA	2,454	456	127	234	NA	NA	NA	234	4,221	NA	4,058	62	101	197	197	156	NA	NA	76	80
1956	13,513	7,186	2,708	872	NA	3,010	455	140	232	NA	NA	NA	232	5,731	NA	5,563	70	98	189	189	175	NA	NA	77	98
1957	16,369	8,843	3,022	1,011	NA	4,231	427	153	230	NA	NA	NA	230	6,902	NA	6,729	78	95	184	184	210	NA	NA	75	136
1958	18,296	9,927	3,422	1,035	NA	4,847	434	189	234	NA	NA	NA	234	7,713	NA	7,540	80	93	180	180	242	NA	NA	76	166
1959	19,229	10,663	3,771	1,171	NA	4,953	507	262	242	NA	NA	NA	242	7,885	NA	7,705	82	98	183	183	255	NA	NA	78	177
1960	19,782	11,176	3,966	1,297	NA	4,965	600	348	250	NA	NA	NA	250	7,912	NA	7,718	84	110	186	186	258	NA	NA	77	181
1961	19,943	11,564	4,266	1,529	NA	4,712	661	396	255	NA	NA	NA	255	7,631	NA	7,439	83	109	189	189	303	NA	NA	80	224
1962	23,329	13,238	4,470	1,571	NA	6,020	748	429	256	NA	NA	NA	256	9,278	NA	9,073	85	120	192	192	366	NA	NA	82	284
1963	24,102	13,998	5,046	1,712	NA	5,936	795	508	263	NA	NA	NA	263	9,250	NA	9,044	87	119	202	202	390	NA	NA	84	306
1964	25,809	15,122	5,815	1,923	NA	6,008	872	504	278	NA	NA	NA	278	9,784	NA	9,584	83	117	229	229	396	NA	NA	108	289
1965	26,387	15,400	5,994	1,771	NA	5,985	1,059	591	280	NA	NA	NA	280	9,979	NA	9,774	78	127	254	254	474	NA	NA	160	314
1966	27,306	15,403	5,939	1,702	NA	5,787	1,221	754	276	NA	NA	NA	276	10,811	NA	10,588	82	141	284	284	531	NA	NA	197	335
1967	27,650	15,758	6,094	1,902	NA	5,606	1,355	801	260	NA	NA	NA	260	10,777	NA	10,546	88	143	307	307	548	NA	NA	205	342
1968	28,101	15,374	6,080	1,827	NA	5,230	1,365	873	252	NA	NA	NA	252	11,624	NA	11,384	88	153	301	301	550	NA	NA	211	339
1969	28,443	15,247	6,410	1,750	NA	4,798	1,338	952	251	NA	NA	NA	251	12,098	NA	11,848	83	167	281	281	566	NA	NA	222	344
1970	28,494	15,358	6,608	1,664	NA	4,716	1,384	986	254	NA	NA	NA	254	12,029	NA	11,779	87	163	276	276	577	NA	NA	230	347
1971	27,497	14,571	6,387	1,468	NA	4,276	1,443	997	285	NA	NA	NA	285	11,754	NA	11,507	87	160	316	316	570	NA	NA	222	349
1972	27,777	14,654	6,480	1,618	NA	3,818	1,765	974	335	NA	NA	NA	335	11,828	NA	11,577	93	158	370	370	590	NA	NA	233	357
1973	28,511	14,691	6,543	1,431	NA	3,783	1,926	1,009	375	NA	NA	NA	375	12,398	NA	12,132	111	154	428	428	619	NA	NA	263	356
1974	28,866	14,285	6,494	1,315	NA	3,557	1,873	1,046	378	NA	NA	NA	378	13,101	NA	12,825	124	152	463	463	639	NA	NA	281	358
1975	29,105	14,839	6,877	1,380	NA	3,565	1,977	1,041	408	NA	NA	NA	408	12,662	NA	12,374	138	150	505	505	690	NA	NA	331	359
1976	30,606	15,220	7,052	1,558	NA	3,522	2,030	1,057	434	NA	NA	NA	434	13,642	NA	13,338	152	152	564	564	745	NA	NA	372	373
1977	31,017	15,034	6,679	1,733	NA	3,573	2,008	1,041	432	NA	NA	NA	432	14,157	NA	13,839	164	154	623	623	772	NA	NA	387	385
1978	32,104	15,236	6,723	1,789	NA	3,584	2,027	1,113	454	NA	NA	NA	454	14,942	NA	14,606	181	155	695	695	777	NA	NA	382	394
1979	33,501	15,515	6,688	1,811	NA	3,614	2,195	1,207	447	NA	NA	NA	447	16,054	NA	15,702	198	154	729	729	756	NA	NA	357	399
1980	34,871	15,879	6,467	1,902	NA	4,127	2,317	1,066	441	NA	NA	NA	441	17,012	NA	16,636	224	151	782	782	757	NA	NA	356	401

TABLE 8

U.S. applied research expenditures, by source of funds and performing sectors: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
1981	37,890	16,023	6,338	1,829	NA	4,738	2,210	907	462	NA	NA	NA	462	19,794	NA	19,396	250	148	841	841	769	NA	NA	368	401
1982	39,812	16,803	6,122	1,946	NA	5,667	2,200	869	453	NA	NA	NA	453	20,876	NA	20,461	264	150	878	878	802	NA	NA	388	413
1983	42,687	18,376	6,290	2,029	NA	6,786	2,360	910	452	NA	NA	NA	452	22,083	NA	21,631	297	155	932	932	843	NA	NA	408	435
1984	45,569	19,281	6,010	2,387	NA	7,463	2,489	932	475	NA	NA	NA	475	23,927	NA	23,425	341	160	997	997	890	NA	NA	430	459
1985	49,976	21,504	6,168	2,541	NA	9,281	2,551	963	515	NA	NA	NA	515	25,952	NA	25,397	389	167	1,077	1,077	927	NA	NA	441	487
1986	52,536	20,076	6,180	2,426	NA	7,809	2,686	975	574	NA	NA	NA	574	29,706	NA	29,088	442	176	1,197	1,197	984	NA	NA	462	521
1987	52,605	20,381	6,334	2,312	NA	7,598	3,092	1,045	627	NA	NA	NA	627	29,192	NA	28,519	489	184	1,331	1,331	1,075	NA	NA	519	556
1988	53,679	19,540	6,112	1,788	NA	6,992	3,560	1,088	685	NA	NA	NA	685	30,791	NA	30,052	549	190	1,487	1,487	1,176	NA	NA	590	586
1989	56,463	20,560	6,239	1,831	NA	7,564	3,711	1,215	729	NA	NA	NA	729	32,279	NA	31,476	607	196	1,632	1,632	1,263	NA	NA	647	616
1990	58,843	23,093	6,158	1,949	NA	10,062	3,609	1,314	763	NA	NA	NA	763	31,919	NA	31,080	636	203	1,739	1,739	1,329	NA	NA	682	647
1991	63,010	23,291	6,677	2,358	NA	9,114	3,640	1,502	763	NA	NA	NA	763	35,794	NA	34,945	639	210	1,779	1,779	1,381	NA	NA	699	683
1992	60,496	21,831	6,916	2,438	NA	7,138	3,851	1,489	763	NA	NA	NA	763	34,663	NA	33,782	661	220	1,786	1,786	1,452	NA	NA	725	727
1993	58,078	21,925	7,537	2,336	NA	6,691	3,959	1,401	772	NA	NA	NA	772	32,008	NA	31,087	690	230	1,840	1,840	1,533	NA	NA	759	774
1994	55,850	21,048	7,604	2,434	NA	5,515	4,032	1,463	789	NA	NA	NA	789	30,497	NA	29,547	708	242	1,916	1,916	1,601	NA	NA	776	825
1995	61,155	20,232	7,398	2,560	NA	4,727	4,152	1,395	835	NA	NA	NA	835	36,479	NA	35,488	738	253	1,959	1,959	1,650	NA	NA	771	879
1996	63,333	20,477	7,147	2,380	NA	5,340	4,201	1,408	856	NA	NA	NA	856	38,254	NA	37,219	769	266	2,040	2,040	1,705	NA	NA	766	939
1997	67,084	18,535	7,206	2,421	NA	3,819	3,631	1,458	791	NA	NA	NA	791	43,988	NA	42,951	742	296	2,013	2,013	1,758	NA	NA	733	1,025
1998	65,956	18,186	7,338	2,460	NA	3,754	3,122	1,512	735	NA	NA	NA	735	43,216	NA	42,180	726	310	1,986	1,986	1,833	NA	NA	716	1,118
1999	72,918	19,503	7,776	2,321	NA	3,961	3,616	1,828	750	NA	NA	NA	750	48,636	NA	47,561	744	332	2,081	2,081	1,948	NA	NA	755	1,194
2000	77,696	21,245	8,395	2,407	NA	3,688	4,237	2,518	768	NA	NA	NA	768	51,281	NA	50,182	743	355	2,205	2,205	2,198	NA	NA	794	1,403
2001	86,338	25,257	9,484	3,448	NA	4,845	4,588	2,891	799	12	NA	NA	787	55,487	75	54,343	719	351	2,332	2,332	2,464	115	NA	835	1,514
2002	66,927	25,093	9,915	3,796	NA	3,247	5,134	3,002	859	16	NA	NA	842	35,644	69	34,537	703	335	2,565	2,565	2,766	141	NA	913	1,712
2003	79,192	28,700	9,962	3,921	NA	5,809	5,779	3,230	936	17	NA	NA	919	43,776	70	42,673	697	336	2,762	2,762	3,018	129	NA	960	1,930
2004	87,664	28,504	9,427	4,021	NA	6,038	5,921	3,096	947	18	NA	NA	929	52,508	71	51,415	689	334	2,770	2,770	2,936	95	NA	960	1,881
2005	85,546	28,663	9,266	4,032	NA	6,485	5,898	2,981	899	17	NA	NA	882	50,142	76	49,040	682	344	2,799	2,799	3,042	98	NA	949	1,995
2006	90,993	29,358	8,843	3,983	103	7,303	6,042	3,083	1,063	15	200	NA	847	54,689	86	53,565	682	356	2,816	2,816	3,067	100	NA	939	2,028
2007	96,888	32,181	8,363	4,219	129	10,359	6,119	2,991	1,121	15	243	NA	862	57,470	86	56,312	703	369	2,850	2,850	3,267	103	NA	982	2,183
2008	84,907	28,694	8,313	4,494	166	6,132	6,635	2,954	1,318	15	297	80	926	48,148	90	46,915	767	376	3,047	3,047	3,701	94	119	1,080	2,408
2009	81,956	34,536	8,892	5,101	210	8,805	8,086	3,443	1,481	19	356	43	1,062	38,707	89	37,405	853	360	3,282	3,282	3,950	106	108	1,133	2,603
2010	88,011	32,962	8,943	5,606	244	5,249	9,527	3,393	1,566	20	394	36	1,116	45,893	75	44,613	847	358	3,414	3,414	4,176	86	203	1,147	2,740
2011	89,328	32,176	8,771	5,528	247	4,814	9,872	2,944	1,541	14	381	76	1,070	47,863	88	46,556	848	371	3,619	3,619	4,128	84	133	1,165	2,746
2012	92,963	32,245	9,215	5,973	237	4,440	9,561	2,821	1,486	20	354	48	1,063	51,212	87	49,833	918	374	3,831	3,831	4,189	81	147	1,202	2,760
2013	92,834	34,082	8,767	7,005	225	6,361	9,123	2,601	1,496	23	317	50	1,106	48,661	99	47,207	964	391	4,034	4,034	4,561	73	210	1,322	2,956
2014	95,001	34,470	9,101	7,017	207	6,684	8,792	2,669	1,443	13	281	36	1,113	49,945	111	48,418	1,010	407	4,250	4,250	4,892	70	259	1,425	3,138

TABLE 8

U.S. applied research expenditures, by source of funds and performing sectors: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
2015	99,736	35,409	9,605	7,380	204	6,270	9,081	2,868	1,435	9	289	24	1,112	53,145	99	51,520	1,108	418	4,547	4,547	5,201	66	215	1,599	3,321
2016	111,423	36,725	9,981	7,603	213	5,422	9,691	3,816	1,757	10	305	46	1,179	60,484	85	58,279	1,213	906	5,073	4,922	7,385	67	250	1,829	5,240
2017	113,296	38,248	10,124	7,868	208	5,386	9,985	4,678	1,765	15	279	33	1,219	60,769	91	58,429	1,259	977	5,327	5,184	7,188	72	193	1,911	5,005
2018	115,588	39,256	10,862	8,219	210	5,236	10,209	4,520	1,785	21	267	23	1,257	62,117	88	59,652	1,321	1,040	5,488	5,352	6,942	73	186	1,953	4,723
2019	125,119	40,481	10,833	8,727	216	5,045	10,537	5,121	1,821	22	258	40	1,286	70,538	80	67,974	1,381	1,087	5,637	5,512	6,642	74	201	1,983	4,375
2020	125,617	41,191	10,967	8,907	213	5,606	10,928	4,571	1,825	19	249	79	1,287	70,927	78	68,449	1,356	1,030	5,727	5,623	5,946	72	249	1,940	3,675
2021	130,443	38,108	10,104	8,959	210	3,169	11,176	4,490	1,737	17	241	129	1,257	79,235	82	76,955	1,335	853	5,731	5,651	5,631	69	265	1,884	3,405
2022[a]	136,942	40,082	10,798	8,953	210	4,756	11,361	4,002	1,662	15	242	60	1,248	84,275	83	81,954	1,383	845	5,893	5,788	5,030	63	234	1,914	2,813
2023[b]	139,375	40,634	10,265	9,628	210	4,880	11,768	3,883	1,700	14	243	62	1,286	85,792	87	83,417	1,457	820	6,187	6,085	5,063	69	241	2,018	2,729

NA = not available.

FFRDC = federally funded research and development center; NPO = nonprofit organization.

[a] Some data for 2022 are preliminary and may be revised later.
[b] The data for 2023 include estimates and are likely to be revised later.

Note(s):
This table reaggregates the R&D performer data in table 4 according to major categories of R&D funding: federal government, nonfederal government (state and local), business, higher education, and NPOs. Business sources of R&D funding in this table include the own funds of domestic R&D-performing businesses, funds from other domestic businesses, and funds from foreign businesses. For further detail on the R&D performers listed, see table 2, footnotes a–f. For detail on type-of-R&D data, see table 3, footnotes b–f. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised. Data are based on reports by performers in the National Center for Science and Engineering Statistics annual surveys on R&D expenditures: Business Enterprise Research and Development Survey, Annual Business Survey, Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—were collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. (See also table 4, general notes.)

Source(s):
National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

TABLE 9

U.S. experimental development expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
Current $millions																									
1953	3,412	1,762	567	48	NA	1,123	9	17	3	NA	NA	NA	3	1,637	NA	1,630	1	6	3	3	7	NA	NA	1	6
1954	3,734	2,027	537	62	NA	1,405	9	15	3	NA	NA	NA	3	1,693	NA	1,685	1	7	3	3	8	NA	NA	1	7
1955	4,113	2,351	543	171	NA	1,614	12	12	4	NA	NA	NA	4	1,748	NA	1,738	2	8	3	3	8	NA	NA	1	7
1956	5,854	3,561	631	348	NA	2,559	14	11	4	NA	NA	NA	4	2,277	NA	2,267	2	8	4	4	9	NA	NA	2	7
1957	6,681	4,477	728	429	NA	3,300	12	9	5	NA	NA	NA	5	2,185	NA	2,174	3	8	4	4	10	NA	NA	2	8
1958	7,213	4,940	842	386	NA	3,691	13	9	6	NA	NA	NA	6	2,252	NA	2,241	3	8	4	4	11	NA	NA	2	9
1959	8,463	5,871	940	477	NA	4,426	16	14	6	NA	NA	NA	6	2,569	NA	2,557	3	9	5	5	12	NA	NA	2	10
1960	9,360	6,390	1,003	559	NA	4,799	19	10	6	NA	NA	NA	6	2,948	NA	2,935	3	10	5	5	12	NA	NA	2	10
1961	9,930	6,701	1,090	670	NA	4,917	22	4	7	NA	NA	NA	7	3,201	NA	3,189	2	10	5	5	16	NA	NA	2	14
1962	10,114	6,822	1,227	618	NA	4,950	23	5	8	NA	NA	NA	8	3,259	NA	3,246	2	11	6	6	20	NA	NA	2	18
1963	11,539	7,955	1,465	668	NA	5,795	22	6	8	NA	NA	NA	8	3,548	NA	3,535	2	11	6	6	22	NA	NA	2	20
1964	12,506	8,610	1,680	739	NA	6,156	30	6	8	NA	NA	NA	8	3,861	NA	3,848	2	11	7	7	21	NA	NA	3	18
1965	13,215	8,742	1,789	674	NA	6,218	48	13	9	NA	NA	NA	9	4,433	NA	4,419	2	12	8	8	24	NA	NA	4	20
1966	14,490	9,466	1,886	654	NA	6,849	61	16	9	NA	NA	NA	9	4,977	NA	4,961	2	14	10	10	28	NA	NA	5	23
1967	15,332	9,521	1,943	706	NA	6,795	66	12	9	NA	NA	NA	9	5,762	NA	5,744	3	15	10	10	31	NA	NA	7	24
1968	16,154	9,756	1,904	724	NA	7,044	72	13	8	NA	NA	NA	8	6,346	NA	6,326	4	16	9	9	35	NA	NA	9	26
1969	17,051	9,848	2,016	792	NA	6,944	80	17	7	NA	NA	NA	7	7,150	NA	7,127	5	18	8	8	38	NA	NA	10	28
1970	16,925	9,382	2,258	790	NA	6,232	84	20	6	NA	NA	NA	6	7,489	NA	7,466	5	18	7	7	40	NA	NA	10	30
1971	17,399	9,561	2,473	841	NA	6,167	69	12	8	NA	NA	NA	8	7,780	NA	7,757	4	19	9	9	42	NA	NA	9	33
1972	18,743	10,141	2,639	863	NA	6,533	63	44	12	NA	NA	NA	12	8,533	NA	8,510	4	19	14	14	44	NA	NA	9	35
1973	20,197	10,311	2,657	860	NA	6,621	71	102	18	NA	NA	NA	18	9,798	NA	9,773	5	20	20	20	51	NA	NA	13	38
1974	21,504	10,506	2,765	983	NA	6,553	75	131	20	NA	NA	NA	20	10,896	NA	10,868	7	22	25	25	57	NA	NA	15	42
1975	22,706	10,993	2,890	1,103	NA	6,783	83	135	22	NA	NA	NA	22	11,600	NA	11,569	8	23	27	27	63	NA	NA	16	47
1976	25,085	12,035	2,972	1,315	NA	7,522	100	128	24	NA	NA	NA	24	12,927	NA	12,890	12	25	31	31	68	NA	NA	16	52
1977	27,667	13,153	3,188	1,418	NA	8,275	153	119	28	NA	NA	NA	28	14,370	NA	14,328	15	27	40	40	76	NA	NA	19	58
1978	31,056	14,383	3,676	1,584	NA	8,756	254	113	32	NA	NA	NA	32	16,504	NA	16,460	15	30	49	49	88	NA	NA	24	64
1979	35,445	16,064	3,944	1,753	NA	9,888	336	143	34	NA	NA	NA	34	19,193	NA	19,145	16	32	56	56	99	NA	NA	28	71
1980	40,748	17,587	4,072	2,009	NA	10,957	362	187	38	NA	NA	NA	38	22,945	NA	22,891	19	35	68	68	110	NA	NA	31	79
1981	46,305	20,242	4,530	2,175	NA	12,791	386	360	44	NA	NA	NA	44	25,817	NA	25,756	24	37	80	80	123	NA	NA	35	88
1982	51,879	22,323	5,178	2,170	NA	14,215	397	362	46	NA	NA	NA	46	29,286	NA	29,219	27	40	88	88	137	NA	NA	39	98
1983	57,771	24,859	6,106	2,385	NA	15,522	399	447	47	NA	NA	NA	47	32,617	NA	32,542	31	44	97	97	151	NA	NA	43	109
1984	66,461	28,320	7,078	2,572	NA	17,640	435	594	51	NA	NA	NA	51	37,815	NA	37,731	37	47	108	108	167	NA	NA	47	120
1985	74,522	32,304	8,011	2,906	NA	20,258	486	644	57	NA	NA	NA	57	41,857	NA	41,762	43	51	120	120	183	NA	NA	49	134

TABLE 9

U.S. experimental development expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
1986	75,855	33,993	8,275	3,101	NA	21,517	513	587	65	NA	NA	NA	65	41,460	NA	41,354	50	55	136	136	201	NA	NA	53	149
1987	79,929	36,691	8,176	3,321	NA	24,122	599	474	73	NA	NA	NA	73	42,784	NA	42,667	57	60	155	155	226	NA	NA	61	165
1988	84,567	37,285	8,864	3,596	NA	23,719	698	407	83	NA	NA	NA	83	46,765	NA	46,634	66	65	180	180	254	NA	NA	71	183
1989	87,723	35,320	9,355	3,635	NA	21,049	773	507	91	NA	NA	NA	91	51,822	NA	51,676	76	70	205	205	285	NA	NA	81	203
1990	94,067	33,859	9,700	3,663	NA	18,966	910	619	99	NA	NA	NA	99	59,568	NA	59,410	83	75	226	226	315	NA	NA	89	226
1991	95,105	31,220	8,778	3,452	NA	17,256	1,012	722	103	NA	NA	NA	103	63,197	NA	63,030	86	82	239	239	345	NA	NA	94	251
1992	99,811	31,514	9,098	3,423	NA	17,181	1,055	758	105	NA	NA	NA	105	67,567	NA	67,388	91	88	246	246	378	NA	NA	100	279
1993	99,705	30,055	9,071	2,986	NA	16,083	1,127	787	109	NA	NA	NA	109	68,866	NA	68,674	97	95	259	259	416	NA	NA	107	309
1994	102,938	30,208	8,823	3,147	NA	16,209	1,213	815	114	NA	NA	NA	114	71,886	NA	71,681	102	103	276	276	455	NA	NA	112	343
1995	113,079	32,436	9,262	3,427	NA	17,824	1,180	744	123	NA	NA	NA	123	79,738	NA	79,518	108	111	288	288	495	NA	NA	113	381
1996	121,377	31,373	9,033	3,448	NA	17,066	1,128	698	128	NA	NA	NA	128	89,032	NA	88,797	115	120	305	305	538	NA	NA	115	423
1997	128,661	32,256	9,077	3,331	NA	18,121	1,041	687	120	NA	NA	NA	120	95,331	NA	95,063	113	155	306	306	648	NA	NA	112	536
1998	144,669	32,684	9,214	3,314	NA	18,452	943	760	113	NA	NA	NA	113	110,865	NA	110,589	112	164	306	306	702	NA	NA	110	592
1999	154,315	30,584	9,265	3,335	NA	16,571	686	727	117	NA	NA	NA	117	122,530	NA	122,236	116	178	325	325	759	NA	NA	118	641
2000	169,414	27,493	9,377	3,482	NA	13,510	545	580	123	NA	NA	NA	123	140,549	NA	140,235	119	195	352	352	897	NA	NA	127	771
2001	167,975	28,690	11,062	3,566	NA	12,542	646	874	132	4	NA	NA	128	137,749	24	137,410	117	197	381	381	1,024	37	NA	136	850
2002	176,971	30,199	11,800	3,763	NA	13,061	639	937	143	3	NA	NA	140	145,048	14	144,727	116	191	425	425	1,155	28	NA	151	976
2003	175,559	30,190	12,646	3,964	NA	11,939	897	743	158	2	NA	NA	155	143,443	9	143,121	118	195	467	467	1,301	17	NA	162	1,122
2004	177,030	34,131	12,746	4,454	NA	14,419	1,211	1,300	164	3	NA	NA	161	140,947	13	140,615	120	199	481	481	1,307	17	NA	167	1,123
2005	195,621	36,475	13,994	4,611	NA	15,512	1,146	1,211	163	5	NA	NA	158	157,053	23	156,696	122	212	501	501	1,428	30	NA	170	1,228
2006	212,857	38,888	16,089	4,547	2	16,720	927	603	167	6	5	NA	156	171,780	36	171,392	126	226	520	520	1,502	41	NA	173	1,287
2007	227,740	39,378	18,016	5,037	3	14,860	894	568	177	8	6	NA	163	185,985	42	185,569	133	240	540	540	1,660	51	NA	186	1,423
2008	259,579	54,540	17,566	6,078	4	29,488	841	562	417	7	7	223	179	201,848	45	201,406	148	250	589	589	2,186	47	330	209	1,600
2009	255,945	55,927	17,245	6,147	5	30,435	1,545	550	443	8	9	144	283	196,175	39	195,614	281	241	892	892	2,509	46	361	362	1,740
2010	251,239	56,937	18,844	6,909	6	28,089	2,452	638	531	11	10	114	397	189,540	40	188,850	408	242	1,186	1,186	3,044	45	647	498	1,854
2011	270,804	58,289	21,879	6,786	6	26,228	2,600	790	638	6	10	230	392	207,738	41	207,025	416	256	1,280	1,280	2,859	39	403	521	1,897
2012	273,078	55,563	19,941	6,632	6	25,840	2,626	518	489	10	9	102	368	212,701	43	211,949	445	263	1,455	1,455	2,871	40	310	579	1,941
2013	286,998	51,548	19,767	6,572	6	22,137	2,592	474	532	11	8	126	387	230,025	49	229,213	484	280	1,592	1,592	3,301	36	532	619	2,115
2014	301,441	48,087	20,303	6,681	6	18,065	2,562	471	501	7	8	87	400	247,492	57	246,601	537	296	1,726	1,726	3,636	36	624	692	2,284
2015	312,983	47,834	18,961	7,063	6	18,850	2,533	422	504	6	8	90	401	258,754	61	257,831	555	307	1,850	1,850	4,041	41	786	774	2,440
2016	324,729	43,213	15,838	7,479	7	16,790	2,580	520	659	8	11	129	420	274,938	64	273,926	562	386	2,021	1,957	3,899	50	760	861	2,228
2017	350,115	44,910	15,848	8,021	9	17,736	2,670	626	651	11	12	92	447	298,819	64	297,747	607	400	2,149	2,091	3,586	51	560	927	2,047
2018	387,805	48,506	18,856	8,567	9	17,301	2,796	977	685	15	12	85	485	332,748	65	331,637	625	420	2,245	2,191	3,621	54	748	910	1,910
2019	430,291	49,074	21,253	8,962	13	15,058	3,074	714	727	17	16	112	491	374,794	60	373,631	634	468	2,263	2,211	3,432	56	617	874	1,886

TABLE 9

U.S. experimental development expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
2020	472,492	58,634	22,356	9,379	19	21,666	3,389	1,824	761	15	22	134	491	407,315	62	406,060	659	533	2,319	2,266	3,463	58	618	882	1,904
2021	526,382	57,889	23,728	9,915	20	18,690	3,647	1,890	820	15	23	211	501	461,022	72	459,578	720	651	2,488	2,429	4,162	61	592	911	2,598
2022[a]	599,959	64,298	24,095	10,544	19	24,227	4,045	1,368	799	13	21	152	525	527,883	75	526,222	820	766	2,774	2,681	4,205	57	616	982	2,550
2023[b]	630,985	66,662	23,643	11,450	19	25,759	4,416	1,375	852	12	22	162	566	556,060	75	554,311	904	770	3,042	2,949	4,369	59	662	1,084	2,563
Constant 2017 $millions																									
1953	25,371	13,104	4,213	353	NA	8,352	63	123	21	NA	NA	NA	21	12,174	NA	12,122	7	45	20	20	52	NA	NA	7	45
1954	27,517	14,934	3,957	453	NA	10,354	63	107	25	NA	NA	NA	25	12,476	NA	12,417	7	52	23	23	59	NA	NA	7	52
1955	29,804	17,033	3,931	1,235	NA	11,697	83	87	28	NA	NA	NA	28	12,662	NA	12,593	11	58	23	23	58	NA	NA	7	51
1956	41,019	24,949	4,418	2,435	NA	17,928	95	74	31	NA	NA	NA	31	15,954	NA	15,884	14	56	25	25	60	NA	NA	11	49
1957	45,319	30,369	4,935	2,910	NA	22,386	81	58	36	NA	NA	NA	36	14,817	NA	14,746	17	54	29	29	68	NA	NA	14	54
1958	47,835	32,761	5,581	2,557	NA	24,481	83	60	37	NA	NA	NA	37	14,935	NA	14,862	20	53	29	29	73	NA	NA	13	60
1959	55,355	38,404	6,148	3,117	NA	28,949	101	88	39	NA	NA	NA	39	16,804	NA	16,725	20	59	30	30	78	NA	NA	13	65
1960	60,404	41,234	6,469	3,607	NA	30,970	123	65	41	NA	NA	NA	41	19,021	NA	18,941	16	65	30	30	77	NA	NA	13	65
1961	63,411	42,792	6,957	4,278	NA	31,396	137	22	44	NA	NA	NA	44	20,441	NA	20,364	13	64	33	33	102	NA	NA	13	89
1962	63,811	43,039	7,741	3,899	NA	31,228	142	28	49	NA	NA	NA	49	20,562	NA	20,480	13	69	37	37	126	NA	NA	13	114
1963	71,971	49,618	9,137	4,166	NA	36,143	137	34	49	NA	NA	NA	49	22,129	NA	22,048	12	69	38	38	137	NA	NA	12	125
1964	76,832	52,896	10,321	4,540	NA	37,820	181	34	49	NA	NA	NA	49	23,720	NA	23,641	12	68	40	40	126	NA	NA	15	111
1965	79,732	52,741	10,791	4,067	NA	37,516	290	78	52	NA	NA	NA	52	26,746	NA	26,662	12	72	47	47	145	NA	NA	24	121
1966	85,040	55,554	11,069	3,835	NA	40,197	358	94	55	NA	NA	NA	55	29,210	NA	29,116	12	82	57	57	164	NA	NA	29	135
1967	87,441	54,302	11,082	4,024	NA	38,754	374	68	48	NA	NA	NA	48	32,860	NA	32,760	14	86	57	57	174	NA	NA	37	137
1968	88,364	53,365	10,415	3,958	NA	38,533	391	68	42	NA	NA	NA	42	34,714	NA	34,605	22	88	51	51	191	NA	NA	49	142
1969	88,916	51,354	10,512	4,128	NA	36,212	415	89	37	NA	NA	NA	37	37,286	NA	37,166	26	94	41	41	198	NA	NA	52	146
1970	83,834	46,474	11,184	3,911	NA	30,869	414	97	32	NA	NA	NA	32	37,095	NA	36,981	25	89	35	35	198	NA	NA	50	149
1971	82,018	45,069	11,656	3,962	NA	29,072	325	54	37	NA	NA	NA	37	36,675	NA	36,567	19	90	41	41	196	NA	NA	40	156
1972	84,697	45,824	11,926	3,897	NA	29,521	282	197	56	NA	NA	NA	56	38,557	NA	38,455	16	86	61	61	199	NA	NA	41	158
1973	86,522	44,171	11,383	3,684	NA	28,364	302	437	75	NA	NA	NA	75	41,975	NA	41,867	21	86	86	86	216	NA	NA	54	163
1974	84,522	41,296	10,870	3,862	NA	25,757	293	515	79	NA	NA	NA	79	42,827	NA	42,717	26	85	96	96	225	NA	NA	59	166
1975	81,677	39,543	10,395	3,968	NA	24,400	297	484	80	NA	NA	NA	80	41,729	NA	41,616	29	84	99	99	226	NA	NA	58	169
1976	85,529	41,035	10,132	4,482	NA	25,646	339	435	82	NA	NA	NA	82	44,074	NA	43,949	39	86	106	106	232	NA	NA	55	178
1977	88,815	42,223	10,234	4,553	NA	26,564	491	382	89	NA	NA	NA	89	46,129	NA	45,994	47	88	129	129	245	NA	NA	59	186
1978	93,140	43,137	11,026	4,752	NA	26,260	761	338	96	NA	NA	NA	96	49,498	NA	49,365	43	89	147	147	263	NA	NA	70	193
1979	98,162	44,488	10,922	4,855	NA	27,384	932	396	95	NA	NA	NA	95	53,151	NA	53,020	43	89	155	155	274	NA	NA	76	198
1980	103,496	44,670	10,344	5,103	NA	27,830	919	475	97	NA	NA	NA	97	58,278	NA	58,141	49	88	172	172	279	NA	NA	78	201

TABLE 9

U.S. experimental development expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
1981	107,446	46,969	10,512	5,047	NA	29,680	895	835	101	NA	NA	NA	101	59,906	NA	59,764	55	87	185	185	285	NA	NA	81	204
1982	113,373	48,782	11,316	4,742	NA	31,064	869	792	100	NA	NA	NA	100	64,000	NA	63,853	58	88	193	193	299	NA	NA	85	214
1983	121,493	52,279	12,840	5,016	NA	32,643	840	940	99	NA	NA	NA	99	68,593	NA	68,436	65	92	205	205	318	NA	NA	90	228
1984	134,899	57,482	14,367	5,221	NA	35,805	882	1,207	104	NA	NA	NA	104	76,755	NA	76,584	75	96	219	219	339	NA	NA	94	245
1985	146,621	63,559	15,761	5,717	NA	39,858	956	1,267	113	NA	NA	NA	113	82,353	NA	82,167	85	101	236	236	360	NA	NA	97	263
1986	146,301	65,562	15,959	5,982	NA	41,499	990	1,131	126	NA	NA	NA	126	79,962	NA	79,759	97	107	263	263	388	NA	NA	102	287
1987	150,429	69,054	15,387	6,250	NA	45,399	1,127	892	138	NA	NA	NA	138	80,521	NA	80,301	107	112	292	292	424	NA	NA	114	311
1988	153,736	67,781	16,114	6,538	NA	43,119	1,269	741	150	NA	NA	NA	150	85,015	NA	84,777	120	117	326	326	463	NA	NA	130	333
1989	153,456	61,786	16,366	6,359	NA	36,822	1,353	887	160	NA	NA	NA	160	90,653	NA	90,398	133	122	358	358	498	NA	NA	142	356
1990	158,618	57,093	16,357	6,177	NA	31,981	1,534	1,044	168	NA	NA	NA	168	100,445	NA	100,178	140	127	382	382	531	NA	NA	150	381
1991	155,121	50,922	14,317	5,631	NA	28,145	1,650	1,178	168	NA	NA	NA	168	103,079	NA	102,805	140	133	391	391	563	NA	NA	153	409
1992	159,169	50,256	14,508	5,459	NA	27,399	1,682	1,209	168	NA	NA	NA	168	107,750	NA	107,464	145	140	392	392	603	NA	NA	159	444
1993	155,319	46,818	14,131	4,652	NA	25,054	1,756	1,225	170	NA	NA	NA	170	107,279	NA	106,979	152	148	404	404	649	NA	NA	167	482
1994	157,003	46,073	13,457	4,800	NA	24,722	1,850	1,243	173	NA	NA	NA	173	109,642	NA	109,329	155	157	420	420	694	NA	NA	170	524
1995	168,929	48,457	13,837	5,120	NA	26,627	1,762	1,111	183	NA	NA	NA	183	119,121	NA	118,792	162	166	430	430	739	NA	NA	169	570
1996	178,066	46,026	13,252	5,059	NA	25,037	1,655	1,023	188	NA	NA	NA	188	130,614	NA	130,269	169	176	448	448	789	NA	NA	168	621
1997	185,551	46,518	13,090	4,803	NA	26,133	1,502	990	174	NA	NA	NA	174	137,482	NA	137,096	163	223	442	442	935	NA	NA	161	774
1998	206,320	46,612	13,141	4,727	NA	26,315	1,345	1,084	161	NA	NA	NA	161	158,110	NA	157,716	159	234	436	436	1,001	NA	NA	157	844
1999	217,005	43,009	13,029	4,690	NA	23,303	965	1,022	165	NA	NA	NA	165	172,307	NA	171,893	163	250	457	457	1,067	NA	NA	166	901
2000	232,958	37,805	12,894	4,788	NA	18,577	749	797	168	NA	NA	NA	168	193,266	NA	192,835	163	268	484	484	1,234	NA	NA	174	1,060
2001	225,895	38,582	14,876	4,796	NA	16,867	869	1,175	178	5	NA	NA	173	185,246	33	184,791	158	265	512	512	1,377	50	NA	183	1,143
2002	234,351	39,991	15,626	4,983	NA	17,296	846	1,240	189	4	NA	NA	185	192,078	18	191,653	154	253	563	563	1,530	37	NA	200	1,293
2003	227,980	39,204	16,422	5,148	NA	15,504	1,165	965	205	3	NA	NA	202	186,274	12	185,856	153	254	606	606	1,690	22	NA	211	1,457
2004	223,871	43,162	16,119	5,632	NA	18,234	1,532	1,645	208	4	NA	NA	204	178,240	16	177,821	151	252	608	608	1,653	22	NA	211	1,420
2005	239,860	44,723	17,159	5,654	NA	19,020	1,406	1,484	200	7	NA	NA	194	192,571	29	192,133	150	260	614	614	1,752	37	NA	208	1,506
2006	253,184	46,256	19,138	5,408	3	19,888	1,102	717	199	8	6	NA	186	204,325	42	203,864	150	269	618	618	1,786	49	NA	206	1,531
2007	263,743	45,603	20,864	5,833	4	17,209	1,036	657	205	9	7	NA	189	215,387	49	214,905	154	278	626	626	1,922	59	NA	216	1,648
2008	294,933	61,968	19,959	6,906	5	33,504	956	639	474	8	8	254	203	229,339	51	228,836	168	284	669	669	2,484	53	375	237	1,818
2009	289,021	63,154	19,474	6,941	6	34,368	1,745	621	501	9	10	162	319	221,526	44	220,893	318	272	1,007	1,007	2,833	51	408	408	1,965
2010	280,301	63,523	21,023	7,708	7	31,338	2,736	711	593	12	11	127	443	211,465	44	210,695	455	270	1,323	1,323	3,397	50	722	556	2,069
2011	296,022	63,717	23,917	7,418	7	28,670	2,842	864	697	7	11	251	428	227,084	45	226,304	455	280	1,399	1,399	3,125	42	441	569	2,073
2012	293,051	59,626	21,400	7,117	7	27,730	2,818	556	525	11	10	110	395	228,258	46	227,451	478	283	1,561	1,561	3,080	43	333	621	2,083
2013	302,835	54,393	20,858	6,935	6	23,359	2,735	500	561	12	9	133	408	242,718	52	241,861	510	295	1,679	1,679	3,483	38	561	653	2,232
2014	312,631	49,872	21,056	6,929	6	18,736	2,657	489	519	7	8	90	414	256,678	60	255,755	557	307	1,790	1,790	3,771	37	647	717	2,369

TABLE 9

U.S. experimental development expenditures, by source of funds and performing sector: 1953–2023

(Millions of current and of constant 2017 dollars)

Year	All funding sources	Federal							Nonfederal government					Business					Higher education		NPOs				
	All performers	Total	Federal intramural	FFRDC	Nonfederal government	Business	Higher education	NPO	Total	FFRDC	Nonfederal government	Business	Higher education	Total	FFRDC	Business	Higher education	NPO	Total	Higher education	Total	FFRDC	Business	Higher education	NPO
2015	321,615	49,153	19,484	7,258	6	19,370	2,602	434	518	6	8	92	412	265,891	63	264,942	570	316	1,901	1,901	4,152	43	808	795	2,507
2016	330,545	43,987	16,122	7,612	7	17,090	2,626	529	671	8	11	132	427	279,862	65	278,832	572	392	2,057	1,992	3,969	51	773	876	2,268
2017	350,115	44,910	15,848	8,021	9	17,736	2,670	626	651	11	12	92	447	298,819	64	297,747	607	400	2,149	2,091	3,586	51	560	927	2,047
2018	379,120	47,419	18,433	8,375	9	16,914	2,733	955	670	15	12	83	474	325,296	63	324,210	611	411	2,195	2,142	3,540	53	731	889	1,867
2019	413,824	47,196	20,440	8,619	13	14,482	2,956	687	699	16	15	107	472	360,451	57	359,333	609	451	2,177	2,126	3,301	53	593	840	1,814
2020	448,452	55,651	21,219	8,902	18	20,564	3,217	1,732	723	14	21	128	466	386,591	59	385,400	625	506	2,201	2,151	3,287	55	587	837	1,807
2021	477,783	52,545	21,537	8,999	18	16,965	3,310	1,715	745	14	20	191	454	418,458	66	417,147	653	591	2,259	2,204	3,778	55	537	826	2,358
2022[a]	508,326	54,477	20,415	8,934	16	20,527	3,427	1,159	677	11	18	129	444	447,258	64	445,851	694	649	2,350	2,271	3,563	48	522	832	2,160
2023[b]	516,045	54,519	19,336	9,364	16	21,067	3,612	1,125	696	10	18	133	463	454,768	61	453,337	740	630	2,488	2,411	3,573	48	542	887	2,096

NA = not available.

FFRDC = federally funded research and development center; NPO = nonprofit organization.

[a] Some data for 2022 are preliminary and may be revised later.
[b] The data for 2023 include estimates and are likely to be revised later.

Note(s):
This table reaggregates the R&D performer data in table 5 according to major categories of R&D funding: federal government, nonfederal government (state and local), business, higher education, and NPOs. Business sources of R&D funding in this table include the own funds of domestic R&D-performing businesses, funds from other domestic businesses, and funds from foreign businesses. For further detail on the R&D performers listed, see table 2, footnotes a–f. For detail on type-of-R&D data, see table 3, footnotes b–f. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised. Data are based on reports by performers in the National Center for Science and Engineering Statistics annual surveys on R&D expenditures: Business Enterprise Research and Development Survey, Annual Business Survey, Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—were collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. (See also table 5, general notes.)

Source(s):
National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

TABLE 10

U.S. R&D expenditures, by state, performing sector, and source of funds: 2022

(Millions of current dollars)

State	R&D Rank[d]	All performers	Federal	FFRDCs			Business				Higher education[a]							NPOs	State, internal[b]	GDP	GDP rank	R&D intensity[c,d]	
		All funding sources	Federal	Total	Federal	Nonfederal[e]	Total	Own	Paid by others		Total	Federal	Other government	Business	Higher education	NPO	Other	Total	Total			Percent	Rank
									Nonfederal[f]	Federal													
U.S. total[g]	na	891,834	44,699	26,834	26,424	410	697,256	612,456	52,479	32,321	94,275	49,059	4,945	5,590	26,121	5,852	2,709	28,052	719	26,006,893	na	3.43	na
States total[h]	na	884,787	41,196	26,524	25,962	562	690,782	607,353	51,811	31,618	97,537	53,861	4,903	5,697	24,470	5,973	2,633	28,052	697	25,859,145	na	3.42	na
Alabama	25	8,415	1,967	0	0	0	4,907	2,259	101	2,548	1,431	779	69	87	437	41	18	98	12	284,949	27	2.95	16
Alaska	49	541	75	0	0	0	211	189	8	13	227	172	3	5	43	2	2	16	12	66,272	49	0.82	46
Arizona	19	12,357	135	82	79	2	10,261	8,250	778	1,233	1,691	730	137	51	552	92	128	187	2	484,052	18	2.55	20
Arkansas	43	1,117	53	0	0	0	604	545	46	13	417	175	70	16	136	12	8	43	*	168,606	34	0.66	48
California	1	260,179	2,530	6,842	6,737	106	235,556	220,081	8,429	7,046	12,108	6,587	464	813	2,482	1,245	517	3,055	88	3,660,416	1	7.11	4
Colorado	15	14,062	426	825	742	84	10,496	8,135	379	1,982	1,899	1,408	72	89	185	93	52	406	9	494,673	15	2.84	19
Connecticut	18	13,232	58	0	0	0	11,443	9,037	213	2,193	1,587	932	7	88	460	91	9	116	28	321,686	23	4.11	10
Delaware	30	4,971	29	0	0	0	4,544	2,874	1,665	5	397	219	12	6	146	6	8	D	2	92,558	43	5.37	6
District of Columbia[i]	24	8,787	5,795	11	11	0	1,007	881	39	87	783	385	7	25	219	105	43	1,187	4	165,768	36	5.30	7
Florida	13	15,926	799	0	0	0	11,509	8,746	935	1,828	3,048	1,490	284	112	1,002	111	49	518	51	1,465,281	4	1.09	42
Georgia	20	12,254	226	0	0	0	8,666	7,684	875	107	3,260	1,969	184	173	783	133	19	99	3	779,684	8	1.57	34
Hawaii	45	881	63	0	0	0	491	447	9	35	301	190	18	3	77	13	1	26	*	103,153	41	0.85	44
Idaho	33	3,837	66	638	630	7	2,932	2,883	43	6	180	97	41	3	33	2	4	14	7	112,290	39	3.42	13
Illinois	11	23,332	267	1,293	1,264	29	18,061	16,785	1,134	142	3,161	1,943	42	198	758	181	39	550	1	1,040,353	5	2.24	24
Indiana	17	13,712	327	0	0	0	11,493	9,943	1,418	132	1,872	878	46	122	628	120	78	19	1	473,493	19	2.90	18
Iowa	29	5,103	91	39	38	*	3,956	3,257	693	6	1,006	508	44	51	365	37	1	8	3	242,753	31	2.10	28
Kansas	31	4,039	149	0	0	0	2,996	2,219	763	14	883	376	90	159	222	20	15	9	2	212,612	33	1.90	30
Kentucky	38	1,844	49	0	0	0	1,053	925	113	15	733	386	50	23	207	22	45	5	4	261,541	28	0.71	47
Louisiana	40	1,687	60	0	0	0	604	530	36	39	942	405	94	105	285	28	24	71	10	298,425	26	0.57	49
Maine	42	1,182	14	0	0	0	656	597	15	45	192	95	22	4	64	4	2	309	12	86,493	44	1.37	35
Maryland	7	29,224	12,684	1,265	1,265	*	8,591	5,843	809	1,938	5,169	4,056	99	158	620	219	18	1,515	1	484,908	17	6.03	5
Massachusetts	2	63,050	644	2,043	2,017	26	49,732	43,311	4,261	2,160	4,837	2,705	50	321	1,112	477	172	5,792	2	695,612	12	9.06	1
Michigan	6	29,475	401	0	0	0	25,790	23,381	2,258	150	3,082	1,611	62	138	1,110	120	42	201	*	627,009	14	4.70	8
Minnesota	21	11,295	73	0	0	0	8,537	8,141	254	142	1,242	663	80	53	364	47	35	1,440	3	454,993	20	2.48	22
Mississippi	39	1,690	590	0	0	0	532	442	46	45	565	298	109	7	137	13	2	1	3	142,762	37	1.18	39
Missouri	27	7,453	137	0	0	0	5,478	4,914	265	299	1,708	992	40	150	399	113	14	125	4	400,265	22	1.86	31
Montana	46	851	94	0	0	0	404	376	15	12	341	198	25	3	106	5	4	9	3	68,702	48	1.24	38
Nebraska	36	2,206	52	0	0	0	1,459	1,395	50	14	627	283	80	30	190	22	22	66	2	167,480	35	1.32	36
Nevada	37	2,201	63	0	0	0	1,811	1,471	316	24	313	131	10	6	149	7	10	15	*	227,321	32	0.97	43
New Hampshire	32	3,902	11	0	0	0	3,293	1,449	403	1,441	551	286	5	12	213	25	9	46	*	106,488	40	3.66	12
New Jersey	8	29,167	708	120	120	1	26,511	20,144	5,692	674	1,517	734	117	69	373	162	62	307	3	758,289	9	3.85	11

TABLE 10

U.S. R&D expenditures, by state, performing sector, and source of funds: 2022

(Millions of current dollars)

State	R&D Rank[d]	All performers	Federal	FFRDCs			Business				Higher education[a]							NPOs	State, internal[b]	GDP	GDP rank	R&D intensity[c,d]	
		All funding sources	Federal	Total	Federal	Nonfederal[e]	Total	Own	Paid by others		Total	Federal	Other government	Business	Higher education	NPO	Other	Total	Total			Percent	Rank
									Nonfederal[f]	Federal													
New Mexico	22	10,812	777	7,623	7,410	213	1,844	1,514	36	294	544	378	40	10	87	20	8	23	1	128,139	38	8.44	2
New York	4	44,935	238	656	640	16	32,196	29,915	1,765	517	8,280	4,447	341	588	1,965	588	352	3,290	275	2,052,759	3	2.19	26
North Carolina	12	22,014	382	0	0	0	16,541	11,503	4,866	172	3,871	2,320	199	343	748	212	49	1,202	18	728,499	11	3.02	14
North Dakota	47	844	48	0	0	0	472	454	16	2	323	108	77	15	115	2	6	1	*	73,780	45	1.14	40
Ohio	10	24,229	5,805	0	0	0	13,759	10,501	2,465	793	3,080	1,801	93	213	790	125	59	1,584	1	832,661	7	2.91	17
Oklahoma	35	2,776	132	0	0	0	1,893	1,820	35	38	651	281	51	33	266	15	4	98	2	245,976	30	1.13	41
Oregon	16	13,869	143	0	0	0	12,678	12,426	187	66	1,001	674	61	54	143	54	16	31	17	298,848	25	4.64	9
Pennsylvania	9	27,402	443	129	129	0	20,624	17,151	3,040	433	5,455	3,123	120	370	1,434	290	119	737	13	919,741	6	2.98	15
Rhode Island	41	1,556	327	0	0	0	635	594	21	19	459	321	11	6	82	33	7	130	5	72,869	46	2.14	27
South Carolina	34	3,832	167	183	180	3	2,616	2,319	180	117	806	409	45	43	274	23	12	31	30	301,945	24	1.27	37
South Dakota	50	367	24	0	0	0	213	201	10	2	117	58	20	2	22	3	12	13	*	69,069	47	0.53	50
Tennessee	26	7,951	359	1,804	1,789	14	3,473	2,147	1,252	74	1,715	958	42	98	549	53	15	600	*	488,670	16	1.63	33
Texas	5	40,726	600	4	4	1	31,365	26,151	2,715	2,499	7,440	3,106	972	531	2,101	431	300	1,314	2	2,436,925	2	1.67	32
Utah	28	5,442	334	0	0	0	4,019	3,748	212	59	1,062	681	27	54	257	34	10	20	6	261,081	29	2.08	29
Vermont	44	910	13	0	0	0	676	614	18	44	219	119	1	3	82	7	5	1	1	41,012	51	2.22	25
Virginia	14	15,565	2,218	1,662	1,631	31	8,766	6,451	647	1,668	2,117	970	147	95	722	99	85	786	16	666,682	13	2.33	23
Washington	3	62,521	399	1,295	1,266	28	57,295	55,718	1,224	353	1,972	1,296	77	70	230	250	49	1,536	25	742,910	10	8.42	3
West Virginia[j]	48	817	59	11	10	*	467	444	10	14	248	119	13	5	88	4	18	28	4	98,290	42	0.83	45
Wisconsin	23	9,991	62	0	0	0	7,585	6,470	1,050	64	1,966	944	131	81	600	159	52	372	5	400,621	21	2.49	21
Wyoming	51	252	28	0	0	0	81	78	1	2	140	69	6	4	58	2	1	1	2	49,783	50	0.51	51
U.S. undistributed[k]	na	4,537	3,772	0	0	0	765	703	53	9	0	0	0	0	0	0	0	0	0	0	na	na	na
Puerto Rico	na	414	28	0	0	0	271	248	NA	NA	103	74	2	5	21	1	*	0	11	113,188	na	NA	na
Other[l]	na	56	15	0	0	0	0	0	0	0	41	36	3	*	1	*	0	0	na	13,311	na	na	na

* amount < $0.5 million; D = suppressed for data quality or to avoid disclosing confidential information; na = not applicable; NA = not available.

FFRDC = federally funded research and development center; GDP = gross domestic product; NPO = nonprofit organization.

[a] State-level higher education R&D data have not been adjusted to eliminate the double counting of funds passed through from an academic institution to subrecipients (other academic institutions, businesses, NPOs, and others). At the national level, funds passed through to such subrecipients accounted for 9% of total R&D expenditures reported by higher education institutions in FY 2022.

[b] Internal performers include state agency and department employees and services performed by others in support of an internal R&D project.

[c] R&D intensity is the ratio of total R&D performed in a state to its state GDP.

[d] Ranks are based on the point estimates for state R&D and do not consider sampling error, suppression, or the undistributed R&D.

[e] Nonfederal sources of R&D expenditures reported by FFRDCs in FY 2022 included state and local governments, businesses, NPOs, and other sources.

[f] R&D paid for by nonfederal sources included funding from other companies located inside or outside the United States; U.S. state government agencies; U.S. universities, colleges, and academic researchers; foreign universities, colleges, and academic researchers; and organizations located inside or outside the United States.

[g] U.S. R&D totals as reported by the NCSES *National Patterns of R&D Resources* series, 2022–23 edition. (See tables 1–9 in this report.)

[h] The states totals differ from U.S. totals for several reasons: (1) some R&D expenditures cannot be allocated to any 1 of the 50 states or the District of Columbia; (2) data are not available to allocate the portion of business R&D performed by companies with fewer than 10 employees ($5.7 billion in 2022) by state; (3) the state-level higher education data have not been adjusted to eliminate the double counting of funds passed through to other performers; (4) state-level R&D data are not converted from fiscal years to calendar years, and (5) some state-level data are suppressed for data quality or to avoid disclosing confidential information.

[i] Federal total excludes $25.8 billion in federally funded R&D performed by others.

[j] FFRDC performance in West Virginia represents Green Bank Observatory. While Green Bank Observatory was split from the National Radio Astronomy Observatory on 1 October 2016, with each retaining FFRDC status, Green Bank Observatory was separately measured for the first time in FY 2021.

[k] R&D expenditures that could not be assigned to any of the 50 states or the District of Columbia.

[l] GDP and R&D expenditures reported for outlying areas (Guam, U.S. Virgin Islands, American Samoa) and offices abroad but excluding Puerto Rico.

Note(s):
Business R&D data refer to calendar years; the data for the other R&D performers refer to fiscal years but are used here as approximations to calendar year data.

Source(s):
State GDP data from Bureau of Economic Analysis, GDP BY State, https://www.bea.gov/data/gdp/gdp-state, accessed 15 October 2024; R&D data from National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

Technical Notes

Overview of 2022–23 Data Update

National Patterns of R&D Resources provides current data on the levels and key trends of the performance and funding of R&D in the United States, with comparisons to the historical record (back to 1953). Detail is also provided for the U.S. total and by performer according to the types of R&D conducted (i.e., basic research, applied research, and experimental development).

The National Center for Science and Engineering Statistics (NCSES) has reviewed this product for unauthorized disclosure of confidential information and approved its release (NCSES-DRN25-009).

Key Information on Publication Series

Report frequency. Reports in this series are typically published annually.

Current reference period. Data from 1953 to 2023 are provided for almost all variables. The data for 2023 are estimates and not previously reported in this series. The data for 2022 are revised from the previous edition (2021–22) of this series. The data for 1953–2021 reflect final survey data but may still include some further (typically minor) revisions.

Survey Data Sources for National Patterns

The *National Patterns* statistics draw primarily from NCSES's annual national surveys of the R&D expenditures and funding of the organizations that perform the bulk of U.S. R&D. These organizations include the business sector, federal and nonfederal government, higher education, and nonprofit organizations. Each of these sectors is summarized—including links to other sections of the NCSES website with specifics on survey coverage, variables collected, and survey or sampling implementation—in the sections below.

Business Sector

For 2019–23, annual data on the R&D performed in the domestic United States by the business sector come from the NCSES **Business Enterprise Research and Development (BERD) Survey**, covering companies with 10 or more employees, and the **Annual Business Survey (ABS)**, covering companies with 9 or fewer employees. BERD and ABS are conducted for NCSES by the Census Bureau in accordance with an agreement between the two agencies. BERD is a sample survey representing for-profit, publicly or privately held companies with 10 or more employees in the United States that performed or funded R&D either domestically or abroad in the manufacturing, mining, utilities, wholesale trade, transportation, information, or services industries. ABS is a sample survey of for-profit employer companies with a U.S. presence engaged in the mining, utilities, construction, manufacturing, wholesale trade, retail trade, or services industries. For the R&D statistics presented in this report, the ABS covers only businesses in the manufacturing, wholesale, and information sectors and the scientific R&D services industries with 1–9 employees.

The 2023 estimated business R&D expenditures in this report are based on 2023 projected R&D reported on 2022 BERD Survey, preliminary information from the 2023 BERD Survey, and trends for business R&D performance. Some of the variation in BERD R&D estimates across survey years is due to changes in individual respondent reporting practices. During the 2023 BERD data collection, some respondents revised their reporting practices and eliminated expenditures that did not meet the BERD definition of R&D. This is expected to result in a meaningful decrease in estimated U.S. R&D performance compared to prior reporting patterns. The estimated 2023 business R&D expenditures reported here are adjusted to this lower and more accurate R&D expenditure amount. This change has affected the comparability of these estimates to those published for years prior to 2023.

For 2017 and 2018, the source of the data for companies with 10 or more employees was the Business R&D Survey (BRDS), a predecessor to the BERD Survey, with similar survey characteristics and coverage. ABS was again the source of data on companies with 9 or fewer employees in both of these years.

From 2008 to 2016, the primary source data on business R&D was the NCSES Business R&D and Innovation Survey (BRDIS), a predecessor of both BERD and BRDS. In a salient difference, BRDIS was designed to be nationally representative of all for-profit companies with 5 or more employees. In 2016, a companion survey, the **Business R&D and Innovation Survey–Microbusiness (BRDI-M)**, provided statistics on the R&D activities that year of businesses with 1–4 employees. Prior to the 2016 data year, statistics on the R&D of these "micro" businesses (typically less than $3 billion annually) were neither available nor reported in the business R&D totals in *National Patterns*.

As noted, BERD, BRDS, and BRDIS are related surveys. With regard to R&D, the topical coverage has been similar: R&D performance (in the United States and worldwide); total and R&D employment (in the United States and worldwide); sources of R&D funding; type of R&D activities (basic research, applied research, development); type of R&D costs; R&D capital expenditures; R&D application and technology focus areas; geographic location (within the United States and in foreign countries); sales (in the United States and worldwide); and patenting, licensing, other technology transfer activities. The ABS and BRDI-M Survey provided R&D performance and funding data compatible with those for the larger companies.

For 2007 and earlier years, the data come from the NCSES Survey of Industrial Research and Development (SIRD), the predecessor to BRDIS. SIRD was also a sample survey, conducted annually (1953–2007), that provided national estimates of the R&D performed within the United States by industrial firms, whether U.S. or foreign-owned. The SIRD target population consisted (same as BRDIS) of all for-profit companies with 5 or more employees, manufacturing and nonmanufacturing, that performed R&D in the United States. Data on the R&D of companies with fewer than 5 employees were not available throughout this period.

(Note: Data on business intramural R&D capital, as reported by BRDIS and its follow-on surveys, are not included as a component in the *National Patterns* total of business intramural R&D.)

Federal Government

Federal intramural R&D. Data on the intramural R&D performed by the federal government come from the NCSES **Survey of Federal Funds for Research and Development** (Federal Funds Survey), which is completed annually by all federal agencies conducting R&D programs (approximately 33 federal departments or independent agencies). The Federal Funds Survey data provide intramural R&D totals as outlays and obligations on a federal fiscal year basis. The obligations data are further detailed by federal agency, performer, type of R&D, geographical area, and field of science or engineering. (Note: Data on federal intramural R&D plant reported by the Federal Funds Survey are not included as a component in the *National Patterns* total of federal intramural R&D.)

Federally funded R&D centers (FFRDCs). The nation's FFRDCs are a second venue of federal R&D performance. (Currently, there are 42 FFRDCs, although the number can change from year to year; NCSES maintains a **Master Government List of the population of FFRDCs**, which it regularly updates.) FFRDCs are R&D-performing organizations administered by an industrial firm, a university, a nonprofit institution, or a consortium but that have funding exclusively or substantially from the federal government. An FFRDC is operated to provide R&D capability to serve an agency's mission objectives or, in some cases, to provide major facilities at universities for research and training purposes. Since FY 2001, NCSES's **FFRDC Research and Development Survey** (known previously as the Survey of Research and Development Expenditures at FFRDCs) has provided annual data (by federal fiscal year) on the R&D expenditures (with additional detail) of all the nation's FFRDCs. Prior to FY 2001, R&D expenditure data for the FFRDCs were collected as part of the major performer surveys: the Survey of R&D Expenditures at Universities and Colleges (for university-administered FFRDCs), the SIRD (for industry-administered FFRDCs), and the Federal Funds Survey (for nonprofit-administered FFRDCs).

Nonfederal Government

The category of nonfederal government R&D performance included in *National Patterns* is the intramural R&D of state governments (i.e., the R&D performance of state agency and department employees and the services performed by others in support of internal R&D projects). Data on this state intramural R&D come from the NCSES **Survey of State Government Research and Development**. This state survey is a comparatively recent NCSES initiative, with the first data year in FY 2006.

In addition, the BERD, FFRDC, and **Higher Education Research and Development (HERD)** Surveys (see sections above and below) provide detail on R&D funding by nonfederal governments other than just state governments.

Higher Education Institutions

For academic FY 2010 and onward, data on the R&D performed in higher education come from the NCSES **HERD Survey**. HERD is an annual census of universities and colleges that grant a bachelor's degree or higher and expend at least $150,000 in separately accounted-for R&D during the fiscal year of these academic institutions. The survey collects information on R&D expenditures by field of research, source of funds, and type of R&D, as well as on head counts of R&D personnel.

The HERD Survey replaced the earlier **Survey of Research and Development Expenditures at Universities and Colleges**. For data years FY 2009 and earlier, the Universities and Colleges Survey provides the data on academic R&D.

Nonprofit Organizations

This sector refers to R&D performed in the United States by nonprofit organizations other than government or academia. The most recent data on nonprofit organization R&D come from the NCSES FY 2022 **Nonprofit Research Activities (NPRA) module of the Annual Business Survey** and the 2016 NPRA Survey. Data for 2017–19 are estimated based on the 2016 NPRA Survey and NPRA 2022 Survey revisions to 2020 data. The 1998–2015 data for nonprofit organization R&D funded by the federal government come from the NCSES annual Survey of Federal Funds for Research and Development; data for nonprofit organization R&D funded by businesses and by the nonprofit sector itself for that period are estimated based on parameters from the 1996–97 **Survey of Research and Development Funding and Performance by Nonprofit Organizations**, which was also conducted in 1973. Data for years prior to 1973 come from earlier *National Patterns* reports (which reflect, in part, surveys in 1957 and 1960).

Statistics on the U.S. Economy

Some of the trend analyses in *National Patterns* draw on National Income and Product Accounts data (e.g., U.S. gross domestic product [GDP], state domestic product) assembled by the U.S. Bureau of Economic Activity (BEA). For details on this U.S. economic data, see **https://www.bea.gov/data/gdp**.

In keeping with international conventions, U.S. R&D expenditures in current dollars are adjusted for inflation based on BEA's implicit GDP price deflator.

Methodology

The *National Patterns* statistical picture of the U.S. R&D system is developed from integration of primary data from NCSES sectoral R&D surveys. Adjustments to the primary data are needed in some cases to increase their consistency. Furthermore, preliminary or otherwise estimated values may be used (and later revised) where final data from one or more of the surveys are not yet available but can reasonably be approximated.

Key features of the methodology include the following:

- Data from the NCSES business R&D surveys (BERD, BRDS, BRDIS, ABS, BRDI-M, SIRD) have been reported on a calendar year basis and are incorporated directly in the *National Patterns* totals. Data from the Federal Funds Survey and the FFRDC Research and Development Survey are reported on a federal fiscal year basis (1 October–30 September the next year) and are adjusted to the calendar year for *National Patterns* integration. The data from the HERD Survey are reported on an academic fiscal year basis (typically, 1 July–30 June the next year) and converted to calendar year. Data from the Survey of State Government R&D are reported according to each state's fiscal year and are also converted to calendar year (presuming that 1 July–30 June the next year is typical).
- NCSES annual surveys of business R&D (particularly BRDIS and SIRD) had long covered the population of private sector companies with 5 or more employees. Inclusion of the BRDI-M data in the *National Patterns* data on business R&D totals in 2016 expanded the covered population to include companies with 1–4 employees, thereby adding $4.8 billion of R&D to the total reported by BRDIS. BRDS data in 2017 and 2018 and subsequently BERD data from 2019 on covered the population of companies with 10 or more employees. Starting in 2017, ABS data covered companies with 1–9 employees in the *National Patterns* reported business R&D totals, accounting for $5.7 billion in 2017 and $6.1 billion in 2021.
- The method for estimating the type of R&D (i.e., basic research, applied research, experimental development) in the business sector was revised for 1998 and later years. This change resulted in a net decrease in the proportion of business R&D classified as basic research. Accordingly, data for 1998 and later years are not directly comparable with data for 1997 and earlier years. The transition to BRDIS (data series starting in 2008) does not appear to have introduced further discontinuities in the type-of-R&D estimates. For universities and colleges, the type-of-R&D estimation method was revised in 1998 and again in 2010. Hence, the latest data for higher education are also not directly comparable to those reported in earlier years.
- Estimates of the type of R&D by source of funding are based on survey responses for federal funding by type of R&D and modeled using nonfederal funding sources of total R&D and the total nonfederally funded R&D by type. Because of this estimation procedure, comparisons of R&D type by funding source are not supported by statistical testing. *National Patterns of R&D* uses the general term "estimates" to describe survey estimates, modeled estimates, and projections. Results that combine these techniques are also called estimates because survey estimates are their major component.
- The data for higher education in 2003 and later years include both science and engineering (S&E) and non-S&E fields. Prior to 2003, only S&E fields are included. Non-S&E R&D was $1.4 billion in FY 2003 and $5.9 billion in FY 2022. Similarly, for the business sector, social science R&D was not included until the 2008 data year, when it was $0.8 billion of the $290.7 billion business R&D total.
- The data for higher education R&D have included, since 1998, a net-out adjustment for R&D funds reported by academic institutions as passed through to other academic subrecipients. This adjustment was recently expanded (back to 1998) to also include pass-throughs to all noneducational recipients (i.e., businesses, nonprofit organizations, and others). The effect of this expanded adjustment is that the annual totals of higher education R&D performance are about $0.4 billion lower in 1998, the first year for this adjustment, to about $2.5 billion lower annually in 2012–15 than previously have been reported in *National Patterns.* In addition, for the 2010–23 survey years, this more comprehensive pass-through funding adjustment has been further improved by tabulating the adjustments on an institution-by-institution basis, which allows for a more precise estimate of the original nonfederal sources of pass-through funds and better estimation of the type of R&D (basic, applied, or experimental development) being passed through to other R&D performers.

- Data on federally funded R&D discussed in this report were derived from surveys of organizations that perform R&D, such as companies, universities, and FFRDCs. In the past, these amounts differed substantially from the R&D that federal agencies had reported funding. For example, in 2009, federal agencies reported obligating $141 billion for R&D funding to all R&D performers (including $53 billion to the business sector), compared with an estimated $127 billion in federal funding reported by all performers of R&D that year ($40 billion by businesses). More recently, with improvements in the methods for the survey of federal funding and adoption of revised R&D definitions, this effect has become less apparent.
- From 2016 forward, the data on federal intramural R&D explicitly exclude expenditures for pre-production development. (Pre-production development is nonexperimental work on a product or system before it goes into full production, e.g., activities and programs that are categorized as operational system development in the Department of Defense's Research, Development, Test and Evaluation [RDT&E] budget activity structure.) This change aligns the federal intramural data with a recent change introduced in the definition of R&D by the U.S. Office of Management and Budget. In FYs 2016–18, pre-production development for federal intramural R&D totaled between $5 billion and $7 billion each year.

Additional details on methodology and technical issues pertaining to specific variables are provided in the notes on each table. For further information about compiling the *National Patterns* statistics, contact the report's author.

Definitions

R&D performers and funders. The U.S. R&D system consists of the R&D activities of differing performers and sources of funding for these activities. The main categories of R&D performers tracked by NCSES are businesses; federal agencies; FFRDCs (administered by businesses, universities, or nonprofit organizations); nonfederal government agencies (specifically those of the 50 states and the District of Columbia); higher education; and nonprofit organizations. For R&D funding, the main categories are businesses; the federal government; nonfederal government (state, regional, local); higher education; and nonprofit organizations. Organizations that perform R&D often receive significant levels of outside funding; R&D funders may also be significant performers.

Type of R&D. As defined by the Organisation for Economic Co-operation and Development's *Frascati Manual* (in seven editions since the early 1960s), R&D spans three main types of activities:

> *Basic research*: Experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.
>
> *Applied research*: Original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective.
>
> *Experimental development*: Systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or improving existing products or processes.[1]

Note(s)

1 Organisation for Economic Co-operation and Development (OECD). 2015. *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development*. Page 45. Paris: OECD Publishing. Available at https://www.oecd.org/publications/frascati-manual-2015-9789264239012-en.htm.

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Correction(s)

13 February 2026: The General Notes on the comparability of R&D expenditure estimates from the Business Enterprise R&D Survey have been revised for clarity.

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