



# NATIONAL SCIENCE BOARD SCIENCE & ENGINEERING INDICATORS 2022



R&D

## Research and Development: U.S. Trends and International Comparisons

### Supplemental Tables

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## Supplemental Tables

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Table SRD-1

**Gross expenditures on R&D and expenditures for R&D as a share of gross domestic product, for selected countries or regions: 1981–2019**

(Billions of current and 2012 constant U.S. PPP dollars, GERD-to-GDP ratio, and annual growth rates)

Year	United States	EU-27 <sup>a</sup>	France	Germany	United Kingdom	China	Japan	South Korea	India
GERD (billions of U.S. PPP dollars)									
1981	72.7	na	11.0	18.8	11.8	NA	24.0	NA	NA
1982	81.2	na	12.5	20.5	NA	NA	27.4	NA	NA
1983	90.4	na	13.4	21.5	12.7	NA	31.1	NA	NA
1984	102.9	na	14.7	23.1	NA	NA	35.0	NA	NA
1985	115.2	na	15.9	25.9	14.7	NA	40.4	NA	NA
1986	120.6	na	16.5	27.5	15.5	NA	42.0	NA	NA
1987	126.7	na	17.7	29.7	16.1	NA	46.1	NA	NA
1988	134.2	na	19.1	31.9	17.1	NA	51.4	NA	NA
1989	142.2	na	21.1	34.2	18.2	NA	58.4	NA	NA
1990	152.4	na	23.3	35.9	18.9	NA	65.4	NA	NA
1991	161.4	108.0	24.4	40.0	18.6	9.1	69.2	7.0	NA
1992	165.8	110.3	25.4	39.7	18.8	10.7	70.0	8.0	NA
1993	166.1	111.5	26.3	39.1	20.0	11.9	69.8	9.5	NA
1994	169.6	113.7	26.9	39.4	20.9	12.5	70.5	11.5	NA
1995	184.1	118.1	27.7	41.0	19.6	12.8	76.6	13.1	NA
1996	197.8	123.1	28.3	42.2	20.1	14.1	83.0	14.8	10.6
1997	212.5	129.6	28.6	44.1	20.7	17.8	87.8	16.2	12.1
1998	226.2	136.6	29.4	46.1	21.4	19.7	91.1	14.6	13.3
1999	245.0	146.6	31.0	50.7	23.3	24.9	92.8	15.8	15.1
2000	268.6	158.9	33.3	53.9	25.2	32.9	98.9	18.5	16.8
2001	279.1	169.3	36.1	56.2	26.3	38.4	103.8	21.3	17.5
2002	278.4	178.1	38.3	58.6	27.9	47.9	108.2	22.5	18.1
2003	292.2	181.8	37.1	61.0	28.6	56.8	112.4	24.1	19.8
2004	303.8	188.6	38.1	62.9	29.4	69.7	117.5	27.9	23.1
2005	326.2	196.3	39.5	64.0	30.6	86.2	128.7	30.6	27.9
2006	351.7	216.3	42.3	69.5	33.3	104.7	138.7	35.4	30.4
2007	378.5	231.5	44.2	73.4	35.2	123.3	147.5	40.6	33.6
2008	405.4	254.2	46.6	81.2	36.5	145.1	148.7	43.9	37.6
2009	404.2	260.8	49.7	82.8	36.5	184.1	137.4	45.8	39.7
2010	408.5	270.4	50.9	87.0	37.6	212.1	140.6	52.2	41.2
2011	427.1	289.7	53.6	95.8	38.8	246.5	148.4	58.4	42.4
2012	434.4	302.4	55.1	100.5	38.5	289.2	152.3	64.9	45.8
2013	455.1	315.6	58.4	102.9	41.5	323.4	164.7	68.2	45.8

Table SRD-1

**Gross expenditures on R&D and expenditures for R&D as a share of gross domestic product, for selected countries or regions: 1981–2019**

(Billions of current and 2012 constant U.S. PPP dollars, GERD-to-GDP ratio, and annual growth rates)

Year	United States	EU-27 <sup>a</sup>	France	Germany	United Kingdom	China	Japan	South Korea	India
2014	477.0	329.1	60.6	109.6	43.8	346.3	169.6	73.1	47.6
2015	495.9	341.6	61.6	114.1	45.7	366.1	168.5	76.9	49.6
2016	522.6	360.1	63.7	122.5	48.1	393.0	160.3	80.8	51.8
2017	555.1	386.7	65.7	133.7	50.8	420.8	166.6	90.3	55.1
2018	606.2	413.7	68.6	142.1	54.2	465.5	172.8	99.0	58.7
2019	668.4	440.3	73.3	148.1	56.9	525.7	173.3	102.5	NA
GERD (billions of 2012 constant U.S. PPP dollars)									
1981	157.3	na	23.8	40.6	25.4	NA	52.0	NA	NA
1982	165.3	na	25.4	41.7	NA	NA	55.9	NA	NA
1983	177.2	na	26.3	42.1	24.9	NA	60.9	NA	NA
1984	194.6	na	27.9	43.7	NA	NA	66.2	NA	NA
1985	211.3	na	29.1	47.6	26.9	NA	74.1	NA	NA
1986	216.7	na	29.6	49.5	27.9	NA	75.5	NA	NA
1987	222.2	na	31.0	52.1	28.3	NA	80.9	NA	NA
1988	227.4	na	32.3	54.0	29.0	NA	87.1	NA	NA
1989	231.9	na	34.4	55.7	29.7	NA	95.1	NA	NA
1990	239.5	na	36.6	56.4	29.8	NA	102.8	NA	NA
1991	245.4	164.2	37.1	60.8	28.3	13.9	105.1	10.7	NA
1992	246.5	163.9	37.8	59.0	27.9	15.9	104.0	11.9	NA
1993	241.2	161.8	38.1	56.7	29.0	17.3	101.3	13.8	NA
1994	241.1	161.6	38.2	56.0	29.7	17.7	100.2	16.4	NA
1995	256.3	164.4	38.5	57.1	27.3	17.8	106.6	18.3	NA
1996	270.5	168.3	38.7	57.7	27.4	19.3	113.5	20.3	14.5
1997	285.6	174.2	38.5	59.3	27.8	24.0	118.0	21.8	16.2
1998	300.8	181.7	39.2	61.3	28.5	26.2	121.1	19.4	17.7
1999	321.2	192.2	40.6	66.4	30.6	32.7	121.6	20.7	19.8
2000	344.2	203.6	42.7	69.1	32.2	42.2	126.8	23.7	21.5
2001	349.6	212.1	45.2	70.4	33.0	48.1	130.1	26.7	21.9
2002	343.7	219.9	47.3	72.4	34.4	59.1	133.5	27.8	22.4
2003	353.6	219.9	44.9	73.8	34.6	68.8	136.0	29.1	23.9
2004	358.1	222.3	45.0	74.2	34.7	82.1	138.4	32.9	27.2
2005	372.9	224.3	45.2	73.2	35.0	98.5	147.1	35.0	31.9
2006	389.8	239.8	46.9	77.0	36.9	116.1	153.8	39.2	33.7
2007	408.5	249.9	47.7	79.2	38.0	133.1	159.2	43.8	36.2
2008	429.5	269.3	49.3	86.0	38.7	153.7	157.5	46.5	39.9

Table SRD-1

**Gross expenditures on R&D and expenditures for R&D as a share of gross domestic product, for selected countries or regions: 1981–2019**

(Billions of current and 2012 constant U.S. PPP dollars, GERD-to-GDP ratio, and annual growth rates)

Year	United States	EU-27 <sup>a</sup>	France	Germany	United Kingdom	China	Japan	South Korea	India	
2009	425.4	274.5	52.3	87.1	38.4	193.8	144.6	48.2	41.8	
2010	424.8	281.2	52.9	90.5	39.1	220.6	146.2	54.2	42.9	
2011	435.1	295.1	54.6	97.6	39.5	251.1	151.2	59.5	43.2	
2012	434.4	302.4	55.1	100.5	38.5	289.2	152.3	64.9	45.8	
2013	447.2	310.1	57.3	101.1	40.8	317.7	161.8	67.0	45.0	
2014	460.2	317.5	58.4	105.7	42.3	334.0	163.6	70.5	45.9	
2015	473.8	326.4	58.9	109.0	43.6	349.8	161.0	73.5	47.4	
2016	494.5	340.7	60.2	115.9	45.5	371.8	151.6	76.5	49.0	
2017	515.2	358.9	61.0	124.1	47.2	390.6	154.6	83.8	51.2	
2018	549.5	374.9	62.2	128.8	49.2	421.9	156.6	89.8	53.2	
2019	595.3	392.2	65.3	131.9	50.7	468.2	154.3	91.3	NA	
	GERD-to-GDP ratio (%)									
1981	2.27	na	1.87	2.35	2.24	NA	2.05	NA	NA	
1982	2.43	na	1.95	2.42	NA	NA	2.13	NA	NA	
1983	2.49	na	1.98	2.41	2.06	NA	2.24	NA	NA	
1984	2.55	na	2.07	2.43	NA	NA	2.33	NA	NA	
1985	2.66	na	2.13	2.59	2.09	NA	2.48	NA	NA	
1986	2.63	na	2.12	2.63	2.10	NA	2.44	NA	NA	
1987	2.61	na	2.16	2.73	2.02	NA	2.50	NA	NA	
1988	2.56	na	2.15	2.73	1.96	NA	2.52	NA	NA	
1989	2.52	na	2.19	2.71	1.95	NA	2.63	NA	NA	
1990	2.56	na	2.27	2.61	1.95	NA	2.71	NA	NA	
1991	2.62	1.65	2.28	2.39	1.87	0.72	2.68	1.71	NA	
1992	2.54	1.63	2.28	2.27	1.84	0.73	2.63	1.80	NA	
1993	2.42	1.62	2.32	2.21	1.86	0.70	2.57	1.95	NA	
1994	2.33	1.57	2.27	2.13	1.84	0.63	2.47	2.12	NA	
1995	2.41	1.56	2.24	2.14	1.65	0.57	2.56	2.16	NA	
1996	2.45	1.57	2.22	2.14	1.58	0.56	2.64	2.22	0.64	
1997	2.48	1.59	2.15	2.19	1.54	0.64	2.72	2.25	0.69	
1998	2.50	1.60	2.09	2.22	1.55	0.65	2.83	2.11	0.70	
1999	2.54	1.65	2.11	2.35	1.63	0.75	2.85	2.02	0.72	
2000	2.62	1.68	2.09	2.41	1.62	0.89	2.86	2.13	0.76	
2001	2.64	1.70	2.14	2.40	1.61	0.94	2.92	2.28	0.74	
2002	2.55	1.71	2.17	2.44	1.62	1.06	2.97	2.21	0.73	
2003	2.55	1.70	2.12	2.47	1.58	1.12	2.99	2.28	0.72	

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**Gross expenditures on R&D and expenditures for R&D as a share of gross domestic product, for selected countries or regions: 1981–2019**

(Billions of current and 2012 constant U.S. PPP dollars, GERD-to-GDP ratio, and annual growth rates)

Year	United States	EU-27 <sup>a</sup>	France	Germany	United Kingdom	China	Japan	South Korea	India
2004	2.49	1.68	2.09	2.44	1.54	1.21	2.98	2.44	0.76
2005	2.50	1.68	2.05	2.44	1.56	1.31	3.13	2.52	0.82
2006	2.55	1.70	2.05	2.47	1.58	1.37	3.23	2.72	0.80
2007	2.62	1.70	2.02	2.46	1.62	1.37	3.29	2.87	0.81
2008	2.74	1.78	2.06	2.62	1.61	1.45	3.29	2.99	0.86
2009	2.79	1.86	2.21	2.74	1.67	1.66	3.20	3.15	0.83
2010	2.71	1.86	2.18	2.73	1.64	1.71	3.10	3.32	0.79
2011	2.74	1.91	2.19	2.81	1.65	1.78	3.21	3.59	0.76
2012	2.67	1.96	2.23	2.88	1.58	1.91	3.17	3.85	0.74
2013	2.70	1.98	2.24	2.84	1.62	2.00	3.28	3.95	0.71
2014	2.72	2.00	2.28	2.88	1.64	2.02	3.37	4.08	0.70
2015	2.72	2.01	2.27	2.93	1.65	2.06	3.24	3.98	0.69
2016	2.80	1.99	2.22	2.94	1.66	2.10	3.11	3.99	0.67
2017	2.85	2.03	2.20	3.05	1.68	2.12	3.17	4.29	0.67
2018	2.95	2.07	2.19	3.12	1.73	2.14	3.22	4.52	0.65
2019	3.13	2.12	2.20	3.19	1.76	2.23	3.20	4.64	NA
GERD, annual growth rates, recent years, current and constant dollars (%)									
Current PPP\$									
CAGR 2000–10	4.3	5.5	4.3	4.9	4.1	20.5	3.6	10.9	9.4
CAGR 2010–19	5.6	5.6	4.1	6.1	4.7	10.6	2.4	7.8	4.5
Constant 2012 PPP\$									
CAGR 2000–10	2.1	3.3	2.2	2.7	1.9	18.0	1.4	8.6	7.2
CAGR 2010–19	3.8	3.8	2.4	4.3	2.9	8.7	0.6	6.0	2.7
GDP, annual growth rates, recent years, current and constant dollars (%)									
Current PPP\$									
CAGR 2000–10	3.9	4.4	3.9	3.6	3.9	12.9	2.7	6.1	9.0
CAGR 2010–19	4.1	4.1	4.0	4.3	3.9	7.4	2.0	3.8	7.1
Constant 2012 PPP\$									
CAGR 2000–10	1.7	2.2	1.8	2.2	1.8	10.5	0.6	3.9	6.7
CAGR 2010–19	2.3	2.3	2.3	1.7	2.2	5.6	0.3	2.1	5.3

na = not applicable; NA = not available.

CAGR = compound average annual growth rate; EU = European Union; GDP = gross domestic product; GERD = gross domestic expenditure on R&amp;D; PPP = purchasing power parity.

<sup>a</sup> Data for the EU include the 27 EU member countries.

**Note(s):**

Table data include the top eight R&D-performing countries in 2019. R&D expenditures in constant U.S. PPP dollars are computed using the U.S. GDP implicit price deflator. Data for the United States in this table reflect international standards for calculating GERD, which vary slightly from the National Science Foundation's protocol for tallying U.S. total R&D. Data for Japan for 1996 onward may not be consistent with earlier data because of changes in methodology. Data for Germany for 1981–90 are for West Germany.

**Source(s):**

National Center for Science and Engineering Statistics, *National Patterns of R&D Resources* (2019–20 edition); Organisation for Economic Co-operation and Development, *Main Science and Technology Indicators* (September 2021 edition); United Nations Educational, Scientific and Cultural Organization, Institute for Statistics, Science Technology and Innovation data set (March 2021 release).

*Science and Engineering Indicators*

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Table SRD-2

## Business R&amp;D performed in the United States, by industry: 2010–19

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Millions of dollars										
All industries, 21–33, 42–81	278,977	294,093	302,250	322,528	340,728	355,821	374,685	400,100	441,036	492,956
Manufacturing industries, 31–33	196,712	201,361	208,415	221,476	232,815	236,132	250,553	257,227	274,075	285,674
Chemicals, 325	58,038	55,324	57,225	61,664	66,301	68,196	73,575	74,977	84,137	97,063
Pharmaceuticals and medicines, 3254	49,415	45,949	48,146	52,426	56,612	58,675	64,628	66,202	74,592	87,619
Other 325	8,623	9,375	9,079	9,238	9,689	9,521	8,947	8,775	9,545	9,444
Machinery, 333	9,955	14,709	14,254	12,650	12,128	13,426	12,585	13,197	14,799	15,184
Computer and electronic products, 334	59,875	62,704	65,068	67,205	73,891	72,110	77,385	78,575	83,697	86,729
Electrical equipment, appliance, and components, 335	3,321	3,595	3,087	4,136	4,365	4,335	4,771	4,291	4,487	5,263
Transportation equipment, 336	42,913	40,880	42,305	45,972	46,746	49,274	51,275	53,292	52,629	45,375
Motor vehicles, bodies, trailers, and parts, 3361–63	D	D	D	16,729	18,404	19,078	22,042	23,881	25,586	24,117
Aerospace products and parts, 3364	29,854	26,054	24,817	27,114	26,181	27,464	26,645	26,383	24,291	18,358
Other 336	D	D	D	2,129	2,161	2,732	2,588	3,028	2,752	2,900
Manufacturing nec, other 31–33	22,610	24,149	26,476	29,849	29,384	28,791	30,962	32,895	34,326	36,060
Nonmanufacturing industries, 21–23, 42–81	82,265	92,731	93,835	101,052	107,913	119,690	124,132	142,874	166,961	207,283
Information, 51	36,853	41,865	46,805	57,207	63,773	65,513	70,748	80,252	94,349	110,227
Software publishers, 5112	26,982	27,965	28,745	35,333	36,052	33,248	33,495	34,264	32,639	32,958
Other 51	9,871	13,900	18,060	21,874	27,721	32,265	37,253	45,988	61,710	77,269
Finance and insurance, 52	2,109	3,457	3,519	4,308	4,122	5,366	7,331	7,616	7,471	8,917
Professional, scientific, and technical services, 54	33,690	38,219	34,309	31,017	30,975	38,626	37,595	36,922	44,860	53,233
Computer systems design and related services, 5415	11,050	13,259	11,251	9,268	11,019	14,333	15,747	13,327	15,923	21,046
Scientific research and development services, 5417	12,140	15,301	16,544	14,201	12,807	16,329	14,842	17,321	20,185	21,669
Other 54	10,500	9,659	6,514	7,548	7,149	7,964	7,006	6,274	8,752	10,518
Nonmanufacturing nec, other 21–23, 42–81	9,613	9,190	9,202	8,520	9,043	10,185	8,458	18,084	20,281	34,906
Percent change from preceding period										
All industries, 21–33, 42–81		5.4	2.8	6.7	5.6	4.4	5.3	6.8	10.2	11.8
Manufacturing industries, 31–33		2.4	3.5	6.3	5.1	1.4	6.1	2.7	6.5	4.2
Chemicals, 325		-4.7	3.4	7.8	7.5	2.9	7.9	1.9	12.2	15.4
Pharmaceuticals and medicines, 3254		-7.0	4.8	8.9	8.0	3.6	10.1	2.4	12.7	17.5
Other 325		8.7	-3.2	1.8	4.9	-1.7	-6.0	-1.9	8.8	-1.1
Machinery, 333		47.8	-3.1	-11.3	-4.1	10.7	-6.3	4.9	12.1	2.6
Computer and electronic products, 334		4.7	3.8	3.3	9.9	-2.4	7.3	1.5	6.5	3.6
Electrical equipment, appliance, and components, 335		8.3	-14.1	34.0	5.5	-0.7	10.1	-10.1	4.6	17.3
Transportation equipment, 336		-4.7	3.5	8.7	1.7	5.4	4.1	3.9	-1.2	-13.8

Table SRD-2

## Business R&amp;D performed in the United States, by industry: 2010–19

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Motor vehicles, bodies, trailers, and parts, 3361–63		D	D	D	10.0	3.7	15.5	8.3	7.1	-5.7
Aerospace products and parts, 3364		-12.7	-4.7	9.3	-3.4	4.9	-3.0	-1.0	-7.9	-24.4
Other 336		D	D	D	1.5	26.4	-5.3	17.0	-9.1	5.4
Manufacturing nec, other 31–33		6.8	9.6	12.7	-1.6	-2.0	7.5	6.2	4.4	5.1
Nonmanufacturing industries, 21–23, 42–81		12.7	1.2	7.7	6.8	10.9	3.7	15.1	16.9	24.2
Information, 51		13.6	11.8	22.2	11.5	2.7	8.0	13.4	17.6	16.8
Software publishers, 5112		3.6	2.8	22.9	2.0	-7.8	0.7	2.3	-4.7	1.0
Other 51		40.8	29.9	21.1	26.7	16.4	15.5	23.4	34.2	25.2
Finance and insurance, 52		63.9	1.8	22.4	-4.3	30.2	36.6	3.9	-1.9	19.4
Professional, scientific, and technical services, 54		13.4	-10.2	-9.6	-0.1	24.7	-2.7	-1.8	21.5	18.7
Computer systems design and related services, 5415		20.0	-15.1	-17.6	18.9	30.1	9.9	-15.4	19.5	32.2
Scientific research and development services, 5417		26.0	8.1	-14.2	-9.8	27.5	-9.1	16.7	16.5	7.4
Other 54		-8.0	-32.6	15.9	-5.3	11.4	-12.0	-10.4	39.5	20.2
Nonmanufacturing nec, other 21–23, 42–81		-4.4	0.1	-7.4	6.1	12.6	-17.0	113.8	12.1	72.1
Industry share of business R&D (%)										
All industries, 21–33, 42–81	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing industries, 31–33	70.5	68.5	69.0	68.7	68.3	66.4	66.9	64.3	62.1	58.0
Chemicals, 325	20.8	18.8	18.9	19.1	19.5	19.2	19.6	18.7	19.1	19.7
Pharmaceuticals and medicines, 3254	17.7	15.6	15.9	16.3	16.6	16.5	17.2	16.5	16.9	17.8
Other 325	3.1	3.2	3.0	2.9	2.8	2.7	2.4	2.2	2.2	1.9
Machinery, 333	3.6	5.0	4.7	3.9	3.6	3.8	3.4	3.3	3.4	3.1
Computer and electronic products, 334	21.5	21.3	21.5	20.8	21.7	20.3	20.7	19.6	19.0	17.6
Electrical equipment, appliance, and components, 335	1.2	1.2	1.0	1.3	1.3	1.2	1.3	1.1	1.0	1.1
Transportation equipment, 336	15.4	13.9	14.0	14.3	13.7	13.8	13.7	13.3	11.9	9.2
Motor vehicles, bodies, trailers, and parts, 3361–63	D	D	D	5.2	5.4	5.4	5.9	6.0	5.8	4.9
Aerospace products and parts, 3364	10.7	8.9	8.2	8.4	7.7	7.7	7.1	6.6	5.5	3.7
Other 336	D	D	D	0.7	0.6	0.8	0.7	0.8	0.6	0.6
Manufacturing nec, other 31–33	8.1	8.2	8.8	9.3	8.6	8.1	8.3	8.2	7.8	7.3
Nonmanufacturing industries, 21–23, 42–81	29.5	31.5	31.0	31.3	31.7	33.6	33.1	35.7	37.9	42.0
Information, 51	13.2	14.2	15.5	17.7	18.7	18.4	18.9	20.1	21.4	22.4
Software publishers, 5112	9.7	9.5	9.5	11.0	10.6	9.3	8.9	8.6	7.4	6.7
Other 51	3.5	4.7	6.0	6.8	8.1	9.1	9.9	11.5	14.0	15.7
Finance and insurance, 52	0.8	1.2	1.2	1.3	1.2	1.5	2.0	1.9	1.7	1.8
Professional, scientific, and technical services, 54	12.1	13.0	11.4	9.6	9.1	10.9	10.0	9.2	10.2	10.8
Computer systems design and related services, 5415	4.0	4.5	3.7	2.9	3.2	4.0	4.2	3.3	3.6	4.3

Table SRD-2

**Business R&D performed in the United States, by industry: 2010–19**

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scientific research and development services, 5417	4.4	5.2	5.5	4.4	3.8	4.6	4.0	4.3	4.6	4.4
Other 54	3.8	3.3	2.2	2.3	2.1	2.2	1.9	1.6	2.0	2.1
Nonmanufacturing nec, other 21–23, 42–81	3.4	3.1	3.0	2.6	2.7	2.9	2.3	4.5	4.6	7.1

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = North American Industry Classification System; nec = not elsewhere classified.

**Note(s):**

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Beginning in survey year 2018, statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. For survey years 2010–13, industry classification was based on the 2007 NAICS, whereas for survey years 2014–18, industry classification was based on the 2012 NAICS. The 2010–16 data come from the Business R&D and Innovation Survey and do not include companies with fewer than 5 domestic employees. Data for 2017–18 come from the Business Research and Development Survey and do not include companies with fewer than 10 domestic employees. Data for 2019 come from the Business Enterprise Research and Development Survey and also do not include companies with fewer than 10 domestic employees.

**Source(s):**

National Center for Science and Engineering Statistics and U.S. Census Bureau, Business R&D and Innovation Survey (BRDIS), Business Research and Development Survey (BRDS), and Business Enterprise Research and Development Survey (BERD).

*Science and Engineering Indicators*

Table SRD-3

## Funds spent for business R&amp;D performed in the United States, by type of R&amp;D and selected sources of funds: 2010–19

(Millions of dollars and percent share)

Source of funds	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Millions of dollars										
All business R&D										
All business R&D <sup>a</sup>	278,977	294,093	302,250	322,528	340,728	355,821	374,685	400,100	441,036	492,956
Paid for by the company	221,706	238,768	247,280	264,913	282,570	296,677	317,731	339,036	377,806	428,968
Paid for by others	57,271	55,324	54,970	57,615	58,158	59,144	56,954	61,065	63,230	63,989
Federal	34,199	31,309	30,621	29,362	26,554	26,990	23,772	24,277	24,685	21,941
All others	23,072	24,015	24,349	28,253	31,604	32,154	33,182	36,788	38,545	42,048
Basic research										
All business R&D <sup>a</sup>	16,371	13,020	13,293	19,508	21,936	21,792	24,644	24,829	28,980	32,239
Paid for by the company	13,453	10,735	11,163	15,275	16,107	16,306	19,143	18,732	22,312	25,916
Paid for by others	2,918	2,285	2,131	4,233	5,829	5,486	5,501	6,097	6,668	6,324
Federal	1,406	677	644	1,196	2,044	2,038	2,005	1,783	2,510	2,313
All others	1,512	1,608	1,487	3,037	3,785	3,448	3,496	4,314	4,158	4,011
Applied research										
All business R&D <sup>a</sup>	44,906	47,186	50,755	51,014	53,415	56,472	61,020	62,132	65,222	74,031
Paid for by the company	35,475	37,573	39,629	38,105	39,012	44,344	48,806	49,149	53,229	59,697
Paid for by others	9,431	9,613	11,126	12,908	14,403	12,128	12,213	12,984	11,993	14,333
Federal	4,705	4,404	4,137	6,028	6,445	6,102	5,181	5,037	5,097	4,883
All others	4,726	5,209	6,989	6,880	7,958	6,026	7,032	7,947	6,896	9,450
Experimental development										
All business R&D <sup>a</sup>	217,699	233,887	238,202	252,007	265,377	277,558	289,021	313,139	346,834	386,686
Paid for by the company	172,777	190,460	196,488	211,532	227,451	236,027	249,782	271,155	302,264	343,355
Paid for by others	44,922	43,426	41,714	40,475	37,927	41,530	39,239	41,984	44,570	43,332
Federal	28,089	26,228	25,840	22,137	18,065	18,850	16,586	17,457	17,078	14,745
All others	16,833	17,198	15,874	18,338	19,862	22,680	22,653	24,527	27,492	28,587
Sources of funds as a percentage of business R&D, by type of R&D										
All business R&D										
All business R&D <sup>a</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Paid for by the company	79.5	81.2	81.8	82.1	82.9	83.4	84.8	84.7	85.7	87.0
Paid for by others	20.5	18.8	18.2	17.9	17.1	16.6	15.2	15.3	14.3	13.0
Federal	12.3	10.6	10.1	9.1	7.8	7.6	6.3	6.1	5.6	4.5
All others	8.3	8.2	8.1	8.8	9.3	9.0	8.9	9.2	8.7	8.5
Basic research										
All business R&D <sup>a</sup>	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0	100.0	100.0

Table SRD-3

## Funds spent for business R&amp;D performed in the United States, by type of R&amp;D and selected sources of funds: 2010–19

(Millions of dollars and percent share)

Source of funds	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Paid for by the company	82.2	82.5	84.0	78.3	73.4	74.8	77.7	75.4	77.0	80.4
Paid for by others	17.8	17.5	16.0	21.7	26.6	25.2	22.3	24.6	23.0	19.6
Federal	8.6	5.2	4.8	6.1	9.3	9.4	8.1	7.2	8.7	7.2
All others	9.2	12.4	11.2	15.6	17.3	15.8	14.2	17.4	14.3	12.4
Applied research										
All business R&D <sup>a</sup>	100.0	100.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0
Paid for by the company	79.0	79.6	78.1	74.7	73.0	78.5	80.0	79.1	81.6	80.6
Paid for by others	21.0	20.4	21.9	25.3	27.0	21.5	20.0	20.9	18.4	19.4
Federal	10.5	9.3	8.2	11.8	12.1	10.8	8.5	8.1	7.8	6.6
All others	10.5	11.0	13.8	13.5	14.9	10.7	11.5	12.8	10.6	12.8
Experimental development										
All business R&D <sup>a</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Paid for by the company	79.4	81.4	82.5	83.9	85.7	85.0	86.4	86.6	87.1	88.8
Paid for by others	20.6	18.6	17.5	16.1	14.3	15.0	13.6	13.4	12.9	11.2
Federal	12.9	11.2	10.8	8.8	6.8	6.8	5.7	5.6	4.9	3.8
All others	7.7	7.4	6.7	7.3	7.5	8.2	7.8	7.8	7.9	7.4

i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = North American Industry Classification System.

<sup>a</sup> Includes companies located in the United States that performed or funded R&D. Data in this table represent an aggregate of all industries in the North American Industry Classification System codes 21–33 and 42–81.

**Note(s):**

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Beginning in survey year 2018, statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. For survey years 2010–13, industry classification was based on the 2007 NAICS, whereas for survey years 2014–18, industry classification was based on the 2012 NAICS. The 2010–16 data come from the Business R&D and Innovation Survey and do not include companies with fewer than 5 domestic employees. Data for 2017–18 come from the Business Research and Development Survey and do not include companies with fewer than 10 domestic employees. Data for 2019 come from the Business Enterprise Research and Development Survey and do not include companies with fewer than 10 domestic employees.

**Source(s):**

National Center for Science and Engineering Statistics and U.S. Census Bureau, Business R&D and Innovation Survey (BRDIS), Business Research and Development Survey (BRDS), and Business Enterprise Research and Development Survey (BERD).

Science and Engineering Indicators

Table SRD-4

## Funds spent for business R&amp;D performed in the United States, by type of R&amp;D and select industry: 2010–19

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Millions of dollars										
All business R&D										
All industries, 21–33, 42–81	278,977	294,093	302,250	322,528	340,728	355,821	374,685	400,100	441,036	492,956
Manufacturing industries, 31–33	196,711	201,361	208,415	221,476	232,815	236,132	250,553	257,227	274,075	285,674
Chemicals, 325	58,038	55,324	57,225	61,664	66,301	68,196	73,575	74,977	84,137	97,063
Computer and electronic products, 334	59,875	62,704	65,068	67,205	73,891	72,110	77,385	78,575	83,697	86,729
Transportation equipment, 336	42,913	40,880	42,305	45,972	46,746	49,274	51,275	53,292	52,629	45,375
Nonmanufacturing industries, 21–23, 42–81	82,265	92,731	93,835	101,052	107,913	119,690	124,132	142,874	166,961	207,283
Information, 51	36,852	41,865	46,805	57,207	63,773	65,513	70,748	80,252	94,349	110,227
Professional, scientific, and technical services, 54	33,690	38,219	34,309	31,017	30,975	38,626	37,595	36,922	44,860	53,233
Basic research										
All industries, 21–33, 42–81	16,371	13,020	13,293	19,508	21,936	21,792	24,644	24,829	28,980	32,239
Manufacturing industries, 31–33	10,667	8,738	9,119	15,186	17,822	16,756	18,882	18,624	20,873	22,701
Chemicals, 325	4,670	4,243	3,964	7,308	9,037	8,317	10,117	10,193	11,972	13,869
Computer and electronic products, 334	2,808	1,438	1,556	2,684	2,792	2,338	2,468	2,543	2,445	2,175
Transportation equipment, 336	1,097	955	952	1,823	2,911	3,605	3,112	2,824	3,062	3,486
Nonmanufacturing industries, 21–23, 42–81	5,704	4,282	4,174	4,321	4,114	5,036	5,762	6,205	8,108	9,538
Information, 51	2,101	1,518	1,868	2,178	2,105	1,627	2,028	2,243	3,250	3,816
Professional, scientific, and technical services, 54	2,663	2,030	1,966	1,630	1,572	2,240	2,671	2,491	3,482	4,161
Applied research										
All industries, 21–33, 42–81	44,906	47,186	50,755	51,014	53,415	56,472	61,020	62,132	65,222	74,031
Manufacturing industries, 31–33	33,224	32,576	35,514	35,166	36,585	39,583	42,443	43,698	44,027	45,769
Chemicals, 325	15,006	15,121	16,640	13,894	13,837	16,047	15,771	17,021	18,531	19,120
Computer and electronic products, 334	8,426	7,069	7,120	8,485	8,740	8,973	10,298	11,194	9,947	11,587
Transportation equipment, 336	3,597	3,563	4,295	6,022	7,141	7,165	7,859	7,490	7,440	7,332
Nonmanufacturing industries, 21–23, 42–81	11,682	14,610	15,241	15,848	16,830	16,889	18,576	18,434	21,195	28,262
Information, 51	2,764	3,864	4,033	5,687	6,137	6,511	6,805	7,626	8,979	8,690
Professional, scientific, and technical services, 54	7,162	8,615	8,825	8,181	8,777	8,264	9,900	8,584	9,384	11,731
Experimental development										
All industries, 21–33, 42–81	217,699	233,887	238,202	252,007	265,377	277,558	289,021	313,139	346,834	386,686
Manufacturing industries, 31–33	152,821	160,047	163,781	171,124	178,408	179,793	189,228	194,904	209,175	217,203
Chemicals, 325	38,362	35,961	36,621	40,462	43,427	43,833	47,687	47,763	53,635	64,075
Computer and electronic products, 334	48,640	54,197	56,392	56,036	62,358	60,799	64,619	64,837	71,305	72,967
Transportation equipment, 336	38,219	36,361	37,058	38,126	36,693	38,504	40,305	42,978	42,128	34,557

Table SRD-4

## Funds spent for business R&amp;D performed in the United States, by type of R&amp;D and select industry: 2010–19

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Nonmanufacturing industries, 21–23, 42–81	64,878	73,839	74,421	80,883	86,970	97,765	99,794	118,235	137,658	169,483
Information, 51	31,987	36,483	40,903	49,341	55,530	57,374	61,916	70,383	82,120	97,721
Professional, scientific, and technical services, 54	23,866	27,573	23,517	21,206	20,626	28,122	25,024	25,848	31,994	37,341
Industry share of each type of R&D (%)										
All business R&D										
All industries, 21–33, 42–81	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing industries, 31–33	70.5	68.5	69.0	68.7	68.3	66.4	66.9	64.3	62.1	58.0
Chemicals, 325	20.8	18.8	18.9	19.1	19.5	19.2	19.6	18.7	19.1	19.7
Computer and electronic products, 334	21.5	21.3	21.5	20.8	21.7	20.3	20.7	19.6	19.0	17.6
Transportation equipment, 336	15.4	13.9	14.0	14.3	13.7	13.8	13.7	13.3	11.9	9.2
Nonmanufacturing industries, 21–23, 42–81	29.5	31.5	31.0	31.3	31.7	33.6	33.1	35.7	37.9	42.0
Information, 51	13.2	14.2	15.5	17.7	18.7	18.4	18.9	20.1	21.4	22.4
Professional, scientific, and technical services, 54	12.1	13.0	11.4	9.6	9.1	10.9	10.0	9.2	10.2	10.8
Basic research										
All industries, 21–33, 42–81	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing industries, 31–33	65.2	67.1	68.6	77.8	81.2	76.9	76.6	75.0	72.0	70.4
Chemicals, 325	28.5	32.6	29.8	37.5	41.2	38.2	41.1	41.1	41.3	43.0
Computer and electronic products, 334	17.2	11.0	11.7	13.8	12.7	10.7	10.0	10.2	8.4	6.7
Transportation equipment, 336	6.7	7.3	7.2	9.3	13.3	16.5	12.6	11.4	10.6	10.8
Nonmanufacturing industries, 21–23, 42–81	34.8	32.9	31.4	22.1	18.8	23.1	23.4	25.0	28.0	29.6
Information, 51	12.8	11.7	14.1	11.2	9.6	7.5	8.2	9.0	11.2	11.8
Professional, scientific, and technical services, 54	16.3	15.6	14.8	8.4	7.2	10.3	10.8	10.0	12.0	12.9
Applied research										
All industries, 21–33, 42–81	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing industries, 31–33	74.0	69.0	70.0	68.9	68.5	70.1	69.6	70.3	67.5	61.8
Chemicals, 325	33.4	32.0	32.8	27.2	25.9	28.4	25.8	27.4	28.4	25.8
Computer and electronic products, 334	18.8	15.0	14.0	16.6	16.4	15.9	16.9	18.0	15.3	15.7
Transportation equipment, 336	8.0	7.6	8.5	11.8	13.4	12.7	12.9	12.1	11.4	9.9
Nonmanufacturing industries, 21–23, 42–81	26.0	31.0	30.0	31.1	31.5	29.9	30.4	29.7	32.5	38.2
Information, 51	6.2	8.2	7.9	11.1	11.5	11.5	11.2	12.3	13.8	11.7
Professional, scientific, and technical services, 54	15.9	18.3	17.4	16.0	16.4	14.6	16.2	13.8	14.4	15.8
Experimental development										
All industries, 21–33, 42–81	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing industries, 31–33	70.2	68.4	68.8	67.9	67.2	64.8	65.5	62.2	60.3	56.2
Chemicals, 325	17.6	15.4	15.4	16.1	16.4	15.8	16.5	15.3	15.5	16.6

Table SRD-4

**Funds spent for business R&D performed in the United States, by type of R&D and select industry: 2010–19**

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Computer and electronic products, 334	22.3	23.2	23.7	22.2	23.5	21.9	22.4	20.7	20.6	18.9
Transportation equipment, 336	17.6	15.5	15.6	15.1	13.8	13.9	13.9	13.7	12.1	8.9
Nonmanufacturing industries, 21–23, 42–81	29.8	31.6	31.2	32.1	32.8	35.2	34.5	37.8	39.7	43.8
Information, 51	14.7	15.6	17.2	19.6	20.9	20.7	21.4	22.5	23.7	25.3
Professional, scientific, and technical services, 54	11.0	11.8	9.9	8.4	7.8	10.1	8.7	8.3	9.2	9.7

i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = North American Industry Classification System.

**Note(s):**

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Beginning in survey year 2018, statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. For survey years 2010–13, industry classification was based on the 2007 NAICS, whereas for survey years 2014–18, industry classification was based on the 2012 NAICS. The 2010–16 data come from the Business R&D and Innovation Survey and do not include companies with fewer than 5 domestic employees. Data for 2017–18 come from the Business Research and Development Survey and do not include companies with fewer than 10 domestic employees. Data for 2019 come from the Business Enterprise Research and Development Survey and do not include companies with fewer than 10 domestic employees.

**Source(s):**

National Center for Science and Engineering Statistics and U.S. Census Bureau, Business R&D and Innovation Survey (BRDIS), Business Research and Development Survey (BRDS), and Business Enterprise Research and Development Survey (BERD).

*Science and Engineering Indicators*



Table SRD-5

## Federal obligations for R&amp;D and R&amp;D plant, by type of R&amp;D: FYs 1953–2021

(Millions of current and constant 2012 dollars)

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
Millions of current dollars						
1953	2,167	1,920	116	NA	NA	248
1954	1,918	1,762	116	NA	NA	156
1955	2,252	2,045	130	NA	NA	207
1956	3,267	2,988	206	646	2,136	279
1957	4,389	3,932	262	662	3,007	457
1958	4,906	4,570	335	744	3,491	336
1959	7,123	6,694	466	874	5,353	429
1960	8,080	7,552	590	1,282	5,679	528
1961	9,607	9,059	815	1,663	6,581	548
1962	11,069	10,290	986	2,018	7,285	779
1963	13,663	12,495	1,152	2,356	8,987	1,168
1964	15,324	14,225	1,303	2,571	10,351	1,099
1965	15,746	14,614	1,435	2,812	10,367	1,132
1966	16,179	15,320	1,579	3,081	10,660	858
1967	17,149	16,529	1,846	2,786	11,898	620
1968	16,525	15,921	1,841	2,941	11,140	604
1969	16,310	15,641	1,945	2,700	10,996	669
1970	15,863	15,339	1,926	2,975	10,438	524
1971	16,154	15,543	1,980	3,143	10,419	611
1972	17,098	16,496	2,187	3,361	10,948	602
1973	17,574	16,800	2,232	3,349	11,219	774
1974	18,176	17,410	2,388	3,788	11,235	766
1975	19,860	19,039	2,588	4,141	12,309	821
1976	21,616	20,780	2,767	4,852	13,160	837
1977	24,818	23,450	3,259	5,255	14,936	1,367
1978	27,141	25,845	3,699	5,908	16,238	1,296
1979	29,621	28,145	4,193	6,342	17,610	1,475
1980	31,386	29,830	4,674	6,923	18,233	1,556
1981	34,590	33,104	5,041	7,171	20,891	1,486
1982	37,822	36,433	5,482	7,541	23,410	1,390
1983	40,009	38,712	6,260	7,993	24,458	1,297
1984	44,012	42,225	7,067	7,911	27,246	1,787
1985	50,180	48,360	7,819	8,315	32,226	1,821
1986	52,951	51,412	8,153	8,349	34,910	1,539
1987	57,100	55,254	8,942	8,998	37,313	1,846
1988	58,827	56,769	9,474	9,177	38,119	2,057
1989	63,572	61,406	10,602	10,164	40,641	2,165
1990	65,831	63,559	11,286	10,337	41,937	2,272
1991	64,148	61,295	12,171	11,798	37,327	2,853
1992	68,577	65,593	12,490	12,001	41,102	2,985
1993	70,415	67,314	13,399	13,491	40,424	3,101
1994	69,451	67,235	13,523	13,888	39,824	2,215
1995	70,443	68,187	13,877	14,557	39,752	2,256
1996	69,399	67,653	14,464	13,796	39,393	1,746
1997	71,753	69,827	14,942	14,423	40,461	1,927
1998	73,914	72,101	15,613	15,309	41,178	1,813
1999	77,386	75,341	17,444	16,084	41,813	2,046

Table SRD-5

## Federal obligations for R&amp;D and R&amp;D plant, by type of R&amp;D: FYs 1953–2021

(Millions of current and constant 2012 dollars)

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
2000	80,403	75,910	19,570	18,901	37,440	4,493
2001	88,562	84,493	21,958	22,756	39,779	4,070
2002	98,013	93,709	23,668	24,338	45,702	4,305
2003	107,794	103,528	24,751	26,320	52,456	4,267
2004	116,069	112,074	26,121	27,237	58,717	3,994
2005	122,620	118,848	27,140	26,598	65,110	3,771
2006	123,855	121,730	26,585	26,951	68,194	2,125
2007	129,431	127,263	26,866	27,228	73,169	2,168
2008	129,050	127,106	27,154	26,740	73,212	1,944
2009	144,758	141,090	32,879	30,813	77,398	3,668
2010	146,968	140,355	31,795	31,933	76,627	6,613
2011	139,703	135,533	29,314	28,751	77,468	4,171
2012	140,670	138,525	30,959	31,027	76,538	2,146
2013	127,626	125,720	29,779	29,753	66,188	1,905
2014	132,779	130,561	31,588	31,604	67,370	2,218
2015	131,578	128,753	31,527	32,298	64,928	2,825
2016	118,274	115,833	32,293	34,812	48,728	2,441
2017	121,627	118,975	33,271	36,600	49,103	2,652
2018	133,278	129,425	36,195	38,392	54,837	3,853
2019	146,801	142,424	40,017	41,101	61,306	4,376
2020	173,553	167,403	41,547	43,758	82,098	6,150
2021 preliminary	185,408	179,465	41,231	43,924	94,310	5,943
Millions of constant 2012 dollars						
1953	15,010	13,293	803	NA	NA	1,717
1954	13,128	12,059	796	NA	NA	1,069
1955	15,298	13,890	878	NA	NA	1,408
1956	21,635	19,789	1,367	4,275	14,147	1,846
1957	28,028	25,109	1,675	4,229	19,205	2,920
1958	30,415	28,331	2,074	4,614	21,642	2,085
1959	43,484	40,864	2,845	5,337	32,682	2,620
1960	48,645	45,465	3,554	7,719	34,192	3,180
1961	57,083	53,824	4,840	9,884	39,101	3,258
1962	65,112	60,529	5,802	11,873	42,854	4,583
1963	79,435	72,643	6,696	13,699	52,248	6,792
1964	87,967	81,661	7,480	14,761	59,420	6,306
1965	88,859	82,473	8,101	15,868	58,505	6,386
1966	89,385	84,643	8,725	17,022	58,896	4,742
1967	91,953	88,628	9,897	14,936	63,795	3,325
1968	85,622	82,493	9,537	15,236	57,721	3,129
1969	80,822	77,507	9,637	13,380	54,490	3,315
1970	74,616	72,149	9,059	13,993	49,098	2,467
1971	72,309	69,573	8,864	14,069	46,640	2,736
1972	73,068	70,495	9,346	14,362	46,787	2,573
1973	71,968	68,797	9,140	13,716	45,941	3,171
1974	69,482	66,552	9,127	14,478	42,947	2,929
1975	68,813	65,970	8,969	14,350	42,651	2,844
1976	70,024	67,313	8,965	15,717	42,631	2,710
1977	74,978	70,847	9,845	15,878	45,125	4,131
1978	76,821	73,154	10,469	16,723	45,962	3,667

Table SRD-5

## Federal obligations for R&amp;D and R&amp;D plant, by type of R&amp;D: FYs 1953–2021

(Millions of current and constant 2012 dollars)

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
1979	77,581	73,717	10,981	16,612	46,124	3,864
1980	75,611	71,863	11,260	16,678	43,924	3,748
1981	75,871	72,612	11,058	15,730	45,824	3,259
1982	77,568	74,718	11,242	15,465	48,011	2,850
1983	78,619	76,069	12,301	15,707	48,061	2,550
1984	83,499	80,108	13,408	15,009	51,691	3,391
1985	92,125	88,782	14,354	15,265	59,163	3,343
1986	95,082	92,319	14,640	14,992	62,687	2,763
1987	100,280	97,038	15,705	15,803	65,531	3,242
1988	100,079	96,579	16,117	15,612	64,851	3,500
1989	103,943	100,403	17,335	16,618	66,450	3,540
1990	103,835	100,252	17,801	16,304	66,147	3,583
1991	97,697	93,352	18,536	17,968	56,849	4,345
1992	101,898	97,463	18,558	17,832	61,073	4,435
1993	102,228	97,727	19,453	19,587	58,687	4,502
1994	98,680	95,532	19,215	19,732	56,585	3,148
1995	98,001	94,862	19,306	20,252	55,304	3,139
1996	94,769	92,384	19,752	18,839	53,794	2,384
1997	96,275	93,689	20,048	19,352	54,289	2,585
1998	97,951	95,548	20,690	20,288	54,570	2,403
1999	101,251	98,575	22,823	21,044	54,708	2,677
2000	103,081	97,321	25,090	24,232	48,000	5,760
2001	110,925	105,827	27,503	28,502	49,823	5,097
2002	120,825	115,518	29,177	30,003	56,339	5,307
2003	130,501	125,336	29,965	31,865	63,506	5,165
2004	137,229	132,507	30,883	32,203	69,421	4,722
2005	140,683	136,357	31,139	30,516	74,702	4,327
2006	137,693	135,331	29,555	29,962	75,814	2,362
2007	140,077	137,730	29,076	29,467	79,188	2,347
2008	136,836	134,775	28,792	28,353	77,630	2,061
2009	151,738	147,893	34,465	32,298	81,130	3,845
2010	152,741	145,868	33,044	33,187	79,637	6,873
2011	142,351	138,101	29,869	29,296	78,936	4,250
2012	140,670	138,525	30,959	31,027	76,538	2,146
2013	125,320	123,449	29,241	29,216	64,992	1,871
2014	127,918	125,782	30,432	30,447	64,904	2,136
2015	125,360	122,669	30,037	30,772	61,860	2,692
2016	111,695	109,390	30,496	32,876	46,018	2,305
2017	112,858	110,397	30,873	33,961	45,563	2,461
2018	120,876	117,381	32,827	34,820	49,734	3,494
2019	130,559	126,667	35,590	36,553	54,524	3,892
2020	152,440	147,038	36,492	38,435	72,111	5,402
2021 preliminary	160,138	155,005	35,612	37,938	81,456	5,133

NA = not available; data were not collected at this level of detail.

**Note(s):**

Due to rounding, detail may not add to total. The data for FY 2021 are preliminary and may later be revised. FYs 2009 and 2010 obligations include additional funding provided by the American Recovery and Reinvestment Act of 2009. Beginning with FY 2016, the reported obligations for *development* reflect the Office of Management and Budget's narrowed definition for this category by more narrowly defining it to be "experimental development" (Circular A-11, Section 84). Most notably, the totals for development do not include Department of Defense (DOD) obligations for Budget Activity-7 (Operational Systems Development). Those funds, previously included in DOD's obligation totals for development, support the

efforts to upgrade systems that have been fielded or have received approval for full-rate production and anticipate production funding in the current or subsequent fiscal year. (In FY 2016, DOD obligations for operational systems development amounted to about \$24.6 billion and to about \$26.0 billion in FY 2017.) With this revision, the data for FY 2016 and onward are not directly comparable with the totals reported in previous years. Obligations for FYs 2020 and 2021 include the additional funding provided by supplemental COVID-19 related appropriations in these years (i.e., the Coronavirus Aid, Relief, and Economic Security Act of March 2020, the American Rescue Plan Act of March 2021, and several other enacted spending authorizations in these fiscal years).

**Source(s):**

National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development.

*Science and Engineering Indicators*

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Table SRD-6

## Federal obligations for R&amp;D and R&amp;D plant, by agency, performer, and type of R&amp;D: FY 2020

(Millions of dollars)

Agency	All federal obligations	Federal intramural <sup>a</sup>	Extramural performers							
			Business firms	United States and U.S. territories						Foreign
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State and local governments	
Total R&D and R&D plant										
All agencies	173,552.9	54,577.7	52,105.5	4,340.8	38,891.5	6,223.0	10,824.2	4,469.7	726.7	1,393.7
Department of Agriculture	3,433.5	2,479.6	4.6	0.0	883.7	0.0	51.9	0.0	8.6	5.1
Department of Commerce	1,980.9	1,552.2	50.5	0.0	313.8	4.2	31.0	19.9	5.1	4.4
Department of Defense	67,006.8	22,964.0	35,247.8	442.2	4,524.9	463.1	1,473.9	916.8	8.8	965.3
Department of Education	240.1	10.5	15.1	0.0	158.2	0.0	46.2	0.0	10.2	0.0
Department of Energy	15,778.0	914.5	3,343.6	2,993.2	1,877.1	3,225.7	148.4	3,213.6	61.6	0.3
Department of Health and Human Services	61,774.8	20,832.4	7,762.8	862.1	23,983.4	20.3	7,608.4	48.1	368.3	288.9
Department of Homeland Security	507.5	132.9	241.9	17.3	29.2	4.8	2.7	69.5	0.8	8.5
Department of the Interior	844.4	721.1	23.4	0.0	80.6	0.5	4.2	0.5	12.9	1.1
Department of Justice	96.4	10.9	8.7	0.0	46.3	0.0	24.7	0.0	5.9	0.0
Department of Transportation	1,224.5	227.8	379.3	0.0	275.8	0.3	54.5	70.0	216.5	0.2
Department of Veterans Affairs	1,565.1	1,495.0	0.0	0.0	0.0	0.0	0.0	70.2	0.0	0.0
Agency for International Development	194.3	19.7	22.4	0.0	51.0	0.0	50.1	0.0	0.0	51.1
Environmental Protection Agency	493.0	244.4	195.3	0.1	51.6	1.1	0.0	0.3	0.0	0.0
National Aeronautics and Space Administration	10,573.6	2,552.1	4,213.9	10.2	1,107.7	2,237.6	384.2	35.0	3.5	29.4
National Science Foundation	6,792.5	20.4	506.9	0.0	5,493.4	262.4	469.8	4.7	15.4	19.5
Patient-Centered Outcomes Research Trust Fund	469.7	0.0	0.0	0.0	0.0	0.0	469.7	0.0	0.0	0.0
Smithsonian Institution	276.0	276.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social Security Administration	69.7	37.2	20.1	0.0	9.5	0.0	2.9	0.0	0.0	0.1
All other agencies	232.0	87.0	69.1	15.7	5.5	3.0	1.7	21.0	9.2	19.9
R&D										
All agencies	167,402.8	51,471.7	51,428.0	4,118.7	38,540.9	5,355.2	10,698.9	3,676.0	720.1	1,393.3
Department of Agriculture	2,643.6	1,689.8	4.6	0.0	883.7	0.0	51.9	0.0	8.6	5.1
Department of Commerce	1,621.7	1,193.0	50.5	0.0	313.8	4.2	31.0	19.9	5.1	4.4
Department of Defense	66,695.0	22,666.6	35,233.5	442.2	4,524.9	463.1	1,473.9	916.8	8.8	965.3

Table SRD-6

## Federal obligations for R&amp;D and R&amp;D plant, by agency, performer, and type of R&amp;D: FY 2020

(Millions of dollars)

Agency	All federal obligations	Federal intramural <sup>a</sup>	Extramural performers							
			Business firms	United States and U.S. territories						Foreign
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State and local governments	
Department of Education	240.1	10.5	15.1	0.0	158.2	0.0	46.2	0.0	10.2	0.0
Department of Energy	13,453.0	871.8	2,973.7	2,771.1	1,837.1	2,375.1	148.4	2,419.9	55.6	0.3
Department of Health and Human Services	60,005.7	19,300.3	7,580.9	862.1	23,928.3	20.3	7,608.4	48.1	368.3	288.9
Department of Homeland Security	507.5	132.9	241.9	17.3	29.2	4.8	2.7	69.5	0.8	8.5
Department of the Interior	837.2	719.6	17.8	0.0	80.6	0.5	4.2	0.5	12.8	1.1
Department of Justice	96.4	10.9	8.7	0.0	46.3	0.0	24.7	0.0	5.9	0.0
Department of Transportation	1,184.2	222.0	344.8	0.0	275.8	0.3	54.5	70.0	216.5	0.2
Department of Veterans Affairs	1,565.1	1,495.0	0.0	0.0	0.0	0.0	0.0	70.2	0.0	0.0
Agency for International Development	194.3	19.7	22.4	0.0	51.0	0.0	50.1	0.0	0.0	51.1
Environmental Protection Agency	488.5	244.4	190.9	0.1	51.6	1.1	0.0	0.3	0.0	0.0
National Aeronautics and Space Administration	10,537.8	2,551.9	4,195.5	10.2	1,107.7	2,220.4	384.2	35.0	3.5	29.4
National Science Foundation	6,351.2	9.4	458.4	0.0	5,237.9	262.4	344.5	4.7	14.8	19.1
Patient-Centered Outcomes Research Trust Fund	469.7	0.0	0.0	0.0	0.0	0.0	469.7	0.0	0.0	0.0
Smithsonian Institution	209.8	209.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social Security Administration	69.7	37.2	20.1	0.0	9.5	0.0	2.9	0.0	0.0	0.1
All other agencies	232.0	87.0	69.1	15.7	5.5	3.0	1.7	21.0	9.2	19.9
Basic research										
All agencies	41,546.6	7,688.1	3,146.8	799.9	20,128.2	3,455.5	4,325.6	1,667.7	114.3	220.6
Department of Agriculture	1,163.8	725.7	0.1	0.0	414.0	0.0	19.0	0.0	2.6	2.4
Department of Commerce	251.2	237.2	5.2	0.0	7.0	0.0	1.4	0.0	0.0	0.3
Department of Defense	2,499.1	401.9	364.5	17.8	1,490.8	19.8	102.1	35.6	0.1	66.4
Department of Education	53.7	2.8	0.2	0.0	41.3	0.0	7.9	0.0	1.6	0.0
Department of Energy	5,501.6	207.3	325.6	334.9	865.1	2,120.1	29.7	1,589.3	29.5	0.2
Department of Health and Human Services	21,809.0	4,514.8	1,084.5	439.7	11,841.6	10.4	3,707.3	18.3	64.2	128.3
Department of Homeland Security	47.4	5.6	24.3	0.3	17.1	0.0	0.0	0.1	0.0	0.0

Table SRD-6

## Federal obligations for R&amp;D and R&amp;D plant, by agency, performer, and type of R&amp;D: FY 2020

(Millions of dollars)

Agency	All federal obligations	Federal intramural <sup>a</sup>	Extramural performers							
			Business firms	United States and U.S. territories						Foreign
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State and local governments	
Department of the Interior	83.9	75.6	0.2	0.0	6.7	0.0	0.2	0.0	1.2	0.0
Department of Justice	0.7	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Department of Transportation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Department of Veterans Affairs	617.7	617.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agency for International Development	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental Protection Agency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
National Aeronautics and Space Administration	3,839.4	680.3	1,078.8	7.2	820.1	1,042.8	185.3	17.9	2.6	4.3
National Science Foundation	5,461.9	8.3	259.9	0.0	4,622.6	262.4	272.6	4.7	12.6	18.7
Patient-Centered Outcomes Research Trust Fund	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smithsonian Institution	209.8	209.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social Security Administration	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other agencies	7.4	1.1	3.5	0.0	1.0	0.0	0.0	1.8	0.0	0.0
Applied research										
All agencies	43,758.1	11,884.2	6,881.6	2,712.6	15,345.5	407.8	4,865.0	848.7	530.4	282.3
Department of Agriculture	1,224.6	733.0	4.5	0.0	447.6	0.0	31.2	0.0	6.0	2.2
Department of Commerce	1,109.6	784.7	40.3	0.0	251.1	0.0	6.1	19.6	3.7	4.1
Department of Defense	6,416.2	2,053.0	2,813.1	67.0	936.3	62.0	310.0	130.2	1.3	43.2
Department of Education	135.8	5.6	3.9	0.0	84.1	0.0	34.6	0.0	7.6	0.0
Department of Energy	5,023.6	604.7	805.5	2,193.1	624.5	167.1	87.9	525.1	15.6	0.1
Department of Health and Human Services	22,424.8	4,819.6	1,221.9	422.4	11,761.8	9.9	3,714.1	18.0	296.4	160.6
Department of Homeland Security	177.9	59.7	41.5	11.1	1.3	4.8	0.7	56.9	0.0	1.9
Department of the Interior	614.5	528.6	14.4	0.0	57.5	0.1	3.0	0.5	9.6	0.7
Department of Justice	83.8	7.7	8.7	0.0	42.5	0.0	24.1	0.0	0.7	0.0
Department of Transportation	900.2	174.8	232.9	0.0	260.9	0.3	52.1	1.7	177.2	0.2
Department of Veterans Affairs	918.1	847.9	0.0	0.0	0.0	0.0	0.0	70.2	0.0	0.0

Table SRD-6

## Federal obligations for R&amp;D and R&amp;D plant, by agency, performer, and type of R&amp;D: FY 2020

(Millions of dollars)

Agency	All federal obligations	Federal intramural <sup>a</sup>	Extramural performers							Foreign
			Business firms	United States and U.S. territories						
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State and local governments	
Agency for International Development	134.8	16.7	12.3	0.0	37.2	0.0	32.5	0.0	0.0	36.1
Environmental Protection Agency	411.9	203.9	154.9	0.1	51.6	1.1	0.0	0.3	0.0	0.0
National Aeronautics and Space Administration	2,554.8	931.7	1,256.4	3.0	160.7	159.4	22.7	7.1	0.9	12.8
National Science Foundation	889.2	1.1	198.5	0.0	615.3	0.0	71.9	0.0	2.1	0.4
Patient-Centered Outcomes Research Trust Fund	469.7	0.0	0.0	0.0	0.0	0.0	469.7	0.0	0.0	0.0
Smithsonian Institution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social Security Administration	69.7	37.2	20.1	0.0	9.5	0.0	2.9	0.0	0.0	0.1
All other agencies	199.0	74.3	52.6	15.7	3.5	3.0	1.7	19.2	9.2	19.9
Development										
All agencies	82,098.0	31,899.4	41,399.5	606.2	3,067.3	1,492.0	1,508.2	1,159.5	75.4	890.5
Department of Agriculture	255.2	231.1	0.0	0.0	22.0	0.0	1.6	0.0	0.0	0.4
Department of Commerce	260.9	171.1	5.0	0.0	55.6	4.1	23.5	0.3	1.3	0.0
Department of Defense	57,779.7	20,211.7	32,055.8	357.3	2,097.8	381.2	1,061.8	751.0	7.3	855.8
Department of Education	50.7	2.1	11.1	0.0	32.8	0.0	3.6	0.0	1.0	0.0
Department of Energy	2,927.9	59.8	1,842.6	243.1	347.4	88.0	30.7	305.5	10.6	0.1
Department of Health and Human Services	15,772.0	9,966.0	5,274.5	0.0	324.9	0.0	187.1	11.9	7.8	0.0
Department of Homeland Security	282.2	67.6	176.1	5.8	10.8	0.0	2.0	12.6	0.8	6.6
Department of the Interior	138.9	115.4	3.2	0.0	16.4	0.4	1.0	0.0	2.1	0.4
Department of Justice	11.9	3.2	0.0	0.0	3.0	0.0	0.6	0.0	5.1	0.0
Department of Transportation	284.0	47.2	111.8	0.0	14.9	0.0	2.4	68.3	39.3	0.0
Department of Veterans Affairs	29.3	29.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agency for International Development	59.4	3.0	10.1	0.0	13.8	0.0	17.6	0.0	0.0	15.0
Environmental Protection Agency	76.6	40.6	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
National Aeronautics and Space Administration	4,143.7	939.9	1,860.4	0.0	126.9	1,018.2	176.2	10.0	0.0	12.2





FFRDC = federally funded research and development center.

<sup>a</sup> Includes costs associated with administration of intramural and extramural programs by federal personnel and actual intramural performance.

**Note(s):**

Detail may not add to total because of rounding. Agencies (in general) with an annual total of R&D and R&D plant of \$100 million or more. All other agencies includes the Department of Housing and Urban Development, Department of Labor, Department of State, Department of the Treasury, Administrative Office of the U.S. Courts, Appalachian Regional Commission, Consumer Product Safety Commission, Federal Communications Commission, Federal Trade Commission, Library of Congress, National Archives and Records Commission, Nuclear Regulatory Commission, Tennessee Valley Authority, RESTORE Act Centers, U.S. Agency for Global Media, and U.S. Postal Service.

**Source(s):**

National Center for Science and Engineering Statistics, Federal Funds for Research and Development, Volume 70, FYs 2020–21.

*Science and Engineering Indicators*

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Table SRD-7

## Federal obligations for research, by agency and S&amp;E field: FY 2020

(Millions of dollars and percent share)

Agency	All federal obligations	Computer sciences and mathematics	Environmental sciences	Life sciences	Physical sciences	Psychology	Social sciences	Other sciences nec	Engineering
Patient-Centered Outcomes Research Trust Fund	470	0	0	470	0	0	0	0	0
RESTORE Act Centers of Excellence Research Grants Program	9	0	9	0	0	0	0	0	0
Smithsonian Institution	210	0	22	82	2	0	0	104	0
Social Security Administration	70	0	0	0	0	0	70	0	0
Tennessee Valley Authority	6	0	0	0	0	0	0	0	6
U.S. Agency for Global Media	5	0	0	0	0	0	5	0	0
U.S. Postal Service	18	0	0	0	0	0	0	0	18
Share by field (%)									
All agencies	100.0	6.9	5.9	49.9	9.9	3.8	1.3	6.8	15.5
Departments									
Department of Agriculture	100.0	0.3	0.7	83.4	4.2	0.0	6.4	0.0	4.9
Department of Commerce	100.0	12.6	35.6	6.6	19.3	0.0	3.4	3.0	19.4
Department of Defense	100.0	29.1	4.3	12.2	7.7	1.1	1.5	12.4	31.7
Department of Education	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Department of Energy	100.0	14.6	4.1	4.8	42.5	0.0	0.0	3.6	30.2
Department of Health and Human Services	100.0	0.8	1.2	80.4	0.2	6.7	0.6	4.3	5.7
Department of Homeland Security	100.0	6.0	3.5	31.6	12.3	0.0	0.0	12.1	34.5
Department of the Interior	100.0	0.4	65.9	30.5	0.1	0.0	1.2	0.1	1.7
Department of Justice	100.0	6.5	1.0	14.1	7.6	1.9	60.8	5.9	2.1
Department of Labor	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Department of State	100.0	0.0	0.0	93.3	0.0	0.0	6.7	0.0	0.0
Department of Transportation	100.0	4.1	3.9	0.9	0.3	2.0	0.2	8.1	80.6
Department of the Treasury	100.0	0.0	0.0	0.0	99.6	0.0	0.0	0.0	0.4
Department of Veterans Affairs	100.0	0.0	0.0	80.1	0.0	10.9	0.0	4.6	4.4
Other agencies									
Administrative Office of the U.S. Courts	100.0	100	0	0	0	0	0	0	0
Agency for International Development	100.0	0.0	0.0	92.9	0.0	0.0	7.1	0.0	0.0
Appalachian Regional Commission	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Consumer Product Safety Commission	100.0	0.0	95.0	0.0	5.0	0.0	0.0	0.0	0.0
Environmental Protection Agency	100.0	2.1	41.2	39.5	2.4	0.0	0.6	0.0	14.2

Table SRD-7

## Federal obligations for research, by agency and S&amp;E field: FY 2020

(Millions of dollars and percent share)

Agency	All federal obligations	Computer sciences and mathematics	Environmental sciences	Life sciences	Physical sciences	Psychology	Social sciences	Other sciences nec	Engineering
Federal Communications Commission	100.0	16.7	0.0	0.0	25.0	0.0	0.0	0.0	58.3
Federal Trade Commission	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Library of Congress	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
National Aeronautics and Space Administration	100.0	0.0	23.7	2.0	25.9	0.0	0.0	15.9	32.6
National Science Foundation	100.0	18.6	15.0	11.8	16.2	0.6	3.3	16.1	18.4
Nuclear Regulatory Commission	100.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	98.8
Patient-Centered Outcomes Research Trust Fund	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
RESTORE Act Centers of Excellence Research Grants Program	100.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Smithsonian Institution	100.0	0.0	10.4	39.1	0.8	0.0	0.0	49.7	0.0
Social Security Administration	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Tennessee Valley Authority	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
U.S. Agency for Global Media	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
U.S. Postal Service	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0

\* = amount greater than \$0 but less than \$50.

nec = not elsewhere classified.

**Note(s):**

Research includes basic research and applied research. Because of rounding, detail may not add to total. Only those agencies and subdivisions that had obligations in variables represented by this table appear in the table.

**Source(s):**

National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, Volume 70, FYs 2020–21.

Science and Engineering Indicators

Table	Title
SRD-1	Gross expenditures on R&D and expenditures for R&D as a share of gross domestic product, for selected countries or regions: 1981–2019
SRD-2	Business R&D performed in the United States, by industry: 2010–19
SRD-3	Funds spent for business R&D performed in the United States, by type of R&D and selected sources of funds: 2010–19
SRD-4	Funds spent for business R&D performed in the United States, by type of R&D and select industry: 2010–19
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SRD-6	Federal obligations for R&D and R&D plant, by agency, performer, and type of R&D: FY 2020
SRD-7	Federal obligations for research, by agency and S&E field: FY 2020
SRD-8	Federal obligations for research, by detailed S&E field: Selected years, FYs 1990–2020

Table SRD-1

**Gross expenditures on R&D and expenditures for R&D as a share of gross domestic product, for selected countries or regions: 1981–2019**

(Billions of current and 2012 constant U.S. PPP dollars, GERD-to-GDP ratio, and annual growth rates)

Year	United States	EU-27 <sup>a</sup>	France	Germany	United Kingdom	China	Japan	South Korea	India
GERD (billions of U.S. PPP dollars)									
1981	72.7	na	11.0	18.8	11.8	NA	24.0	NA	NA
1982	81.2	na	12.5	20.5	NA	NA	27.4	NA	NA
1983	90.4	na	13.4	21.5	12.7	NA	31.1	NA	NA
1984	102.9	na	14.7	23.1	NA	NA	35.0	NA	NA
1985	115.2	na	15.9	25.9	14.7	NA	40.4	NA	NA
1986	120.6	na	16.5	27.5	15.5	NA	42.0	NA	NA
1987	126.7	na	17.7	29.7	16.1	NA	46.1	NA	NA
1988	134.2	na	19.1	31.9	17.1	NA	51.4	NA	NA
1989	142.2	na	21.1	34.2	18.2	NA	58.4	NA	NA
1990	152.4	na	23.3	35.9	18.9	NA	65.4	NA	NA
1991	161.4	108.0	24.4	40.0	18.6	9.1	69.2	7.0	NA
1992	165.8	110.3	25.4	39.7	18.8	10.7	70.0	8.0	NA
1993	166.1	111.5	26.3	39.1	20.0	11.9	69.8	9.5	NA
1994	169.6	113.7	26.9	39.4	20.9	12.5	70.5	11.5	NA
1995	184.1	118.1	27.7	41.0	19.6	12.8	76.6	13.1	NA
1996	197.8	123.1	28.3	42.2	20.1	14.1	83.0	14.8	10.6
1997	212.5	129.6	28.6	44.1	20.7	17.8	87.8	16.2	12.1
1998	226.2	136.6	29.4	46.1	21.4	19.7	91.1	14.6	13.3
1999	245.0	146.6	31.0	50.7	23.3	24.9	92.8	15.8	15.1
2000	268.6	158.9	33.3	53.9	25.2	32.9	98.9	18.5	16.8
2001	279.1	169.3	36.1	56.2	26.3	38.4	103.8	21.3	17.5
2002	278.4	178.1	38.3	58.6	27.9	47.9	108.2	22.5	18.1
2003	292.2	181.8	37.1	61.0	28.6	56.8	112.4	24.1	19.8
2004	303.8	188.6	38.1	62.9	29.4	69.7	117.5	27.9	23.1
2005	326.2	196.3	39.5	64.0	30.6	86.2	128.7	30.6	27.9
2006	351.7	216.3	42.3	69.5	33.3	104.7	138.7	35.4	30.4
2007	378.5	231.5	44.2	73.4	35.2	123.3	147.5	40.6	33.6
2008	405.4	254.2	46.6	81.2	36.5	145.1	148.7	43.9	37.6
2009	404.2	260.8	49.7	82.8	36.5	184.1	137.4	45.8	39.7
2010	408.5	270.4	50.9	87.0	37.6	212.1	140.6	52.2	41.2
2011	427.1	289.7	53.6	95.8	38.8	246.5	148.4	58.4	42.4
2012	434.4	302.4	55.1	100.5	38.5	289.2	152.3	64.9	45.8
2013	455.1	315.6	58.4	102.9	41.5	323.4	164.7	68.2	45.8
2014	477.0	329.1	60.6	109.6	43.8	346.3	169.6	73.1	47.6

Table SRD-1

**Gross expenditures on R&D and expenditures for R&D as a share of gross domestic product, for selected countries or regions: 1981–2019**

(Billions of current and 2012 constant U.S. PPP dollars, GERD-to-GDP ratio, and annual growth rates)

Year	United States	EU-27 <sup>a</sup>	France	Germany	United Kingdom	China	Japan	South Korea	India
2015	495.9	341.6	61.6	114.1	45.7	366.1	168.5	76.9	49.6
2016	522.6	360.1	63.7	122.5	48.1	393.0	160.3	80.8	51.8
2017	555.1	386.7	65.7	133.7	50.8	420.8	166.6	90.3	55.1
2018	606.2	413.7	68.6	142.1	54.2	465.5	172.8	99.0	58.7
2019	668.4	440.3	73.3	148.1	56.9	525.7	173.3	102.5	NA
GERD (billions of 2012 constant U.S. PPP dollars)									
1981	157.3	na	23.8	40.6	25.4	NA	52.0	NA	NA
1982	165.3	na	25.4	41.7	NA	NA	55.9	NA	NA
1983	177.2	na	26.3	42.1	24.9	NA	60.9	NA	NA
1984	194.6	na	27.9	43.7	NA	NA	66.2	NA	NA
1985	211.3	na	29.1	47.6	26.9	NA	74.1	NA	NA
1986	216.7	na	29.6	49.5	27.9	NA	75.5	NA	NA
1987	222.2	na	31.0	52.1	28.3	NA	80.9	NA	NA
1988	227.4	na	32.3	54.0	29.0	NA	87.1	NA	NA
1989	231.9	na	34.4	55.7	29.7	NA	95.1	NA	NA
1990	239.5	na	36.6	56.4	29.8	NA	102.8	NA	NA
1991	245.4	164.2	37.1	60.8	28.3	13.9	105.1	10.7	NA
1992	246.5	163.9	37.8	59.0	27.9	15.9	104.0	11.9	NA
1993	241.2	161.8	38.1	56.7	29.0	17.3	101.3	13.8	NA
1994	241.1	161.6	38.2	56.0	29.7	17.7	100.2	16.4	NA
1995	256.3	164.4	38.5	57.1	27.3	17.8	106.6	18.3	NA
1996	270.5	168.3	38.7	57.7	27.4	19.3	113.5	20.3	14.5
1997	285.6	174.2	38.5	59.3	27.8	24.0	118.0	21.8	16.2
1998	300.8	181.7	39.2	61.3	28.5	26.2	121.1	19.4	17.7
1999	321.2	192.2	40.6	66.4	30.6	32.7	121.6	20.7	19.8
2000	344.2	203.6	42.7	69.1	32.2	42.2	126.8	23.7	21.5
2001	349.6	212.1	45.2	70.4	33.0	48.1	130.1	26.7	21.9
2002	343.7	219.9	47.3	72.4	34.4	59.1	133.5	27.8	22.4
2003	353.6	219.9	44.9	73.8	34.6	68.8	136.0	29.1	23.9
2004	358.1	222.3	45.0	74.2	34.7	82.1	138.4	32.9	27.2
2005	372.9	224.3	45.2	73.2	35.0	98.5	147.1	35.0	31.9
2006	389.8	239.8	46.9	77.0	36.9	116.1	153.8	39.2	33.7
2007	408.5	249.9	47.7	79.2	38.0	133.1	159.2	43.8	36.2
2008	429.5	269.3	49.3	86.0	38.7	153.7	157.5	46.5	39.9
2009	425.4	274.5	52.3	87.1	38.4	193.8	144.6	48.2	41.8



Table SRD-1

**Gross expenditures on R&D and expenditures for R&D as a share of gross domestic product, for selected countries or regions: 1981–2019**

(Billions of current and 2012 constant U.S. PPP dollars, GERD-to-GDP ratio, and annual growth rates)

Year	United States	EU-27 <sup>a</sup>	France	Germany	United Kingdom	China	Japan	South Korea	India	
2010	424.8	281.2	52.9	90.5	39.1	220.6	146.2	54.2	42.9	
2011	435.1	295.1	54.6	97.6	39.5	251.1	151.2	59.5	43.2	
2012	434.4	302.4	55.1	100.5	38.5	289.2	152.3	64.9	45.8	
2013	447.2	310.1	57.3	101.1	40.8	317.7	161.8	67.0	45.0	
2014	460.2	317.5	58.4	105.7	42.3	334.0	163.6	70.5	45.9	
2015	473.8	326.4	58.9	109.0	43.6	349.8	161.0	73.5	47.4	
2016	494.5	340.7	60.2	115.9	45.5	371.8	151.6	76.5	49.0	
2017	515.2	358.9	61.0	124.1	47.2	390.6	154.6	83.8	51.2	
2018	549.5	374.9	62.2	128.8	49.2	421.9	156.6	89.8	53.2	
2019	595.3	392.2	65.3	131.9	50.7	468.2	154.3	91.3	NA	
	GERD-to-GDP ratio (%)									
1981	2.27	na	1.87	2.35	2.24	NA	2.05	NA	NA	
1982	2.43	na	1.95	2.42	NA	NA	2.13	NA	NA	
1983	2.49	na	1.98	2.41	2.06	NA	2.24	NA	NA	
1984	2.55	na	2.07	2.43	NA	NA	2.33	NA	NA	
1985	2.66	na	2.13	2.59	2.09	NA	2.48	NA	NA	
1986	2.63	na	2.12	2.63	2.10	NA	2.44	NA	NA	
1987	2.61	na	2.16	2.73	2.02	NA	2.50	NA	NA	
1988	2.56	na	2.15	2.73	1.96	NA	2.52	NA	NA	
1989	2.52	na	2.19	2.71	1.95	NA	2.63	NA	NA	
1990	2.56	na	2.27	2.61	1.95	NA	2.71	NA	NA	
1991	2.62	1.65	2.28	2.39	1.87	0.72	2.68	1.71	NA	
1992	2.54	1.63	2.28	2.27	1.84	0.73	2.63	1.80	NA	
1993	2.42	1.62	2.32	2.21	1.86	0.70	2.57	1.95	NA	
1994	2.33	1.57	2.27	2.13	1.84	0.63	2.47	2.12	NA	
1995	2.41	1.56	2.24	2.14	1.65	0.57	2.56	2.16	NA	
1996	2.45	1.57	2.22	2.14	1.58	0.56	2.64	2.22	0.64	
1997	2.48	1.59	2.15	2.19	1.54	0.64	2.72	2.25	0.69	
1998	2.50	1.60	2.09	2.22	1.55	0.65	2.83	2.11	0.70	
1999	2.54	1.65	2.11	2.35	1.63	0.75	2.85	2.02	0.72	
2000	2.62	1.68	2.09	2.41	1.62	0.89	2.86	2.13	0.76	
2001	2.64	1.70	2.14	2.40	1.61	0.94	2.92	2.28	0.74	
2002	2.55	1.71	2.17	2.44	1.62	1.06	2.97	2.21	0.73	
2003	2.55	1.70	2.12	2.47	1.58	1.12	2.99	2.28	0.72	
2004	2.49	1.68	2.09	2.44	1.54	1.21	2.98	2.44	0.76	

Table SRD-1

**Gross expenditures on R&D and expenditures for R&D as a share of gross domestic product, for selected countries or regions: 1981–2019**

(Billions of current and 2012 constant U.S. PPP dollars, GERD-to-GDP ratio, and annual growth rates)

Year	United States	EU-27 <sup>a</sup>	France	Germany	United Kingdom	China	Japan	South Korea	India
2005	2.50	1.68	2.05	2.44	1.56	1.31	3.13	2.52	0.82
2006	2.55	1.70	2.05	2.47	1.58	1.37	3.23	2.72	0.80
2007	2.62	1.70	2.02	2.46	1.62	1.37	3.29	2.87	0.81
2008	2.74	1.78	2.06	2.62	1.61	1.45	3.29	2.99	0.86
2009	2.79	1.86	2.21	2.74	1.67	1.66	3.20	3.15	0.83
2010	2.71	1.86	2.18	2.73	1.64	1.71	3.10	3.32	0.79
2011	2.74	1.91	2.19	2.81	1.65	1.78	3.21	3.59	0.76
2012	2.67	1.96	2.23	2.88	1.58	1.91	3.17	3.85	0.74
2013	2.70	1.98	2.24	2.84	1.62	2.00	3.28	3.95	0.71
2014	2.72	2.00	2.28	2.88	1.64	2.02	3.37	4.08	0.70
2015	2.72	2.01	2.27	2.93	1.65	2.06	3.24	3.98	0.69
2016	2.80	1.99	2.22	2.94	1.66	2.10	3.11	3.99	0.67
2017	2.85	2.03	2.20	3.05	1.68	2.12	3.17	4.29	0.67
2018	2.95	2.07	2.19	3.12	1.73	2.14	3.22	4.52	0.65
2019	3.13	2.12	2.20	3.19	1.76	2.23	3.20	4.64	NA
GERD, annual growth rates, recent years, current and constant dollars (%)									
Current PPP\$									
CAGR 2000–10	4.3	5.5	4.3	4.9	4.1	20.5	3.6	10.9	9.4
CAGR 2010–19	5.6	5.6	4.1	6.1	4.7	10.6	2.4	7.8	4.5
Constant 2012 PPP\$									
CAGR 2000–10	2.1	3.3	2.2	2.7	1.9	18.0	1.4	8.6	7.2
CAGR 2010–19	3.8	3.8	2.4	4.3	2.9	8.7	0.6	6.0	2.7
GDP, annual growth rates, recent years, current and constant dollars (%)									
Current PPP\$									
CAGR 2000–10	3.9	4.4	3.9	3.6	3.9	12.9	2.7	6.1	9.0
CAGR 2010–19	4.1	4.1	4.0	4.3	3.9	7.4	2.0	3.8	7.1
Constant 2012 PPP\$									
CAGR 2000–10	1.7	2.2	1.8	2.2	1.8	10.5	0.6	3.9	6.7
CAGR 2010–19	2.3	2.3	2.3	1.7	2.2	5.6	0.3	2.1	5.3

na = not applicable; NA = not available.

CAGR = compound average annual growth rate; EU = European Union; GDP = gross domestic product; GERD = gross domestic expenditure on R&amp;D; PPP = purchasing power parity.

<sup>a</sup> Data for the EU include the 27 EU member countries.

**Note(s):**

Table data include the top eight R&D-performing countries in 2019. R&D expenditures in constant U.S. PPP dollars are computed using the U.S. GDP implicit price deflator. Data for the United States in this table reflect international standards for calculating GERD, which vary slightly from the National Science Foundation's protocol for tallying U.S. total R&D. Data for Japan for 1996 onward may not be consistent with earlier data because of changes in methodology. Data for Germany for 1981–90 are for West Germany.

**Source(s):**

National Center for Science and Engineering Statistics, *National Patterns of R&D Resources* (2019–20 edition); Organisation for Economic Co-operation and Development, *Main Science and Technology Indicators* (September 2021 edition); United Nations Educational, Scientific and Cultural Organization, Institute for Statistics, Science Technology and Innovation data set (March 2021 release).

*Science and Engineering Indicators*

Table SRD-2

## Business R&amp;D performed in the United States, by industry: 2010–19

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Millions of dollars										
All industries, 21–33, 42–81	278,977	294,093	302,250	322,528	340,728	355,821	374,685	400,100	441,036	492,956
Manufacturing industries, 31–33	196,712	201,361	208,415	221,476	232,815	236,132	250,553	257,227	274,075	285,674
Chemicals, 325	58,038	55,324	57,225	61,664	66,301	68,196	73,575	74,977	84,137	97,063
Pharmaceuticals and medicines, 3254	49,415	45,949	48,146	52,426	56,612	58,675	64,628	66,202	74,592	87,619
Other 325	8,623	9,375	9,079	9,238	9,689	9,521	8,947	8,775	9,545	9,444
Machinery, 333	9,955	14,709	14,254	12,650	12,128	13,426	12,585	13,197	14,799	15,184
Computer and electronic products, 334	59,875	62,704	65,068	67,205	73,891	72,110	77,385	78,575	83,697	86,729
Electrical equipment, appliance, and components, 335	3,321	3,595	3,087	4,136	4,365	4,335	4,771	4,291	4,487	5,263
Transportation equipment, 336	42,913	40,880	42,305	45,972	46,746	49,274	51,275	53,292	52,629	45,375
Motor vehicles, bodies, trailers, and parts, 3361–63	D	D	D	16,729	18,404	19,078	22,042	23,881	25,586	24,117
Aerospace products and parts, 3364	29,854	26,054	24,817	27,114	26,181	27,464	26,645	26,383	24,291	18,358
Other 336	D	D	D	2,129	2,161	2,732	2,588	3,028	2,752	2,900
Manufacturing nec, other 31–33	22,610	24,149	26,476	29,849	29,384	28,791	30,962	32,895	34,326	36,060
Nonmanufacturing industries, 21–23, 42–81	82,265	92,731	93,835	101,052	107,913	119,690	124,132	142,874	166,961	207,283
Information, 51	36,853	41,865	46,805	57,207	63,773	65,513	70,748	80,252	94,349	110,227
Software publishers, 5112	26,982	27,965	28,745	35,333	36,052	33,248	33,495	34,264	32,639	32,958
Other 51	9,871	13,900	18,060	21,874	27,721	32,265	37,253	45,988	61,710	77,269
Finance and insurance, 52	2,109	3,457	3,519	4,308	4,122	5,366	7,331	7,616	7,471	8,917
Professional, scientific, and technical services, 54	33,690	38,219	34,309	31,017	30,975	38,626	37,595	36,922	44,860	53,233
Computer systems design and related services, 5415	11,050	13,259	11,251	9,268	11,019	14,333	15,747	13,327	15,923	21,046
Scientific research and development services, 5417	12,140	15,301	16,544	14,201	12,807	16,329	14,842	17,321	20,185	21,669
Other 54	10,500	9,659	6,514	7,548	7,149	7,964	7,006	6,274	8,752	10,518
Nonmanufacturing nec, other 21–23, 42–81	9,613	9,190	9,202	8,520	9,043	10,185	8,458	18,084	20,281	34,906
Percent change from preceding period										
All industries, 21–33, 42–81		5.4	2.8	6.7	5.6	4.4	5.3	6.8	10.2	11.8
Manufacturing industries, 31–33		2.4	3.5	6.3	5.1	1.4	6.1	2.7	6.5	4.2
Chemicals, 325		-4.7	3.4	7.8	7.5	2.9	7.9	1.9	12.2	15.4
Pharmaceuticals and medicines, 3254		-7.0	4.8	8.9	8.0	3.6	10.1	2.4	12.7	17.5
Other 325		8.7	-3.2	1.8	4.9	-1.7	-6.0	-1.9	8.8	-1.1
Machinery, 333		47.8	-3.1	-11.3	-4.1	10.7	-6.3	4.9	12.1	2.6
Computer and electronic products, 334		4.7	3.8	3.3	9.9	-2.4	7.3	1.5	6.5	3.6
Electrical equipment, appliance, and components, 335		8.3	-14.1	34.0	5.5	-0.7	10.1	-10.1	4.6	17.3
Transportation equipment, 336		-4.7	3.5	8.7	1.7	5.4	4.1	3.9	-1.2	-13.8
Motor vehicles, bodies, trailers, and parts, 3361–63		D	D	D	10.0	3.7	15.5	8.3	7.1	-5.7

Table SRD-2

## Business R&amp;D performed in the United States, by industry: 2010–19

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Aerospace products and parts, 3364		-12.7	-4.7	9.3	-3.4	4.9	-3.0	-1.0	-7.9	-24.4
Other 336		D	D	D	1.5	26.4	-5.3	17.0	-9.1	5.4
Manufacturing nec, other 31–33		6.8	9.6	12.7	-1.6	-2.0	7.5	6.2	4.4	5.1
Nonmanufacturing industries, 21–23, 42–81		12.7	1.2	7.7	6.8	10.9	3.7	15.1	16.9	24.2
Information, 51		13.6	11.8	22.2	11.5	2.7	8.0	13.4	17.6	16.8
Software publishers, 5112		3.6	2.8	22.9	2.0	-7.8	0.7	2.3	-4.7	1.0
Other 51		40.8	29.9	21.1	26.7	16.4	15.5	23.4	34.2	25.2
Finance and insurance, 52		63.9	1.8	22.4	-4.3	30.2	36.6	3.9	-1.9	19.4
Professional, scientific, and technical services, 54		13.4	-10.2	-9.6	-0.1	24.7	-2.7	-1.8	21.5	18.7
Computer systems design and related services, 5415		20.0	-15.1	-17.6	18.9	30.1	9.9	-15.4	19.5	32.2
Scientific research and development services, 5417		26.0	8.1	-14.2	-9.8	27.5	-9.1	16.7	16.5	7.4
Other 54		-8.0	-32.6	15.9	-5.3	11.4	-12.0	-10.4	39.5	20.2
Nonmanufacturing nec, other 21–23, 42–81		-4.4	0.1	-7.4	6.1	12.6	-17.0	113.8	12.1	72.1
Industry share of business R&D (%)										
All industries, 21–33, 42–81	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing industries, 31–33	70.5	68.5	69.0	68.7	68.3	66.4	66.9	64.3	62.1	58.0
Chemicals, 325	20.8	18.8	18.9	19.1	19.5	19.2	19.6	18.7	19.1	19.7
Pharmaceuticals and medicines, 3254	17.7	15.6	15.9	16.3	16.6	16.5	17.2	16.5	16.9	17.8
Other 325	3.1	3.2	3.0	2.9	2.8	2.7	2.4	2.2	2.2	1.9
Machinery, 333	3.6	5.0	4.7	3.9	3.6	3.8	3.4	3.3	3.4	3.1
Computer and electronic products, 334	21.5	21.3	21.5	20.8	21.7	20.3	20.7	19.6	19.0	17.6
Electrical equipment, appliance, and components, 335	1.2	1.2	1.0	1.3	1.3	1.2	1.3	1.1	1.0	1.1
Transportation equipment, 336	15.4	13.9	14.0	14.3	13.7	13.8	13.7	13.3	11.9	9.2
Motor vehicles, bodies, trailers, and parts, 3361–63	D	D	D	5.2	5.4	5.4	5.9	6.0	5.8	4.9
Aerospace products and parts, 3364	10.7	8.9	8.2	8.4	7.7	7.7	7.1	6.6	5.5	3.7
Other 336	D	D	D	0.7	0.6	0.8	0.7	0.8	0.6	0.6
Manufacturing nec, other 31–33	8.1	8.2	8.8	9.3	8.6	8.1	8.3	8.2	7.8	7.3
Nonmanufacturing industries, 21–23, 42–81	29.5	31.5	31.0	31.3	31.7	33.6	33.1	35.7	37.9	42.0
Information, 51	13.2	14.2	15.5	17.7	18.7	18.4	18.9	20.1	21.4	22.4
Software publishers, 5112	9.7	9.5	9.5	11.0	10.6	9.3	8.9	8.6	7.4	6.7
Other 51	3.5	4.7	6.0	6.8	8.1	9.1	9.9	11.5	14.0	15.7
Finance and insurance, 52	0.8	1.2	1.2	1.3	1.2	1.5	2.0	1.9	1.7	1.8
Professional, scientific, and technical services, 54	12.1	13.0	11.4	9.6	9.1	10.9	10.0	9.2	10.2	10.8
Computer systems design and related services, 5415	4.0	4.5	3.7	2.9	3.2	4.0	4.2	3.3	3.6	4.3
Scientific research and development services, 5417	4.4	5.2	5.5	4.4	3.8	4.6	4.0	4.3	4.6	4.4

Table SRD-2

**Business R&D performed in the United States, by industry: 2010–19**

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Other 54	3.8	3.3	2.2	2.3	2.1	2.2	1.9	1.6	2.0	2.1
Nonmanufacturing nec, other 21–23, 42–81	3.4	3.1	3.0	2.6	2.7	2.9	2.3	4.5	4.6	7.1

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = North American Industry Classification System; nec = not elsewhere classified.

**Note(s):**

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Beginning in survey year 2018, statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. For survey years 2010–13, industry classification was based on the 2007 NAICS, whereas for survey years 2014–18, industry classification was based on the 2012 NAICS. The 2010–16 data come from the Business R&D and Innovation Survey and do not include companies with fewer than 5 domestic employees. Data for 2017–18 come from the Business Research and Development Survey and do not include companies with fewer than 10 domestic employees. Data for 2019 come from the Business Enterprise Research and Development Survey and also do not include companies with fewer than 10 domestic employees.

**Source(s):**

National Center for Science and Engineering Statistics and U.S. Census Bureau, Business R&D and Innovation Survey (BRDIS), Business Research and Development Survey (BRDS), and Business Enterprise Research and Development Survey (BERD).

*Science and Engineering Indicators*

Table SRD-3

## Funds spent for business R&amp;D performed in the United States, by type of R&amp;D and selected sources of funds: 2010–19

(Millions of dollars and percent share)

Source of funds	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Millions of dollars										
All business R&D										
All business R&D <sup>a</sup>	278,977	294,093	302,250	322,528	340,728	355,821	374,685	400,100	441,036	492,956
Paid for by the company	221,706	238,768	247,280	264,913	282,570	296,677	317,731	339,036	377,806	428,968
Paid for by others	57,271	55,324	54,970	57,615	58,158	59,144	56,954	61,065	63,230	63,989
Federal	34,199 i	31,309 i	30,621 i	29,362	26,554 i	26,990	23,772	24,277 i	24,685	21,941
All others	23,072	24,015	24,349	28,253	31,604	32,154	33,182	36,788	38,545	42,048
Basic research										
All business R&D <sup>a</sup>	16,371	13,020	13,293	19,508	21,936	21,792	24,644	24,829	28,980	32,239
Paid for by the company	13,453	10,735	11,163	15,275	16,107	16,306	19,143	18,732	22,312	25,916
Paid for by others	2,918	2,285	2,131	4,233	5,829	5,486	5,501 i	6,097	6,668	6,324
Federal	1,406	677	644 i	1,196 i	2,044 i	2,038 i	2,005 i	1,783 i	2,510 i	2,313 i
All others	1,512	1,608	1,487	3,037	3,785	3,448	3,496	4,314	4,158	4,011
Applied research										
All business R&D <sup>a</sup>	44,906	47,186	50,755	51,014	53,415	56,472	61,020	62,132	65,222	74,031
Paid for by the company	35,475	37,573	39,629	38,105	39,012	44,344	48,806	49,149	53,229	59,697
Paid for by others	9,431	9,613	11,126 i	12,908	14,403	12,128	12,213	12,984	11,993	14,333
Federal	4,705	4,404	4,137 i	6,028 i	6,445 i	6,102 i	5,181 i	5,037 i	5,097 i	4,883
All others	4,726	5,209	6,989	6,880	7,958	6,026	7,032	7,947	6,896	9,450
Experimental development										
All business R&D <sup>a</sup>	217,699	233,887	238,202	252,007	265,377	277,558	289,021	313,139	346,834	386,686
Paid for by the company	172,777	190,460	196,488	211,532	227,451	236,027	249,782	271,155	302,264	343,355
Paid for by others	44,922 i	43,426	41,714 i	40,475	37,927 i	41,530	39,239	41,984	44,570	43,332
Federal	28,089 i	26,228 i	25,840 i	22,137 i	18,065 i	18,850 i	16,586	17,457 i	17,078	14,745
All others	16,833	17,198	15,874	18,338	19,862	22,680	22,653	24,527	27,492	28,587
Sources of funds as a percentage of business R&D, by type of R&D										
All business R&D										
All business R&D <sup>a</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Paid for by the company	79.5	81.2	81.8	82.1	82.9	83.4	84.8	84.7	85.7	87.0
Paid for by others	20.5	18.8	18.2	17.9	17.1	16.6	15.2	15.3	14.3	13.0
Federal	12.3	10.6	10.1	9.1	7.8	7.6	6.3	6.1	5.6	4.5
All others	8.3	8.2	8.1	8.8	9.3	9.0	8.9	9.2	8.7	8.5
Basic research										
All business R&D <sup>a</sup>	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0	100.0	100.0
Paid for by the company	82.2	82.5	84.0	78.3	73.4	74.8		77.7	75.4	80.4

Table SRD-3

## Funds spent for business R&amp;D performed in the United States, by type of R&amp;D and selected sources of funds: 2010–19

(Millions of dollars and percent share)

Source of funds	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Paid for by others	17.8	17.5	16.0	21.7	26.6	25.2	22.3	24.6	23.0	19.6
Federal	8.6	5.2	4.8	6.1	9.3	9.4	8.1	7.2	8.7	7.2
All others	9.2	12.4	11.2	15.6	17.3	15.8	14.2	17.4	14.3	12.4
Applied research										
All business R&D <sup>a</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Paid for by the company	79.0	79.6	78.1	74.7	73.0	78.5	80.0	79.1	81.6	80.6
Paid for by others	21.0	20.4	21.9	25.3	27.0	21.5	20.0	20.9	18.4	19.4
Federal	10.5	9.3	8.2	11.8	12.1	10.8	8.5	8.1	7.8	6.6
All others	10.5	11.0	13.8	13.5	14.9	10.7	11.5	12.8	10.6	12.8
Experimental development										
All business R&D <sup>a</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Paid for by the company	79.4	81.4	82.5	83.9	85.7	85.0	86.4	86.6	87.1	88.8
Paid for by others	20.6	18.6	17.5	16.1	14.3	15.0	13.6	13.4	12.9	11.2
Federal	12.9	11.2	10.8	8.8	6.8	6.8	5.7	5.6	4.9	3.8
All others	7.7	7.4	6.7	7.3	7.5	8.2	7.8	7.8	7.9	7.4

i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = North American Industry Classification System.

<sup>a</sup> Includes companies located in the United States that performed or funded R&D. Data in this table represent an aggregate of all industries in the North American Industry Classification System codes 21–33 and 42–81.**Note(s):**

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Beginning in survey year 2018, statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. For survey years 2010–13, industry classification was based on the 2007 NAICS, whereas for survey years 2014–18, industry classification was based on the 2012 NAICS. The 2010–16 data come from the Business R&D and Innovation Survey and do not include companies with fewer than 5 domestic employees. Data for 2017–18 come from the Business Research and Development Survey and do not include companies with fewer than 10 domestic employees. Data for 2019 come from the Business Enterprise Research and Development Survey and do not include companies with fewer than 10 domestic employees.

**Source(s):**

National Center for Science and Engineering Statistics and U.S. Census Bureau, Business R&amp;D and Innovation Survey (BRDIS), Business Research and Development Survey (BRDS), and Business Enterprise Research and Development Survey (BERD).

*Science and Engineering Indicators*



Table SRD-4

## Funds spent for business R&amp;D performed in the United States, by type of R&amp;D and select industry: 2010–19

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Millions of dollars										
All business R&D										
All industries, 21–33, 42–81	278,977	294,093	302,250	322,528	340,728	355,821	374,685	400,100	441,036	492,956
Manufacturing industries, 31–33	196,711	201,361	208,415	221,476	232,815	236,132	250,553	257,227	274,075	285,674
Chemicals, 325	58,038	55,324	57,225	61,664	66,301	68,196	73,575	74,977	84,137	97,063
Computer and electronic products, 334	59,875	62,704	65,068	67,205	73,891	72,110	77,385	78,575	83,697	86,729
Transportation equipment, 336	42,913	40,880	42,305	45,972	46,746	49,274	51,275	53,292	52,629	45,375
Nonmanufacturing industries, 21–23, 42–81	82,265	92,731	93,835	101,052	107,913	119,690	124,132	142,874	166,961	207,283
Information, 51	36,852	41,865	46,805	57,207	63,773	65,513	70,748	80,252	94,349	110,227
Professional, scientific, and technical services, 54	33,690	38,219	34,309	31,017	30,975	38,626	37,595	36,922	44,860	53,233
Basic research										
All industries, 21–33, 42–81	16,371	13,020	13,293	19,508	21,936	21,792	24,644	24,829	28,980	32,239
Manufacturing industries, 31–33	10,667	8,738	9,119	15,186	17,822	16,756	18,882	18,624	20,873	22,701
Chemicals, 325	4,670	4,243	3,964	7,308	9,037	8,317	10,117	10,193	11,972	13,869
Computer and electronic products, 334	2,808	1,438	1,556	2,684	2,792	2,338	2,468	2,543	2,445	2,175
Transportation equipment, 336	1,097	955	952	1,823	2,911	3,605	3,112	2,824	3,062	3,486
Nonmanufacturing industries, 21–23, 42–81	5,704	4,282	4,174	4,321	4,114	5,036	5,762	6,205	8,108	9,538
Information, 51	2,101	1,518	1,868	2,178	2,105	1,627	2,028	2,243	3,250	3,816
Professional, scientific, and technical services, 54	2,663	2,030	1,966	1,630	1,572	2,240	2,671	2,491	3,482	4,161
Applied research										
All industries, 21–33, 42–81	44,906	47,186	50,755	51,014	53,415	56,472	61,020	62,132	65,222	74,031
Manufacturing industries, 31–33	33,224	32,576	35,514	35,166	36,585	39,583	42,443	43,698	44,027	45,769
Chemicals, 325	15,006	15,121	16,640	13,894	13,837	16,047	15,771	17,021	18,531	19,120
Computer and electronic products, 334	8,426	7,069	7,120	8,485	8,740	8,973	10,298	11,194	9,947	11,587
Transportation equipment, 336	3,597	3,563	4,295	6,022	7,141	7,165	7,859	7,490	7,440	7,332
Nonmanufacturing industries, 21–23, 42–81	11,682	14,610	15,241	15,848	16,830	16,889	18,576	18,434	21,195	28,262
Information, 51	2,764	3,864	4,033	5,687	6,137	6,511	6,805	7,626	8,979	8,690
Professional, scientific, and technical services, 54	7,162	8,615	8,825	8,181	8,777	8,264	9,900	8,584	9,384	11,731
Experimental development										
All industries, 21–33, 42–81	217,699	233,887	238,202	252,007	265,377	277,558	289,021	313,139	346,834	386,686
Manufacturing industries, 31–33	152,821	160,047	163,781	171,124	178,408	179,793	189,228	194,904	209,175	217,203
Chemicals, 325	38,362	35,961	36,621	40,462	43,427	43,833	47,687	47,763	53,635	64,075
Computer and electronic products, 334	48,640	54,197	56,392	56,036	62,358	60,799	64,619	64,837	71,305	72,967
Transportation equipment, 336	38,219	36,361	37,058	38,126	36,693	38,504	40,305	42,978	42,128	34,557
Nonmanufacturing industries, 21–23, 42–81	64,878	73,839	74,421	80,883	86,970	97,765	99,794	118,235	137,658	169,483

Table SRD-4

## Funds spent for business R&amp;D performed in the United States, by type of R&amp;D and select industry: 2010–19

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Information, 51	31,987	36,483	40,903	49,341	55,530	57,374	61,916	70,383	82,120	97,721
Professional, scientific, and technical services, 54	23,866	27,573	23,517	21,206	20,626	28,122	25,024	25,848	31,994	37,341
Industry share of each type of R&D (%)										
All business R&D										
All industries, 21–33, 42–81	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing industries, 31–33	70.5	68.5	69.0	68.7	68.3	66.4	66.9	64.3	62.1	58.0
Chemicals, 325	20.8	18.8	18.9	19.1	19.5	19.2	19.6	18.7	19.1	19.7
Computer and electronic products, 334	21.5	21.3	21.5	20.8	21.7	20.3	20.7	19.6	19.0	17.6
Transportation equipment, 336	15.4	13.9	14.0	14.3	13.7	13.8	13.7	13.3	11.9	9.2
Nonmanufacturing industries, 21–23, 42–81	29.5	31.5	31.0	31.3	31.7	33.6	33.1	35.7	37.9	42.0
Information, 51	13.2	14.2	15.5	17.7	18.7	18.4	18.9	20.1	21.4	22.4
Professional, scientific, and technical services, 54	12.1	13.0	11.4	9.6	9.1	10.9	10.0	9.2	10.2	10.8
Basic research										
All industries, 21–33, 42–81	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing industries, 31–33	65.2	67.1	68.6	77.8	81.2	76.9	76.6	75.0	72.0	70.4
Chemicals, 325	28.5	32.6	29.8	37.5	41.2	38.2	41.1	41.1	41.3	43.0
Computer and electronic products, 334	17.2	11.0	11.7	13.8	12.7	10.7	10.0	10.2	8.4	6.7
Transportation equipment, 336	6.7	7.3	7.2	9.3	13.3	16.5	12.6	11.4	10.6	10.8
Nonmanufacturing industries, 21–23, 42–81	34.8	32.9	31.4	22.1	18.8	23.1	23.4	25.0	28.0	29.6
Information, 51	12.8	11.7	14.1	11.2	9.6	7.5	8.2	9.0	11.2	11.8
Professional, scientific, and technical services, 54	16.3	15.6	14.8	8.4	7.2	10.3	10.8	10.0	12.0	12.9
Applied research										
All industries, 21–33, 42–81	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing industries, 31–33	74.0	69.0	70.0	68.9	68.5	70.1	69.6	70.3	67.5	61.8
Chemicals, 325	33.4	32.0	32.8	27.2	25.9	28.4	25.8	27.4	28.4	25.8
Computer and electronic products, 334	18.8	15.0	14.0	16.6	16.4	15.9	16.9	18.0	15.3	15.7
Transportation equipment, 336	8.0	7.6	8.5	11.8	13.4	12.7	12.9	12.1	11.4	9.9
Nonmanufacturing industries, 21–23, 42–81	26.0	31.0	30.0	31.1	31.5	29.9	30.4	29.7	32.5	38.2
Information, 51	6.2	8.2	7.9	11.1	11.5	11.5	11.2	12.3	13.8	11.7
Professional, scientific, and technical services, 54	15.9	18.3	17.4	16.0	16.4	14.6	16.2	13.8	14.4	15.8
Experimental development										
All industries, 21–33, 42–81	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing industries, 31–33	70.2	68.4	68.8	67.9	67.2	64.8	65.5	62.2	60.3	56.2
Chemicals, 325	17.6	15.4	15.4	16.1	16.4	15.8	16.5	15.3	15.5	16.6
Computer and electronic products, 334	22.3	23.2	23.7	22.2	23.5	21.9	22.4	20.7	20.6	18.9

Table SRD-4

**Funds spent for business R&D performed in the United States, by type of R&D and select industry: 2010–19**

(Millions of dollars and percent)

Industry and NAICS code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Transportation equipment, 336	17.6	15.5	15.6	15.1	13.8	13.9	13.9	13.7	12.1	8.9
Nonmanufacturing industries, 21–23, 42–81	29.8	31.6	31.2	32.1	32.8	35.2	34.5	37.8	39.7	43.8
Information, 51	14.7	15.6	17.2	19.6	20.9	20.7	21.4	22.5	23.7	25.3
Professional, scientific, and technical services, 54	11.0	11.8	9.9	8.4	7.8	10.1	8.7	8.3	9.2	9.7

i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = North American Industry Classification System.

**Note(s):**

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Beginning in survey year 2018, statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. For survey years 2010–13, industry classification was based on the 2007 NAICS, whereas for survey years 2014–18, industry classification was based on the 2012 NAICS. The 2010–16 data come from the Business R&D and Innovation Survey and do not include companies with fewer than 5 domestic employees. Data for 2017–18 come from the Business Research and Development Survey and do not include companies with fewer than 10 domestic employees. Data for 2019 come from the Business Enterprise Research and Development Survey and do not include companies with fewer than 10 domestic employees.

**Source(s):**

National Center for Science and Engineering Statistics and U.S. Census Bureau, Business R&D and Innovation Survey (BRDIS), Business Research and Development Survey (BRDS), and Business Enterprise Research and Development Survey (BERD).

*Science and Engineering Indicators*

Table SRD-5

## Federal obligations for R&amp;D and R&amp;D plant, by type of R&amp;D: FYs 1953–2021

(Millions of current and constant 2012 dollars)

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
Millions of current dollars						
1953	2,167	1,920	116	NA	NA	248
1954	1,918	1,762	116	NA	NA	156
1955	2,252	2,045	130	NA	NA	207
1956	3,267	2,988	206	646	2,136	279
1957	4,389	3,932	262	662	3,007	457
1958	4,906	4,570	335	744	3,491	336
1959	7,123	6,694	466	874	5,353	429
1960	8,080	7,552	590	1,282	5,679	528
1961	9,607	9,059	815	1,663	6,581	548
1962	11,069	10,290	986	2,018	7,285	779
1963	13,663	12,495	1,152	2,356	8,987	1,168
1964	15,324	14,225	1,303	2,571	10,351	1,099
1965	15,746	14,614	1,435	2,812	10,367	1,132
1966	16,179	15,320	1,579	3,081	10,660	858
1967	17,149	16,529	1,846	2,786	11,898	620
1968	16,525	15,921	1,841	2,941	11,140	604
1969	16,310	15,641	1,945	2,700	10,996	669
1970	15,863	15,339	1,926	2,975	10,438	524
1971	16,154	15,543	1,980	3,143	10,419	611
1972	17,098	16,496	2,187	3,361	10,948	602
1973	17,574	16,800	2,232	3,349	11,219	774
1974	18,176	17,410	2,388	3,788	11,235	766
1975	19,860	19,039	2,588	4,141	12,309	821
1976	21,616	20,780	2,767	4,852	13,160	837
1977	24,818	23,450	3,259	5,255	14,936	1,367
1978	27,141	25,845	3,699	5,908	16,238	1,296
1979	29,621	28,145	4,193	6,342	17,610	1,475
1980	31,386	29,830	4,674	6,923	18,233	1,556
1981	34,590	33,104	5,041	7,171	20,891	1,486
1982	37,822	36,433	5,482	7,541	23,410	1,390
1983	40,009	38,712	6,260	7,993	24,458	1,297
1984	44,012	42,225	7,067	7,911	27,246	1,787
1985	50,180	48,360	7,819	8,315	32,226	1,821
1986	52,951	51,412	8,153	8,349	34,910	1,539
1987	57,100	55,254	8,942	8,998	37,313	1,846
1988	58,827	56,769	9,474	9,177	38,119	2,057
1989	63,572	61,406	10,602	10,164	40,641	2,165
1990	65,831	63,559	11,286	10,337	41,937	2,272
1991	64,148	61,295	12,171	11,798	37,327	2,853
1992	68,577	65,593	12,490	12,001	41,102	2,985
1993	70,415	67,314	13,399	13,491	40,424	3,101
1994	69,451	67,235	13,523	13,888	39,824	2,215
1995	70,443	68,187	13,877	14,557	39,752	2,256
1996	69,399	67,653	14,464	13,796	39,393	1,746
1997	71,753	69,827	14,942	14,423	40,461	1,927
1998	73,914	72,101	15,613	15,309	41,178	1,813
1999	77,386	75,341	17,444	16,084	41,813	2,046
2000	80,403	75,910	19,570	18,901	37,440	4,493

Table SRD-5

## Federal obligations for R&amp;D and R&amp;D plant, by type of R&amp;D: FYs 1953–2021

(Millions of current and constant 2012 dollars)

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
2001	88,562	84,493	21,958	22,756	39,779	4,070
2002	98,013	93,709	23,668	24,338	45,702	4,305
2003	107,794	103,528	24,751	26,320	52,456	4,267
2004	116,069	112,074	26,121	27,237	58,717	3,994
2005	122,620	118,848	27,140	26,598	65,110	3,771
2006	123,855	121,730	26,585	26,951	68,194	2,125
2007	129,431	127,263	26,866	27,228	73,169	2,168
2008	129,050	127,106	27,154	26,740	73,212	1,944
2009	144,758	141,090	32,879	30,813	77,398	3,668
2010	146,968	140,355	31,795	31,933	76,627	6,613
2011	139,703	135,533	29,314	28,751	77,468	4,171
2012	140,670	138,525	30,959	31,027	76,538	2,146
2013	127,626	125,720	29,779	29,753	66,188	1,905
2014	132,779	130,561	31,588	31,604	67,370	2,218
2015	131,578	128,753	31,527	32,298	64,928	2,825
2016	118,274	115,833	32,293	34,812	48,728	2,441
2017	121,627	118,975	33,271	36,600	49,103	2,652
2018	133,278	129,425	36,195	38,392	54,837	3,853
2019	146,801	142,424	40,017	41,101	61,306	4,376
2020	173,553	167,403	41,547	43,758	82,098	6,150
2021 preliminary	185,408	179,465	41,231	43,924	94,310	5,943
Millions of constant 2012 dollars						
1953	15,010	13,293	803	NA	NA	1,717
1954	13,128	12,059	796	NA	NA	1,069
1955	15,298	13,890	878	NA	NA	1,408
1956	21,635	19,789	1,367	4,275	14,147	1,846
1957	28,028	25,109	1,675	4,229	19,205	2,920
1958	30,415	28,331	2,074	4,614	21,642	2,085
1959	43,484	40,864	2,845	5,337	32,682	2,620
1960	48,645	45,465	3,554	7,719	34,192	3,180
1961	57,083	53,824	4,840	9,884	39,101	3,258
1962	65,112	60,529	5,802	11,873	42,854	4,583
1963	79,435	72,643	6,696	13,699	52,248	6,792
1964	87,967	81,661	7,480	14,761	59,420	6,306
1965	88,859	82,473	8,101	15,868	58,505	6,386
1966	89,385	84,643	8,725	17,022	58,896	4,742
1967	91,953	88,628	9,897	14,936	63,795	3,325
1968	85,622	82,493	9,537	15,236	57,721	3,129
1969	80,822	77,507	9,637	13,380	54,490	3,315
1970	74,616	72,149	9,059	13,993	49,098	2,467
1971	72,309	69,573	8,864	14,069	46,640	2,736
1972	73,068	70,495	9,346	14,362	46,787	2,573
1973	71,968	68,797	9,140	13,716	45,941	3,171
1974	69,482	66,552	9,127	14,478	42,947	2,929
1975	68,813	65,970	8,969	14,350	42,651	2,844
1976	70,024	67,313	8,965	15,717	42,631	2,710
1977	74,978	70,847	9,845	15,878	45,125	4,131
1978	76,821	73,154	10,469	16,723	45,962	3,667
1979	77,581	73,717	10,981	16,612	46,124	3,864

Table SRD-5

## Federal obligations for R&amp;D and R&amp;D plant, by type of R&amp;D: FYs 1953–2021

(Millions of current and constant 2012 dollars)

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
1980	75,611	71,863	11,260	16,678	43,924	3,748
1981	75,871	72,612	11,058	15,730	45,824	3,259
1982	77,568	74,718	11,242	15,465	48,011	2,850
1983	78,619	76,069	12,301	15,707	48,061	2,550
1984	83,499	80,108	13,408	15,009	51,691	3,391
1985	92,125	88,782	14,354	15,265	59,163	3,343
1986	95,082	92,319	14,640	14,992	62,687	2,763
1987	100,280	97,038	15,705	15,803	65,531	3,242
1988	100,079	96,579	16,117	15,612	64,851	3,500
1989	103,943	100,403	17,335	16,618	66,450	3,540
1990	103,835	100,252	17,801	16,304	66,147	3,583
1991	97,697	93,352	18,536	17,968	56,849	4,345
1992	101,898	97,463	18,558	17,832	61,073	4,435
1993	102,228	97,727	19,453	19,587	58,687	4,502
1994	98,680	95,532	19,215	19,732	56,585	3,148
1995	98,001	94,862	19,306	20,252	55,304	3,139
1996	94,769	92,384	19,752	18,839	53,794	2,384
1997	96,275	93,689	20,048	19,352	54,289	2,585
1998	97,951	95,548	20,690	20,288	54,570	2,403
1999	101,251	98,575	22,823	21,044	54,708	2,677
2000	103,081	97,321	25,090	24,232	48,000	5,760
2001	110,925	105,827	27,503	28,502	49,823	5,097
2002	120,825	115,518	29,177	30,003	56,339	5,307
2003	130,501	125,336	29,965	31,865	63,506	5,165
2004	137,229	132,507	30,883	32,203	69,421	4,722
2005	140,683	136,357	31,139	30,516	74,702	4,327
2006	137,693	135,331	29,555	29,962	75,814	2,362
2007	140,077	137,730	29,076	29,467	79,188	2,347
2008	136,836	134,775	28,792	28,353	77,630	2,061
2009	151,738	147,893	34,465	32,298	81,130	3,845
2010	152,741	145,868	33,044	33,187	79,637	6,873
2011	142,351	138,101	29,869	29,296	78,936	4,250
2012	140,670	138,525	30,959	31,027	76,538	2,146
2013	125,320	123,449	29,241	29,216	64,992	1,871
2014	127,918	125,782	30,432	30,447	64,904	2,136
2015	125,360	122,669	30,037	30,772	61,860	2,692
2016	111,695	109,390	30,496	32,876	46,018	2,305
2017	112,858	110,397	30,873	33,961	45,563	2,461
2018	120,876	117,381	32,827	34,820	49,734	3,494
2019	130,559	126,667	35,590	36,553	54,524	3,892
2020	152,440	147,038	36,492	38,435	72,111	5,402
2021 preliminary	160,138	155,005	35,612	37,938	81,456	5,133

NA = not available; data were not collected at this level of detail.

**Note(s):**

Due to rounding, detail may not add to total. The data for FY 2021 are preliminary and may later be revised. FYs 2009 and 2010 obligations include additional funding provided by the American Recovery and Reinvestment Act of 2009. Beginning with FY 2016, the reported obligations for *development* reflect the Office of Management and Budget's narrowed definition for this category by more narrowly defining it to be "experimental development" (Circular A-11, Section 84). Most notably, the totals for development do not include Department of Defense (DOD) obligations for Budget Activity-7 (Operational Systems Development). Those funds, previously included in DOD's obligation totals for development, support the efforts to upgrade systems that have been fielded or have received approval for full-rate production and anticipate production funding in the current

or subsequent fiscal year. (In FY 2016, DOD obligations for operational systems development amounted to about \$24.6 billion and to about \$26.0 billion in FY 2017.) With this revision, the data for FY 2016 and onward are not directly comparable with the totals reported in previous years. Obligations for FYs 2020 and 2021 include the additional funding provided by supplemental COVID-19 related appropriations in these years (i.e., the Coronavirus Aid, Relief, and Economic Security Act of March 2020, the American Rescue Plan Act of March 2021, and several other enacted spending authorizations in these fiscal years).

**Source(s):**

National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development.

*Science and Engineering Indicators*

Table SRD-6

## Federal obligations for R&amp;D and R&amp;D plant, by agency, performer, and type of R&amp;D: FY 2020

(Millions of dollars)

Agency	All federal obligations	Federal intramural <sup>a</sup>	Extramural performers							Foreign
			Business firms	United States and U.S. territories						
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State and local governments	
Total R&D and R&D plant										
All agencies	173,552.9	54,577.7	52,105.5	4,340.8	38,891.5	6,223.0	10,824.2	4,469.7	726.7	1,393.7
Department of Agriculture	3,433.5	2,479.6	4.6	0.0	883.7	0.0	51.9	0.0	8.6	5.1
Department of Commerce	1,980.9	1,552.2	50.5	0.0	313.8	4.2	31.0	19.9	5.1	4.4
Department of Defense	67,006.8	22,964.0	35,247.8	442.2	4,524.9	463.1	1,473.9	916.8	8.8	965.3
Department of Education	240.1	10.5	15.1	0.0	158.2	0.0	46.2	0.0	10.2	0.0
Department of Energy	15,778.0	914.5	3,343.6	2,993.2	1,877.1	3,225.7	148.4	3,213.6	61.6	0.3
Department of Health and Human Services	61,774.8	20,832.4	7,762.8	862.1	23,983.4	20.3	7,608.4	48.1	368.3	288.9
Department of Homeland Security	507.5	132.9	241.9	17.3	29.2	4.8	2.7	69.5	0.8	8.5
Department of the Interior	844.4	721.1	23.4	0.0	80.6	0.5	4.2	0.5	12.9	1.1
Department of Justice	96.4	10.9	8.7	0.0	46.3	0.0	24.7	0.0	5.9	0.0
Department of Transportation	1,224.5	227.8	379.3	0.0	275.8	0.3	54.5	70.0	216.5	0.2
Department of Veterans Affairs	1,565.1	1,495.0	0.0	0.0	0.0	0.0	0.0	70.2	0.0	0.0
Agency for International Development	194.3	19.7	22.4	0.0	51.0	0.0	50.1	0.0	0.0	51.1
Environmental Protection Agency	493.0	244.4	195.3	0.1	51.6	1.1	0.0	0.3	0.0	0.0
National Aeronautics and Space Administration	10,573.6	2,552.1	4,213.9	10.2	1,107.7	2,237.6	384.2	35.0	3.5	29.4
National Science Foundation	6,792.5	20.4	506.9	0.0	5,493.4	262.4	469.8	4.7	15.4	19.5
Patient-Centered Outcomes Research Trust Fund	469.7	0.0	0.0	0.0	0.0	0.0	469.7	0.0	0.0	0.0
Smithsonian Institution	276.0	276.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social Security Administration	69.7	37.2	20.1	0.0	9.5	0.0	2.9	0.0	0.0	0.1
All other agencies	232.0	87.0	69.1	15.7	5.5	3.0	1.7	21.0	9.2	19.9
R&D										
All agencies	167,402.8	51,471.7	51,428.0	4,118.7	38,540.9	5,355.2	10,698.9	3,676.0	720.1	1,393.3
Department of Agriculture	2,643.6	1,689.8	4.6	0.0	883.7	0.0	51.9	0.0	8.6	5.1
Department of Commerce	1,621.7	1,193.0	50.5	0.0	313.8	4.2	31.0	19.9	5.1	4.4
Department of Defense	66,695.0	22,666.6	35,233.5	442.2	4,524.9	463.1	1,473.9	916.8	8.8	965.3
Department of Education	240.1	10.5	15.1	0.0	158.2	0.0	46.2	0.0	10.2	0.0



Table SRD-6

## Federal obligations for R&amp;D and R&amp;D plant, by agency, performer, and type of R&amp;D: FY 2020

(Millions of dollars)

Agency	All federal obligations	Federal intramural <sup>a</sup>	Extramural performers							Foreign
			Business firms	United States and U.S. territories					State and local governments	
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs		
Department of Energy	13,453.0	871.8	2,973.7	2,771.1	1,837.1	2,375.1	148.4	2,419.9	55.6	0.3
Department of Health and Human Services	60,005.7	19,300.3	7,580.9	862.1	23,928.3	20.3	7,608.4	48.1	368.3	288.9
Department of Homeland Security	507.5	132.9	241.9	17.3	29.2	4.8	2.7	69.5	0.8	8.5
Department of the Interior	837.2	719.6	17.8	0.0	80.6	0.5	4.2	0.5	12.8	1.1
Department of Justice	96.4	10.9	8.7	0.0	46.3	0.0	24.7	0.0	5.9	0.0
Department of Transportation	1,184.2	222.0	344.8	0.0	275.8	0.3	54.5	70.0	216.5	0.2
Department of Veterans Affairs	1,565.1	1,495.0	0.0	0.0	0.0	0.0	0.0	70.2	0.0	0.0
Agency for International Development	194.3	19.7	22.4	0.0	51.0	0.0	50.1	0.0	0.0	51.1
Environmental Protection Agency	488.5	244.4	190.9	0.1	51.6	1.1	0.0	0.3	0.0	0.0
National Aeronautics and Space Administration	10,537.8	2,551.9	4,195.5	10.2	1,107.7	2,220.4	384.2	35.0	3.5	29.4
National Science Foundation	6,351.2	9.4	458.4	0.0	5,237.9	262.4	344.5	4.7	14.8	19.1
Patient-Centered Outcomes Research Trust Fund	469.7	0.0	0.0	0.0	0.0	0.0	469.7	0.0	0.0	0.0
Smithsonian Institution	209.8	209.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social Security Administration	69.7	37.2	20.1	0.0	9.5	0.0	2.9	0.0	0.0	0.1
All other agencies	232.0	87.0	69.1	15.7	5.5	3.0	1.7	21.0	9.2	19.9
Basic research										
All agencies	41,546.6	7,688.1	3,146.8	799.9	20,128.2	3,455.5	4,325.6	1,667.7	114.3	220.6
Department of Agriculture	1,163.8	725.7	0.1	0.0	414.0	0.0	19.0	0.0	2.6	2.4
Department of Commerce	251.2	237.2	5.2	0.0	7.0	0.0	1.4	0.0	0.0	0.3
Department of Defense	2,499.1	401.9	364.5	17.8	1,490.8	19.8	102.1	35.6	0.1	66.4
Department of Education	53.7	2.8	0.2	0.0	41.3	0.0	7.9	0.0	1.6	0.0
Department of Energy	5,501.6	207.3	325.6	334.9	865.1	2,120.1	29.7	1,589.3	29.5	0.2
Department of Health and Human Services	21,809.0	4,514.8	1,084.5	439.7	11,841.6	10.4	3,707.3	18.3	64.2	128.3
Department of Homeland Security	47.4	5.6	24.3	0.3	17.1	0.0	0.0	0.1	0.0	0.0
Department of the Interior	83.9	75.6	0.2	0.0	6.7	0.0	0.2	0.0	1.2	0.0

Table SRD-6

## Federal obligations for R&amp;D and R&amp;D plant, by agency, performer, and type of R&amp;D: FY 2020

(Millions of dollars)

Agency	All federal obligations	Federal intramural <sup>a</sup>	Extramural performers							
			Business firms	United States and U.S. territories					Foreign	
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs		State and local governments
Department of Justice	0.7	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Department of Transportation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Department of Veterans Affairs	617.7	617.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agency for International Development	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental Protection Agency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
National Aeronautics and Space Administration	3,839.4	680.3	1,078.8	7.2	820.1	1,042.8	185.3	17.9	2.6	4.3
National Science Foundation	5,461.9	8.3	259.9	0.0	4,622.6	262.4	272.6	4.7	12.6	18.7
Patient-Centered Outcomes Research Trust Fund	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smithsonian Institution	209.8	209.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social Security Administration	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other agencies	7.4	1.1	3.5	0.0	1.0	0.0	0.0	1.8	0.0	0.0
Applied research										
All agencies	43,758.1	11,884.2	6,881.6	2,712.6	15,345.5	407.8	4,865.0	848.7	530.4	282.3
Department of Agriculture	1,224.6	733.0	4.5	0.0	447.6	0.0	31.2	0.0	6.0	2.2
Department of Commerce	1,109.6	784.7	40.3	0.0	251.1	0.0	6.1	19.6	3.7	4.1
Department of Defense	6,416.2	2,053.0	2,813.1	67.0	936.3	62.0	310.0	130.2	1.3	43.2
Department of Education	135.8	5.6	3.9	0.0	84.1	0.0	34.6	0.0	7.6	0.0
Department of Energy	5,023.6	604.7	805.5	2,193.1	624.5	167.1	87.9	525.1	15.6	0.1
Department of Health and Human Services	22,424.8	4,819.6	1,221.9	422.4	11,761.8	9.9	3,714.1	18.0	296.4	160.6
Department of Homeland Security	177.9	59.7	41.5	11.1	1.3	4.8	0.7	56.9	0.0	1.9
Department of the Interior	614.5	528.6	14.4	0.0	57.5	0.1	3.0	0.5	9.6	0.7
Department of Justice	83.8	7.7	8.7	0.0	42.5	0.0	24.1	0.0	0.7	0.0
Department of Transportation	900.2	174.8	232.9	0.0	260.9	0.3	52.1	1.7	177.2	0.2
Department of Veterans Affairs	918.1	847.9	0.0	0.0	0.0	0.0	0.0	70.2	0.0	0.0
Agency for International Development	134.8	16.7	12.3	0.0	37.2	0.0	32.5	0.0	0.0	36.1





FFRDC = federally funded research and development center.

<sup>a</sup> Includes costs associated with administration of intramural and extramural programs by federal personnel and actual intramural performance.

**Note(s):**

Detail may not add to total because of rounding. Agencies (in general) with an annual total of R&D and R&D plant of \$100 million or more. All other agencies includes the Department of Housing and Urban Development, Department of Labor, Department of State, Department of the Treasury, Administrative Office of the U.S. Courts, Appalachian Regional Commission, Consumer Product Safety Commission, Federal Communications Commission, Federal Trade Commission, Library of Congress, National Archives and Records Commission, Nuclear Regulatory Commission, Tennessee Valley Authority, RESTORE Act Centers, U.S. Agency for Global Media, and U.S. Postal Service.

**Source(s):**

National Center for Science and Engineering Statistics, Federal Funds for Research and Development, Volume 70, FYs 2020–21.

*Science and Engineering Indicators*



Table SRD-7

## Federal obligations for research, by agency and S&amp;E field: FY 2020

(Millions of dollars and percent share)

Agency	All federal obligations	Computer sciences and mathematics	Environmental sciences	Life sciences	Physical sciences	Psychology	Social sciences	Other sciences nec	Engineering
Patient-Centered Outcomes Research Trust Fund	470	0	0	470	0	0	0	0	0
RESTORE Act Centers of Excellence Research Grants Program	9	0	9	0	0	0	0	0	0
Smithsonian Institution	210	0	22	82	2	0	0	104	0
Social Security Administration	70	0	0	0	0	0	70	0	0
Tennessee Valley Authority	6	0	0	0	0	0	0	0	6
U.S. Agency for Global Media	5	0	0	0	0	0	5	0	0
U.S. Postal Service	18	0	0	0	0	0	0	0	18
Share by field (%)									
All agencies	100.0	6.9	5.9	49.9	9.9	3.8	1.3	6.8	15.5
Departments									
Department of Agriculture	100.0	0.3	0.7	83.4	4.2	0.0	6.4	0.0	4.9
Department of Commerce	100.0	12.6	35.6	6.6	19.3	0.0	3.4	3.0	19.4
Department of Defense	100.0	29.1	4.3	12.2	7.7	1.1	1.5	12.4	31.7
Department of Education	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Department of Energy	100.0	14.6	4.1	4.8	42.5	0.0	0.0	3.6	30.2
Department of Health and Human Services	100.0	0.8	1.2	80.4	0.2	6.7	0.6	4.3	5.7
Department of Homeland Security	100.0	6.0	3.5	31.6	12.3	0.0	0.0	12.1	34.5
Department of the Interior	100.0	0.4	65.9	30.5	0.1	0.0	1.2	0.1	1.7
Department of Justice	100.0	6.5	1.0	14.1	7.6	1.9	60.8	5.9	2.1
Department of Labor	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Department of State	100.0	0.0	0.0	93.3	0.0	0.0	6.7	0.0	0.0
Department of Transportation	100.0	4.1	3.9	0.9	0.3	2.0	0.2	8.1	80.6
Department of the Treasury	100.0	0.0	0.0	0.0	99.6	0.0	0.0	0.0	0.4
Department of Veterans Affairs	100.0	0.0	0.0	80.1	0.0	10.9	0.0	4.6	4.4
Other agencies									
Administrative Office of the U.S. Courts	100.0	100	0	0	0	0	0	0	0
Agency for International Development	100.0	0.0	0.0	92.9	0.0	0.0	7.1	0.0	0.0
Appalachian Regional Commission	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Consumer Product Safety Commission	100.0	0.0	95.0	0.0	5.0	0.0	0.0	0.0	0.0
Environmental Protection Agency	100.0	2.1	41.2	39.5	2.4	0.0	0.6	0.0	14.2

Table SRD-7

## Federal obligations for research, by agency and S&amp;E field: FY 2020

(Millions of dollars and percent share)

Agency	All federal obligations	Computer sciences and mathematics	Environmental sciences	Life sciences	Physical sciences	Psychology	Social sciences	Other sciences nec	Engineering
Federal Communications Commission	100.0	16.7	0.0	0.0	25.0	0.0	0.0	0.0	58.3
Federal Trade Commission	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Library of Congress	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
National Aeronautics and Space Administration	100.0	0.0	23.7	2.0	25.9	0.0	0.0	15.9	32.6
National Science Foundation	100.0	18.6	15.0	11.8	16.2	0.6	3.3	16.1	18.4
Nuclear Regulatory Commission	100.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	98.8
Patient-Centered Outcomes Research Trust Fund	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
RESTORE Act Centers of Excellence Research Grants Program	100.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Smithsonian Institution	100.0	0.0	10.4	39.1	0.8	0.0	0.0	49.7	0.0
Social Security Administration	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Tennessee Valley Authority	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
U.S. Agency for Global Media	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
U.S. Postal Service	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0

\* = amount greater than \$0 but less than \$50.

nec = not elsewhere classified.

**Note(s):**

Research includes basic research and applied research. Because of rounding, detail may not add to total. Only those agencies and subdivisions that had obligations in variables represented by this table appear in the table.

**Source(s):**

National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, Volume 70, FYs 2020–21.

*Science and Engineering Indicators*



Table SRD-8

## Federal obligations for research, by detailed S&amp;E field: Selected years, FYs 1990–2020

(Millions of current and constant 2012 dollars, percent share by field, and annual growth rates)

S&E field	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	Average annual growth rate		
												1990–2000	2000–10	2010–20
	Millions of current dollars											Percent		
Total, all fields	21,622.4	28,434.4	38,470.6	53,738.2	63,728.0	63,825.4	67,104.6	69,871.3	74,587.6	81,117.8	85,304.8	5.9	5.2	3.0
Computer sciences and mathematics	840.7	1,579.1	2,205.6	2,983.4	3,411.8	3,862.7	4,222.8	3,894.2	4,206.9	4,330.0	5,912.4	10.1	4.5	5.7
Computer sciences	562.1	1,013.9	1,659.6	2,157.1	2,362.0	2,645.6	2,815.4	2,734.7	2,887.9	2,896.8	4,280.5	-	-	-
Mathematics	241.3	258.6	432.9	686.6	835.5	1,005.9	1,160.0	941.7	1,055.2	1,156.9	681.4	-	-	-
Other computer sciences and mathematics	37.3	306.6	113.1	139.7	214.4	211.2	247.3	217.8	263.8	276.3	950.4	-	-	-
Environmental sciences	2,174.1	2,854.4	3,328.8	3,502.6	3,338.9	4,413.7	4,450.4	4,469.6	4,567.6	5,074.7	5,039.5	4.4	0.0	4.2
Atmospheric sciences	773.4	1,135.6	1,104.3	1,185.1	953.8	1,567.9	1,597.0	1,651.3	796.3	824.2	908.1	-	-	-
Geological sciences	661.1	848.3	639.2	673.5	530.4	643.3	562.4	580.3	227.1	239.1	306.0	-	-	-
Oceanography	520.1	407.3	673.0	771.5	743.7	726.0	773.0	774.3	777.7	819.2	946.2	-	-	-
Other environmental sciences	219.5	463.3	912.2	872.5	1,111.0	1,476.5	1,518.0	1,463.8	2,766.4	3,192.1	2,879.2	-	-	-
Life sciences	8,829.8	11,811.0	17,964.7	28,127.8	33,909.1	30,625.1	32,045.4	34,089.6	36,994.4	38,303.7	42,524.8	7.4	6.6	2.3
Agricultural sciences	691.4	670.3	895.0	1,094.2	1,131.9	1,320.3	1,283.1	1,353.4	1,325.0	1,445.5	1,412.6	-	-	-
Biological sciences (excluding environmental biology)	4,144.6	4,925.4	10,740.0	13,351.6	17,213.9	14,839.7	15,922.6	16,555.7	17,828.5	18,910.4	20,165.4	-	-	-
Environmental biology	342.3	806.9	740.0	699.0	816.4	819.1	788.1	783.4	922.4	924.2	901.9	-	-	-
Medical sciences	3,382.4	4,972.2	4,463.8	10,862.1	11,677.0	11,086.8	11,358.6	12,648.7	13,564.5	13,774.8	16,182.2	-	-	-
Other life sciences	269.1	436.3	1,125.9	2,120.9	3,070.0	2,559.2	2,693.0	2,748.4	3,353.9	3,248.8	3,862.7	-	-	-
Physical sciences	3,808.7	4,278.3	4,788.0	5,493.7	5,870.8	6,510.3	6,705.6	6,581.5	7,881.4	9,816.1	8,419.9	2.3	2.1	3.7
Astronomy	597.2	764.5	880.3	884.9	559.9	1,230.2	1,246.7	1,292.4	887.3	1,583.4	871.3	-	-	-
Chemistry	761.7	863.5	1,225.6	1,197.5	1,310.6	967.7	998.9	969.2	1,121.2	1,125.5	1,143.8	-	-	-
Physics	2,254.9	2,451.2	2,405.4	3,041.3	3,470.1	3,040.2	3,731.9	3,675.9	3,541.1	3,446.0	3,577.1	-	-	-
Other physical sciences	195.0	199.2	276.7	370.0	530.2	1,272.2	728.1	643.9	2,331.7	3,661.3	2,827.6	-	-	-
Psychology	448.6	622.6	1,626.7	1,891.8	2,155.6	1,994.9	2,021.4	2,081.2	2,326.9	2,753.6	3,275.8	13.7	2.9	4.3
Biological aspects	130.6	58.8	8.2	2.3	13.6	19.1	19.8	10.4	19.9	17.5	13.5	-	-	-
Social aspects	177.5	156.3	56.0	46.6	74.5	58.5	56.0	56.4	48.4	52.7	41.8	-	-	-
Other psychological sciences	140.5	407.5	1,562.5	1,842.8	2,067.4	1,917.2	1,945.6	2,014.4	2,258.5	2,683.3	3,220.5	-	-	-
Social sciences	630.0	678.7	1,050.4	1,097.1	1,197.3	1,136.3	1,226.7	1,027.2	1,039.4	1,155.7	1,137.4	5.2	1.3	-0.5
Anthropology	14.4	21.7	15.9	18.0	24.7	29.9	31.5	32.1	34.7	34.9	19.3	-	-	-
Economics	197.2	206.5	249.5	215.9	274.0	336.8	370.9	294.1	282.4	294.9	202.7	-	-	-
Political science	13.1	22.3	22.6	32.7	14.2	16.0	14.6	17.6	10.8	14.2	12.5	-	-	-
Sociology	116.2	47.8	90.6	70.2	132.3	128.2	197.4	178.0	143.2	224.0	152.4	-	-	-
Other social sciences	289.1	380.3	671.8	760.4	752.0	625.3	612.2	505.4	568.2	587.6	750.5	-	-	-

Table SRD-8

## Federal obligations for research, by detailed S&amp;E field: Selected years, FYs 1990–2020

(Millions of current and constant 2012 dollars, percent share by field, and annual growth rates)

S&E field	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	Average annual growth rate		
												1990–2000	2000–10	2010–20
Other sciences nec	663.7	901.8	1,160.2	2,088.9	2,763.2	3,298.8	3,460.8	4,520.6	3,812.4	4,404.8	5,772.9	5.7	9.1	7.6
Engineering	4,226.6	5,708.4	6,346.4	8,552.9	11,081.2	11,983.6	12,971.5	13,207.4	13,758.6	15,279.3	13,222.0	4.1	5.7	1.8
Aeronautical engineering	927.1	1,248.3	1,463.9	1,276.3	830.1	1,825.1	1,836.1	1,892.1	1,118.0	1,199.2	1,093.5	-	-	-
Astronautical engineering	580.8	546.5	515.0	494.1	389.9	660.6	650.7	651.4	795.8	829.7	915.9	-	-	-
Chemical engineering	241.9	246.1	196.5	283.8	509.7	374.6	373.0	302.3	692.3	454.1	788.2	-	-	-
Civil engineering	317.7	339.4	239.2	279.2	699.8	457.6	461.9	605.9	476.3	566.3	475.7	-	-	-
Electrical engineering	640.0	756.3	744.8	1,033.5	1,360.9	897.3	1,062.9	1,102.7	1,009.8	970.6	880.6	-	-	-
Mechanical engineering	268.3	412.5	289.3	323.7	363.6	323.6	374.2	449.8	498.2	630.1	522.8	-	-	-
Metallurgy and materials engineering	554.5	815.3	918.1	1,184.1	1,758.8	1,756.9	1,975.4	1,941.1	1,915.0	1,842.8	704.5	-	-	-
Other engineering	696.3	1,344.0	1,979.6	3,678.3	5,168.4	5,688.0	6,237.3	6,262.1	7,253.1	8,786.5	7,840.8	-	-	-
	Millions of constant 2012 dollars											Percent		
Total, all fields	34,104.7	39,558.2	49,321.3	61,654.7	66,231.6	60,809.3	63,372.0	64,833.7	67,647.0	72,143.2	74,927.4	3.8	3.0	1.2
Computer sciences and mathematics	1,326.1	2,196.9	2,827.7	3,422.9	3,545.8	3,680.2	3,987.9	3,613.4	3,815.4	3,850.9	5,193.1	7.9	2.3	3.9
Computer sciences	886.6	1,410.5	2,127.7	2,474.9	2,454.8	2,520.6	2,658.8	2,537.5	2,619.2	2,576.3	3,759.8	-	-	-
Mathematics	380.7	359.8	555.0	787.7	868.3	958.4	1,095.5	873.8	957.0	1,028.9	598.5	-	-	-
Other computer sciences and mathematics	58.8	426.5	145.0	160.3	222.8	201.2	233.5	202.1	239.3	245.7	834.8	-	-	-
Environmental sciences	3,429.2	3,971.1	4,267.7	4,018.6	3,470.1	4,205.1	4,202.9	4,147.4	4,142.6	4,513.3	4,426.4	2.2	-2.0	2.5
Atmospheric sciences	1,219.9	1,579.9	1,415.8	1,359.7	991.3	1,493.8	1,508.2	1,532.2	722.2	733.0	797.6	-	-	-
Geological sciences	1,042.8	1,180.2	819.5	772.7	551.2	612.9	531.1	538.5	206.0	212.6	268.8	-	-	-
Oceanography	820.4	566.6	862.8	885.2	772.9	691.7	730.0	718.5	705.3	728.6	831.1	-	-	-
Other environmental sciences	346.1	644.5	1,169.5	1,001.0	1,154.6	1,406.7	1,433.6	1,358.3	2,509.0	2,838.9	2,528.9	-	-	-
Life sciences	13,927.2	16,431.6	23,031.7	32,271.5	35,241.2	29,177.9	30,262.9	31,631.8	33,552.0	34,065.9	37,351.6	5.2	4.3	0.6
Agricultural sciences	1,090.6	932.5	1,147.4	1,255.4	1,176.4	1,257.9	1,211.7	1,255.8	1,201.7	1,285.6	1,240.8	-	-	-
Biological sciences (excluding environmental biology)	6,537.3	6,852.3	13,769.2	15,318.5	17,890.1	14,138.4	15,036.9	15,362.1	16,169.5	16,818.2	17,712.3	-	-	-
Environmental biology	540.0	1,122.6	948.7	802.0	848.5	780.4	744.3	726.9	836.6	821.9	792.2	-	-	-
Medical sciences	5,334.9	6,917.4	5,722.8	12,462.3	12,135.7	10,562.9	10,726.8	11,736.8	12,302.3	12,250.8	14,213.6	-	-	-
Other life sciences	424.5	607.0	1,443.5	2,433.3	3,190.6	2,438.3	2,543.2	2,550.2	3,041.8	2,889.4	3,392.8	-	-	-
Physical sciences	6,007.4	5,952.0	6,138.5	6,303.0	6,101.4	6,202.6	6,332.6	6,107.0	7,148.0	8,730.1	7,395.6	0.2	-0.1	1.9
Astronomy	941.9	1,063.6	1,128.6	1,015.3	581.9	1,172.1	1,177.4	1,199.2	804.7	1,408.2	765.3	-	-	-
Chemistry	1,201.4	1,201.3	1,571.3	1,373.9	1,362.1	922.0	943.3	899.3	1,016.9	1,001.0	1,004.7	-	-	-
Physics	3,556.7	3,410.1	3,083.8	3,489.3	3,606.4	2,896.5	3,524.3	3,410.9	3,211.6	3,064.7	3,141.9	-	-	-
Other physical sciences	307.5	277.1	354.7	424.5	551.0	1,212.1	687.6	597.5	2,114.7	3,256.2	2,483.6	-	-	-

Table SRD-8

## Federal obligations for research, by detailed S&amp;E field: Selected years, FYs 1990–2020

(Millions of current and constant 2012 dollars, percent share by field, and annual growth rates)

S&E field	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	Average annual growth rate		
												1990–2000	2000–10	2010–20
Psychology	707.6	866.2	2,085.5	2,170.5	2,240.3	1,900.6	1,909.0	1,931.1	2,110.4	2,449.0	2,877.3	11.4	0.7	2.5
Biological aspects	206.1	81.8	10.5	2.6	14.1	18.2	18.7	9.7	18.0	15.6	11.9	-	-	-
Social aspects	279.9	217.4	71.8	53.5	77.4	55.7	52.9	52.3	43.9	46.9	36.7	-	-	-
Other psychological sciences	221.6	566.9	2,003.2	2,114.3	2,148.6	1,826.6	1,837.4	1,869.2	2,048.3	2,386.4	2,828.7	-	-	-
Social sciences	993.7	944.2	1,346.7	1,258.7	1,244.3	1,082.6	1,158.5	953.1	942.7	1,027.8	999.0	3.1	-0.8	-2.2
Anthropology	22.7	30.2	20.4	20.7	25.7	28.5	29.7	29.8	31.5	31.0	17.0	-	-	-
Economics	311.0	287.3	319.9	247.7	284.8	320.9	350.3	272.9	256.1	262.3	178.0	-	-	-
Political science	20.7	31.0	29.0	37.5	14.8	15.2	13.8	16.3	9.8	12.6	11.0	-	-	-
Sociology	183.2	66.5	116.2	80.5	137.5	122.1	186.4	165.2	129.9	199.2	133.9	-	-	-
Other social sciences	456.1	529.1	861.3	872.4	781.5	595.8	578.1	469.0	515.3	522.6	659.2	-	-	-
Other sciences nec	1,046.9	1,254.6	1,487.4	2,396.6	2,871.8	3,142.9	3,268.3	4,194.7	3,457.6	3,917.5	5,070.6	3.6	6.8	5.9
Engineering	6,666.6	7,941.6	8,136.4	9,812.9	11,516.5	11,417.3	12,250.0	12,255.2	12,478.3	13,588.8	11,613.5	2.0	3.5	0.1
Aeronautical engineering	1,462.3	1,736.6	1,876.8	1,464.3	862.7	1,738.9	1,734.0	1,755.7	1,014.0	1,066.5	960.5	-	-	-
Astronautical engineering	916.1	760.3	660.3	566.9	405.2	629.4	614.5	604.4	721.7	737.9	804.5	-	-	-
Chemical engineering	381.5	342.4	251.9	325.6	529.7	356.9	352.3	280.5	627.9	403.9	692.3	-	-	-
Civil engineering	501.1	472.2	306.7	320.3	727.3	436.0	436.2	562.2	432.0	503.6	417.8	-	-	-
Electrical engineering	1,009.5	1,052.2	954.9	1,185.8	1,414.4	854.9	1,003.8	1,023.2	915.8	863.2	773.5	-	-	-
Mechanical engineering	423.2	573.9	370.9	371.4	377.9	308.3	353.4	417.4	451.8	560.4	459.2	-	-	-
Metallurgy and materials engineering	874.6	1,134.3	1,177.1	1,358.5	1,827.9	1,673.9	1,865.5	1,801.2	1,736.8	1,638.9	618.8	-	-	-
Other engineering	1,098.3	1,869.8	2,537.9	4,220.2	5,371.4	5,419.2	5,890.4	5,810.6	6,578.2	7,814.4	6,887.0	-	-	-
	Share by field (%)											Percent		
Total, all fields	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-	-	-
Computer sciences and mathematics	3.9	5.6	5.7	5.6	5.4	6.1	6.3	5.6	5.6	5.3	6.9	-	-	-
Computer sciences	2.6	3.6	4.3	4.0	3.7	4.1	4.2	3.9	3.9	3.6	5.0	-	-	-
Mathematics	1.1	0.9	1.1	1.3	1.3	1.6	1.7	1.3	1.4	1.4	0.8	-	-	-
Other computer sciences and mathematics	0.2	1.1	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	1.1	-	-	-
Environmental sciences	10.1	10.0	8.7	6.5	5.2	6.9	6.6	6.4	6.1	6.3	5.9	-	-	-
Atmospheric sciences	3.6	4.0	2.9	2.2	1.5	2.5	2.4	2.4	1.1	1.0	1.1	-	-	-
Geological sciences	3.1	3.0	1.7	1.3	0.8	1.0	0.8	0.8	0.3	0.3	0.4	-	-	-
Oceanography	2.4	1.4	1.7	1.4	1.2	1.1	1.2	1.1	1.0	1.0	1.1	-	-	-
Other environmental sciences	1.0	1.6	2.4	1.6	1.7	2.3	2.3	2.1	3.7	3.9	3.4	-	-	-
Life sciences	40.8	41.5	46.7	52.3	53.2	48.0	47.8	48.8	49.6	47.2	49.9	-	-	-
Agricultural sciences	3.2	2.4	2.3	2.0	1.8	2.1	1.9	1.9	1.8	1.8	1.7	-	-	-

Table SRD-8

## Federal obligations for research, by detailed S&amp;E field: Selected years, FYs 1990–2020

(Millions of current and constant 2012 dollars, percent share by field, and annual growth rates)

S&E field	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	Average annual growth rate		
												1990–2000	2000–10	2010–20
Biological sciences (excluding environmental biology)	19.2	17.3	27.9	24.8	27.0	23.3	23.7	23.7	23.9	23.3	23.6	-	-	-
Environmental biology	1.6	2.8	1.9	1.3	1.3	1.3	1.2	1.1	1.2	1.1	1.1	-	-	-
Medical sciences	15.6	17.5	11.6	20.2	18.3	17.4	16.9	18.1	18.2	17.0	19.0	-	-	-
Other life sciences	1.2	1.5	2.9	3.9	4.8	4.0	4.0	3.9	4.5	4.0	4.5	-	-	-
Physical sciences	17.6	15.0	12.4	10.2	9.2	10.2	10.0	9.4	10.6	12.1	9.9	-	-	-
Astronomy	2.8	2.7	2.3	1.6	0.9	1.9	1.9	1.8	1.2	2.0	1.0	-	-	-
Chemistry	3.5	3.0	3.2	2.2	2.1	1.5	1.5	1.4	1.5	1.4	1.3	-	-	-
Physics	10.4	8.6	6.3	5.7	5.4	4.8	5.6	5.3	4.7	4.2	4.2	-	-	-
Other physical sciences	0.9	0.7	0.7	0.7	0.8	2.0	1.1	0.9	3.1	4.5	3.3	-	-	-
Psychology	2.1	2.2	4.2	3.5	3.4	3.1	3.0	3.0	3.1	3.4	3.8	-	-	-
Biological aspects	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Social aspects	0.8	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	-	-	-
Other psychological sciences	0.6	1.4	4.1	3.4	3.2	3.0	2.9	2.9	3.0	3.3	3.8	-	-	-
Social sciences	2.9	2.4	2.7	2.0	1.9	1.8	1.8	1.5	1.4	1.4	1.3	-	-	-
Anthropology	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Economics	0.9	0.7	0.6	0.4	0.4	0.5	0.6	0.4	0.4	0.4	0.2	-	-	-
Political science	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Sociology	0.5	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.2	-	-	-
Other social sciences	1.3	1.3	1.7	1.4	1.2	1.0	0.9	0.7	0.8	0.7	0.9	-	-	-
Other sciences nec	3.1	3.2	3.0	3.9	4.3	5.2	5.2	6.5	5.1	5.4	6.8	-	-	-
Engineering	19.5	20.1	16.5	15.9	17.4	18.8	19.3	18.9	18.4	18.8	15.5	-	-	-
Aeronautical engineering	4.3	4.4	3.8	2.4	1.3	2.9	2.7	2.7	1.5	1.5	1.3	-	-	-
Astronautical engineering	2.7	1.9	1.3	0.9	0.6	1.0	1.0	0.9	1.1	1.0	1.1	-	-	-
Chemical engineering	1.1	0.9	0.5	0.5	0.8	0.6	0.6	0.4	0.9	0.6	0.9	-	-	-
Civil engineering	1.5	1.2	0.6	0.5	1.1	0.7	0.7	0.9	0.6	0.7	0.6	-	-	-
Electrical engineering	3.0	2.7	1.9	1.9	2.1	1.4	1.6	1.6	1.4	1.2	1.0	-	-	-
Mechanical engineering	1.2	1.5	0.8	0.6	0.6	0.5	0.6	0.6	0.7	0.8	0.6	-	-	-
Metallurgy and materials engineering	2.6	2.9	2.4	2.2	2.8	2.8	2.9	2.8	2.6	2.3	0.8	-	-	-
Other engineering	3.2	4.7	5.1	6.8	8.1	8.9	9.3	9.0	9.7	10.8	9.2	-	-	-

nec = not elsewhere classified.

**Note(s):**

Because of rounding, detail may not add to total.

**Source(s):**

National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, Volume 70, FYs 2020–21.

*Science and Engineering Indicators*