National Patterns of R&D Resources: 2018–19 Data Update

Detailed Statistical Tables | NSF 21-325 | April 09, 2021

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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 in the United States. These detailed statistical tables supplement analytical InfoBriefs available at **https://www.nsf.gov/statistics/natlpatterns/**, 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, with comparisons to the historical record for U.S. R&D (back to 1953) and to the corresponding pace of overall U.S. economic growth.

The data for 2019 are "estimates" based mainly on early findings from the 2019 sectoral R&D expenditure surveys and evident recent trends. The data for 2018 were included in the previous edition (2017–18) of this report series but are now revised to reflect new, nearly final input from the sectoral surveys; they are marked "preliminary" because some of the sectoral components still lack final data. The numbers for 1953–2017 reflect mainly final survey data and, in general, exhibit minor revisions (if any).

The statistical tables are arranged to exhibit the U.S. R&D data from two differing perspectives. The first perspective (**table 2**–**table 5**) is by type of R&D performer, with subsequent breakouts by the source of funds. The second perspective (**table 6**–**table 9**) is by source of funds, with subsequent 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 2018.

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.

Data Tables

U.S. gross domestic product and R&D: 1953–2019

Table	Title
1	U.S. gross domestic product, R&D, and ratio of R&D to gross domestic product (and components): 1953–2019

U.S. R&D expenditures

Table	Title
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TABLE 1

U.S. gross domestic product, R&D, and ratio of R&D to gross domestic product (and components): 1953–2019

(Billions of current and of constant 2012 dollars and R&D-to-GDP ratio)

Year	GDP			Total R&D		R&D/GDP (%)							
							R&D, by performer				R&D, by source of funding		
	Current $billions	Constant 2012 $billions	Deflator[a] (2012 = 1.00000)	Current $billions	Constant 2012 $billions	Total	Business	Federal[b]	Higher education	Other[c]	Business	Federal	Other[d]
1953	389.2	2,695.6	0.14438	5.2	35.7	1.33	0.93	0.29	0.07	0.03	0.58	0.71	0.03
1954	390.5	2,680.0	0.14571	5.6	38.6	1.44	1.04	0.29	0.08	0.03	0.61	0.79	0.04
1955	425.5	2,871.2	0.14820	6.2	41.7	1.45	1.04	0.30	0.08	0.03	0.59	0.82	0.04
1956	449.4	2,932.4	0.15325	8.5	55.5	1.89	1.40	0.38	0.09	0.03	0.74	1.11	0.04
1957	474.0	2,994.1	0.15831	9.9	62.6	2.09	1.55	0.42	0.09	0.04	0.73	1.31	0.04
1958	481.2	2,972.0	0.16191	10.9	67.4	2.27	1.68	0.45	0.10	0.04	0.77	1.45	0.05
1959	521.7	3,178.2	0.16415	12.5	76.1	2.39	1.76	0.47	0.11	0.04	0.78	1.57	0.05
1960	542.4	3,260.0	0.16638	13.7	82.4	2.53	1.85	0.50	0.13	0.05	0.83	1.64	0.05
1961	562.2	3,343.5	0.16815	14.6	86.6	2.59	1.84	0.55	0.15	0.05	0.85	1.69	0.06
1962	603.9	3,548.4	0.17019	15.6	91.9	2.59	1.83	0.54	0.16	0.06	0.85	1.68	0.06
1963	637.5	3,702.9	0.17216	17.5	101.8	2.75	1.92	0.58	0.18	0.06	0.86	1.83	0.07
1964	684.5	3,916.3	0.17478	19.1	109.3	2.79	1.91	0.62	0.20	0.06	0.86	1.86	0.07
1965	742.3	4,170.8	0.17798	20.3	113.8	2.73	1.86	0.59	0.21	0.06	0.88	1.78	0.07
1966	813.4	4,445.9	0.18296	22.1	120.6	2.71	1.87	0.56	0.22	0.07	0.90	1.74	0.07
1967	860.0	4,567.8	0.18827	23.3	124.0	2.71	1.86	0.56	0.24	0.07	0.95	1.69	0.07
1968	940.7	4,792.3	0.19629	24.7	125.7	2.62	1.81	0.52	0.23	0.06	0.96	1.59	0.07
1969	1,017.6	4,942.1	0.20590	26.0	126.3	2.55	1.75	0.51	0.22	0.06	0.98	1.50	0.07
1970	1,073.3	4,951.3	0.21677	26.3	121.2	2.45	1.64	0.52	0.23	0.06	0.97	1.40	0.08
1971	1,164.9	5,114.3	0.22777	27.0	118.3	2.31	1.53	0.50	0.22	0.06	0.93	1.31	0.08
1972	1,279.1	5,383.3	0.23761	28.7	121.0	2.25	1.49	0.49	0.22	0.06	0.92	1.25	0.08
1973	1,425.4	5,687.2	0.25063	31.0	123.5	2.17	1.45	0.45	0.21	0.06	0.93	1.16	0.07
1974	1,545.2	5,656.5	0.27317	33.4	122.1	2.16	1.44	0.45	0.21	0.06	0.96	1.12	0.08
1975	1,684.9	5,644.8	0.29849	35.7	119.5	2.12	1.39	0.45	0.21	0.06	0.94	1.10	0.08
1976	1,873.4	5,949.0	0.31491	39.4	125.2	2.10	1.39	0.44	0.21	0.06	0.94	1.08	0.08
1977	2,081.8	6,224.1	0.33447	43.3	129.6	2.08	1.39	0.43	0.21	0.06	0.94	1.06	0.08
1978	2,351.6	6,568.6	0.35801	48.7	136.1	2.07	1.37	0.43	0.21	0.06	0.95	1.04	0.08
1979	2,627.3	6,776.6	0.38770	55.4	142.8	2.11	1.41	0.42	0.22	0.06	0.99	1.04	0.08
1980	2,857.3	6,759.2	0.42273	63.2	149.6	2.21	1.51	0.42	0.23	0.06	1.08	1.05	0.08
1981	3,207.0	6,930.7	0.46272	72.3	156.2	2.25	1.57	0.41	0.22	0.06	1.12	1.05	0.08
1982	3,343.8	6,805.8	0.49132	80.7	164.4	2.41	1.71	0.42	0.23	0.06	1.22	1.11	0.09
1983	3,634.0	7,117.7	0.51056	89.9	176.2	2.48	1.75	0.44	0.23	0.06	1.25	1.14	0.09
1984	4,037.6	7,632.8	0.52898	102.2	193.3	2.53	1.81	0.43	0.23	0.06	1.29	1.15	0.09
1985	4,339.0	7,951.1	0.54571	114.7	210.1	2.64	1.90	0.44	0.24	0.06	1.34	1.21	0.09
1986	4,579.6	8,226.4	0.55670	120.2	216.0	2.63	1.88	0.43	0.25	0.06	1.33	1.19	0.10

TABLE 1

U.S. gross domestic product, R&D, and ratio of R&D to gross domestic product (and components): 1953–2019

(Billions of current and of constant 2012 dollars and R&D-to-GDP ratio)

Year	GDP			Total R&D		R&D/GDP (%)							
							R&D, by performer				R&D, by source of funding		
	Current $billions	Constant 2012 $billions	Deflator[a] (2012 = 1.00000)	Current $billions	Constant 2012 $billions	Total	Business	Federal[b]	Higher education	Other[c]	Business	Federal	Other[d]
1987	4,855.2	8,511.0	0.57046	126.4	221.5	2.60	1.86	0.42	0.26	0.06	1.29	1.21	0.11
1988	5,236.4	8,866.5	0.59058	133.9	226.7	2.56	1.81	0.41	0.27	0.06	1.30	1.15	0.11
1989	5,641.6	9,192.1	0.61374	141.9	231.2	2.52	1.77	0.40	0.28	0.07	1.33	1.07	0.11
1990	5,963.1	9,365.5	0.63671	152.0	238.7	2.55	1.80	0.39	0.28	0.07	1.40	1.03	0.12
1991	6,158.1	9,355.4	0.65824	160.9	244.4	2.61	1.86	0.38	0.30	0.08	1.50	0.99	0.13
1992	6,520.3	9,684.9	0.67324	165.4	245.6	2.54	1.79	0.37	0.30	0.08	1.48	0.93	0.13
1993	6,858.6	9,951.5	0.68920	165.7	240.5	2.42	1.68	0.36	0.30	0.08	1.41	0.88	0.13
1994	7,287.2	10,352.4	0.70391	169.2	240.4	2.32	1.61	0.34	0.30	0.08	1.36	0.83	0.13
1995	7,639.7	10,630.3	0.71867	183.6	255.5	2.40	1.70	0.33	0.30	0.08	1.45	0.82	0.13
1996	8,073.1	11,031.4	0.73183	197.3	269.7	2.44	1.76	0.31	0.29	0.08	1.53	0.79	0.13
1997	8,577.6	11,521.9	0.74446	211.9	284.6	2.47	1.81	0.29	0.29	0.08	1.59	0.75	0.13
1998	9,062.8	12,038.3	0.75283	225.8	299.9	2.49	1.84	0.29	0.28	0.08	1.63	0.73	0.13
1999	9,630.7	12,610.5	0.76370	244.5	320.1	2.54	1.89	0.28	0.29	0.08	1.71	0.69	0.14
2000	10,252.3	13,131.0	0.78077	267.9	343.2	2.61	1.95	0.28	0.29	0.09	1.81	0.66	0.14
2001	10,581.8	13,262.1	0.79790	278.5	349.1	2.63	1.91	0.31	0.31	0.10	1.78	0.70	0.15
2002	10,936.4	13,493.1	0.81052	277.9	342.9	2.54	1.77	0.32	0.34	0.11	1.65	0.72	0.17
2003	11,458.2	13,879.1	0.82557	291.4	352.9	2.54	1.75	0.32	0.35	0.11	1.62	0.74	0.18
2004	12,213.7	14,406.4	0.84780	302.7	357.1	2.48	1.71	0.31	0.35	0.11	1.57	0.74	0.17
2005	13,036.6	14,912.5	0.87421	325.3	372.1	2.50	1.73	0.30	0.35	0.11	1.59	0.73	0.17
2006	13,814.6	15,338.3	0.90066	350.9	389.6	2.54	1.79	0.30	0.34	0.10	1.64	0.72	0.17
2007	14,451.9	15,626.0	0.92486	377.9	408.6	2.61	1.86	0.31	0.34	0.10	1.71	0.73	0.18
2008	14,712.8	15,604.7	0.94284	404.8	429.3	2.75	1.98	0.31	0.35	0.11	1.75	0.80	0.20
2009	14,448.9	15,208.8	0.95004	402.9	424.1	2.79	1.95	0.33	0.38	0.12	1.71	0.87	0.21
2010	14,992.1	15,598.8	0.96111	406.6	423.1	2.71	1.86	0.34	0.39	0.13	1.66	0.84	0.21
2011	15,542.6	15,840.7	0.98118	426.2	434.4	2.74	1.89	0.34	0.39	0.12	1.71	0.82	0.21
2012	16,197.0	16,197.0	1.00000	433.7	433.7	2.68	1.87	0.32	0.38	0.11	1.70	0.76	0.21
2013	16,784.9	16,495.4	1.01755	454.3	446.4	2.71	1.92	0.30	0.37	0.11	1.77	0.72	0.22
2014	17,527.3	16,912.0	1.03638	476.0	459.3	2.72	1.94	0.30	0.36	0.12	1.82	0.68	0.22
2015	18,238.3	17,432.2	1.04624	494.5	472.6	2.71	1.95	0.29	0.35	0.12	1.83	0.66	0.23
2016	18,745.1	17,730.5	1.05722	521.7	493.5	2.78	2.02	0.27	0.36	0.12	1.92	0.62	0.24
2017	19,543.0	18,144.1	1.07710	555.2	515.5	2.84	2.08	0.27	0.36	0.13	1.98	0.62	0.24
2018	20,611.9	18,687.8	1.10296	606.1	549.5	2.94	2.16	0.28	0.36	0.13	2.07	0.63	0.24
2019[e]	21,433.2	19,091.7	1.12264	656.0	584.4	3.06	2.27	0.29	0.37	0.13	2.16	0.65	0.25

GDP = gross domestic product.

[a] Implicit price deflator for GDP.
[b] Includes federal intramural R&D and R&D by federally funded R&D centers.
[c] Includes R&D in the United States performed by nonfederal government and nonprofit organizations (NPOs).
[d] Includes funding for U.S. R&D by nonfederal government, higher education, and NPOs.
[e] Data for 2019 are estimates and will later be revised.

Note(s):
Detail may not add to total because of rounding.

Source(s):
GDP data from Bureau of Economic Analysis, National Economic Accounts, Gross Domestic Product, **https://apps.bea.gov/iTable/index_nipa.cfm**, accessed 3 August 2020; 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: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	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	3,630	2,200	1,430	NA	NA	NA	273	149	40	21	37	27	112	58	26	28
1954	5,621	1,127	963	165	165	NA	4,070	2,320	1,750	NA	NA	NA	301	165	45	24	40	29	123	61	31	31
1955	6,185	1,292	973	319	319	NA	4,420	2,460	1,960	NA	NA	NA	342	191	50	27	42	32	132	65	35	32
1956	8,501	1,692	1,131	561	561	NA	6,272	3,277	2,995	NA	NA	NA	391	221	57	32	46	36	146	71	37	38
1957	9,908	1,985	1,297	688	688	NA	7,324	3,396	3,928	NA	NA	NA	433	242	64	37	51	40	167	79	37	51
1958	10,915	2,163	1,507	657	657	NA	8,066	3,630	4,436	NA	NA	NA	491	280	72	39	56	45	195	95	38	62
1959	12,490	2,470	1,681	789	789	NA	9,200	3,983	5,217	NA	NA	NA	586	356	81	40	61	50	234	125	42	67
1960	13,711	2,711	1,801	910	910	NA	10,032	4,428	5,604	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	10,353	4,668	5,685	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	11,037	5,029	6,008	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	12,216	5,360	6,856	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	13,049	5,792	7,257	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	13,812	6,445	7,367	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	15,193	7,216	7,977	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	15,966	8,020	7,946	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	17,014	8,869	8,145	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	17,844	9,857	7,987	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	17,594	10,288	7,306	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	17,829	10,654	7,175	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	19,004	11,535	7,469	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	20,704	13,104	7,600	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	22,239	14,667	7,572	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	23,460	15,582	7,878	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	26,107	17,436	8,671	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	28,863	19,340	9,523	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	32,222	22,115	10,107	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	37,062	25,708	11,354	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	43,228	30,476	12,752	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	50,425	35,428	14,997	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	57,166	40,105	17,061	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	63,683	44,588	19,095	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	73,061	51,404	21,657	NA	NA	NA	9,154	5,748	721	518	1,514	654	2,511	1,548	265	698
1985	114,671	19,227	13,093	6,134	6,134	NA	82,376	57,043	25,333	NA	NA	NA	10,308	6,388	834	630	1,743	713	2,761	1,694	289	778

TABLE 2

U.S. R&D expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1986	120,249	19,909	13,505	6,405	6,405	NA	85,932	59,932	26,000	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	90,160	61,403	28,757	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	94,893	66,672	28,221	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	99,860	73,501	26,359	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	107,404	81,602	25,802	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	114,675	90,580	24,095	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	116,757	94,388	22,369	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	115,435	94,591	20,844	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	117,392	97,131	20,261	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	129,830	108,652	21,178	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	142,371	121,015	21,356	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	155,409	133,611	21,798	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	167,102	145,016	22,086	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	182,090	161,594	20,496	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	199,961	182,844	17,117	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	202,017	185,118	16,899	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	193,868	177,467	16,401	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	200,724	182,926	17,798	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	208,301	188,035	20,266	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	226,159	204,250	21,909	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	247,669	223,365	24,304	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	269,267	242,682	26,585	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	290,680	225,848	36,360	12,181	15,533	758	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	282,393	221,104	39,573	9,567	11,464	685	54,909	31,740	3,679	3,032	12,057	4,400	17,452	7,097	1,258	9,097
2010	406,600	50,798	31,970	18,828	18,409	691	278,977	218,187	34,199	11,013	14,532	1,046	58,084	34,681	3,674	2,953	12,263	4,514	18,050	7,093	1,266	9,691
2011	426,213	53,524	34,950	18,574	18,176	694	294,092	235,426	31,309	11,124	15,351	882	60,088	35,742	3,616	2,999	13,103	4,629	17,815	6,564	1,340	9,911
2012	433,719	52,144	34,017	18,128	17,727	665	302,251	242,674	30,621	11,624	16,699	633	60,895	34,967	3,560	3,170	14,299	4,899	17,764	6,239	1,376	10,149
2013	454,271	51,086	33,406	17,680	17,296	620	322,528	259,908	29,362	13,450	18,795	1,013	61,548	33,840	3,642	3,376	15,378	5,313	18,489	5,970	1,464	11,056
2014	475,969	52,687	34,783	17,903	17,523	583	340,728	277,272	26,554	13,227	22,544	1,131	62,352	33,125	3,714	3,603	16,209	5,701	19,620	6,135	1,548	11,937
2015	494,482	52,847	34,199	18,649	18,287	595	355,821	289,892	26,990	14,595	23,102	1,242	64,621	33,556	3,776	3,843	17,293	6,154	20,599	6,247	1,605	12,747
2016	521,703	51,187	31,762	19,424	19,059	621	379,528	310,391	24,154	14,649	29,016	1,318	67,774	34,670	3,924	4,044	18,432	6,704	22,594	6,971	1,709	13,914
2017	555,245	52,553	32,231	20,322	19,943	636	405,791	324,177	24,974	17,729	37,913	998	71,108	35,986	4,044	4,278	19,585	7,216	25,157	8,218	1,807	15,132
2018	606,085	58,356	36,793	21,563	21,163	656	445,637	357,922	25,199	19,286	42,060	1,170	74,897	37,736	4,210	4,580	20,704	7,669	26,538	8,451	1,957	16,130
2019[g]	656,038	63,051	40,086	22,965	22,562	678	485,826	387,187	27,910	22,391	46,985	1,353	78,717	39,462	4,378	4,902	21,791	8,184	27,767	8,575	2,097	17,094

TABLE 2

U.S. R&D expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
Constant 2012 $millions																						
1953	35,738	7,937	7,030	907	907	NA	25,141	15,237	9,904	NA	NA	NA	1,887	1,032	274	142	253	187	772	398	180	194
1954	38,573	7,735	6,606	1,129	1,129	NA	27,932	15,922	12,010	NA	NA	NA	2,066	1,129	305	161	271	199	841	415	213	213
1955	41,735	8,715	6,566	2,149	2,149	NA	29,825	16,600	13,226	NA	NA	NA	2,308	1,289	337	182	283	216	887	435	236	216
1956	55,467	11,037	7,377	3,661	3,661	NA	40,926	21,383	19,543	NA	NA	NA	2,551	1,442	369	206	300	235	953	463	241	248
1957	62,586	12,535	8,193	4,343	4,343	NA	46,263	21,451	24,812	NA	NA	NA	2,735	1,525	404	231	322	253	1,052	496	234	322
1958	67,414	13,359	9,304	4,055	4,055	NA	49,817	22,420	27,398	NA	NA	NA	3,033	1,729	445	241	343	275	1,204	587	235	383
1959	76,086	15,047	10,241	4,807	4,807	NA	56,046	24,264	31,782	NA	NA	NA	3,570	2,166	490	241	372	302	1,422	758	256	408
1960	82,408	16,291	10,822	5,469	5,469	NA	60,296	26,614	33,682	NA	NA	NA	4,234	2,720	541	240	403	331	1,587	890	288	409
1961	86,615	18,279	11,817	6,462	6,462	NA	61,571	27,761	33,810	NA	NA	NA	4,957	3,310	598	238	443	369	1,808	1,005	291	511
1962	91,874	19,058	12,853	6,205	6,205	NA	64,851	29,549	35,302	NA	NA	NA	5,832	4,034	658	238	494	408	2,133	1,175	317	640
1963	101,759	21,590	14,861	6,729	6,729	NA	70,956	31,133	39,823	NA	NA	NA	6,842	4,870	726	235	558	453	2,370	1,359	319	691
1964	109,296	24,387	16,967	7,421	7,421	NA	74,659	33,138	41,520	NA	NA	NA	7,864	5,693	787	232	649	503	2,386	1,430	315	641
1965	113,794	24,576	17,736	6,841	6,841	NA	77,606	36,213	41,393	NA	NA	NA	8,959	6,557	840	233	764	565	2,652	1,607	348	697
1966	120,642	24,730	18,081	6,649	6,649	NA	83,042	39,441	43,601	NA	NA	NA	9,937	7,297	875	246	899	620	2,932	1,796	383	754
1967	124,005	25,415	18,298	7,117	7,117	NA	84,802	42,597	42,204	NA	NA	NA	10,809	7,917	892	274	1,060	667	2,980	1,816	393	770
1968	125,661	24,807	17,818	6,990	6,990	NA	86,676	45,182	41,494	NA	NA	NA	11,141	8,080	940	293	1,123	706	3,036	1,854	413	769
1969	126,251	25,401	18,407	6,994	6,994	NA	86,662	47,872	38,790	NA	NA	NA	11,073	7,885	1,010	294	1,132	753	3,116	1,882	452	782
1970	121,194	25,757	19,162	6,595	6,595	NA	81,164	47,460	33,704	NA	NA	NA	11,152	7,775	1,093	302	1,193	789	3,121	1,889	438	793
1971	118,327	25,680	19,356	6,324	6,324	NA	78,275	46,775	31,501	NA	NA	NA	11,261	7,725	1,150	316	1,271	799	3,111	1,872	430	808
1972	120,958	26,130	19,678	6,452	6,452	NA	79,981	48,547	31,434	NA	NA	NA	11,603	7,954	1,187	332	1,311	819	3,243	1,984	425	833
1973	123,495	25,585	19,297	6,288	6,288	NA	82,607	52,284	30,323	NA	NA	NA	11,784	8,014	1,201	359	1,373	838	3,519	2,258	419	842
1974	122,118	25,319	18,788	6,531	6,531	NA	81,410	53,691	27,719	NA	NA	NA	11,773	7,907	1,170	383	1,440	873	3,617	2,337	418	861
1975	119,507	25,396	18,632	6,764	6,764	NA	78,596	52,203	26,393	NA	NA	NA	11,959	8,041	1,166	395	1,446	911	3,556	2,261	416	879
1976	125,226	26,327	18,704	7,623	7,623	NA	82,903	55,368	27,535	NA	NA	NA	12,380	8,317	1,172	416	1,524	951	3,616	2,258	429	928
1977	129,570	26,656	18,571	8,085	8,085	NA	86,294	57,822	28,472	NA	NA	NA	12,994	8,648	1,178	462	1,700	1,006	3,628	2,213	440	975
1978	136,085	28,346	19,447	8,899	8,899	NA	90,004	61,773	28,231	NA	NA	NA	13,954	9,297	1,237	507	1,897	1,015	3,781	2,318	447	1,015
1979	142,839	28,470	19,271	9,200	9,200	NA	95,594	66,309	29,285	NA	NA	NA	14,739	9,925	1,242	553	2,025	994	4,035	2,541	449	1,045
1980	149,562	28,109	18,524	9,585	9,585	NA	102,260	72,094	30,166	NA	NA	NA	15,270	10,254	1,227	623	2,175	991	3,923	2,406	448	1,069
1981	156,232	28,090	18,595	9,494	9,494	NA	108,974	76,564	32,410	NA	NA	NA	15,312	10,091	1,256	679	2,285	1,001	3,856	2,322	445	1,088
1982	164,350	28,626	19,338	9,288	9,288	NA	116,353	81,628	34,725	NA	NA	NA	15,474	9,929	1,264	739	2,456	1,086	3,897	2,298	456	1,143
1983	176,179	31,025	21,211	9,814	9,814	NA	124,732	87,332	37,400	NA	NA	NA	16,161	10,205	1,289	846	2,657	1,164	4,261	2,557	478	1,226
1984	193,284	33,116	22,526	10,591	10,591	NA	138,117	97,176	40,941	NA	NA	NA	17,304	10,865	1,363	978	2,862	1,235	4,747	2,926	502	1,319
1985	210,131	35,232	23,992	11,240	11,240	NA	150,952	104,530	46,422	NA	NA	NA	18,888	11,706	1,527	1,154	3,194	1,307	5,059	3,104	529	1,426

TABLE 2

U.S. R&D expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1986	216,004	35,763	24,258	11,505	11,505	NA	154,361	107,657	46,704	NA	NA	NA	20,729	12,624	1,741	1,338	3,626	1,401	5,151	3,028	564	1,558
1987	221,505	35,725	23,820	11,905	11,905	NA	158,047	107,637	50,410	NA	NA	NA	22,450	13,617	1,866	1,457	3,965	1,545	5,282	2,988	599	1,695
1988	226,693	36,497	24,285	12,212	12,212	NA	160,677	112,892	47,785	NA	NA	NA	24,080	14,550	1,973	1,580	4,279	1,698	5,439	2,984	630	1,826
1989	231,189	37,032	24,816	12,216	12,216	NA	162,706	119,758	42,948	NA	NA	NA	25,473	15,180	2,076	1,728	4,647	1,843	5,978	3,360	659	1,959
1990	238,716	36,946	24,613	12,333	12,333	NA	168,686	128,162	40,524	NA	NA	NA	26,604	15,610	2,197	1,831	5,005	1,962	6,480	3,684	691	2,105
1991	244,403	35,462	23,167	12,295	12,295	NA	174,215	137,609	36,605	NA	NA	NA	27,659	16,205	2,252	1,886	5,253	2,063	7,067	4,070	728	2,270
1992	245,602	35,964	23,547	12,417	12,417	NA	173,425	140,199	33,226	NA	NA	NA	28,798	17,122	2,265	1,960	5,300	2,150	7,416	4,167	774	2,474
1993	240,467	35,597	23,985	11,612	11,612	NA	167,491	137,247	30,244	NA	NA	NA	29,737	17,857	2,259	2,019	5,381	2,221	7,643	4,125	823	2,695
1994	240,380	34,961	23,235	11,726	11,726	NA	166,770	137,987	28,783	NA	NA	NA	30,695	18,462	2,305	2,068	5,594	2,265	7,954	4,136	876	2,941
1995	255,506	35,276	23,521	11,755	11,755	NA	180,653	151,184	29,468	NA	NA	NA	31,471	18,913	2,436	2,153	5,719	2,249	8,108	3,962	934	3,212
1996	269,662	34,227	22,662	11,565	11,565	NA	194,541	165,360	29,182	NA	NA	NA	32,409	19,245	2,543	2,284	6,061	2,276	8,485	3,970	998	3,517
1997	284,628	33,894	22,592	11,301	11,301	NA	208,754	179,474	29,280	NA	NA	NA	33,080	19,232	2,555	2,402	6,517	2,374	8,901	4,049	1,086	3,766
1998	299,880	34,327	23,063	11,264	11,264	NA	221,965	192,628	29,337	NA	NA	NA	33,982	19,525	2,551	2,522	6,898	2,486	9,606	4,358	1,141	4,107
1999	320,086	35,152	23,755	11,397	11,397	NA	238,430	211,592	26,838	NA	NA	NA	35,975	20,576	2,667	2,646	7,403	2,684	10,528	4,924	1,219	4,385
2000	343,186	36,522	24,651	11,872	11,872	NA	256,107	234,184	21,923	NA	NA	NA	38,316	21,895	2,795	2,705	8,030	2,892	12,240	5,776	1,306	5,158
2001	349,091	41,123	28,042	13,081	12,603	NA	253,187	232,007	21,179	NA	NA	NA	41,045	23,783	2,906	2,657	8,615	3,085	13,736	6,878	1,290	5,569
2002	342,881	43,777	29,361	14,416	13,870	NA	239,190	218,955	20,235	NA	NA	NA	45,260	26,717	3,110	2,595	9,467	3,371	14,654	7,129	1,231	6,294
2003	352,925	45,102	30,260	14,842	14,343	NA	243,133	221,575	21,558	NA	NA	NA	49,150	29,757	3,338	2,532	10,036	3,487	15,540	7,201	1,236	7,103
2004	357,079	44,451	29,367	15,084	14,709	NA	245,697	221,793	23,904	NA	NA	NA	51,069	31,404	3,415	2,533	10,187	3,530	15,863	7,710	1,228	6,924
2005	372,095	45,261	30,110	15,151	14,749	NA	258,702	233,641	25,062	NA	NA	NA	52,035	31,735	3,369	2,607	10,698	3,627	16,097	7,486	1,266	7,344
2006	389,612	46,199	31,354	14,845	14,399	343	274,986	248,001	26,985	NA	NA	NA	52,593	31,396	3,397	2,735	11,298	3,768	15,491	6,710	1,312	7,468
2007	408,591	47,717	32,285	15,432	14,970	420	291,143	262,398	28,745	NA	NA	NA	53,446	31,058	3,577	2,916	11,821	4,073	15,866	6,465	1,359	8,042
2008	429,315	48,416	31,648	16,768	16,300	521	308,301	239,539	38,564	12,919	16,475	804	55,210	31,432	3,783	3,133	12,449	4,413	16,867	6,614	1,384	8,869
2009	424,122	50,074	32,167	17,907	17,442	637	297,245	232,732	41,654	10,070	12,067	721	57,796	33,409	3,873	3,192	12,691	4,632	18,369	7,470	1,324	9,575
2010	423,054	52,854	33,264	19,590	19,154	719	290,267	227,017	35,583	11,459	15,120	1,088	60,434	36,084	3,822	3,072	12,759	4,697	18,780	7,380	1,317	10,083
2011	434,387	54,551	35,621	18,930	18,524	707	299,733	239,941	31,909	11,337	15,645	899	61,240	36,428	3,685	3,057	13,354	4,718	18,157	6,690	1,366	10,101
2012	433,719	52,144	34,017	18,128	17,727	665	302,251	242,674	30,621	11,624	16,699	633	60,895	34,967	3,560	3,170	14,299	4,899	17,764	6,239	1,376	10,149
2013	446,436	50,205	32,830	17,375	16,998	609	316,965	255,425	28,856	13,218	18,471	996	60,486	33,256	3,579	3,318	15,112	5,221	18,170	5,867	1,438	10,865
2014	459,260	50,837	33,562	17,275	16,908	563	328,767	267,538	25,622	12,763	21,753	1,091	60,163	31,962	3,584	3,477	15,640	5,500	18,931	5,920	1,493	11,518
2015	472,627	50,512	32,687	17,824	17,479	568	340,094	277,079	25,797	13,950	22,081	1,187	61,764	32,073	3,609	3,673	16,528	5,882	19,689	5,971	1,534	12,183
2016	493,465	48,416	30,043	18,373	18,027	587	358,986	293,590	22,847	13,857	27,446	1,247	64,105	32,793	3,712	3,825	17,434	6,341	21,371	6,593	1,616	13,161
2017	515,500	48,791	29,924	18,867	18,516	590	376,745	300,972	23,186	16,460	35,199	927	66,018	33,410	3,755	3,972	18,183	6,699	23,356	7,630	1,677	14,049
2018	549,507	52,909	33,359	19,550	19,187	595	404,037	324,511	22,847	17,485	38,134	1,061	67,905	34,213	3,817	4,152	18,771	6,953	24,061	7,662	1,774	14,625
2019[g]	584,369	56,163	35,707	20,456	20,097	604	432,751	344,888	24,861	19,945	41,852	1,205	70,117	35,151	3,899	4,367	19,411	7,290	24,733	7,639	1,868	15,227

NA = not available.

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

[a] 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 system 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, 2017, and 2018, this intramural preproduction development totaled in the range of $5–$7 billion each year.

[b] The R&D expenditures of FFRDCs are chiefly federally funded; the small remainder ($401 million of the $21.6 billion total in 2018) 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; from 2001 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] State intramural R&D performance includes 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 ($337 million of the $656 million total in 2018) or from the federal government ($269 million in 2018), but other sources include other nonfederal governments ($18 million), businesses ($22 million), higher education ($3 million), or NPOs ($8 million).

[d] R&D performed by companies in the domestic United States. Data for 2008–15 come from the National Center for Science and Engineering Statistics' (NCSES's) 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 ($4.8 billion in 2016). Data for 2017 and 2018 come from NCSES's annual Business Research and Development Survey (BRDS), which covers all publicly or privately held companies with 10 or more employees, plus the Annual Business Surveys (ABS) for 2017 and 2018, which collected statistics on the R&D activities of businesses with 1–9 employees ($5.7 billion in 2017). BRDIS, BRDS, BRDI-M, and ABS 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). Data for 2019 are estimates, based on the 2018 surveys. Prior to 2008, the data collected by the predecessor survey (the Survey of Industrial R&D) 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 foreign businesses includes funding from both parent or unaffiliated businesses outside the United States ($18.4 billion in 2018) and funding from U.S. businesses' foreign subsidiaries ($23.7 billion in 2018). Business R&D performance funded by other sources includes state government, foreign government, 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 $4.6 billion in FY 2018.) 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 2018, total pass-through was $6.315 billion, with $3.541 billion to other academic recipients and $2.774 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 2018, $3.101 billion was from NPOs, and $1.453 billion was from these unclassified other sources.)

[f] Data on NPO R&D funded by the federal government come from NCSES's annual Survey of Federal Funds for Research and Development. The NPO R&D funded by nonfederal government is included in the NPO-funded category. The data for NPO R&D,1998–2019, funded by businesses and by the nonprofit sector itself are estimated, based on parameters from the 1996–97 Survey of Research and Development Funding and Performance by Nonprofit Organizations.

[g] The data for 2019 are estimates and will later be revised.

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. Except for the nonprofit sector, data are based on annual reports by performers in NCSES's annual R&D expenditure surveys: BRDS, Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Expenditures Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers from 1977 and after, 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: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	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	151	132	19	NA	NA	NA	123	82	7	13	6	16	48	27	9	12
1954	509	141	96	45	45	NA	166	143	23	NA	NA	NA	148	97	10	15	8	18	55	31	11	13
1955	570	160	98	62	62	NA	169	162	7	NA	NA	NA	180	117	14	17	12	21	62	35	13	14
1956	718	203	114	89	89	NA	223	216	7	NA	NA	NA	220	143	19	20	15	24	73	41	15	17
1957	813	234	124	110	110	NA	234	230	4	NA	NA	NA	261	167	25	23	20	27	86	48	15	23
1958	943	264	149	115	115	NA	266	252	14	NA	NA	NA	312	202	31	24	24	31	102	58	16	28
1959	1,087	298	165	134	134	NA	282	248	34	NA	NA	NA	388	263	38	24	28	36	119	71	18	30
1960	1,286	334	184	150	150	NA	333	297	36	NA	NA	NA	485	341	45	25	33	41	135	84	21	30
1961	1,511	407	230	177	177	NA	344	314	30	NA	NA	NA	598	432	54	25	40	48	163	104	22	37
1962	1,824	441	252	189	189	NA	449	345	104	NA	NA	NA	737	546	64	25	48	55	198	128	24	46
1963	2,115	501	285	216	216	NA	484	375	109	NA	NA	NA	909	689	75	25	58	63	222	147	25	50
1964	2,396	584	339	245	245	NA	507	384	123	NA	NA	NA	1,071	824	84	25	70	68	235	163	25	47
1965	2,664	625	375	250	250	NA	563	406	157	NA	NA	NA	1,221	944	94	27	86	70	256	175	29	52
1966	2,930	683	410	273	273	NA	593	451	142	NA	NA	NA	1,380	1,066	104	29	106	75	274	184	32	58
1967	3,168	735	434	301	301	NA	595	427	168	NA	NA	NA	1,554	1,188	114	34	136	83	285	190	34	61
1968	3,376	797	482	315	315	NA	607	462	145	NA	NA	NA	1,681	1,265	131	38	156	91	292	192	37	63
1969	3,491	858	545	313	313	NA	581	458	123	NA	NA	NA	1,754	1,288	153	40	171	103	298	188	43	67
1970	3,594	866	562	304	304	NA	566	444	122	NA	NA	NA	1,855	1,323	179	43	196	115	307	191	44	72
1971	3,720	870	581	289	289	NA	557	456	101	NA	NA	NA	1,968	1,385	194	50	214	127	326	204	45	77
1972	3,850	915	603	313	313	NA	554	463	91	NA	NA	NA	2,038	1,437	195	55	216	134	344	213	47	84
1973	4,099	1,034	652	382	382	NA	595	499	96	NA	NA	NA	2,103	1,489	196	59	223	137	368	229	49	90
1974	4,511	1,182	715	467	467	NA	650	536	114	NA	NA	NA	2,282	1,609	204	66	250	153	397	242	54	102
1975	4,875	1,292	760	533	533	NA	677	573	104	NA	NA	NA	2,480	1,768	212	72	264	164	426	251	59	116
1976	5,373	1,479	850	629	629	NA	750	634	116	NA	NA	NA	2,675	1,924	218	75	283	175	470	274	65	131
1977	6,008	1,689	943	746	746	NA	836	701	135	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	941	785	156	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	1,054	893	161	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	1,205	1,035	170	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	1,477	1,313	164	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	1,776	1,523	253	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	2,106	1,760	346	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	2,472	2,132	340	NA	NA	NA	6,145	4,087	436	313	915	395	984	494	139	351
1985	14,748	3,884	1,947	1,936	1,936	NA	2,731	2,373	358	NA	NA	NA	7,024	4,606	514	389	1,075	440	1,110	560	153	397

TABLE 3

U.S. basic research expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1986	17,154	4,071	2,026	2,045	2,045	NA	3,930	3,496	434	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	4,181	3,583	598	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	4,163	3,507	656	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	4,818	3,832	986	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	4,629	3,760	869	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	7,376	6,125	1,251	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	6,528	5,816	712	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	6,427	5,961	466	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	6,514	6,078	436	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	5,569	5,379	190	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	7,498	6,848	650	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	9,795	8,766	1,029	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	5,853	4,851	1,002	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	6,645	5,537	1,108	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	7,040	6,115	925	NA	NA	NA	22,290	13,469	1,501	1,453	4,314	1,553	4,902	2,099	566	2,236
2001	46,843	8,832	4,260	4,571	4,404	NA	8,053	7,299	754	NA	NA	NA	24,455	14,919	1,606	1,467	4,759	1,704	5,503	2,464	571	2,467
2002	50,789	9,737	4,511	5,227	5,029	NA	7,547	6,659	888	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	5,075	4,904	NA	8,330	6,944	1,386	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	9,672	4,697	4,976	4,852	NA	7,835	6,763	1,072	NA	NA	NA	32,246	20,730	2,000	1,483	5,965	2,067	6,626	2,788	578	3,259
2005	59,904	9,907	4,770	5,136	5,000	NA	8,667	7,559	1,108	NA	NA	NA	34,248	21,786	2,068	1,600	6,568	2,226	7,082	2,902	614	3,565
2006	61,568	9,953	4,716	5,238	5,080	46	8,384	6,940	1,444	NA	NA	NA	35,944	22,270	2,191	1,765	7,288	2,431	7,240	2,849	656	3,735
2007	64,603	8,053	4,621	3,432	3,298	58	11,268	8,488	2,780	NA	NA	NA	37,568	22,546	2,400	1,956	7,932	2,733	7,656	2,829	698	4,130
2008	68,542	8,533	4,957	3,576	3,432	73	12,369	9,741	1,475	484	639	30	39,127	22,954	2,573	2,131	8,467	3,002	8,441	3,073	724	4,643
2009	72,861	10,012	5,441	4,571	4,432	90	14,784	11,999	1,340	662	736	47	38,728	22,993	2,456	1,995	8,253	3,031	9,248	3,498	698	5,051
2010	76,344	11,748	5,111	6,637	6,475	103	16,371	13,239	1,406	722	935	68	38,625	23,586	2,276	1,783	8,000	2,981	9,498	3,414	703	5,381
2011	73,510	11,522	5,047	6,475	6,333	103	13,020	10,585	677	745	954	59	39,538	23,970	2,244	1,803	8,487	3,034	9,328	3,081	744	5,503
2012	73,807	11,150	5,489	5,661	5,530	99	13,294	10,955	644	710	946	39	39,773	23,285	2,200	1,865	9,236	3,188	9,492	3,092	764	5,635
2013	79,099	9,519	5,330	4,188	4,085	92	19,508	14,986	1,196	1,446	1,771	109	39,998	22,476	2,206	1,975	9,918	3,423	9,982	3,031	813	6,139
2014	82,733	9,875	5,705	4,170	4,077	99	21,936	15,805	2,044	1,584	2,367	135	40,246	21,967	2,241	2,086	10,341	3,611	10,577	3,090	859	6,628
2015	84,229	10,017	5,890	4,127	4,043	100	21,792	15,933	2,038	1,565	2,123	133	41,317	22,054	2,292	2,202	10,974	3,795	11,003	3,034	891	7,077
2016	89,989	10,315	6,119	4,196	4,112	94	25,053	18,792	2,037	1,535	2,551	137	42,628	22,413	2,344	2,281	11,582	4,009	11,899	3,224	949	7,726
2017	93,469	10,388	6,259	4,128	4,054	104	25,617	18,299	1,853	2,085	3,260	120	44,523	23,168	2,375	2,402	12,241	4,337	12,839	3,434	1,003	8,402
2018	101,123	11,096	6,827	4,269	4,188	120	29,208	21,103	2,536	2,069	3,377	124	46,983	24,288	2,435	2,587	12,961	4,713	13,717	3,675	1,087	8,956
2019[g]	107,838	11,995	7,414	4,581	4,500	129	31,999	22,832	2,811	2,401	3,811	143	49,293	25,363	2,508	2,760	13,611	5,052	14,421	3,766	1,164	9,492

TABLE 3

U.S. basic research expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
Constant 2012 $millions																						
1953	3,182	952	703	249	249	NA	1,046	914	132	NA	NA	NA	852	564	45	90	42	111	332	187	62	83
1954	3,490	964	659	305	305	NA	1,139	981	158	NA	NA	NA	1,012	662	66	103	58	124	374	209	75	89
1955	3,846	1,076	658	418	418	NA	1,140	1,093	47	NA	NA	NA	1,211	786	94	115	78	138	418	236	88	94
1956	4,683	1,321	741	581	581	NA	1,453	1,409	44	NA	NA	NA	1,436	930	124	127	101	153	473	264	98	111
1957	5,138	1,475	783	692	692	NA	1,478	1,453	25	NA	NA	NA	1,645	1,052	157	142	125	171	540	300	95	145
1958	5,825	1,631	920	710	710	NA	1,640	1,556	84	NA	NA	NA	1,927	1,248	192	148	148	191	627	355	99	173
1959	6,622	1,815	1,002	813	813	NA	1,718	1,511	207	NA	NA	NA	2,364	1,599	229	146	173	216	725	433	110	183
1960	7,727	2,004	1,103	902	902	NA	1,999	1,785	214	NA	NA	NA	2,912	2,047	271	147	201	246	811	505	126	180
1961	8,986	2,418	1,365	1,053	1,053	NA	2,049	1,867	181	NA	NA	NA	3,553	2,566	319	149	237	282	966	616	131	220
1962	10,719	2,591	1,481	1,111	1,111	NA	2,640	2,027	612	NA	NA	NA	4,328	3,205	374	147	281	320	1,160	749	141	270
1963	12,287	2,907	1,653	1,255	1,255	NA	2,813	2,178	635	NA	NA	NA	5,277	4,002	435	142	334	363	1,289	854	145	290
1964	13,708	3,341	1,940	1,402	1,402	NA	2,901	2,197	704	NA	NA	NA	6,125	4,712	483	143	398	389	1,342	930	143	269
1965	14,968	3,509	2,104	1,405	1,405	NA	3,163	2,281	882	NA	NA	NA	6,858	5,301	531	149	483	393	1,438	983	163	292
1966	16,015	3,733	2,241	1,492	1,492	NA	3,241	2,465	776	NA	NA	NA	7,543	5,827	566	159	582	410	1,498	1,006	175	317
1967	16,824	3,901	2,302	1,599	1,599	NA	3,160	2,268	892	NA	NA	NA	8,251	6,307	605	178	720	441	1,511	1,007	181	324
1968	17,199	4,058	2,455	1,602	1,602	NA	3,092	2,354	739	NA	NA	NA	8,561	6,444	666	191	796	464	1,488	978	188	321
1969	16,953	4,168	2,648	1,520	1,520	NA	2,822	2,224	597	NA	NA	NA	8,516	6,253	742	192	831	498	1,447	913	209	325
1970	16,579	3,995	2,592	1,402	1,402	NA	2,611	2,048	563	NA	NA	NA	8,557	6,101	827	198	903	528	1,416	881	203	332
1971	16,333	3,818	2,552	1,267	1,267	NA	2,445	2,002	443	NA	NA	NA	8,640	6,078	850	217	939	555	1,429	893	198	338
1972	16,203	3,851	2,536	1,315	1,315	NA	2,332	1,949	383	NA	NA	NA	8,575	6,048	822	231	909	564	1,446	894	198	354
1973	16,357	4,126	2,601	1,524	1,524	NA	2,374	1,991	383	NA	NA	NA	8,391	5,939	783	233	890	545	1,466	912	196	359
1974	16,512	4,326	2,616	1,710	1,710	NA	2,379	1,962	417	NA	NA	NA	8,352	5,890	746	242	916	558	1,455	884	197	373
1975	16,331	4,329	2,545	1,784	1,784	NA	2,268	1,920	348	NA	NA	NA	8,307	5,923	712	240	883	549	1,427	841	199	387
1976	17,062	4,697	2,699	1,997	1,997	NA	2,382	2,013	368	NA	NA	NA	8,493	6,110	691	238	900	554	1,491	869	207	415
1977	17,963	5,049	2,819	2,230	2,230	NA	2,499	2,096	404	NA	NA	NA	8,869	6,320	693	266	999	590	1,545	888	214	443
1978	19,438	5,724	2,917	2,807	2,807	NA	2,628	2,193	436	NA	NA	NA	9,430	6,701	726	297	1,112	594	1,655	966	220	468
1979	20,213	5,861	2,869	2,991	2,991	NA	2,719	2,303	415	NA	NA	NA	9,872	7,013	737	329	1,202	591	1,761	1,048	224	489
1980	20,691	5,929	2,868	3,061	3,061	NA	2,851	2,448	402	NA	NA	NA	10,208	7,240	726	369	1,287	587	1,705	971	226	508
1981	20,871	5,992	2,902	3,090	3,090	NA	3,192	2,838	354	NA	NA	NA	10,236	7,199	731	395	1,330	582	1,451	700	226	525
1982	21,678	6,156	3,097	3,059	3,059	NA	3,615	3,100	515	NA	NA	NA	10,362	7,072	749	439	1,458	645	1,545	751	234	559
1983	23,269	6,646	3,394	3,252	3,252	NA	4,125	3,447	678	NA	NA	NA	10,808	7,224	775	509	1,599	701	1,690	834	248	608
1984	25,203	7,053	3,548	3,505	3,505	NA	4,673	4,030	643	NA	NA	NA	11,616	7,725	823	591	1,729	746	1,861	934	263	664
1985	27,026	7,117	3,568	3,548	3,548	NA	5,004	4,348	656	NA	NA	NA	12,871	8,439	943	713	1,971	806	2,033	1,026	280	727

TABLE 3

U.S. basic research expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1986	30,813	7,313	3,639	3,674	3,674	NA	7,060	6,280	780	NA	NA	NA	14,267	9,200	1,088	837	2,267	876	2,174	1,066	302	806
1987	32,396	7,520	3,589	3,931	3,931	NA	7,329	6,281	1,048	NA	NA	NA	15,152	9,688	1,154	901	2,453	956	2,396	1,184	323	888
1988	33,504	8,041	3,583	4,458	4,458	NA	7,049	5,938	1,111	NA	NA	NA	15,821	10,052	1,194	956	2,590	1,028	2,593	1,280	343	970
1989	35,668	8,349	3,762	4,587	4,587	NA	7,850	6,244	1,607	NA	NA	NA	16,650	10,464	1,248	1,039	2,793	1,108	2,818	1,402	363	1,054
1990	36,169	8,406	3,642	4,764	4,764	NA	7,270	5,905	1,365	NA	NA	NA	17,474	10,819	1,330	1,108	3,030	1,187	3,018	1,487	384	1,147
1991	41,231	8,467	3,613	4,854	4,854	NA	11,206	9,305	1,901	NA	NA	NA	18,324	11,277	1,385	1,160	3,232	1,269	3,235	1,574	408	1,253
1992	41,001	8,654	3,593	5,062	5,062	NA	9,696	8,639	1,058	NA	NA	NA	19,175	11,969	1,398	1,210	3,272	1,327	3,476	1,655	438	1,383
1993	41,704	8,906	3,803	5,103	5,103	NA	9,325	8,649	676	NA	NA	NA	19,800	12,533	1,382	1,235	3,291	1,358	3,673	1,679	470	1,525
1994	42,123	8,607	3,618	4,989	4,989	NA	9,254	8,635	619	NA	NA	NA	20,458	12,982	1,409	1,264	3,419	1,384	3,805	1,615	505	1,685
1995	41,202	8,344	3,742	4,601	4,601	NA	7,749	7,485	264	NA	NA	NA	21,076	13,405	1,488	1,315	3,493	1,374	4,033	1,628	543	1,862
1996	44,818	8,298	3,662	4,636	4,636	NA	10,246	9,357	888	NA	NA	NA	21,920	13,790	1,570	1,410	3,744	1,405	4,355	1,706	585	2,064
1997	49,320	8,261	3,688	4,572	4,572	NA	13,157	11,775	1,382	NA	NA	NA	23,439	14,451	1,657	1,559	4,231	1,541	4,463	1,769	603	2,091
1998	46,281	8,559	3,989	4,571	4,571	NA	7,775	6,444	1,331	NA	NA	NA	25,093	15,365	1,717	1,697	4,642	1,673	4,854	1,940	634	2,280
1999	50,127	9,252	4,382	4,869	4,869	NA	8,701	7,250	1,451	NA	NA	NA	26,793	16,310	1,815	1,801	5,039	1,828	5,382	2,270	677	2,435
2000	53,836	9,992	4,822	5,170	5,170	NA	9,017	7,832	1,185	NA	NA	NA	28,549	17,251	1,923	1,861	5,525	1,990	6,278	2,689	725	2,864
2001	58,707	11,069	5,339	5,729	5,520	NA	10,093	9,148	945	NA	NA	NA	30,649	18,698	2,012	1,839	5,964	2,136	6,896	3,088	716	3,092
2002	62,662	12,014	5,565	6,449	6,205	NA	9,311	8,216	1,096	NA	NA	NA	33,982	21,146	2,153	1,797	6,553	2,333	7,355	3,177	684	3,495
2003	66,407	11,797	5,650	6,147	5,940	NA	10,090	8,411	1,679	NA	NA	NA	36,602	23,280	2,293	1,739	6,894	2,395	7,918	3,288	686	3,944
2004	66,501	11,409	5,540	5,869	5,723	NA	9,242	7,977	1,264	NA	NA	NA	38,035	24,452	2,359	1,750	7,036	2,438	7,815	3,289	682	3,845
2005	68,524	11,332	5,457	5,875	5,719	NA	9,914	8,647	1,267	NA	NA	NA	39,176	24,921	2,365	1,831	7,513	2,546	8,101	3,320	703	4,078
2006	68,359	11,051	5,236	5,815	5,641	51	9,309	7,705	1,603	NA	NA	NA	39,909	24,726	2,432	1,959	8,092	2,699	8,039	3,163	729	4,147
2007	69,852	8,708	4,996	3,711	3,566	62	12,183	9,178	3,006	NA	NA	NA	40,620	24,378	2,595	2,115	8,576	2,955	8,279	3,059	754	4,465
2008	72,697	9,050	5,257	3,793	3,640	77	13,119	10,331	1,564	513	678	32	41,499	24,346	2,729	2,260	8,981	3,184	8,953	3,260	768	4,925
2009	76,693	10,539	5,727	4,812	4,665	95	15,562	12,630	1,410	696	775	50	40,765	24,202	2,585	2,099	8,687	3,191	9,734	3,682	735	5,317
2010	79,434	12,223	5,317	6,906	6,737	107	17,034	13,775	1,463	751	973	71	40,188	24,540	2,368	1,855	8,324	3,101	9,882	3,553	731	5,599
2011	74,920	11,743	5,144	6,599	6,454	105	13,270	10,788	690	759	973	60	40,296	24,429	2,287	1,838	8,650	3,092	9,506	3,140	758	5,608
2012	73,807	11,150	5,489	5,661	5,530	99	13,294	10,955	644	710	946	39	39,773	23,285	2,200	1,865	9,236	3,188	9,492	3,092	764	5,635
2013	77,734	9,355	5,238	4,116	4,015	90	19,172	14,728	1,175	1,421	1,740	107	39,308	22,088	2,168	1,940	9,747	3,364	9,810	2,979	799	6,033
2014	79,829	9,529	5,505	4,024	3,934	95	21,166	15,250	1,972	1,528	2,284	131	38,833	21,196	2,162	2,013	9,978	3,484	10,206	2,982	829	6,395
2015	80,506	9,574	5,630	3,944	3,864	96	20,829	15,229	1,948	1,496	2,029	127	39,490	21,079	2,190	2,105	10,489	3,627	10,517	2,900	852	6,765
2016	85,118	9,757	5,788	3,969	3,889	89	23,697	17,775	1,927	1,452	2,413	130	40,321	21,199	2,217	2,158	10,955	3,792	11,255	3,050	898	7,308
2017	86,778	9,644	5,811	3,833	3,764	96	23,783	16,989	1,720	1,936	3,027	111	41,336	21,510	2,205	2,230	11,365	4,026	11,920	3,188	931	7,800
2018	91,684	10,060	6,189	3,870	3,797	108	26,482	19,133	2,299	1,876	3,062	112	42,597	22,021	2,207	2,345	11,751	4,273	12,437	3,331	985	8,120
2019[g]	96,057	10,685	6,604	4,081	4,008	115	28,503	20,337	2,504	2,139	3,395	128	43,908	22,592	2,234	2,458	12,124	4,500	12,846	3,354	1,037	8,455

NA = not available.

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

[a] See **table 2**, footnote a.

[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 the 2016 Survey of State Government Research and Development. 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 for other than 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] The data for 2019 are estimates and will later be revised.

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. Except for the nonprofit sector, data are based on annual reports by performers in the National Center for Science and Engineering Statistics' annual R&D expenditure surveys: Business Research and Development Survey, Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Expenditures Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers from 1977 and after, 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 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: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	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	726	438	288	NA	NA	NA	134	59	30	7	28	10	35	14	11	10
1954	1,378	388	330	59	59	NA	814	492	322	NA	NA	NA	137	60	32	8	28	10	40	16	13	11
1955	1,502	419	333	86	86	NA	899	560	339	NA	NA	NA	142	63	32	9	27	11	43	18	14	11
1956	1,929	511	387	125	125	NA	1,224	794	430	NA	NA	NA	146	65	33	10	27	11	48	20	14	14
1957	2,413	595	446	149	149	NA	1,616	992	624	NA	NA	NA	147	63	34	12	27	11	57	23	14	20
1958	2,759	672	516	156	156	NA	1,868	1,137	731	NA	NA	NA	152	66	35	12	27	12	68	29	14	25
1959	2,940	756	577	179	179	NA	1,935	1,178	757	NA	NA	NA	167	78	37	13	28	12	82	40	15	27
1960	3,065	816	615	201	201	NA	1,965	1,196	769	NA	NA	NA	186	93	39	13	29	12	99	54	17	28
1961	3,123	908	668	240	240	NA	1,903	1,165	738	NA	NA	NA	199	104	40	13	30	13	114	62	17	35
1962	3,698	958	709	249	249	NA	2,392	1,438	954	NA	NA	NA	216	119	41	14	30	13	132	68	19	45
1963	3,864	1,084	809	275	275	NA	2,402	1,450	952	NA	NA	NA	230	128	42	14	32	14	150	82	19	49
1964	4,201	1,260	947	313	313	NA	2,538	1,560	978	NA	NA	NA	256	142	45	14	37	18	148	82	19	47
1965	4,374	1,287	994	294	294	NA	2,612	1,620	992	NA	NA	NA	304	176	46	13	42	27	171	98	21	52
1966	4,653	1,302	1,012	290	290	NA	2,790	1,804	986	NA	NA	NA	351	208	47	14	48	34	210	129	24	57
1967	4,848	1,402	1,069	334	334	NA	2,832	1,849	983	NA	NA	NA	389	238	46	16	54	36	226	141	25	60
1968	5,137	1,446	1,112	334	334	NA	3,037	2,081	956	NA	NA	NA	405	250	46	16	55	39	250	160	28	62
1969	5,454	1,565	1,229	336	336	NA	3,192	2,272	920	NA	NA	NA	417	257	48	16	54	43	281	183	32	66
1970	5,752	1,670	1,334	336	336	NA	3,330	2,378	952	NA	NA	NA	451	280	51	18	56	47	302	199	33	70
1971	5,833	1,666	1,355	312	312	NA	3,348	2,441	907	NA	NA	NA	499	306	61	19	67	47	320	212	34	74
1972	6,147	1,792	1,434	358	358	NA	3,407	2,562	845	NA	NA	NA	619	391	74	21	82	52	330	216	35	79
1973	6,655	1,861	1,527	334	334	NA	3,715	2,832	883	NA	NA	NA	725	450	88	26	100	62	355	236	36	83
1974	7,344	1,987	1,652	335	335	NA	4,168	3,263	905	NA	NA	NA	794	477	96	32	118	72	396	266	39	91
1975	8,091	2,295	1,912	384	384	NA	4,431	3,440	991	NA	NA	NA	934	550	113	39	141	92	431	290	42	100
1976	8,976	2,525	2,068	457	457	NA	4,945	3,912	1,033	NA	NA	NA	1,042	596	127	45	166	109	464	310	45	109
1977	9,662	2,621	2,081	540	540	NA	5,424	4,311	1,113	NA	NA	NA	1,126	626	134	51	194	121	492	324	48	120
1978	10,704	2,838	2,242	597	597	NA	6,065	4,870	1,195	NA	NA	NA	1,247	676	151	61	232	128	554	371	52	132
1979	12,097	3,069	2,415	654	654	NA	6,975	5,670	1,305	NA	NA	NA	1,418	793	161	71	263	129	635	436	55	144
1980	13,729	3,295	2,546	749	749	NA	8,175	6,550	1,625	NA	NA	NA	1,622	912	174	88	308	140	637	420	60	158
1981	16,329	3,520	2,731	788	788	NA	10,401	8,359	2,042	NA	NA	NA	1,781	953	199	108	363	159	628	391	64	173
1982	18,218	3,692	2,802	890	890	NA	11,956	9,363	2,593	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	13,513	10,286	3,227	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	15,218	11,541	3,677	NA	NA	NA	2,332	1,226	234	168	491	212	764	459	79	226
1985	25,401	4,427	3,135	1,292	1,292	NA	17,625	12,908	4,717	NA	NA	NA	2,527	1,296	262	198	547	224	822	490	85	247

TABLE 4

U.S. applied research expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1986	27,240	4,462	3,204	1,258	1,258	NA	19,131	15,082	4,049	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	19,190	15,153	4,037	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	20,377	16,531	3,846	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	22,317	17,993	4,324	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	24,399	18,432	5,967	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	27,013	21,425	5,588	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	25,660	21,184	4,476	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	24,251	19,956	4,295	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	22,988	19,372	3,616	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	26,919	23,755	3,164	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	29,010	25,370	3,640	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	32,430	29,782	2,648	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	32,208	29,576	2,632	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	36,638	33,821	2,817	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	39,176	36,494	2,682	NA	NA	NA	6,361	3,081	558	540	1,604	578	3,110	1,831	258	1,021
2001	63,956	9,522	7,052	2,469	2,379	NA	44,012	40,409	3,603	NA	NA	NA	6,886	3,411	585	535	1,734	621	3,537	2,150	261	1,126
2002	50,521	10,506	7,487	3,019	2,905	NA	28,533	26,081	2,452	NA	NA	NA	7,670	3,877	636	531	1,937	689	3,812	2,267	253	1,293
2003	61,059	10,933	7,672	3,262	3,152	NA	37,334	32,861	4,473	NA	NA	NA	8,560	4,450	708	537	2,127	739	4,232	2,487	259	1,486
2004	69,132	10,589	7,455	3,135	3,057	NA	45,432	40,657	4,775	NA	NA	NA	8,911	4,682	735	545	2,190	759	4,200	2,448	264	1,488
2005	69,653	10,886	7,557	3,329	3,241	NA	45,284	39,995	5,289	NA	NA	NA	9,144	4,810	719	557	2,283	774	4,339	2,432	280	1,627
2006	76,622	11,075	7,435	3,640	3,531	255	51,173	45,033	6,140	NA	NA	NA	9,522	5,080	712	573	2,368	789	4,596	2,592	300	1,705
2007	85,319	12,697	7,222	5,475	5,293	321	57,570	48,625	8,945	NA	NA	NA	9,945	5,284	745	607	2,461	848	4,786	2,583	318	1,885
2008	76,639	13,356	7,316	6,040	5,843	407	46,864	35,382	5,397	2,815	3,094	175	10,962	5,840	815	675	2,682	951	5,050	2,600	331	2,119
2009	74,136	14,063	7,874	6,189	5,979	502	41,055	29,264	7,797	1,865	1,996	134	12,843	7,220	942	757	2,917	1,007	5,673	3,049	319	2,305
2010	79,055	13,203	8,016	5,187	5,025	572	44,906	34,912	4,705	2,256	2,819	214	14,556	8,673	1,002	764	3,083	1,036	5,818	3,041	321	2,456
2011	81,926	13,251	8,024	5,227	5,057	575	47,186	37,047	4,404	2,413	3,131	191	15,371	9,194	981	781	3,341	1,074	5,544	2,693	340	2,512
2012	86,856	14,328	8,587	5,741	5,566	550	50,755	38,891	4,137	3,336	4,209	182	15,674	9,077	994	862	3,609	1,133	5,550	2,629	349	2,572
2013	88,191	15,132	8,309	6,823	6,639	513	51,013	37,385	6,028	3,275	4,078	247	15,895	8,794	1,051	920	3,861	1,270	5,638	2,465	371	2,802
2014	91,803	15,727	8,775	6,952	6,765	471	53,415	38,281	6,445	3,331	5,074	285	16,198	8,616	1,075	980	4,133	1,394	5,991	2,574	392	3,025
2015	97,273	16,698	9,347	7,351	7,182	481	56,472	43,330	6,102	2,735	4,072	233	17,195	8,984	1,084	1,086	4,461	1,580	6,428	2,791	407	3,230
2016	106,825	17,433	9,805	7,628	7,469	509	62,871	48,543	5,327	3,175	5,536	291	18,756	9,683	1,160	1,202	4,883	1,828	7,256	3,297	433	3,526
2017	110,991	18,170	10,124	8,046	7,868	510	64,040	47,727	5,386	3,853	6,849	226	19,826	10,152	1,221	1,269	5,239	1,945	8,445	4,152	458	3,835
2018	116,319	19,704	11,111	8,593	8,407	514	66,609	50,915	5,359	3,469	6,651	214	20,899	10,658	1,289	1,368	5,544	2,041	8,593	4,009	496	4,088
2019[g]	124,849	20,468	11,176	9,292	9,104	526	72,709	55,038	5,919	4,036	7,469	247	22,085	11,175	1,353	1,492	5,868	2,197	9,061	4,197	531	4,332

TABLE 4

U.S. applied research expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
	Constant 2012 $millions																					
1953	8,928	2,732	2,403	329	329	NA	5,028	3,034	1,995	NA	NA	NA	925	409	209	45	193	69	242	97	76	69
1954	9,457	2,663	2,261	401	401	NA	5,586	3,377	2,210	NA	NA	NA	937	408	216	51	192	69	271	106	89	75
1955	10,133	2,827	2,247	580	580	NA	6,064	3,779	2,285	NA	NA	NA	955	425	218	57	183	71	287	118	94	74
1956	12,584	3,334	2,522	812	812	NA	7,984	5,181	2,803	NA	NA	NA	953	424	216	65	176	72	313	131	91	91
1957	15,243	3,755	2,814	941	941	NA	10,206	6,266	3,940	NA	NA	NA	925	398	214	73	171	69	357	142	88	126
1958	17,040	4,150	3,187	963	963	NA	11,537	7,022	4,514	NA	NA	NA	936	405	218	74	168	71	417	176	86	154
1959	17,909	4,603	3,512	1,090	1,090	NA	11,789	7,176	4,613	NA	NA	NA	1,017	472	225	76	171	73	500	244	91	164
1960	18,424	4,901	3,693	1,208	1,208	NA	11,813	7,188	4,624	NA	NA	NA	1,115	559	233	78	173	72	595	325	102	168
1961	18,573	5,397	3,973	1,424	1,424	NA	11,317	6,928	4,389	NA	NA	NA	1,181	616	237	77	176	74	678	369	101	208
1962	21,727	5,626	4,163	1,463	1,463	NA	14,056	8,449	5,607	NA	NA	NA	1,269	696	238	79	179	76	776	400	112	264
1963	22,446	6,293	4,699	1,594	1,594	NA	13,951	8,422	5,528	NA	NA	NA	1,333	741	245	81	188	78	868	473	110	285
1964	24,036	7,206	5,415	1,791	1,791	NA	14,521	8,925	5,596	NA	NA	NA	1,462	812	259	77	213	100	847	469	109	269
1965	24,574	7,231	5,582	1,649	1,649	NA	14,676	9,102	5,574	NA	NA	NA	1,705	986	261	73	237	149	961	551	118	292
1966	25,430	7,117	5,531	1,585	1,585	NA	15,250	9,860	5,389	NA	NA	NA	1,919	1,137	257	77	265	183	1,145	702	131	312
1967	25,750	7,447	5,675	1,771	1,771	NA	15,042	9,821	5,221	NA	NA	NA	2,063	1,261	242	82	286	191	1,198	746	133	319
1968	26,170	7,364	5,662	1,702	1,702	NA	15,472	10,601	4,870	NA	NA	NA	2,063	1,271	234	82	280	196	1,271	813	143	316
1969	26,489	7,599	5,970	1,629	1,629	NA	15,502	11,034	4,468	NA	NA	NA	2,025	1,246	234	78	262	206	1,362	886	155	321
1970	26,537	7,704	6,154	1,550	1,550	NA	15,362	10,970	4,392	NA	NA	NA	2,078	1,289	236	81	257	215	1,393	918	152	323
1971	25,609	7,316	5,949	1,368	1,368	NA	14,699	10,717	3,982	NA	NA	NA	2,191	1,343	266	81	294	206	1,403	929	149	325
1972	25,870	7,542	6,035	1,507	1,507	NA	14,339	10,783	3,556	NA	NA	NA	2,603	1,643	312	86	344	217	1,387	907	147	332
1973	26,554	7,427	6,094	1,333	1,333	NA	14,822	11,299	3,523	NA	NA	NA	2,891	1,793	350	104	398	245	1,414	940	144	331
1974	26,884	7,273	6,048	1,225	1,225	NA	15,258	11,945	3,313	NA	NA	NA	2,905	1,744	352	115	432	262	1,449	974	142	333
1975	27,107	7,689	6,405	1,285	1,285	NA	14,845	11,525	3,320	NA	NA	NA	3,129	1,841	380	129	471	308	1,444	970	139	335
1976	28,505	8,019	6,568	1,451	1,451	NA	15,703	12,423	3,280	NA	NA	NA	3,309	1,891	404	141	526	346	1,474	984	142	348
1977	28,888	7,835	6,220	1,614	1,614	NA	16,217	12,889	3,328	NA	NA	NA	3,365	1,870	402	152	580	360	1,472	969	144	359
1978	29,900	7,928	6,261	1,666	1,666	NA	16,941	13,603	3,338	NA	NA	NA	3,482	1,888	422	169	647	356	1,549	1,037	144	367
1979	31,202	7,916	6,229	1,687	1,687	NA	17,991	14,625	3,366	NA	NA	NA	3,656	2,044	417	184	679	333	1,639	1,124	143	372
1980	32,478	7,794	6,023	1,772	1,772	NA	19,339	15,495	3,844	NA	NA	NA	3,838	2,158	411	209	729	332	1,507	993	141	373
1981	35,289	7,607	5,903	1,703	1,703	NA	22,478	18,065	4,413	NA	NA	NA	3,849	2,059	431	233	784	343	1,357	845	138	373
1982	37,080	7,514	5,702	1,812	1,812	NA	24,335	19,057	5,278	NA	NA	NA	3,897	2,049	422	246	818	362	1,334	810	140	385
1983	39,756	7,748	5,859	1,890	1,890	NA	26,467	20,147	6,321	NA	NA	NA	4,144	2,198	421	277	868	380	1,397	848	144	405
1984	42,442	7,820	5,597	2,223	2,223	NA	28,769	21,817	6,951	NA	NA	NA	4,408	2,318	443	317	929	401	1,445	868	149	428
1985	46,546	8,112	5,745	2,367	2,367	NA	32,297	23,654	8,644	NA	NA	NA	4,631	2,376	479	362	1,003	411	1,506	897	155	453

TABLE 4

U.S. applied research expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1986	48,931	8,015	5,755	2,260	2,260	NA	34,365	27,092	7,273	NA	NA	NA	4,993	2,502	535	411	1,114	431	1,557	908	163	486
1987	48,997	8,053	5,900	2,153	2,153	NA	33,639	26,563	7,077	NA	NA	NA	5,643	2,880	584	456	1,240	483	1,662	973	171	518
1988	49,998	7,358	5,693	1,665	1,665	NA	34,503	27,991	6,512	NA	NA	NA	6,400	3,316	638	511	1,385	550	1,737	1,014	177	546
1989	52,590	7,516	5,811	1,705	1,705	NA	36,362	29,317	7,045	NA	NA	NA	6,824	3,456	679	565	1,520	603	1,888	1,132	183	573
1990	54,808	7,552	5,736	1,816	1,816	NA	38,320	28,949	9,372	NA	NA	NA	6,920	3,362	711	592	1,619	635	2,016	1,224	189	603
1991	58,689	8,415	6,219	2,196	2,196	NA	41,038	32,549	8,489	NA	NA	NA	7,004	3,390	711	595	1,657	651	2,231	1,399	196	636
1992	56,347	8,712	6,442	2,271	2,271	NA	38,114	31,466	6,648	NA	NA	NA	7,252	3,587	711	615	1,664	675	2,269	1,387	205	678
1993	54,095	9,196	7,020	2,176	2,176	NA	35,187	28,955	6,232	NA	NA	NA	7,471	3,688	719	643	1,714	707	2,241	1,305	215	721
1994	52,020	9,349	7,082	2,267	2,267	NA	32,657	27,520	5,137	NA	NA	NA	7,657	3,756	735	660	1,784	722	2,357	1,363	225	769
1995	56,961	9,276	6,891	2,385	2,385	NA	37,457	33,054	4,403	NA	NA	NA	7,874	3,867	777	687	1,825	718	2,354	1,299	236	819
1996	58,989	8,874	6,657	2,217	2,217	NA	39,640	34,667	4,974	NA	NA	NA	8,041	3,913	798	716	1,900	714	2,434	1,311	248	875
1997	62,483	8,967	6,712	2,255	2,255	NA	43,562	40,005	3,557	NA	NA	NA	7,367	3,382	737	691	1,875	683	2,588	1,358	275	954
1998	61,431	9,126	6,835	2,291	2,291	NA	42,783	39,286	3,496	NA	NA	NA	6,785	2,908	684	676	1,850	667	2,738	1,408	289	1,041
1999	67,897	9,402	7,241	2,161	2,161	NA	47,974	44,285	3,689	NA	NA	NA	7,399	3,367	698	693	1,938	703	3,122	1,702	309	1,111
2000	72,368	10,061	7,819	2,242	2,242	NA	50,176	46,741	3,435	NA	NA	NA	8,147	3,947	715	692	2,054	740	3,983	2,345	331	1,307
2001	80,156	11,933	8,839	3,095	2,982	NA	55,160	50,644	4,516	NA	NA	NA	8,630	4,275	733	671	2,173	778	4,433	2,695	327	1,411
2002	62,332	12,962	9,238	3,725	3,584	NA	35,203	32,178	3,025	NA	NA	NA	9,462	4,783	785	655	2,390	851	4,704	2,796	312	1,595
2003	73,960	13,243	9,292	3,951	3,818	NA	45,222	39,804	5,418	NA	NA	NA	10,369	5,390	857	650	2,576	895	5,126	3,012	313	1,800
2004	81,543	12,491	8,793	3,698	3,606	NA	53,588	47,956	5,632	NA	NA	NA	10,510	5,523	867	642	2,583	895	4,954	2,888	311	1,755
2005	79,676	12,453	8,645	3,808	3,707	NA	51,800	45,750	6,050	NA	NA	NA	10,460	5,503	823	637	2,612	886	4,964	2,781	321	1,861
2006	85,073	12,296	8,255	4,042	3,920	284	56,817	50,000	6,817	NA	NA	NA	10,573	5,640	791	636	2,629	877	5,103	2,878	333	1,893
2007	92,251	13,729	7,808	5,920	5,723	347	62,247	52,575	9,672	NA	NA	NA	10,753	5,713	805	656	2,661	917	5,175	2,793	344	2,038
2008	81,285	14,165	7,760	6,406	6,197	432	49,705	37,527	5,724	2,986	3,282	186	11,627	6,194	864	716	2,844	1,008	5,356	2,758	351	2,248
2009	78,035	14,803	8,288	6,515	6,294	528	43,214	30,803	8,207	1,963	2,101	141	13,519	7,600	991	797	3,070	1,060	5,972	3,209	335	2,427
2010	82,254	13,738	8,340	5,397	5,229	595	46,723	36,325	4,895	2,347	2,933	223	15,145	9,024	1,042	794	3,207	1,077	6,053	3,164	334	2,555
2011	83,498	13,505	8,178	5,327	5,154	586	48,091	37,758	4,488	2,459	3,191	195	15,665	9,370	999	796	3,405	1,095	5,651	2,745	346	2,560
2012	86,856	14,328	8,587	5,741	5,566	550	50,755	38,891	4,137	3,336	4,209	182	15,674	9,077	994	862	3,609	1,133	5,550	2,629	349	2,572
2013	86,669	14,871	8,165	6,705	6,524	504	50,133	36,740	5,924	3,219	4,008	243	15,620	8,642	1,033	904	3,794	1,248	5,541	2,423	365	2,754
2014	88,580	15,175	8,467	6,708	6,528	455	51,540	36,937	6,219	3,214	4,896	275	15,629	8,314	1,037	946	3,988	1,345	5,781	2,484	378	2,919
2015	92,974	15,960	8,934	7,026	6,864	459	53,976	41,415	5,832	2,614	3,892	222	16,435	8,587	1,036	1,038	4,263	1,510	6,144	2,668	389	3,088
2016	101,043	16,489	9,274	7,215	7,064	482	59,468	45,916	5,039	3,003	5,236	275	17,740	9,159	1,097	1,136	4,619	1,729	6,863	3,118	410	3,335
2017	103,046	16,869	9,399	7,470	7,305	474	59,456	44,311	5,000	3,577	6,359	210	18,407	9,425	1,134	1,178	4,864	1,806	7,840	3,855	425	3,560
2018	105,461	17,865	10,074	7,791	7,622	466	60,391	46,162	4,859	3,146	6,030	194	18,948	9,663	1,169	1,240	5,026	1,850	7,791	3,635	450	3,706
2019[g]	111,210	18,232	9,955	8,277	8,110	468	64,766	49,026	5,272	3,595	6,653	220	19,672	9,954	1,206	1,329	5,227	1,957	8,071	3,739	473	3,859

NA = not available.

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

[a] See **table 2**, footnote a.

[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 the 2016 Survey of State Government Research and Development. 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 1998 and forward, reflect institution-specific detail on the type of R&D performed. Type-of-R&D splits for other than 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] The data for 2019 are estimates and will later be revised.

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. Except for the nonprofit sector, data are based on annual reports by performers in the National Center for Science and Engineering Statistics' annual R&D expenditure surveys: Business Research and Development Survey, Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Expenditures Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers from 1977 and after, 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 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. development expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	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	2,753	1,630	1,123	NA	NA	NA	16	9	3	1	3	1	29	17	6	6
1954	3,734	599	537	62	62	NA	3,090	1,685	1,405	NA	NA	NA	17	9	3	1	3	1	29	15	7	7
1955	4,113	713	543	171	171	NA	3,352	1,738	1,614	NA	NA	NA	21	12	4	2	3	1	27	12	8	7
1956	5,854	978	631	348	348	NA	4,826	2,267	2,559	NA	NA	NA	25	14	4	2	4	2	26	11	8	7
1957	6,681	1,157	728	429	429	NA	5,474	2,174	3,300	NA	NA	NA	26	12	5	3	4	2	25	9	8	8
1958	7,213	1,227	842	386	386	NA	5,932	2,241	3,691	NA	NA	NA	28	13	6	3	4	2	26	9	8	9
1959	8,463	1,417	940	477	477	NA	6,983	2,557	4,426	NA	NA	NA	31	16	6	3	5	2	33	14	9	10
1960	9,360	1,562	1,003	559	559	NA	7,734	2,935	4,799	NA	NA	NA	35	19	6	3	5	2	30	10	10	10
1961	9,930	1,760	1,090	670	670	NA	8,106	3,189	4,917	NA	NA	NA	37	22	7	2	5	2	28	4	10	14
1962	10,114	1,845	1,227	618	618	NA	8,196	3,246	4,950	NA	NA	NA	40	23	8	2	6	2	34	5	11	18
1963	11,539	2,133	1,465	668	668	NA	9,330	3,535	5,795	NA	NA	NA	40	22	8	2	6	2	37	6	11	20
1964	12,506	2,419	1,680	739	739	NA	10,004	3,848	6,156	NA	NA	NA	49	30	8	2	7	3	35	6	11	18
1965	13,215	2,463	1,789	674	674	NA	10,637	4,419	6,218	NA	NA	NA	71	48	9	2	8	4	45	13	12	20
1966	14,490	2,540	1,886	654	654	NA	11,810	4,961	6,849	NA	NA	NA	87	61	9	2	10	5	53	16	14	23
1967	15,332	2,649	1,943	706	706	NA	12,539	5,744	6,795	NA	NA	NA	93	66	9	3	10	7	51	12	15	24
1968	16,154	2,628	1,904	724	724	NA	13,370	6,326	7,044	NA	NA	NA	102	72	8	4	9	9	55	13	16	26
1969	17,051	2,807	2,016	792	792	NA	14,071	7,127	6,944	NA	NA	NA	110	80	7	5	8	10	63	17	18	28
1970	16,925	3,047	2,258	790	790	NA	13,698	7,466	6,232	NA	NA	NA	112	84	6	5	7	10	68	20	18	30
1971	17,399	3,313	2,473	841	841	NA	13,924	7,757	6,167	NA	NA	NA	98	69	8	4	9	9	64	12	19	33
1972	18,743	3,502	2,639	863	863	NA	15,043	8,510	6,533	NA	NA	NA	101	63	12	4	14	9	98	44	19	35
1973	20,197	3,517	2,657	860	860	NA	16,394	9,773	6,621	NA	NA	NA	126	71	18	5	20	13	160	102	20	38
1974	21,504	3,748	2,765	983	983	NA	17,421	10,868	6,553	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	18,352	11,569	6,783	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	20,412	12,890	7,522	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	22,603	14,328	8,275	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	25,216	16,460	8,756	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	29,033	19,145	9,888	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	33,848	22,891	10,957	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	38,547	25,756	12,791	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	43,434	29,219	14,215	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	48,064	32,542	15,522	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	55,371	37,731	17,640	NA	NA	NA	677	435	51	37	108	47	762	594	47	120
1985	74,522	10,916	8,011	2,906	2,906	NA	62,020	41,762	20,258	NA	NA	NA	756	486	57	43	120	49	829	644	51	134

TABLE 5

U.S. development expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1986	75,855	11,376	8,275	3,101	3,101	NA	62,871	41,354	21,517	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	66,789	42,667	24,122	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	70,353	46,634	23,719	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	72,725	51,676	21,049	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	78,376	59,410	18,966	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	80,286	63,030	17,256	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	84,569	67,388	17,181	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	84,757	68,674	16,083	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	87,890	71,681	16,209	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	97,342	79,518	17,824	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	105,863	88,797	17,066	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	113,184	95,063	18,121	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	129,041	110,589	18,452	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	138,807	122,236	16,571	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	153,745	140,235	13,510	NA	NA	NA	1,265	545	123	119	352	127	1,545	580	195	771
2001	167,740	14,459	11,062	3,397	3,273	NA	149,952	137,410	12,542	NA	NA	NA	1,409	646	128	117	381	136	1,921	874	197	850
2002	176,601	15,238	11,800	3,438	3,308	NA	157,788	144,727	13,061	NA	NA	NA	1,472	639	140	116	425	151	2,104	937	191	976
2003	175,483	16,563	12,646	3,917	3,785	NA	155,060	143,121	11,939	NA	NA	NA	1,799	897	155	118	467	162	2,060	743	195	1,122
2004	177,220	17,424	12,746	4,677	4,561	NA	155,034	140,615	14,419	NA	NA	NA	2,140	1,211	161	120	481	167	2,623	1,300	199	1,123
2005	195,731	18,775	13,994	4,781	4,654	NA	172,208	156,696	15,512	NA	NA	NA	2,098	1,146	158	122	501	170	2,651	1,211	212	1,228
2006	212,719	20,582	16,089	4,493	4,358	7	188,112	171,392	16,720	NA	NA	NA	1,902	927	156	126	520	173	2,116	603	226	1,287
2007	227,968	23,381	18,016	5,365	5,254	9	200,429	185,569	14,860	NA	NA	NA	1,917	894	163	133	540	186	2,231	568	240	1,423
2008	259,596	23,760	17,566	6,194	6,094	11	231,447	180,724	29,488	8,882	11,799	553	1,965	841	179	148	589	209	2,412	562	250	1,600
2009	255,933	23,497	17,245	6,252	6,159	14	226,554	179,841	30,435	7,041	8,732	505	3,338	1,527	282	280	888	361	2,531	550	241	1,740
2010	251,200	25,847	18,844	7,004	6,909	16	217,700	170,036	28,089	8,035	10,778	762	4,903	2,422	396	407	1,180	498	2,734	638	242	1,854
2011	270,776	28,751	21,879	6,872	6,786	16	233,886	187,794	26,228	7,966	11,266	632	5,180	2,579	391	415	1,275	521	2,943	790	256	1,896
2012	273,056	26,666	19,941	6,725	6,631	15	238,202	192,828	25,840	7,578	11,543	413	5,449	2,605	367	444	1,455	579	2,723	518	263	1,942
2013	286,982	26,436	19,767	6,668	6,572	14	252,007	207,537	22,137	8,729	12,946	658	5,656	2,570	385	482	1,599	620	2,869	474	280	2,115
2014	301,433	27,084	20,303	6,781	6,681	13	265,377	223,186	18,065	8,312	15,103	711	5,908	2,542	399	537	1,735	696	3,051	471	296	2,284
2015	312,980	26,132	18,961	7,171	7,062	14	277,557	230,629	18,850	10,295	16,907	876	6,110	2,518	401	555	1,858	779	3,168	422	307	2,439
2016	324,889	23,439	15,838	7,601	7,479	18	291,603	243,055	16,790	9,940	20,929	889	6,390	2,574	420	562	1,968	867	3,439	450	327	2,662
2017	350,784	23,995	15,848	8,147	8,021	22	316,135	258,151	17,736	11,792	27,804	652	6,760	2,666	448	607	2,105	934	3,873	632	346	2,895
2018	388,642	27,556	18,856	8,701	8,567	23	349,820	285,903	17,304	13,747	32,032	833	7,016	2,790	486	626	2,199	916	4,228	767	374	3,086
2019[g]	423,352	30,588	21,496	9,092	8,958	23	381,119	309,316	19,180	15,954	35,705	963	7,338	2,923	516	650	2,313	935	4,284	612	401	3,271

TABLE 5

U.S. development expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
	Constant 2012 $millions																					
1953	23,628	4,253	3,924	329	329	NA	19,067	11,289	7,778	NA	NA	NA	111	59	20	7	18	7	197	114	42	42
1954	25,626	4,108	3,685	422	422	NA	21,207	11,564	9,643	NA	NA	NA	117	58	24	7	21	7	196	100	48	48
1955	27,756	4,811	3,661	1,151	1,151	NA	22,621	11,728	10,893	NA	NA	NA	142	78	26	10	22	7	182	81	54	47
1956	38,200	6,382	4,114	2,267	2,267	NA	31,489	14,793	16,696	NA	NA	NA	163	88	29	13	23	10	166	69	52	46
1957	42,204	7,305	4,595	2,710	2,710	NA	34,580	13,732	20,847	NA	NA	NA	164	76	33	16	27	13	155	54	51	51
1958	44,549	7,578	5,197	2,381	2,381	NA	36,640	13,841	22,799	NA	NA	NA	170	77	35	19	27	12	161	56	49	56
1959	51,555	8,629	5,726	2,903	2,903	NA	42,539	15,577	26,962	NA	NA	NA	189	94	36	18	28	12	198	82	55	61
1960	56,257	9,385	6,025	3,360	3,360	NA	46,484	17,640	28,844	NA	NA	NA	207	114	38	15	28	12	180	60	60	60
1961	59,056	10,464	6,479	3,985	3,985	NA	48,205	18,966	29,240	NA	NA	NA	223	128	41	12	30	12	164	21	59	83
1962	59,428	10,841	7,210	3,631	3,631	NA	48,156	19,073	29,083	NA	NA	NA	235	132	45	12	34	12	197	26	65	106
1963	67,026	12,389	8,509	3,880	3,880	NA	54,192	20,533	33,660	NA	NA	NA	232	128	46	12	35	12	212	32	64	116
1964	71,552	13,840	9,612	4,228	4,228	NA	57,237	22,016	35,221	NA	NA	NA	277	169	45	11	37	14	197	31	63	103
1965	74,252	13,836	10,049	3,787	3,787	NA	59,767	24,829	34,937	NA	NA	NA	396	270	49	11	44	22	253	73	67	112
1966	79,197	13,880	10,309	3,572	3,572	NA	64,551	27,116	37,435	NA	NA	NA	476	333	51	11	53	27	290	87	77	126
1967	81,432	14,067	10,320	3,747	3,747	NA	66,600	30,509	36,091	NA	NA	NA	494	348	45	13	53	35	271	64	80	127
1968	82,292	13,386	9,700	3,686	3,686	NA	68,112	32,227	35,885	NA	NA	NA	517	364	39	20	47	46	278	64	82	132
1969	82,809	13,634	9,790	3,844	3,844	NA	68,338	34,613	33,724	NA	NA	NA	532	386	34	24	39	49	306	83	87	136
1970	78,077	14,058	10,416	3,642	3,642	NA	63,191	34,442	28,749	NA	NA	NA	517	385	30	23	32	46	311	90	83	138
1971	76,386	14,546	10,855	3,690	3,690	NA	61,131	34,056	27,075	NA	NA	NA	430	303	34	18	38	37	279	50	83	145
1972	78,884	14,738	11,108	3,630	3,630	NA	63,311	35,816	27,495	NA	NA	NA	425	263	52	15	57	38	410	183	80	147
1973	80,583	14,033	10,602	3,431	3,431	NA	65,410	38,993	26,417	NA	NA	NA	501	281	70	20	80	50	638	407	80	152
1974	78,721	13,720	10,123	3,597	3,597	NA	63,773	39,784	23,989	NA	NA	NA	514	273	73	24	90	55	713	480	79	155
1975	76,069	13,377	9,682	3,695	3,695	NA	61,483	38,759	22,725	NA	NA	NA	523	276	74	27	92	54	686	451	78	157
1976	79,658	13,611	9,437	4,174	4,174	NA	64,819	40,932	23,886	NA	NA	NA	578	316	76	37	99	51	651	405	80	165
1977	82,719	13,771	9,531	4,240	4,240	NA	67,578	42,837	24,740	NA	NA	NA	759	457	83	43	120	55	610	356	82	173
1978	86,747	14,694	10,269	4,426	4,426	NA	70,435	45,977	24,458	NA	NA	NA	1,041	709	89	41	137	66	577	315	83	179
1979	91,425	14,693	10,172	4,521	4,521	NA	74,885	49,381	25,504	NA	NA	NA	1,211	868	88	40	144	71	635	369	83	184
1980	96,393	14,386	9,634	4,752	4,752	NA	80,070	54,151	25,920	NA	NA	NA	1,225	856	90	46	160	73	711	442	82	187
1981	100,071	14,491	9,791	4,701	4,701	NA	83,305	55,662	27,643	NA	NA	NA	1,227	834	95	51	172	75	1,048	777	81	190
1982	105,592	14,956	10,539	4,417	4,417	NA	88,403	59,471	28,932	NA	NA	NA	1,215	809	93	54	180	79	1,018	737	82	199
1983	113,153	16,630	11,959	4,671	4,671	NA	94,140	63,738	30,402	NA	NA	NA	1,209	782	92	61	191	83	1,174	876	86	213
1984	125,640	18,244	13,381	4,863	4,863	NA	104,675	71,328	33,347	NA	NA	NA	1,281	822	97	70	204	88	1,441	1,124	89	228
1985	136,559	20,004	14,679	5,325	5,325	NA	113,650	76,528	37,122	NA	NA	NA	1,386	891	105	80	220	90	1,519	1,180	94	245

TABLE 5

U.S. development expenditures, by performing sector and source of funds: 1953–2019

(Millions of current and of constant 2012 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	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Business	Higher education	NPO	Total	Federal	Business	NPO
1986	136,260	20,435	14,864	5,571	5,571	NA	112,936	74,285	38,651	NA	NA	NA	1,469	922	117	90	245	95	1,420	1,054	99	267
1987	140,112	20,153	14,331	5,821	5,821	NA	117,079	74,794	42,285	NA	NA	NA	1,656	1,049	128	100	272	106	1,224	830	105	289
1988	143,192	21,098	15,009	6,089	6,089	NA	119,125	78,963	40,162	NA	NA	NA	1,859	1,182	140	112	304	121	1,109	690	109	310
1989	142,931	21,166	15,243	5,923	5,923	NA	118,494	84,198	34,296	NA	NA	NA	1,999	1,260	149	124	334	132	1,271	826	114	332
1990	147,740	20,988	15,235	5,753	5,753	NA	123,095	93,308	29,788	NA	NA	NA	2,210	1,429	156	130	355	139	1,446	972	118	355
1991	144,483	18,580	13,335	5,245	5,245	NA	121,971	95,755	26,215	NA	NA	NA	2,330	1,537	156	131	364	143	1,602	1,097	124	381
1992	148,253	18,598	13,513	5,084	5,084	NA	125,614	100,094	25,520	NA	NA	NA	2,371	1,567	156	135	365	148	1,671	1,126	131	414
1993	144,668	17,495	13,162	4,333	4,333	NA	122,978	99,643	23,336	NA	NA	NA	2,466	1,636	158	141	376	155	1,728	1,141	138	449
1994	146,236	17,005	12,535	4,471	4,471	NA	124,859	101,832	23,027	NA	NA	NA	2,580	1,724	161	145	392	159	1,792	1,158	146	488
1995	157,344	17,656	12,888	4,769	4,769	NA	135,447	110,646	24,801	NA	NA	NA	2,521	1,641	171	151	401	158	1,720	1,035	155	531
1996	165,854	17,055	12,343	4,712	4,712	NA	144,655	121,336	23,320	NA	NA	NA	2,448	1,542	175	157	417	157	1,696	953	164	579
1997	172,825	16,666	12,192	4,474	4,474	NA	152,035	127,694	24,341	NA	NA	NA	2,274	1,399	162	152	411	150	1,851	922	208	721
1998	192,167	16,642	12,239	4,402	4,402	NA	171,408	146,898	24,510	NA	NA	NA	2,104	1,253	150	148	406	146	2,014	1,010	218	786
1999	202,061	16,498	12,132	4,367	4,367	NA	181,755	160,057	21,698	NA	NA	NA	1,784	899	153	152	425	154	2,024	952	233	839
2000	216,983	16,469	12,009	4,460	4,460	NA	196,914	179,611	17,303	NA	NA	NA	1,620	698	157	152	451	162	1,979	742	250	987
2001	210,228	18,121	13,864	4,257	4,102	NA	187,934	172,215	15,719	NA	NA	NA	1,765	810	161	147	477	171	2,407	1,095	247	1,065
2002	217,887	18,800	14,558	4,242	4,081	NA	194,676	178,561	16,114	NA	NA	NA	1,816	789	172	144	525	187	2,595	1,155	236	1,204
2003	212,559	20,062	15,318	4,744	4,585	NA	187,821	173,360	14,461	NA	NA	NA	2,180	1,087	188	143	566	196	2,496	900	236	1,359
2004	209,036	20,552	15,035	5,517	5,380	NA	182,867	165,859	17,008	NA	NA	NA	2,524	1,429	190	141	567	196	3,094	1,534	235	1,325
2005	223,896	21,477	16,008	5,469	5,323	NA	196,988	179,244	17,744	NA	NA	NA	2,399	1,311	181	140	573	194	3,032	1,385	242	1,405
2006	236,181	22,852	17,864	4,988	4,838	8	208,860	190,296	18,564	NA	NA	NA	2,112	1,029	174	140	577	192	2,349	669	251	1,429
2007	246,488	25,281	19,480	5,801	5,681	10	216,712	200,645	16,067	NA	NA	NA	2,073	967	177	144	584	201	2,412	614	260	1,539
2008	275,333	25,201	18,631	6,570	6,464	12	245,477	191,680	31,276	9,421	12,515	587	2,085	892	190	157	624	221	2,558	596	265	1,697
2009	269,394	24,733	18,152	6,581	6,483	15	238,469	189,299	32,036	7,411	9,192	531	3,513	1,608	296	295	934	380	2,664	579	253	1,832
2010	261,365	26,893	19,606	7,287	7,188	17	226,510	176,917	29,226	8,360	11,214	793	5,101	2,520	412	423	1,228	518	2,845	663	252	1,929
2011	275,969	29,302	22,299	7,004	6,916	16	238,372	191,396	26,731	8,119	11,482	644	5,279	2,628	398	423	1,299	531	2,999	806	261	1,933
2012	273,056	26,666	19,941	6,725	6,631	15	238,202	192,828	25,840	7,578	11,543	413	5,449	2,605	367	444	1,455	579	2,723	518	263	1,942
2013	282,032	25,980	19,426	6,553	6,459	14	247,660	203,957	21,755	8,579	12,723	647	5,558	2,526	378	474	1,571	609	2,820	466	275	2,079
2014	290,852	26,133	19,590	6,543	6,446	13	256,061	215,351	17,431	8,020	14,572	686	5,701	2,453	385	518	1,674	671	2,944	455	286	2,204
2015	299,147	24,977	18,123	6,854	6,750	13	265,289	220,436	18,017	9,840	16,160	837	5,839	2,407	383	530	1,776	744	3,028	403	294	2,331
2016	307,304	22,170	14,981	7,189	7,074	17	275,820	229,900	15,881	9,402	19,797	841	6,044	2,435	397	531	1,861	820	3,253	425	309	2,518
2017	325,675	22,278	14,714	7,564	7,447	20	293,506	239,672	16,466	10,948	25,814	606	6,276	2,475	416	564	1,954	867	3,596	587	321	2,688
2018	352,362	24,984	17,095	7,888	7,767	21	317,165	259,214	15,689	12,464	29,042	756	6,361	2,529	441	568	1,993	830	3,833	695	340	2,798
2019[g]	377,102	27,246	19,147	8,099	7,979	20	339,483	275,524	17,084	14,211	31,805	858	6,537	2,604	460	579	2,060	833	3,816	545	357	2,913

NA = not available.

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

[a] See **table 2**, footnote a.

[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 footnote b in **table 2**.)

[c] Type-of-R&D data for state intramural R&D became available in the 2016 Survey of State Government Research and Development. 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 1998 and forward, reflect institution-specific detail on the type of R&D performed. Type-of-R&D splits for other than 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] The data for 2019 are estimates and will later be revised.

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. Except for the nonprofit sector, data are based on annual reports by performers in the National Center for Science and Engineering Statistics' annual R&D expenditure surveys: Business Research and Development Survey, Higher Education Research and Development Survey, Survey of Federal Funds for Research and Development, FFRDC Research and Development Expenditures Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers from 1977 and after, 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 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: 1953–2019

(Millions of current and of constant 2012 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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	1,095	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	1,220	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	1,351	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	1,491	NA	NA	713	778

TABLE 6

U.S. R&D expenditures, by source of funds and performing sector: 1953–2019

(Millions of current and of constant 2012 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	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	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	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	2,081	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	2,333	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	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	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	3,113	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	3,388	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	3,665	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	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	4,239	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	4,571	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	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	5,399	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	6,285	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	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	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	8,988	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	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	9,771	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	10,320	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	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	13,184	209	452	4,161	8,362
2009	402,931	125,765	30,560	16,571	224	39,573	31,740	7,097	4,295	40	381	195	3,679	246,609	184	242,135	3,032	1,258	12,057	14,205	218	490	4,400	9,097
2010	406,600	126,617	31,970	18,409	264	34,199	34,681	7,093	4,303	46	427	156	3,674	248,124	174	243,732	2,953	1,266	12,263	15,294	199	890	4,514	9,691
2011	426,213	127,015	34,950	18,176	273	31,309	35,742	6,564	4,387	30	421	321	3,616	266,429	189	261,901	2,999	1,340	13,103	15,280	179	561	4,629	9,911
2012	433,719	123,837	34,017	17,727	266	30,621	34,967	6,239	4,158	42	398	157	3,560	275,728	185	270,997	3,170	1,376	14,299	15,697	173	476	4,899	10,149
2013	454,271	120,132	33,406	17,296	257	29,362	33,840	5,970	4,243	45	362	194	3,642	297,188	195	292,153	3,376	1,464	15,378	17,331	144	819	5,313	11,056
2014	475,969	118,368	34,783	17,523	247	26,554	33,125	6,135	4,214	26	336	138	3,714	318,411	218	313,043	3,603	1,548	16,209	18,768	137	993	5,701	11,937
2015	494,482	119,525	34,199	18,287	246	26,990	33,556	6,247	4,271	19	348	127	3,776	333,241	205	327,589	3,843	1,605	17,293	20,153	138	1,115	6,154	12,747
2016	521,703	116,870	31,762	19,059	255	24,154	34,670	6,971	4,508	23	366	195	3,924	360,002	192	354,056	4,044	1,709	18,432	21,892	150	1,123	6,704	13,914
2017	555,245	121,610	32,231	19,943	258	24,974	35,986	8,218	4,597	33	378	142	4,044	386,098	194	379,819	4,278	1,807	19,585	23,355	152	856	7,216	15,132
2018	606,085	129,610	36,793	21,163	269	25,199	37,736	8,451	4,762	45	387	120	4,210	425,999	194	419,268	4,580	1,957	20,704	25,010	162	1,049	7,669	16,130
2019[a]	656,038	138,880	40,086	22,562	284	27,910	39,462	8,575	4,960	52	394	137	4,378	463,745	182	456,563	4,902	2,097	21,791	26,662	169	1,216	8,184	17,094

TABLE 6

U.S. R&D expenditures, by source of funds and performing sector: 1953–2019

(Millions of current and of constant 2012 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	Higher education	Total	FFRDC	Business	Higher education	NPO
Constant 2012 $millions																								
1953	35,738	19,272	7,030	907	NA	9,904	1,032	398	274	NA	NA	NA	274	15,559	NA	15,237	142	180	253	381	NA	NA	187	194
1954	38,573	21,289	6,606	1,129	NA	12,010	1,129	415	305	NA	NA	NA	305	16,296	NA	15,922	161	213	271	412	NA	NA	199	213
1955	41,735	23,665	6,566	2,149	NA	13,226	1,289	435	337	NA	NA	NA	337	17,018	NA	16,600	182	236	283	432	NA	NA	216	216
1956	55,467	32,485	7,377	3,661	NA	19,543	1,442	463	369	NA	NA	NA	369	21,830	NA	21,383	206	241	300	483	NA	NA	235	248
1957	62,586	39,369	8,193	4,343	NA	24,812	1,525	496	404	NA	NA	NA	404	21,916	NA	21,451	231	234	322	575	NA	NA	253	322
1958	67,414	43,073	9,304	4,055	NA	27,398	1,729	587	445	NA	NA	NA	445	22,895	NA	22,420	241	235	343	658	NA	NA	275	383
1959	76,086	49,753	10,241	4,807	NA	31,782	2,166	758	490	NA	NA	NA	490	24,761	NA	24,264	241	256	372	710	NA	NA	302	408
1960	82,408	53,582	10,822	5,469	NA	33,682	2,720	890	541	NA	NA	NA	541	27,143	NA	26,614	240	288	403	739	NA	NA	331	409
1961	86,615	56,403	11,817	6,462	NA	33,810	3,310	1,005	598	NA	NA	NA	598	28,291	NA	27,761	238	291	443	880	NA	NA	369	511
1962	91,874	59,569	12,853	6,205	NA	35,302	4,034	1,175	658	NA	NA	NA	658	30,105	NA	29,549	238	317	494	1,049	NA	NA	408	640
1963	101,759	67,643	14,861	6,729	NA	39,823	4,870	1,359	726	NA	NA	NA	726	31,688	NA	31,133	235	319	558	1,144	NA	NA	453	691
1964	109,296	73,031	16,967	7,421	NA	41,520	5,693	1,430	787	NA	NA	NA	787	33,685	NA	33,138	232	315	649	1,144	NA	NA	503	641
1965	113,794	74,134	17,736	6,841	NA	41,393	6,557	1,607	840	NA	NA	NA	840	36,794	NA	36,213	233	348	764	1,261	NA	NA	565	697
1966	120,642	77,423	18,081	6,649	NA	43,601	7,297	1,796	875	NA	NA	NA	875	40,070	NA	39,441	246	383	899	1,375	NA	NA	620	754
1967	124,005	77,353	18,298	7,117	NA	42,204	7,917	1,816	892	NA	NA	NA	892	43,264	NA	42,597	274	393	1,060	1,437	NA	NA	667	770
1968	125,661	76,235	17,818	6,990	NA	41,494	8,080	1,854	940	NA	NA	NA	940	45,888	NA	45,182	293	413	1,123	1,475	NA	NA	706	769
1969	126,251	73,957	18,407	6,994	NA	38,790	7,885	1,882	1,010	NA	NA	NA	1,010	48,617	NA	47,872	294	452	1,132	1,535	NA	NA	753	782
1970	121,194	69,125	19,162	6,595	NA	33,704	7,775	1,889	1,093	NA	NA	NA	1,093	48,201	NA	47,460	302	438	1,193	1,582	NA	NA	789	793
1971	118,327	66,778	19,356	6,324	NA	31,501	7,725	1,872	1,150	NA	NA	NA	1,150	47,521	NA	46,775	316	430	1,271	1,607	NA	NA	799	808
1972	120,958	67,503	19,678	6,452	NA	31,434	7,954	1,984	1,187	NA	NA	NA	1,187	49,304	NA	48,547	332	425	1,311	1,652	NA	NA	819	833
1973	123,495	66,181	19,297	6,288	NA	30,323	8,014	2,258	1,201	NA	NA	NA	1,201	53,062	NA	52,284	359	419	1,373	1,680	NA	NA	838	842
1974	122,118	63,282	18,788	6,531	NA	27,719	7,907	2,337	1,170	NA	NA	NA	1,170	54,492	NA	53,691	383	418	1,440	1,734	NA	NA	873	861
1975	119,507	62,091	18,632	6,764	NA	26,393	8,041	2,261	1,166	NA	NA	NA	1,166	53,015	NA	52,203	395	416	1,446	1,790	NA	NA	911	879
1976	125,226	64,436	18,704	7,623	NA	27,535	8,317	2,258	1,172	NA	NA	NA	1,172	56,214	NA	55,368	416	429	1,524	1,880	NA	NA	951	928
1977	129,570	65,988	18,571	8,085	NA	28,472	8,648	2,213	1,178	NA	NA	NA	1,178	58,724	NA	57,822	462	440	1,700	1,981	NA	NA	1,006	975
1978	136,085	68,193	19,447	8,899	NA	28,231	9,297	2,318	1,237	NA	NA	NA	1,237	62,727	NA	61,773	507	447	1,897	2,031	NA	NA	1,015	1,015
1979	142,839	70,221	19,271	9,200	NA	29,285	9,925	2,541	1,242	NA	NA	NA	1,242	67,311	NA	66,309	553	449	2,025	2,039	NA	NA	994	1,045
1980	149,562	70,935	18,524	9,585	NA	30,166	10,254	2,406	1,227	NA	NA	NA	1,227	73,165	NA	72,094	623	448	2,175	2,060	NA	NA	991	1,069
1981	156,232	72,914	18,595	9,494	NA	32,410	10,091	2,322	1,256	NA	NA	NA	1,256	77,688	NA	76,564	679	445	2,285	2,089	NA	NA	1,001	1,088
1982	164,350	75,579	19,338	9,288	NA	34,725	9,929	2,298	1,264	NA	NA	NA	1,264	82,823	NA	81,628	739	456	2,456	2,229	NA	NA	1,086	1,143
1983	176,179	81,187	21,211	9,814	NA	37,400	10,205	2,557	1,289	NA	NA	NA	1,289	88,656	NA	87,332	846	478	2,657	2,391	NA	NA	1,164	1,226
1984	193,284	87,849	22,526	10,591	NA	40,941	10,865	2,926	1,363	NA	NA	NA	1,363	98,656	NA	97,176	978	502	2,862	2,555	NA	NA	1,235	1,319
1985	210,131	96,463	23,992	11,240	NA	46,422	11,706	3,104	1,527	NA	NA	NA	1,527	106,213	NA	104,530	1,154	529	3,194	2,732	NA	NA	1,307	1,426

TABLE 6

U.S. R&D expenditures, by source of funds and performing sector: 1953–2019

(Millions of current and of constant 2012 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	Higher education	Total	FFRDC	Business	Higher education	NPO
1986	216,004	98,119	24,258	11,505	NA	46,704	12,624	3,028	1,741	NA	NA	NA	1,741	109,559	NA	107,657	1,338	564	3,626	2,959	NA	NA	1,401	1,558
1987	221,505	102,740	23,820	11,905	NA	50,410	13,617	2,988	1,866	NA	NA	NA	1,866	109,693	NA	107,637	1,457	599	3,965	3,241	NA	NA	1,545	1,695
1988	226,693	101,816	24,285	12,212	NA	47,785	14,550	2,984	1,973	NA	NA	NA	1,973	115,102	NA	112,892	1,580	630	4,279	3,524	NA	NA	1,698	1,826
1989	231,189	98,519	24,816	12,216	NA	42,948	15,180	3,360	2,076	NA	NA	NA	2,076	122,146	NA	119,758	1,728	659	4,647	3,801	NA	NA	1,843	1,959
1990	238,716	96,764	24,613	12,333	NA	40,524	15,610	3,684	2,197	NA	NA	NA	2,197	130,684	NA	128,162	1,831	691	5,005	4,067	NA	NA	1,962	2,105
1991	244,403	92,342	23,167	12,295	NA	36,605	16,205	4,070	2,252	NA	NA	NA	2,252	140,223	NA	137,609	1,886	728	5,253	4,333	NA	NA	2,063	2,270
1992	245,602	90,479	23,547	12,417	NA	33,226	17,122	4,167	2,265	NA	NA	NA	2,265	142,933	NA	140,199	1,960	774	5,300	4,624	NA	NA	2,150	2,474
1993	240,467	87,823	23,985	11,612	NA	30,244	17,857	4,125	2,259	NA	NA	NA	2,259	140,089	NA	137,247	2,019	823	5,381	4,915	NA	NA	2,221	2,695
1994	240,380	86,342	23,235	11,726	NA	28,783	18,462	4,136	2,305	NA	NA	NA	2,305	140,932	NA	137,987	2,068	876	5,594	5,207	NA	NA	2,265	2,941
1995	255,506	87,618	23,521	11,755	NA	29,468	18,913	3,962	2,436	NA	NA	NA	2,436	154,272	NA	151,184	2,153	934	5,719	5,461	NA	NA	2,249	3,212
1996	269,662	86,624	22,662	11,565	NA	29,182	19,245	3,970	2,543	NA	NA	NA	2,543	168,641	NA	165,360	2,284	998	6,061	5,792	NA	NA	2,276	3,517
1997	284,628	86,454	22,592	11,301	NA	29,280	19,232	4,049	2,555	NA	NA	NA	2,555	182,962	NA	179,474	2,402	1,086	6,517	6,140	NA	NA	2,374	3,766
1998	299,880	87,547	23,063	11,264	NA	29,337	19,525	4,358	2,551	NA	NA	NA	2,551	196,291	NA	192,628	2,522	1,141	6,898	6,593	NA	NA	2,486	4,107
1999	320,086	87,490	23,755	11,397	NA	26,838	20,576	4,924	2,667	NA	NA	NA	2,667	215,456	NA	211,592	2,646	1,219	7,403	7,070	NA	NA	2,684	4,385
2000	343,186	86,117	24,651	11,872	NA	21,923	21,895	5,776	2,795	NA	NA	NA	2,795	238,195	NA	234,184	2,705	1,306	8,030	8,050	NA	NA	2,892	5,158
2001	349,091	92,485	28,042	12,603	NA	21,179	23,783	6,878	2,934	28	NA	NA	2,906	236,131	177	232,007	2,657	1,290	8,615	8,926	273	NA	3,085	5,569
2002	342,881	97,312	29,361	13,870	NA	20,235	26,717	7,129	3,150	39	NA	NA	3,110	222,948	167	218,955	2,595	1,231	9,467	10,004	339	NA	3,371	6,294
2003	352,925	103,120	30,260	14,343	NA	21,558	29,757	7,201	3,377	39	NA	NA	3,338	225,505	162	221,575	2,532	1,236	10,036	10,887	297	NA	3,487	7,103
2004	357,079	107,095	29,367	14,709	NA	23,904	31,404	7,710	3,451	36	NA	NA	3,415	225,698	144	221,793	2,533	1,228	10,187	10,648	194	NA	3,530	6,924
2005	372,095	109,142	30,110	14,749	NA	25,062	31,735	7,486	3,405	36	NA	NA	3,369	237,673	160	233,641	2,607	1,266	10,698	11,177	206	NA	3,627	7,344
2006	389,612	110,960	31,354	14,399	117	26,985	31,396	6,710	3,657	34	226	NA	3,397	252,239	190	248,001	2,735	1,312	11,298	11,458	222	NA	3,768	7,468
2007	408,591	113,669	32,285	14,970	146	28,745	31,058	6,465	3,886	35	274	NA	3,577	266,867	195	262,398	2,916	1,359	11,821	12,348	233	NA	4,073	8,042
2008	429,315	124,745	31,648	16,300	187	38,564	31,432	6,614	4,477	35	334	325	3,783	273,661	211	268,933	3,133	1,384	12,449	13,983	221	479	4,413	8,869
2009	424,122	132,379	32,167	17,442	236	41,654	33,409	7,470	4,521	42	401	205	3,873	259,579	194	254,869	3,192	1,324	12,691	14,952	229	516	4,632	9,575
2010	423,054	131,740	33,264	19,154	275	35,583	36,084	7,380	4,477	48	444	162	3,822	258,165	181	253,595	3,072	1,317	12,759	15,913	207	926	4,697	10,083
2011	434,387	129,451	35,621	18,524	278	31,909	36,428	6,690	4,471	30	429	327	3,685	271,539	192	266,924	3,057	1,366	13,354	15,573	183	572	4,718	10,101
2012	433,719	123,837	34,017	17,727	266	30,621	34,967	6,239	4,158	42	398	157	3,560	275,728	185	270,997	3,170	1,376	14,299	15,697	173	476	4,899	10,149
2013	446,436	118,060	32,830	16,998	253	28,856	33,256	5,867	4,170	44	356	191	3,579	292,062	192	287,114	3,318	1,438	15,112	17,032	141	805	5,221	10,865
2014	459,260	114,212	33,562	16,908	239	25,622	31,962	5,920	4,066	25	324	133	3,584	307,233	210	302,054	3,477	1,493	15,640	18,109	132	958	5,500	11,518
2015	472,627	114,242	32,687	17,479	235	25,797	32,073	5,971	4,082	18	333	121	3,609	318,513	196	313,110	3,673	1,534	16,528	19,262	132	1,066	5,882	12,183
2016	493,465	110,544	30,043	18,027	241	22,847	32,793	6,593	4,264	22	346	184	3,712	340,516	182	334,893	3,825	1,616	17,434	20,707	142	1,062	6,341	13,161
2017	515,500	112,905	29,924	18,516	240	23,186	33,410	7,630	4,268	30	351	132	3,755	358,460	180	352,631	3,972	1,677	18,183	21,683	141	794	6,699	14,049
2018	549,507	117,511	33,359	19,187	244	22,847	34,213	7,662	4,317	41	351	109	3,817	386,233	176	380,130	4,152	1,774	18,771	22,675	146	951	6,953	14,625
2019[a]	584,369	123,708	35,707	20,097	253	24,861	35,151	7,639	4,418	46	351	122	3,899	413,082	162	406,685	4,367	1,868	19,411	23,750	150	1,083	7,290	15,227

NA = not available.

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

[a] The data for 2019 are estimates and will later be revised.

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. 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. Except for the nonprofit sector, data are based on annual reports by performers in the National Center for Science and Engineering Statistics' annual R&D expenditure surveys: Business 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 Expenditures Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. (See **table 2**, general notes.) The 1998–2018 data for NPO R&D performance funded by businesses and the nonprofit sector itself are estimated, based on parameters from the 1996–97 Survey of Research and Development Funding and Performance by Nonprofit Organizations.

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: 1953–2019

(Millions of current and of constant 2012 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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	837	NA	NA	440	397

TABLE 7

U.S. basic research expenditures, by source of funds and performing sector: 1953–2019

(Millions of current and of constant 2012 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	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	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	1,052	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	1,180	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	1,327	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	1,486	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	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	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	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	2,160	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	2,326	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	2,539	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	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	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	3,255	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	3,790	NA	NA	1,553	2,236
2001	46,843	26,802	4,260	4,404	NA	754	14,919	2,464	1,615	10	NA	NA	1,606	9,400	62	7,299	1,467	571	4,759	4,267	95	NA	1,704	2,467
2002	50,789	30,141	4,511	5,029	NA	888	17,139	2,575	1,759	14	NA	NA	1,745	8,730	61	6,659	1,456	554	5,311	4,847	123	NA	1,891	2,833
2003	54,823	32,889	4,664	4,904	NA	1,386	19,220	2,714	1,906	13	NA	NA	1,893	9,002	55	6,944	1,436	567	5,692	5,335	102	NA	1,978	3,256
2004	56,379	34,139	4,697	4,852	NA	1,072	20,730	2,788	2,011	12	NA	NA	2,000	8,872	48	6,763	1,483	578	5,965	5,391	64	NA	2,067	3,259
2005	59,904	35,566	4,770	5,000	NA	1,108	21,786	2,902	2,080	12	NA	NA	2,068	9,828	54	7,559	1,600	614	6,568	5,861	70	NA	2,226	3,565
2006	61,568	36,375	4,716	5,080	16	1,444	22,270	2,849	2,233	12	30	NA	2,191	9,428	67	6,940	1,765	656	7,288	6,244	78	NA	2,431	3,735
2007	64,603	36,094	4,621	3,298	20	2,780	22,546	2,829	2,448	10	38	NA	2,400	11,199	57	8,488	1,956	698	7,932	6,930	68	NA	2,733	4,130
2008	68,542	35,917	4,957	3,432	26	1,475	22,954	3,073	2,643	11	47	12	2,573	13,784	65	10,864	2,131	724	8,467	7,731	68	18	3,002	4,643
2009	72,861	37,737	5,441	4,432	33	1,340	22,993	3,498	2,539	13	57	13	2,456	16,147	58	13,397	1,995	698	8,253	8,185	69	34	3,031	5,051
2010	76,344	40,032	5,111	6,475	39	1,406	23,586	3,414	2,368	18	63	10	2,276	17,449	67	14,897	1,783	703	8,000	8,496	77	58	2,981	5,381
2011	73,510	39,148	5,047	6,333	41	677	23,970	3,081	2,339	11	62	21	2,244	14,898	67	12,284	1,803	744	8,487	8,638	64	38	3,034	5,503
2012	73,807	38,080	5,489	5,530	40	644	23,285	3,092	2,283	14	59	10	2,200	15,301	61	12,611	1,865	764	9,236	8,908	57	29	3,188	5,635
2013	79,099	36,157	5,330	4,085	38	1,196	22,476	3,031	2,293	12	54	21	2,206	21,043	53	18,203	1,975	813	9,918	9,688	39	88	3,423	6,139
2014	82,733	36,925	5,705	4,077	42	2,044	21,967	3,090	2,320	6	57	17	2,241	22,755	53	19,757	2,086	859	10,341	10,392	34	119	3,611	6,628
2015	84,229	37,101	5,890	4,043	42	2,038	22,054	3,034	2,368	4	59	14	2,292	22,761	47	19,621	2,202	891	10,974	11,024	32	120	3,795	7,077
2016	89,989	37,944	6,119	4,112	38	2,037	22,413	3,224	2,425	5	55	20	2,344	26,153	44	22,879	2,281	949	11,582	11,887	34	117	4,009	7,726
2017	93,469	38,810	6,259	4,054	42	1,853	23,168	3,434	2,460	6	62	17	2,375	27,087	38	23,644	2,402	1,003	12,241	12,871	30	103	4,337	8,402
2018	101,123	41,562	6,827	4,188	49	2,536	24,288	3,675	2,526	9	70	12	2,435	30,261	39	26,549	2,587	1,087	12,961	13,813	33	112	4,713	8,956
2019[a]	107,838	43,908	7,414	4,500	54	2,811	25,363	3,766	2,607	10	75	14	2,508	33,005	37	29,044	2,760	1,164	13,611	14,707	34	130	5,052	9,492

TABLE 7

U.S. basic research expenditures, by source of funds and performing sector: 1953–2019

(Millions of current and of constant 2012 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	Higher education	Total	FFRDC	Business	Higher education	NPO
Constant 2012 $millions																								
1953	3,182	1,835	703	249	NA	132	564	187	45	NA	NA	NA	45	1,067	NA	914	90	62	42	194	NA	NA	111	83
1954	3,490	1,994	659	305	NA	158	662	209	66	NA	NA	NA	66	1,160	NA	981	103	75	58	213	NA	NA	124	89
1955	3,846	2,146	658	418	NA	47	786	236	94	NA	NA	NA	94	1,296	NA	1,093	115	88	78	233	NA	NA	138	94
1956	4,683	2,559	741	581	NA	44	930	264	124	NA	NA	NA	124	1,635	NA	1,409	127	98	101	264	NA	NA	153	111
1957	5,138	2,852	783	692	NA	25	1,052	300	157	NA	NA	NA	157	1,690	NA	1,453	142	95	125	316	NA	NA	171	145
1958	5,825	3,317	920	710	NA	84	1,248	355	192	NA	NA	NA	192	1,803	NA	1,556	148	99	148	364	NA	NA	191	173
1959	6,622	4,054	1,002	813	NA	207	1,599	433	229	NA	NA	NA	229	1,767	NA	1,511	146	110	173	399	NA	NA	216	183
1960	7,727	4,770	1,103	902	NA	214	2,047	505	271	NA	NA	NA	271	2,059	NA	1,785	147	126	201	427	NA	NA	246	180
1961	8,986	5,781	1,365	1,053	NA	181	2,566	616	319	NA	NA	NA	319	2,147	NA	1,867	149	131	237	503	NA	NA	282	220
1962	10,719	7,158	1,481	1,111	NA	612	3,205	749	374	NA	NA	NA	374	2,315	NA	2,027	147	141	281	591	NA	NA	320	270
1963	12,287	8,398	1,653	1,255	NA	635	4,002	854	435	NA	NA	NA	435	2,466	NA	2,178	142	145	334	653	NA	NA	363	290
1964	13,708	9,686	1,940	1,402	NA	704	4,712	930	483	NA	NA	NA	483	2,483	NA	2,197	143	143	398	658	NA	NA	389	269
1965	14,968	10,676	2,104	1,405	NA	882	5,301	983	531	NA	NA	NA	531	2,593	NA	2,281	149	163	483	685	NA	NA	393	292
1966	16,015	11,342	2,241	1,492	NA	776	5,827	1,006	566	NA	NA	NA	566	2,799	NA	2,465	159	175	582	727	NA	NA	410	317
1967	16,824	12,107	2,302	1,599	NA	892	6,307	1,007	605	NA	NA	NA	605	2,626	NA	2,268	178	181	720	765	NA	NA	441	324
1968	17,199	12,219	2,455	1,602	NA	739	6,444	978	666	NA	NA	NA	666	2,733	NA	2,354	191	188	796	785	NA	NA	464	321
1969	16,953	11,931	2,648	1,520	NA	597	6,253	913	742	NA	NA	NA	742	2,625	NA	2,224	192	209	831	823	NA	NA	498	325
1970	16,579	11,540	2,592	1,402	NA	563	6,101	881	827	NA	NA	NA	827	2,450	NA	2,048	198	203	903	860	NA	NA	528	332
1971	16,333	11,234	2,552	1,267	NA	443	6,078	893	850	NA	NA	NA	850	2,417	NA	2,002	217	198	939	893	NA	NA	555	338
1972	16,203	11,176	2,536	1,315	NA	383	6,048	894	822	NA	NA	NA	822	2,378	NA	1,949	231	198	909	917	NA	NA	564	354
1973	16,357	11,359	2,601	1,524	NA	383	5,939	912	783	NA	NA	NA	783	2,420	NA	1,991	233	196	890	904	NA	NA	545	359
1974	16,512	11,517	2,616	1,710	NA	417	5,890	884	746	NA	NA	NA	746	2,401	NA	1,962	242	197	916	932	NA	NA	558	373
1975	16,331	11,442	2,545	1,784	NA	348	5,923	841	712	NA	NA	NA	712	2,358	NA	1,920	240	199	883	936	NA	NA	549	387
1976	17,062	12,043	2,699	1,997	NA	368	6,110	869	691	NA	NA	NA	691	2,459	NA	2,013	238	207	900	970	NA	NA	554	415
1977	17,963	12,661	2,819	2,230	NA	404	6,320	888	693	NA	NA	NA	693	2,576	NA	2,096	266	214	999	1,033	NA	NA	590	443
1978	19,438	13,827	2,917	2,807	NA	436	6,701	966	726	NA	NA	NA	726	2,710	NA	2,193	297	220	1,112	1,062	NA	NA	594	468
1979	20,213	14,337	2,869	2,991	NA	415	7,013	1,048	737	NA	NA	NA	737	2,856	NA	2,303	329	224	1,202	1,080	NA	NA	591	489
1980	20,691	14,542	2,868	3,061	NA	402	7,240	971	726	NA	NA	NA	726	3,043	NA	2,448	369	226	1,287	1,095	NA	NA	587	508
1981	20,871	14,245	2,902	3,090	NA	354	7,199	700	731	NA	NA	NA	731	3,459	NA	2,838	395	226	1,330	1,107	NA	NA	582	525
1982	21,678	14,494	3,097	3,059	NA	515	7,072	751	749	NA	NA	NA	749	3,773	NA	3,100	439	234	1,458	1,204	NA	NA	645	559
1983	23,269	15,382	3,394	3,252	NA	678	7,224	834	775	NA	NA	NA	775	4,204	NA	3,447	509	248	1,599	1,309	NA	NA	701	608
1984	25,203	16,355	3,548	3,505	NA	643	7,725	934	823	NA	NA	NA	823	4,885	NA	4,030	591	263	1,729	1,410	NA	NA	746	664
1985	27,026	17,238	3,568	3,548	NA	656	8,439	1,026	943	NA	NA	NA	943	5,341	NA	4,348	713	280	1,971	1,533	NA	NA	806	727

TABLE 7

U.S. basic research expenditures, by source of funds and performing sector: 1953–2019

(Millions of current and of constant 2012 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	Higher education	Total	FFRDC	Business	Higher education	NPO
1986	30,813	18,358	3,639	3,674	NA	780	9,200	1,066	1,088	NA	NA	NA	1,088	7,418	NA	6,280	837	302	2,267	1,682	NA	NA	876	806
1987	32,396	19,440	3,589	3,931	NA	1,048	9,688	1,184	1,154	NA	NA	NA	1,154	7,505	NA	6,281	901	323	2,453	1,844	NA	NA	956	888
1988	33,504	20,484	3,583	4,458	NA	1,111	10,052	1,280	1,194	NA	NA	NA	1,194	7,238	NA	5,938	956	343	2,590	1,998	NA	NA	1,028	970
1989	35,668	21,821	3,762	4,587	NA	1,607	10,464	1,402	1,248	NA	NA	NA	1,248	7,645	NA	6,244	1,039	363	2,793	2,161	NA	NA	1,108	1,054
1990	36,169	22,077	3,642	4,764	NA	1,365	10,819	1,487	1,330	NA	NA	NA	1,330	7,397	NA	5,905	1,108	384	3,030	2,335	NA	NA	1,187	1,147
1991	41,231	23,218	3,613	4,854	NA	1,901	11,277	1,574	1,385	NA	NA	NA	1,385	10,874	NA	9,305	1,160	408	3,232	2,522	NA	NA	1,269	1,253
1992	41,001	23,335	3,593	5,062	NA	1,058	11,969	1,655	1,398	NA	NA	NA	1,398	10,286	NA	8,639	1,210	438	3,272	2,710	NA	NA	1,327	1,383
1993	41,704	23,794	3,803	5,103	NA	676	12,533	1,679	1,382	NA	NA	NA	1,382	10,354	NA	8,649	1,235	470	3,291	2,883	NA	NA	1,358	1,525
1994	42,123	23,823	3,618	4,989	NA	619	12,982	1,615	1,409	NA	NA	NA	1,409	10,404	NA	8,635	1,264	505	3,419	3,069	NA	NA	1,384	1,685
1995	41,202	23,640	3,742	4,601	NA	264	13,405	1,628	1,488	NA	NA	NA	1,488	9,343	NA	7,485	1,315	543	3,493	3,236	NA	NA	1,374	1,862
1996	44,818	24,682	3,662	4,636	NA	888	13,790	1,706	1,570	NA	NA	NA	1,570	11,353	NA	9,357	1,410	585	3,744	3,469	NA	NA	1,405	2,064
1997	49,320	25,862	3,688	4,572	NA	1,382	14,451	1,769	1,657	NA	NA	NA	1,657	13,938	NA	11,775	1,559	603	4,231	3,632	NA	NA	1,541	2,091
1998	46,281	27,195	3,989	4,571	NA	1,331	15,365	1,940	1,717	NA	NA	NA	1,717	8,774	NA	6,444	1,697	634	4,642	3,953	NA	NA	1,673	2,280
1999	50,127	29,283	4,382	4,869	NA	1,451	16,310	2,270	1,815	NA	NA	NA	1,815	9,727	NA	7,250	1,801	677	5,039	4,262	NA	NA	1,828	2,435
2000	53,836	31,116	4,822	5,170	NA	1,185	17,251	2,689	1,923	NA	NA	NA	1,923	10,418	NA	7,832	1,861	725	5,525	4,854	NA	NA	1,990	2,864
2001	58,707	33,591	5,339	5,520	NA	945	18,698	3,088	2,025	12	NA	NA	2,012	11,781	78	9,148	1,839	716	5,964	5,347	120	NA	2,136	3,092
2002	62,662	37,188	5,565	6,205	NA	1,096	21,146	3,177	2,171	18	NA	NA	2,153	10,771	75	8,216	1,797	684	6,553	5,980	152	NA	2,333	3,495
2003	66,407	39,837	5,650	5,940	NA	1,679	23,280	3,288	2,309	16	NA	NA	2,293	10,904	67	8,411	1,739	686	6,894	6,462	123	NA	2,395	3,944
2004	66,501	40,268	5,540	5,723	NA	1,264	24,452	3,289	2,373	14	NA	NA	2,359	10,465	56	7,977	1,750	682	7,036	6,358	76	NA	2,438	3,845
2005	68,524	40,684	5,457	5,719	NA	1,267	24,921	3,320	2,380	14	NA	NA	2,365	11,242	62	8,647	1,831	703	7,513	6,704	80	NA	2,546	4,078
2006	68,359	40,387	5,236	5,641	17	1,603	24,726	3,163	2,479	13	34	NA	2,432	10,468	75	7,705	1,959	729	8,092	6,932	87	NA	2,699	4,147
2007	69,852	39,027	4,996	3,566	22	3,006	24,378	3,059	2,647	11	41	NA	2,595	12,109	61	9,178	2,115	754	8,576	7,493	73	NA	2,955	4,465
2008	72,697	38,094	5,257	3,640	28	1,564	24,346	3,260	2,803	11	50	13	2,729	14,620	69	11,522	2,260	768	8,981	8,200	72	19	3,184	4,925
2009	76,693	39,722	5,727	4,665	35	1,410	24,202	3,682	2,672	13	60	14	2,585	16,997	61	14,101	2,099	735	8,687	8,615	72	36	3,191	5,317
2010	79,434	41,652	5,317	6,737	41	1,463	24,540	3,553	2,463	19	66	11	2,368	18,155	70	15,499	1,855	731	8,324	8,840	80	61	3,101	5,599
2011	74,920	39,899	5,144	6,454	41	690	24,429	3,140	2,384	11	64	22	2,287	15,184	69	12,520	1,838	758	8,650	8,804	65	38	3,092	5,608
2012	73,807	38,080	5,489	5,530	40	644	23,285	3,092	2,283	14	59	10	2,200	15,301	61	12,611	1,865	764	9,236	8,908	57	29	3,188	5,635
2013	77,734	35,533	5,238	4,015	38	1,175	22,088	2,979	2,253	12	53	20	2,168	20,680	52	17,889	1,940	799	9,747	9,521	38	87	3,364	6,033
2014	79,829	35,629	5,505	3,934	40	1,972	21,196	2,982	2,239	6	55	16	2,162	21,956	51	19,063	2,013	829	9,978	10,027	32	115	3,484	6,395
2015	80,506	35,461	5,630	3,864	40	1,948	21,079	2,900	2,264	4	56	13	2,190	21,755	45	18,754	2,105	852	10,489	10,537	30	114	3,627	6,765
2016	85,118	35,890	5,788	3,889	36	1,927	21,199	3,050	2,293	5	52	19	2,217	24,737	42	21,640	2,158	898	10,955	11,243	33	111	3,792	7,308
2017	86,778	36,032	5,811	3,764	39	1,720	21,510	3,188	2,284	6	57	16	2,205	25,148	35	21,951	2,230	931	11,365	11,949	28	95	4,026	7,800
2018	91,684	37,682	6,189	3,797	44	2,299	22,021	3,331	2,290	8	64	11	2,207	27,436	35	24,071	2,345	985	11,751	12,524	30	101	4,273	8,120
2019[a]	96,057	39,111	6,604	4,008	48	2,504	22,592	3,354	2,322	9	67	12	2,234	29,399	33	25,871	2,458	1,037	12,124	13,100	30	115	4,500	8,455

NA = not available.

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

[a] The data for 2019 are estimates and will later be revised.

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. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For comparisons, use only the historical data reported in this table because some back-year data may have been revised. Except for the nonprofit sector, data are based on annual reports by performers in the National Center for Science and Engineering Statistics' annual R&D expenditure surveys: Business 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 Expenditures Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—are 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.) The 1998–2018 data for NPO R&D performance funded by businesses and the nonprofit sector itself are estimated, based on parameters from the 1996–97 Survey of Research and Development Funding and Performance by Nonprofit Organizations. 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 onward, 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.) Type-of-R&D data for FFRDC R&D in 1953–54 include only those of university-administered FFRDCs. Starting in 2001, type-of-R&D data distinguish federally funded from nonfederally funded FFRDC R&D. (See also **table 2**, footnote b.) 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. Furthermore, the type-of-R&D splits for other than total and federally funded are estimated. (See also **table 2**, footnote e.) Type-of-R&D data for R&D by NPOs in 1998 and later years are estimated, except for those that are federally funded. (See also **table 2**, footnote f.) Type-of-R&D data for state intramural R&D became available in the 2016 Survey of State Government Research and Development. These data prior to 2016 are estimated. (See also **table 2**, footnote c.)

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: 1953–2019

(Millions of current and of constant 2012 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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	471	NA	NA	224	247

TABLE 8

U.S. applied research expenditures, by source of funds and performing sectors: 1953–2019

(Millions of current and of constant 2012 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	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	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	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	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	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	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	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	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	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	1,049	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	1,104	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	1,162	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	1,219	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	1,285	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	1,385	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	1,598	NA	NA	578	1,021
2001	63,956	18,595	7,052	2,379	NA	3,603	3,411	2,150	590	5	NA	NA	585	41,238	33	40,409	535	261	1,734	1,798	52	NA	621	1,126
2002	50,521	18,987	7,487	2,905	NA	2,452	3,877	2,267	644	8	NA	NA	636	26,899	35	26,081	531	253	1,937	2,053	71	NA	689	1,293
2003	61,059	22,234	7,672	3,152	NA	4,473	4,450	2,487	716	9	NA	NA	708	33,692	36	32,861	537	259	2,127	2,290	65	NA	739	1,486
2004	69,132	22,417	7,455	3,057	NA	4,775	4,682	2,448	742	7	NA	NA	735	41,495	30	40,657	545	264	2,190	2,287	40	NA	759	1,488
2005	69,653	23,329	7,557	3,241	NA	5,289	4,810	2,432	727	8	NA	NA	719	40,867	35	39,995	557	280	2,283	2,447	45	NA	774	1,627
2006	76,622	24,864	7,435	3,531	87	6,140	5,080	2,592	889	8	169	NA	712	45,952	47	45,033	573	300	2,368	2,549	54	NA	789	1,705
2007	85,319	29,438	7,222	5,293	111	8,945	5,284	2,583	968	14	210	NA	745	49,627	77	48,625	607	318	2,461	2,824	92	NA	848	1,885
2008	76,639	27,142	7,316	5,843	146	5,397	5,840	2,600	1,161	15	261	71	815	42,386	89	41,292	675	331	2,682	3,268	93	105	951	2,119
2009	74,136	32,105	7,874	5,979	186	7,797	7,220	3,049	1,314	19	316	38	942	34,288	88	33,124	757	319	2,917	3,512	104	96	1,007	2,305
2010	79,055	29,679	8,016	5,025	219	4,705	8,673	3,041	1,405	18	354	32	1,002	41,138	67	39,987	764	321	3,083	3,750	77	182	1,036	2,456
2011	81,926	29,598	8,024	5,057	226	4,404	9,194	2,693	1,411	13	348	70	981	43,792	81	42,591	781	340	3,341	3,784	77	122	1,074	2,512
2012	86,856	30,215	8,587	5,566	220	4,137	9,077	2,629	1,387	19	330	45	994	47,728	81	46,436	862	349	3,609	3,917	76	137	1,133	2,572
2013	88,191	32,448	8,309	6,639	213	6,028	8,794	2,465	1,420	22	300	47	1,051	46,122	94	44,738	920	371	3,861	4,340	69	200	1,270	2,802
2014	91,803	33,375	8,775	6,765	200	6,445	8,616	2,574	1,394	13	271	35	1,075	48,164	107	46,685	980	392	4,133	4,737	67	250	1,394	3,025
2015	97,273	34,605	9,347	7,182	199	6,102	8,984	2,791	1,398	9	282	24	1,084	51,726	96	50,137	1,086	407	4,461	5,084	64	209	1,580	3,230
2016	106,825	35,790	9,805	7,469	209	5,327	9,683	3,297	1,516	10	300	45	1,160	58,972	84	57,253	1,202	433	4,883	5,665	65	245	1,828	3,526
2017	110,991	37,888	10,124	7,868	207	5,386	10,152	4,152	1,572	15	303	33	1,221	60,247	91	58,429	1,269	458	5,239	6,045	72	193	1,945	3,835
2018	116,319	39,756	11,111	8,407	211	5,359	10,658	4,009	1,636	21	303	23	1,289	62,989	90	61,036	1,368	496	5,544	6,394	75	191	2,041	4,088
2019[a]	124,849	41,792	11,176	9,104	221	5,919	11,175	4,197	1,709	24	305	26	1,353	68,651	85	66,543	1,492	531	5,868	6,828	78	221	2,197	4,332

TABLE 8

U.S. applied research expenditures, by source of funds and performing sectors: 1953–2019

(Millions of current and of constant 2012 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	Higher education	Total	FFRDC	Business	Higher education	NPO
Constant 2012 $millions																								
1953	8,928	5,233	2,403	329	NA	1,995	409	97	209	NA	NA	NA	209	3,155	NA	3,034	45	76	193	139	NA	NA	69	69
1954	9,457	5,387	2,261	401	NA	2,210	408	106	216	NA	NA	NA	216	3,517	NA	3,377	51	89	192	144	NA	NA	69	75
1955	10,133	5,656	2,247	580	NA	2,285	425	118	218	NA	NA	NA	218	3,931	NA	3,779	57	94	183	145	NA	NA	71	74
1956	12,584	6,692	2,522	812	NA	2,803	424	131	216	NA	NA	NA	216	5,338	NA	5,181	65	91	176	163	NA	NA	72	91
1957	15,243	8,235	2,814	941	NA	3,940	398	142	214	NA	NA	NA	214	6,427	NA	6,266	73	88	171	196	NA	NA	69	126
1958	17,040	9,245	3,187	963	NA	4,514	405	176	218	NA	NA	NA	218	7,183	NA	7,022	74	86	168	225	NA	NA	71	154
1959	17,909	9,931	3,512	1,090	NA	4,613	472	244	225	NA	NA	NA	225	7,344	NA	7,176	76	91	171	238	NA	NA	73	164
1960	18,424	10,409	3,693	1,208	NA	4,624	559	325	233	NA	NA	NA	233	7,369	NA	7,188	78	102	173	240	NA	NA	72	168
1961	18,573	10,770	3,973	1,424	NA	4,389	616	369	237	NA	NA	NA	237	7,107	NA	6,928	77	101	176	282	NA	NA	74	208
1962	21,727	12,328	4,163	1,463	NA	5,607	696	400	238	NA	NA	NA	238	8,640	NA	8,449	79	112	179	341	NA	NA	76	264
1963	22,446	13,036	4,699	1,594	NA	5,528	741	473	245	NA	NA	NA	245	8,614	NA	8,422	81	110	188	363	NA	NA	78	285
1964	24,036	14,083	5,415	1,791	NA	5,596	812	469	259	NA	NA	NA	259	9,111	NA	8,925	77	109	213	369	NA	NA	100	269
1965	24,574	14,342	5,582	1,649	NA	5,574	986	551	261	NA	NA	NA	261	9,293	NA	9,102	73	118	237	441	NA	NA	149	292
1966	25,430	14,345	5,531	1,585	NA	5,389	1,137	702	257	NA	NA	NA	257	10,068	NA	9,860	77	131	265	495	NA	NA	183	312
1967	25,750	14,675	5,675	1,771	NA	5,221	1,261	746	242	NA	NA	NA	242	10,036	NA	9,821	82	133	286	510	NA	NA	191	319
1968	26,170	14,318	5,662	1,702	NA	4,870	1,271	813	234	NA	NA	NA	234	10,826	NA	10,601	82	143	280	512	NA	NA	196	316
1969	26,489	14,199	5,970	1,629	NA	4,468	1,246	886	234	NA	NA	NA	234	11,267	NA	11,034	78	155	262	527	NA	NA	206	321
1970	26,537	14,303	6,154	1,550	NA	4,392	1,289	918	236	NA	NA	NA	236	11,203	NA	10,970	81	152	257	537	NA	NA	215	323
1971	25,609	13,570	5,949	1,368	NA	3,982	1,343	929	266	NA	NA	NA	266	10,947	NA	10,717	81	149	294	531	NA	NA	206	325
1972	25,870	13,648	6,035	1,507	NA	3,556	1,643	907	312	NA	NA	NA	312	11,016	NA	10,783	86	147	344	549	NA	NA	217	332
1973	26,554	13,683	6,094	1,333	NA	3,523	1,793	940	350	NA	NA	NA	350	11,547	NA	11,299	104	144	398	577	NA	NA	245	331
1974	26,884	13,304	6,048	1,225	NA	3,313	1,744	974	352	NA	NA	NA	352	12,202	NA	11,945	115	142	432	595	NA	NA	262	333
1975	27,107	13,820	6,405	1,285	NA	3,320	1,841	970	380	NA	NA	NA	380	11,793	NA	11,525	129	139	471	643	NA	NA	308	335
1976	28,505	14,175	6,568	1,451	NA	3,280	1,891	984	404	NA	NA	NA	404	12,706	NA	12,423	141	142	526	694	NA	NA	346	348
1977	28,888	14,002	6,220	1,614	NA	3,328	1,870	969	402	NA	NA	NA	402	13,185	NA	12,889	152	144	580	719	NA	NA	360	359
1978	29,900	14,190	6,261	1,666	NA	3,338	1,888	1,037	422	NA	NA	NA	422	13,916	NA	13,603	169	144	647	724	NA	NA	356	367
1979	31,202	14,450	6,229	1,687	NA	3,366	2,044	1,124	417	NA	NA	NA	417	14,952	NA	14,625	184	143	679	704	NA	NA	333	372
1980	32,478	14,789	6,023	1,772	NA	3,844	2,158	993	411	NA	NA	NA	411	15,844	NA	15,495	209	141	729	705	NA	NA	332	373
1981	35,289	14,923	5,903	1,703	NA	4,413	2,059	845	431	NA	NA	NA	431	18,436	NA	18,065	233	138	784	716	NA	NA	343	373
1982	37,080	15,650	5,702	1,812	NA	5,278	2,049	810	422	NA	NA	NA	422	19,443	NA	19,057	246	140	818	747	NA	NA	362	385
1983	39,756	17,115	5,859	1,890	NA	6,321	2,198	848	421	NA	NA	NA	421	20,567	NA	20,147	277	144	868	785	NA	NA	380	405
1984	42,442	17,957	5,597	2,223	NA	6,951	2,318	868	443	NA	NA	NA	443	22,284	NA	21,817	317	149	929	829	NA	NA	401	428
1985	46,546	20,028	5,745	2,367	NA	8,644	2,376	897	479	NA	NA	NA	479	24,171	NA	23,654	362	155	1,003	864	NA	NA	411	453

TABLE 8

U.S. applied research expenditures, by source of funds and performing sectors: 1953–2019

(Millions of current and of constant 2012 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	Higher education	Total	FFRDC	Business	Higher education	NPO
1986	48,931	18,698	5,755	2,260	NA	7,273	2,502	908	535	NA	NA	NA	535	27,667	NA	27,092	411	163	1,114	916	NA	NA	431	486
1987	48,997	18,983	5,900	2,153	NA	7,077	2,880	973	584	NA	NA	NA	584	27,189	NA	26,563	456	171	1,240	1,001	NA	NA	483	518
1988	49,998	18,200	5,693	1,665	NA	6,512	3,316	1,014	638	NA	NA	NA	638	28,679	NA	27,991	511	177	1,385	1,096	NA	NA	550	546
1989	52,590	19,150	5,811	1,705	NA	7,045	3,456	1,132	679	NA	NA	NA	679	30,065	NA	29,317	565	183	1,520	1,176	NA	NA	603	573
1990	54,808	21,509	5,736	1,816	NA	9,372	3,362	1,224	711	NA	NA	NA	711	29,730	NA	28,949	592	189	1,619	1,238	NA	NA	635	603
1991	58,689	21,694	6,219	2,196	NA	8,489	3,390	1,399	711	NA	NA	NA	711	33,340	NA	32,549	595	196	1,657	1,287	NA	NA	651	636
1992	56,347	20,334	6,442	2,271	NA	6,648	3,587	1,387	711	NA	NA	NA	711	32,286	NA	31,466	615	205	1,664	1,353	NA	NA	675	678
1993	54,095	20,421	7,020	2,176	NA	6,232	3,688	1,305	719	NA	NA	NA	719	29,813	NA	28,955	643	215	1,714	1,428	NA	NA	707	721
1994	52,020	19,605	7,082	2,267	NA	5,137	3,756	1,363	735	NA	NA	NA	735	28,405	NA	27,520	660	225	1,784	1,491	NA	NA	722	769
1995	56,961	18,845	6,891	2,385	NA	4,403	3,867	1,299	777	NA	NA	NA	777	33,977	NA	33,054	687	236	1,825	1,537	NA	NA	718	819
1996	58,989	19,072	6,657	2,217	NA	4,974	3,913	1,311	798	NA	NA	NA	798	35,631	NA	34,667	716	248	1,900	1,588	NA	NA	714	875
1997	62,483	17,264	6,712	2,255	NA	3,557	3,382	1,358	737	NA	NA	NA	737	40,971	NA	40,005	691	275	1,875	1,637	NA	NA	683	954
1998	61,431	16,938	6,835	2,291	NA	3,496	2,908	1,408	684	NA	NA	NA	684	40,252	NA	39,286	676	289	1,850	1,708	NA	NA	667	1,041
1999	67,897	18,160	7,241	2,161	NA	3,689	3,367	1,702	698	NA	NA	NA	698	45,287	NA	44,285	693	309	1,938	1,814	NA	NA	703	1,111
2000	72,368	19,788	7,819	2,242	NA	3,435	3,947	2,345	715	NA	NA	NA	715	47,764	NA	46,741	692	331	2,054	2,047	NA	NA	740	1,307
2001	80,156	23,306	8,839	2,982	NA	4,516	4,275	2,695	740	7	NA	NA	733	51,684	42	50,644	671	327	2,173	2,254	65	NA	778	1,411
2002	62,332	23,426	9,238	3,584	NA	3,025	4,783	2,796	795	10	NA	NA	785	33,188	43	32,178	655	312	2,390	2,534	88	NA	851	1,595
2003	73,960	26,931	9,292	3,818	NA	5,418	5,390	3,012	868	10	NA	NA	857	40,810	43	39,804	650	313	2,576	2,774	79	NA	895	1,800
2004	81,543	26,441	8,793	3,606	NA	5,632	5,523	2,888	875	9	NA	NA	867	48,945	35	47,956	642	311	2,583	2,698	48	NA	895	1,755
2005	79,676	26,686	8,645	3,707	NA	6,050	5,503	2,781	832	9	NA	NA	823	46,748	40	45,750	637	321	2,612	2,799	52	NA	886	1,861
2006	85,073	27,606	8,255	3,920	97	6,817	5,640	2,878	987	9	187	NA	791	51,021	52	50,000	636	333	2,629	2,830	60	NA	877	1,893
2007	92,251	31,830	7,808	5,723	121	9,672	5,713	2,793	1,047	15	227	NA	805	53,659	83	52,575	656	344	2,661	3,054	99	NA	917	2,038
2008	81,285	28,787	7,760	6,197	155	5,724	6,194	2,758	1,232	16	277	75	864	44,956	94	43,795	716	351	2,844	3,466	99	111	1,008	2,248
2009	78,035	33,794	8,288	6,294	196	8,207	7,600	3,209	1,383	20	332	40	991	36,091	92	34,866	797	335	3,070	3,697	109	101	1,060	2,427
2010	82,254	30,880	8,340	5,229	228	4,895	9,024	3,164	1,462	19	368	33	1,042	42,803	70	41,605	794	334	3,207	3,902	80	189	1,077	2,555
2011	83,498	30,166	8,178	5,154	231	4,488	9,370	2,745	1,438	13	355	71	999	44,632	82	43,408	796	346	3,405	3,856	78	124	1,095	2,560
2012	86,856	30,215	8,587	5,566	220	4,137	9,077	2,629	1,387	19	330	45	994	47,728	81	46,436	862	349	3,609	3,917	76	137	1,133	2,572
2013	86,669	31,888	8,165	6,524	209	5,924	8,642	2,423	1,395	21	295	46	1,033	45,327	92	43,966	904	365	3,794	4,265	68	196	1,248	2,754
2014	88,580	32,204	8,467	6,528	193	6,219	8,314	2,484	1,345	12	262	34	1,037	46,473	103	45,046	946	378	3,988	4,570	65	241	1,345	2,919
2015	92,974	33,076	8,934	6,864	190	5,832	8,587	2,668	1,336	9	269	23	1,036	49,439	91	47,921	1,038	389	4,263	4,859	62	200	1,510	3,088
2016	101,043	33,852	9,274	7,064	198	5,039	9,159	3,118	1,434	10	284	43	1,097	55,780	79	54,155	1,136	410	4,619	5,358	62	232	1,729	3,335
2017	103,046	35,176	9,399	7,305	192	5,000	9,425	3,855	1,460	14	282	30	1,134	55,934	85	54,246	1,178	425	4,864	5,612	66	179	1,806	3,560
2018	105,461	36,044	10,074	7,622	191	4,859	9,663	3,635	1,483	19	275	21	1,169	57,109	81	55,338	1,240	450	5,026	5,797	68	173	1,850	3,706
2019[a]	111,210	37,227	9,955	8,110	196	5,272	9,954	3,739	1,522	21	272	23	1,206	61,151	76	59,274	1,329	473	5,227	6,082	70	197	1,957	3,859

NA = not available.

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

[a] The data for 2019 are estimates and will later be revised.

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. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For comparisons, use only the historical data reported in this table because some back-year data may have been revised. Except for the nonprofit sector, data are based on annual reports by performers in the National Center for Science and Engineering Statistics' annual R&D expenditure surveys: Business 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 Expenditures Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—are 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.) The 1998–2018 data for NPO R&D performance funded by businesses and the nonprofit sector itself are estimated, based on parameters from the 1996–97 Survey of Research and Development Funding and Performance by Nonprofit Organizations. 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 onward, 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.) Type-of-R&D data for FFRDC R&D in 1953–54 include only those of university-administered FFRDCs. Starting in 2001, type-of-R&D data distinguish federally funded from nonfederally funded FFRDC R&D. (See also **table 2**, footnote b.) 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. Furthermore, the type-of-R&D splits for other than total and federally funded are estimated. (See also **table 2**, footnote e.) Type-of-R&D data for R&D by NPOs in 1998 and later years are estimated, except for those that are federally funded. (See also **table 2**, footnote f.) Type-of-R&D data for state intramural R&D became available in the 2016 Survey of State Government Research and Development. These data prior to 2016 are estimated. (See also **table 2**, footnote c.)

Source(s):

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

TABLE 9

U.S. development expenditures, by source of funds and performing sector: 1953–2019

(Millions of current and of constant 2012 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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	183	NA	NA	49	134

TABLE 9

U.S. development expenditures, by source of funds and performing sector: 1953–2019

(Millions of current and of constant 2012 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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	897	NA	NA	127	771
2001	167,740	28,396	11,062	3,273	NA	12,542	646	874	136	7	NA	NA	128	137,770	46	137,410	117	197	381	1,057	71	NA	136	850
2002	176,601	29,745	11,800	3,308	NA	13,061	639	937	149	9	NA	NA	140	145,074	40	144,727	116	191	425	1,208	81	NA	151	976
2003	175,483	30,011	12,646	3,785	NA	11,939	897	743	166	10	NA	NA	155	143,477	43	143,121	118	195	467	1,363	78	NA	162	1,122
2004	177,220	34,238	12,746	4,561	NA	14,419	1,211	1,300	172	11	NA	NA	161	140,978	45	140,615	120	199	481	1,350	60	NA	167	1,123
2005	195,731	36,517	13,994	4,654	NA	15,512	1,146	1,211	169	11	NA	NA	158	157,080	50	156,696	122	212	501	1,463	65	NA	170	1,228
2006	212,719	38,699	16,089	4,358	2	16,720	927	603	171	10	5	NA	156	171,802	58	171,392	126	226	520	1,527	67	NA	173	1,287
2007	227,968	39,595	18,016	5,254	3	14,860	894	568	178	8	6	NA	163	185,989	47	185,569	133	240	540	1,665	56	NA	186	1,423
2008	259,596	54,556	17,566	6,094	4	29,488	841	562	417	7	7	223	179	201,848	45	201,406	148	250	589	2,186	47	330	209	1,600
2009	255,933	55,921	17,245	6,159	5	30,435	1,527	550	442	8	9	144	282	196,174	39	195,614	280	241	888	2,509	46	361	361	1,740
2010	251,200	56,907	18,844	6,909	6	28,089	2,422	638	530	11	10	114	396	189,537	40	188,849	407	242	1,180	3,046	45	649	498	1,854
2011	270,776	58,268	21,879	6,786	6	26,228	2,579	790	637	6	10	230	391	207,739	41	207,026	415	256	1,275	2,858	39	402	521	1,896
2012	273,056	55,542	19,941	6,631	6	25,840	2,605	518	488	10	9	102	367	212,699	43	211,949	444	263	1,455	2,871	40	310	579	1,942
2013	286,982	51,526	19,767	6,572	6	22,137	2,570	474	531	11	8	126	385	230,023	49	229,212	482	280	1,599	3,303	36	532	620	2,115
2014	301,433	48,067	20,303	6,681	6	18,065	2,542	471	500	7	8	87	399	247,492	58	246,601	537	296	1,735	3,640	36	624	696	2,284
2015	312,980	47,819	18,961	7,062	6	18,850	2,518	422	504	6	8	90	401	258,754	62	257,831	555	307	1,858	4,045	42	786	779	2,439
2016	324,889	43,137	15,838	7,479	7	16,790	2,574	450	568	8	11	129	420	274,877	64	273,924	562	327	1,968	4,339	50	760	867	2,662
2017	350,784	44,912	15,848	8,021	9	17,736	2,666	632	564	11	13	92	448	298,764	64	297,747	607	346	2,105	4,440	51	560	934	2,895
2018	388,642	48,292	18,856	8,567	9	17,304	2,790	767	600	15	13	85	486	332,748	65	331,682	626	374	2,199	4,804	54	748	916	3,086
2019[a]	423,352	53,179	21,496	8,958	10	19,180	2,923	612	644	17	13	97	516	362,088	61	360,975	650	401	2,313	5,128	56	866	935	3,271

TABLE 9

U.S. development expenditures, by source of funds and performing sector: 1953–2019

(Millions of current and of constant 2012 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	Higher education	Total	FFRDC	Business	Higher education	NPO
Constant 2012 $millions																								
1953	23,628	12,204	3,924	329	NA	7,778	59	114	20	NA	NA	NA	20	11,338	NA	11,289	7	42	18	48	NA	NA	7	42
1954	25,626	13,908	3,685	422	NA	9,643	58	100	24	NA	NA	NA	24	11,619	NA	11,564	7	48	21	55	NA	NA	7	48
1955	27,756	15,863	3,661	1,151	NA	10,893	78	81	26	NA	NA	NA	26	11,792	NA	11,728	10	54	22	54	NA	NA	7	47
1956	38,200	23,234	4,114	2,267	NA	16,696	88	69	29	NA	NA	NA	29	14,858	NA	14,793	13	52	23	55	NA	NA	10	46
1957	42,204	28,282	4,595	2,710	NA	20,847	76	54	33	NA	NA	NA	33	13,799	NA	13,732	16	51	27	63	NA	NA	13	51
1958	44,549	30,510	5,197	2,381	NA	22,799	77	56	35	NA	NA	NA	35	13,909	NA	13,841	19	49	27	68	NA	NA	12	56
1959	51,555	35,768	5,726	2,903	NA	26,962	94	82	36	NA	NA	NA	36	15,650	NA	15,577	18	55	28	73	NA	NA	12	61
1960	56,257	38,403	6,025	3,360	NA	28,844	114	60	38	NA	NA	NA	38	17,715	NA	17,640	15	60	28	72	NA	NA	12	60
1961	59,056	39,852	6,479	3,985	NA	29,240	128	21	41	NA	NA	NA	41	19,037	NA	18,966	12	59	30	95	NA	NA	12	83
1962	59,428	40,082	7,210	3,631	NA	29,083	132	26	45	NA	NA	NA	45	19,149	NA	19,073	12	65	34	118	NA	NA	12	106
1963	67,026	46,209	8,509	3,880	NA	33,660	128	32	46	NA	NA	NA	46	20,608	NA	20,533	12	64	35	128	NA	NA	12	116
1964	71,552	49,261	9,612	4,228	NA	35,221	169	31	45	NA	NA	NA	45	22,090	NA	22,016	11	63	37	117	NA	NA	14	103
1965	74,252	49,116	10,049	3,787	NA	34,937	270	73	49	NA	NA	NA	49	24,908	NA	24,829	11	67	44	135	NA	NA	22	112
1966	79,197	51,737	10,309	3,572	NA	37,435	333	87	51	NA	NA	NA	51	27,203	NA	27,116	11	77	53	153	NA	NA	27	126
1967	81,432	50,570	10,320	3,747	NA	36,091	348	64	45	NA	NA	NA	45	30,602	NA	30,509	13	80	53	162	NA	NA	35	127
1968	82,292	49,698	9,700	3,686	NA	35,885	364	64	39	NA	NA	NA	39	32,329	NA	32,227	20	82	47	178	NA	NA	46	132
1969	82,809	47,827	9,790	3,844	NA	33,724	386	83	34	NA	NA	NA	34	34,725	NA	34,613	24	87	39	185	NA	NA	49	136
1970	78,077	43,282	10,416	3,642	NA	28,749	385	90	30	NA	NA	NA	30	34,548	NA	34,442	23	83	32	185	NA	NA	46	138
1971	76,386	41,974	10,855	3,690	NA	27,075	303	50	34	NA	NA	NA	34	34,157	NA	34,056	18	83	38	182	NA	NA	37	145
1972	78,884	42,679	11,108	3,630	NA	27,495	263	183	52	NA	NA	NA	52	35,910	NA	35,816	15	80	57	185	NA	NA	38	147
1973	80,583	41,139	10,602	3,431	NA	26,417	281	407	70	NA	NA	NA	70	39,093	NA	38,993	20	80	80	201	NA	NA	50	152
1974	78,721	38,461	10,123	3,597	NA	23,989	273	480	73	NA	NA	NA	73	39,887	NA	39,784	24	79	90	209	NA	NA	55	155
1975	76,069	36,829	9,682	3,695	NA	22,725	276	451	74	NA	NA	NA	74	38,864	NA	38,759	27	78	92	211	NA	NA	54	157
1976	79,658	38,218	9,437	4,174	NA	23,886	316	405	76	NA	NA	NA	76	41,049	NA	40,932	37	80	99	216	NA	NA	51	165
1977	82,719	39,325	9,531	4,240	NA	24,740	457	356	83	NA	NA	NA	83	42,963	NA	42,837	43	82	120	228	NA	NA	55	173
1978	86,747	40,176	10,269	4,426	NA	24,458	709	315	89	NA	NA	NA	89	46,100	NA	45,977	41	83	137	245	NA	NA	66	179
1979	91,425	41,434	10,172	4,521	NA	25,504	868	369	88	NA	NA	NA	88	49,503	NA	49,381	40	83	144	255	NA	NA	71	184
1980	96,393	41,604	9,634	4,752	NA	25,920	856	442	90	NA	NA	NA	90	54,278	NA	54,151	46	82	160	260	NA	NA	73	187
1981	100,071	43,745	9,791	4,701	NA	27,643	834	777	95	NA	NA	NA	95	55,794	NA	55,662	51	81	172	265	NA	NA	75	190
1982	105,592	45,434	10,539	4,417	NA	28,932	809	737	93	NA	NA	NA	93	59,607	NA	59,471	54	82	180	278	NA	NA	79	199
1983	113,153	48,690	11,959	4,671	NA	30,402	782	876	92	NA	NA	NA	92	63,884	NA	63,738	61	86	191	296	NA	NA	83	213
1984	125,640	53,537	13,381	4,863	NA	33,347	822	1,124	97	NA	NA	NA	97	71,487	NA	71,328	70	89	204	316	NA	NA	88	228
1985	136,559	59,197	14,679	5,325	NA	37,122	891	1,180	105	NA	NA	NA	105	76,701	NA	76,528	80	94	220	335	NA	NA	90	245

TABLE 9

U.S. development expenditures, by source of funds and performing sector: 1953–2019

(Millions of current and of constant 2012 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	Higher education	Total	FFRDC	Business	Higher education	NPO
1986	136,260	61,062	14,864	5,571	NA	38,651	922	1,054	117	NA	NA	NA	117	74,474	NA	74,285	90	99	245	361	NA	NA	95	267
1987	140,112	64,318	14,331	5,821	NA	42,285	1,049	830	128	NA	NA	NA	128	74,998	NA	74,794	100	105	272	395	NA	NA	106	289
1988	143,192	63,133	15,009	6,089	NA	40,162	1,182	690	140	NA	NA	NA	140	79,184	NA	78,963	112	109	304	431	NA	NA	121	310
1989	142,931	57,548	15,243	5,923	NA	34,296	1,260	826	149	NA	NA	NA	149	84,436	NA	84,198	124	114	334	464	NA	NA	132	332
1990	147,740	53,177	15,235	5,753	NA	29,788	1,429	972	156	NA	NA	NA	156	93,556	NA	93,308	130	118	355	494	NA	NA	139	355
1991	144,483	47,430	13,335	5,245	NA	26,215	1,537	1,097	156	NA	NA	NA	156	96,010	NA	95,755	131	124	364	524	NA	NA	143	381
1992	148,253	46,810	13,513	5,084	NA	25,520	1,567	1,126	156	NA	NA	NA	156	100,360	NA	100,094	135	131	365	562	NA	NA	148	414
1993	144,668	43,608	13,162	4,333	NA	23,336	1,636	1,141	158	NA	NA	NA	158	99,922	NA	99,643	141	138	376	604	NA	NA	155	449
1994	146,236	42,914	12,535	4,471	NA	23,027	1,724	1,158	161	NA	NA	NA	161	102,123	NA	101,832	145	146	392	647	NA	NA	159	488
1995	157,344	45,133	12,888	4,769	NA	24,801	1,641	1,035	171	NA	NA	NA	171	110,951	NA	110,646	151	155	401	688	NA	NA	158	531
1996	165,854	42,870	12,343	4,712	NA	23,320	1,542	953	175	NA	NA	NA	175	121,657	NA	121,336	157	164	417	735	NA	NA	157	579
1997	172,825	43,328	12,192	4,474	NA	24,341	1,399	922	162	NA	NA	NA	162	128,053	NA	127,694	152	208	411	870	NA	NA	150	721
1998	192,167	43,414	12,239	4,402	NA	24,510	1,253	1,010	150	NA	NA	NA	150	147,264	NA	146,898	148	218	406	932	NA	NA	146	786
1999	202,061	40,048	12,132	4,367	NA	21,698	899	952	153	NA	NA	NA	153	160,442	NA	160,057	152	233	425	993	NA	NA	154	839
2000	216,983	35,213	12,009	4,460	NA	17,303	698	742	157	NA	NA	NA	157	180,013	NA	179,611	152	250	451	1,149	NA	NA	162	987
2001	210,228	35,589	13,864	4,102	NA	15,719	810	1,095	170	9	NA	NA	161	172,667	58	172,215	147	247	477	1,325	89	NA	171	1,065
2002	217,887	36,698	14,558	4,081	NA	16,114	789	1,155	184	12	NA	NA	172	178,990	49	178,561	144	236	525	1,491	100	NA	187	1,204
2003	212,559	36,351	15,318	4,585	NA	14,461	1,087	900	201	13	NA	NA	188	173,791	52	173,360	143	236	566	1,650	95	NA	196	1,359
2004	209,036	40,385	15,035	5,380	NA	17,008	1,429	1,534	203	13	NA	NA	190	166,288	53	165,859	141	235	567	1,592	71	NA	196	1,325
2005	223,896	41,772	16,008	5,323	NA	17,744	1,311	1,385	194	13	NA	NA	181	179,683	58	179,244	140	242	573	1,674	74	NA	194	1,405
2006	236,181	42,967	17,864	4,838	3	18,564	1,029	669	190	11	5	NA	174	190,751	64	190,296	140	251	577	1,696	74	NA	192	1,429
2007	246,488	42,812	19,480	5,681	3	16,067	967	614	192	9	6	NA	177	201,100	51	200,645	144	260	584	1,800	61	NA	201	1,539
2008	275,333	57,863	18,631	6,464	4	31,276	892	596	442	8	8	237	190	214,085	48	213,615	157	265	624	2,319	50	350	221	1,697
2009	269,394	58,862	18,152	6,483	6	32,036	1,608	579	466	9	9	151	296	206,491	41	205,902	295	253	934	2,641	48	380	380	1,832
2010	261,365	59,210	19,606	7,188	6	29,226	2,520	663	552	11	10	118	412	197,207	41	196,491	423	252	1,228	3,169	47	675	518	1,929
2011	275,969	59,386	22,299	6,916	6	26,731	2,628	806	649	7	10	234	398	211,723	41	210,997	423	261	1,299	2,912	39	409	531	1,933
2012	273,056	55,542	19,941	6,631	6	25,840	2,605	518	488	10	9	102	367	212,699	43	211,949	444	263	1,455	2,871	40	310	579	1,942
2013	282,032	50,638	19,426	6,459	6	21,755	2,526	466	521	11	8	124	378	226,055	48	225,259	474	275	1,571	3,246	35	523	609	2,079
2014	290,852	46,380	19,590	6,446	5	17,431	2,453	455	482	7	7	84	385	238,804	56	237,944	518	286	1,674	3,512	35	602	671	2,204
2015	299,147	45,705	18,123	6,750	5	18,017	2,407	403	482	6	8	86	383	247,318	59	246,435	530	294	1,776	3,867	40	752	744	2,331
2016	307,304	40,802	14,981	7,074	7	15,881	2,435	425	537	7	10	122	397	259,999	61	259,098	531	309	1,861	4,104	47	719	820	2,518
2017	325,675	41,697	14,714	7,447	8	16,466	2,475	587	524	10	12	86	416	277,378	60	276,434	564	321	1,954	4,122	47	520	867	2,688
2018	352,362	43,784	17,095	7,767	8	15,689	2,529	695	544	14	12	77	441	301,686	59	300,720	568	340	1,993	4,355	49	678	830	2,798
2019[a]	377,102	47,369	19,147	7,979	9	17,084	2,604	545	574	15	12	86	460	322,531	54	321,540	579	357	2,060	4,568	50	772	833	2,913

NA = not available.

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

[a] The data for 2019 are estimates and will later be revised.

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. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For comparisons, use only the historical data reported in this table because some back-year data may have been revised. Except for the nonprofit sector, data are based on annual reports by performers in the National Center for Science and Engineering Statistics' annual R&D expenditure surveys: Business 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 Expenditures Survey, and Survey of State Government Research and Development. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—are 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.) The 1998–2018 data for NPO R&D performance funded by businesses and the nonprofit sector itself are estimated, based on parameters from the 1996–97 Survey of Research and Development Funding and Performance by Nonprofit Organizations. 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 onward, 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.) Type-of-R&D data for FFRDC R&D in 1953–54 include only those of university-administered FFRDCs. Starting in 2001, type-of-R&D data distinguish federally funded from nonfederally funded FFRDC R&D. (See also **table 2**, footnote b.) 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. Furthermore, the type-of-R&D splits for other than total and federally funded are estimated. (See also **table 2**, footnote e.) Type-of-R&D data for R&D by other NPOs in 1998 and later years are estimated, except for those that are federally funded. (See also **table 2**, footnote f.) Type-of-R&D data for state intramural R&D became available in the 2016 Survey of State Government Research and Development. These data prior to 2016 are estimated. (See also **table 2**, footnote c.)

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: 2018

(Millions of current dollars)

State	All R&D	R&D rank	Performer: Source of funds:	Federal	FFRDCs			Business				Higher education[a]							NPOs	State, internal[b]	GDP	GDP rank	R&D intensity[c]	
										Paid by others														
				Federal	Total	Federal	Nonfederal[d]	Total	Own	Nonfederal[e]	Federal	Total	Federal	Other government	Business	Higher education	NPO	Other	Federal[f]	Total	GDP		Percent	Rank
U.S. total[g]	606,085	na		36,793	21,563	21,163	400	445,637	381,615	38,823	25,199	74,897	37,736	4,210	4,580	20,704	5,204	2,465	8,451	656	20,611,900	na	2.91	na
States total[g]	579,587	na		32,351	21,172	20,770	401	438,454	375,406	38,337 - 38,568	24,447 - 24,708	79,159	41,856	4,303	4,713	20,370	5,438	2,478	7,816	635	20,495,101	na	2.83	na
Alabama	4,876	26		1,524	0	0	0	2,236	1,284	101	851	1,069	592	54	72	302	33	16	35	11	221,031	27	2.21	24
Alaska	297	50		95	0	0	0	25	20	4	1	165	111	4	3	45	1	1	5	7	54,293	47	0.55	49
Arizona	7,773	21		126	34	24	10	6,203	4,673	715	815	1,359	577	67	33	467	85	130	50	2	350,718	20	2.22	23
Arkansas	852	42		28	0	0	0	471	423	28	19	343	126	66	12	119	9	12	10	*	127,761	35	0.67	47
California	164,398	1		2,138	6,462	6,349	113	144,524	129,656	7,691	7,177	10,175	5,090	445	693	2,249	1,061	636	1,021	78	2,975,083	1	5.53	5
Colorado	7,712	22		469	547	489	58	5,032	4,286	232	514	1,552	1,083	54	86	151	88	90	103	9	372,453	16	2.07	27
Connecticut	8,851	16		20	0	0	0	7,488	6,193	356	939	1,287	709	9	96	360	99	14	34	23	279,782	23	3.16	13
Delaware	2,594	34		3	0	0	0	2,375	1,432	933	9	208	132	14	5	48	5	4	6	3	74,187	43	3.50	12
District of Columbia	5,632	25		4,218	8	8	0	400	278	17	105	630	323	5	22	185	69	27	374	2	138,774	34	4.06	7
Florida	10,516	14		1,083	0	0	0	6,489	4,498	709	1,282	2,726	1,242	276	119	881	153	54	166	52	1,050,298	4	1.00	38
Georgia	7,817	20		229	0	0	0	5,067	4,094	868	105	2,474	1,384	139	141	641	154	14	45	2	602,024	9	1.30	34
Hawaii	633	43		171	0	0	0	146	89	37	20	298	187	20	1	73	15	2	18	*	93,101	39	0.68	46
Idaho	3,172	31		40	395	376	19	2,556	2,376	177	4	171	86	38	3	35	2	7	4	6	79,091	41	4.01	8
Illinois	17,119	10		186	1,106	1,075	31	13,182	12,239	859	84	2,570	1,494	45	172	676	145	38	74	1	863,040	5	1.98	28
Indiana	8,595	18		110	0	0	0	6,976	6,004	861	110	1,505	628	45	88	602	109	33	3	*	368,425	18	2.33	18
Iowa	4,324	28		71	37	36	1	3,315	2,556	94 - 325	434 - 665	886	399	51	47	352	33	4	13	3	190,147	30	2.27	19
Kansas	3,261	30		18	0	0	0	2,593	1,645	940	8	641	254	80	71	201	32	3	7	2	171,719	32	1.90	29
Kentucky	2,044	35		10	0	0	0	1,435	1,178	58	199	597	266	53	23	187	25	43	1	2	207,849	28	0.98	39
Louisiana	1,237	39		61	0	0	0	415	359	37	20	744	290	91	69	224	46	24	3	13	253,236	24	0.49	50
Maine	527	46		9	0	0	0	285	266	14	6	129	58	25	6	33	4	3	102	3	64,557	44	0.82	43
Maryland	23,112	7		11,473	981	981	0	6,016	4,227	463	1,326	4,167	3,211	80	129	519	215	14	472	3	411,619	15	5.61	4
Massachusetts	35,335	8		398	1,768	1,756	12	27,282	22,581	4,037	665	4,060	2,252	35	293	947	387	146	1,819	8	570,464	11	6.19	2
Michigan	25,438	6		161	0	0	0	22,412	20,323	1,829	260	2,781	1,375	63	125	1,055	120	44	83	0	521,803	14	4.87	6
Minnesota	8,744	17		42	0	0	0	7,405	7,021	246	138	1,000	475	87	45	325	42	26	297	1	371,930	17	2.35	17
Mississippi	1,171	40		414	0	0	0	276	250	15	11	479	212	96	14	141	12	4	*	2	113,579	37	1.03	37
Missouri	8,491	19		40	0	0	0	7,171	3,976	195	3,000	1,222	692	8	99	313	97	12	51	8	317,949	22	2.67	15
Montana	462	47		44	0	0	0	180	157	13	10	230	137	12	4	65	7	6	5	3	50,692	49	0.91	41
Nebraska	1,148	41		33	0	0	0	570	513	40	17	536	226	71	30	164	21	24	9	*	124,705	36	0.92	40
Nevada	1,241	38		16	0	0	0	960	638	296	25	260	114	16	4	115	5	6	4	*	169,180	33	0.73	45
New Hampshire	3,089	32		31	0	0	0	2,566	992	292	1,281	471	237	3	14	185	25	7	20	*	84,584	40	3.65	11

TABLE 10

U.S. R&D expenditures, by state, performing sector, and source of funds: 2018

(Millions of current dollars)

State	All R&D	R&D rank	Performer: Source of funds:	Federal	FFRDCs			Business				Higher education[a]							NPOs	State, internal[b]	GDP	GDP rank	R&D intensity[c]	
										Paid by others														
				Federal	Total	Federal	Nonfederal[d]	Total	Own	Nonfederal[e]	Federal	Total	Federal	Other government	Business	Higher education	NPO	Other	Federal[f]	Total	GDP		Percent	Rank
New Jersey	22,873	8		1,152	82	82	0	20,251	16,843	3,222	186	1,359	691	85	54	400	87	42	27	2	612,979	8	3.73	10
New Mexico	7,026	24		763	5,169	5,103	66	699	374	31	294	368	244	23	5	70	18	7	26	1	100,080	38	7.02	1
New York	25,822	5		300	553	525	27	17,515	15,370	1,285	860	6,634	3,445	342	430	1,657	522	238	581	241	1,705,010	3	1.51	31
North Carolina	15,437	11		330	0	0	0	11,716	7,790	3,760	167	3,205	1,828	151	360	627	195	45	166	19	567,452	12	2.72	14
North Dakota	600	45		30	0	0	0	312	284	26	2	256	86	55	11	92	2	9	1	2	56,287	46	1.07	36
Ohio	14,273	12		1,989	0	0	0	9,646	6,820	2,081	744	2,370	1,426	103	194	462	154	31	259	8	675,030	7	2.11	25
Oklahoma	1,664	36		248	0	0	0	868	822	34	13	517	210	66	34	188	12	7	30	1	198,596	29	0.84	42
Oregon	9,688	15		81	0	0	0	8,751	8,446	225	79	821	545	60	41	100	59	16	19	16	241,978	25	4.00	9
Pennsylvania	17,481	9		444	143	143	*	12,104	10,633	1,330	141	4,406	2,441	97	277	1,175	280	137	377	7	778,375	6	2.25	21
Rhode Island	1,412	37		261	0	0	0	703	663	10	29	368	238	16	8	79	22	5	78	2	59,925	45	2.36	16
South Carolina	2,750	33		103	154	153	1	1,670	1,462	140	68	761	339	28	46	305	27	16	32	28	235,287	26	1.17	35
South Dakota	344	49		12	0	0	0	201	179	21	1	116	56	21	3	22	6	8	15	*	53,239	48	0.65	48
Tennessee	4,816	27		264	1,399	1,378	21	1,440	1,184	203	52	1,294	726	35	61	405	49	18	417	2	362,737	19	1.33	33
Texas	27,214	4		464	5	5	*	20,929	18,267	2,063	599	5,643	2,242	848	396	1,448	441	268	169	3	1,795,635	2	1.52	30
Utah	4,026	29		168	0	0	0	3,025	2,642	189	194	812	491	34	44	200	33	10	2	18	181,623	31	2.22	22
Vermont	438	48		4	0	0	0	300	233	49	19	133	90	0	3	30	8	2	0	1	32,981	51	1.33	32
Virginia	11,084	13		2,112	1,372	1,345	27	5,725	4,092	325	1,307	1,684	780	106	86	550	100	63	178	13	533,510	13	2.08	26
Washington	33,816	3		174	956	943	13	30,305	29,498	634	173	1,809	1,156	70	73	287	187	35	556	15	575,417	10	5.88	3
West Virginia	605	44		142	0	0	0	238	209	10	20	212	90	12	11	75	6	18	11	3	77,633	42	0.78	44
Wisconsin	7,597	23		49	0	0	0	5,966	5,334	539	92	1,542	728	83	50	499	128	53	35	5	337,553	21	2.25	20
Wyoming	157	51		1	0	0	0	39	34	3	2	113	43	15	6	41	3	6	2	2	39,703	50	0.40	51
U.S. undistributed[h]	4,050	na		1,466	0	0	0	2,584	2,399	0 - 186	0 - 186	0	0	0	0	0	0	0	0	0	0	na	na	na
Puerto Rico	604	na		6	0	0	0	493	476	NA	NA	104	70	3	6	24	1	1	*	na	107,975	na	NA	na
Other[i]	427	na		401	0	0	0	0	0	0	0	23	19	2	*	*	*	0	3	na	na	na	na	na

* = value < $0.5 million; na = not applicable; NA = not available.

FFRDC = federally funded R&D 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 8.0% of total R&D expenditures reported by higher education institutions in FY 2018.

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

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

[d] Nonfederal sources of R&D expenditures reported by FFRDCs in FY 2018 included state and local governments ($44 million), business ($198 million), NPOs ($44 million), and all other sources ($116 million).

[e] R&D paid for by nonfederal sources in 2018 included funding from other companies located inside ($19 billion) or outside ($18 billion) the United States; U.S. state government agencies ($120 million); U.S. universities, colleges, and academic researchers ($77 million); foreign

universities, colleges, and academic researchers ($5 million); and other organizations located inside ($380 million) or outside ($340 million) the United States.

[f] Other sources of support for NPOs were unavailable by state. In 2018, total nonprofit performance is estimated at $26.5 billion. Business provided an estimated $2.0 billion to the nonprofit sector, and nonprofit institutions provided an estimated $16.1 billion.

[g] States totals differ from U.S. totals for several reasons: (a) some R&D expenditures cannot be allocated to 1 of 50 states or the District of Columbia, (b) nonfederal sources of other nonprofit R&D expenditures could not be allocated by state, (c) state-level higher education data have not been adjusted to eliminate double counting of funds passed through from one academic institution to another, and (d) state-level R&D data are not converted from fiscal years to calendar years.

[h] Reported data that could not be assigned to 1 of the 50 states or the District of Columbia.

[i] Includes 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):

National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series). State GDP data are from the Bureau of Economic Analysis, http://www.bea.gov/regional/index.htm, accessed 20 November 2020.

Technical Notes

Overview of 2018–19 Data Update

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 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).

Key Information on Publication Series

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

Current reference period. Data from 1953 to 2019 are provided for almost all variables. The data for 2019 are estimates and not previously reported in this series. The data for 2018 are revised from the previous edition (2017–18) of this series. The data for 1953–2018 reflect final 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 are 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 2017 and forward, annual data on the R&D performed in the domestic United States by the business sector come from NCSES's Business Research and Development Survey (BRDS). For 2008 through 2016, the source was NCSES's Business R&D and Innovation Survey (BRDIS) (**https://www.nsf.gov/statistics/srvyindustry/**). Both BRDIS and BRDS are cosponsored with the U.S. Census Bureau. BRDS is sample survey of companies in manufacturing and nonmanufacturing industries; it is designed to be nationally representative of all for-profit companies in the United States (publicly or privately held) with 10 or more employees (typically, a sample of about 45,000 companies representing a national population of about 1.1 million companies). Similarly, BRDIS was a nationally representative sample survey but covering all for-profit companies with 5 or more employees. Key variables covered by these business sector surveys include 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); patenting, licensing, other technology transfer activities; and innovation indicators. (Note: data on business intramural R&D capital reported by BRDIS are not included as a component in the *National Patterns* total of business intramural R&D.) And, for the first time in the *National Patterns* series, starting with 2016, the business R&D totals include R&D performed by micro companies (generally, companies with fewer than 10 employees). The data sources are the Business R&D and Innovation Survey–Microbusiness (BRDI-M) (**https://www.nsf.gov/statistics/srvymicrobus/**), which collected statistics on the R&D activities in 2016 of businesses with 1–4 employees, and for 2017–18, the Annual Business Survey (ABS) (**https://www.nsf.gov/statistics/srvyabs/**), which collected statistics on the R&D activities of businesses with 1–9 employees.

For 2007 and earlier years, the data come from the NCSES Survey of Industrial Research and Development (SIRD), the predecessor to BRDIS (**https://www.nsf.gov/statistics/srvyindustry/sird.cfm**). 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.

As sample surveys, data estimates from BRDS, BRDIS, BRDI-M, ABS, and SIRD have sampling error.

Federal Government

Federal intramural R&D. Data on the intramural R&D performed by the federal government come from NCSES's Survey of Federal Funds for Research and Development (Federal Funds Survey), which is completed annually by all federal agencies conducting R&D programs (approximately 28 federal departments or independent agencies; **https://www.nsf.gov/statistics/srvyfedfunds/**). 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 (for research, not for development). (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 41 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: **https://www.nsf.gov/statistics/ffrdclist/**.) 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 (**https://www.nsf.gov/statistics/srvyffrdc/**). 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 Survey of Industrial R&D (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 NCSES's Survey of State Government Research and Development (**https://www.nsf.gov/statistics/srvystaterd/**). This state survey is a comparatively recent NCSES initiative, with the first data year in FY 2006.

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

Higher Education Institutions

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

The HERD Survey replaced the earlier Survey of Research and Development Expenditures at Universities and Colleges (**https://www.nsf.gov/statistics/srvyrdexpenditures/**). 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. Data on the R&D performed by such nonprofit organizations that are federally funded comes from the aforementioned NCSES Federal Funds Survey (reported annually, on a federal fiscal year basis). Data for the R&D performed by nonprofit organizations with funding from within the nonprofit sector and from business sources (both reported on a calendar year basis) are estimated, based on parameters from NCSES's past comprehensive R&D surveys of the sector. NCSES's most recent Survey of Research and Development Funding and Performance by Nonprofit Organizations dates to 1973 and 1996–97 (**https://www.nsf.gov/statistics/srvyrdnonprofit/**). 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 **http://www.bea.gov/national/index.htm#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 arises from integration of the primary data from the NCSES sectoral R&D surveys. Adjustments to the primary data are needed in some cases to enable consistent addition. 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 calculated.

Key features of the methodology include the following.

- Data from BRDIS are 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 also are 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 covered the population of companies with 10 or more employees. Inclusion of the ABS data for 2017 and 2018 added coverage of companies with 1–9 employees to the *National Patterns* reported business R&D totals in these years (respectively, $5.7 billion and $4.6 billion).
- 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, the 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.

- 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 $4.8 billion in FY 2018. 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.
- Higher education institutions reporting R&D expenditures of less than $1 million were not included in the *National Patterns* totals for FYs 2010 and 2011. For FY 2012 and forward, the methodology was revised to include this increment. The R&D expenditures of these institutions totaled $143 million in FY 2012 and have ranged from $130 million to $150 million in subsequent years.
- 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 2010–19 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. These amounts can differ substantially from the R&D that federal agencies have 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). And, in 2015, federal agencies reported obligating $129 billion for R&D funding to all R&D performers (including $48 billion to the business sector), compared with an estimated $113 billion in federal funding reported by all performers of R&D that year ($20 billion by businesses).
- 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 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 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 states); 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]

Notes

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 **http://www.oecd.org/publications/frascati-manual-2015-9789264239012-en.htm**.

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