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R&D

Academic Research and Development

Supplemental Tables

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This publication is part of the *Science and Engineering Indicators* suite of reports. *Indicators* is a congressionally mandated report on the state of the U.S. science and engineering enterprise. It is policy relevant and policy neutral. *Indicators* is prepared under the guidance of the National Science Board by the National Center for Science and Engineering Statistics, a federal statistical agency within the National Science Foundation. With the 2020 edition, *Indicators* is changing from a single report to a set of disaggregated and streamlined reports published on a rolling basis. Detailed data tables will continue to be available online.

Supplemental Tables

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TABLE S5B-1

Current fund expenditures for research equipment at academic institutions, by R&D field: FYs 2004–18

(Millions of current dollars, millions of constant 2012 dollars, and percent distribution)

Field	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Current \$millions															
All fields	1,895	1,880	1,826	1,824	1,874	1,947	2,148	2,256	2,040	2,255	2,037	2,120	2,170	2,191	2,146
Science	1,501	1,441	1,383	1,395	1,439	1,472	1,603	1,627	1,430	1,547	1,337	1,504	1,520	1,538	1,510
Computer and information sciences	105	72	70	75	80	90	65	91	73	273	70	88	97	103	90
Geosciences, atmospheric sciences, and ocean sciences	126	123	123	136	144	126	151	115	121	116	116	126	111	107	95
Atmospheric science and meteorology	20	26	34	31	27	17	24	21	20	18	22	20	21	26	17
Geological and earth sciences	43	44	35	36	39	47	52	47	53	47	52	50	42	34	40
Ocean sciences and marine sciences	41	40	44	62	70	52	58	32	29	39	32	46	39	37	33
Geosciences, atmospheric sciences, and ocean sciences nec	22	13	10	7	9	11	17	15	19	12	10	11	9	10	6
Life sciences	836	826	752	737	796	786	908	928	817	747	736	818	845	849	875
Agricultural sciences	79	72	75	79	103	81	81	74	85	79	84	90	89	77	79
Biological and biomedical sciences	348	326	302	272	303	299	396	393	334	313	310	332	365	384	394
Health sciences	376	378	337	340	355	367	390	413	358	317	297	324	338	335	358
Natural resources and conservation	na	na	na	na	na	na	na	na	na	na	na	na	11	11	14
Life sciences nec	34	50	37	46	35	40	42	47	39	39	45	71	42	43	30
Mathematics and statistics	8	9	9	9	9	9	8	7	7	7	6	6	9	7	9
Physical sciences	339	325	329	310	302	333	364	380	331	329	344	398	389	402	384
Astronomy and astrophysics	25	23	20	29	27	29	24	26	28	20	26	54	36	40	31
Chemistry	118	113	122	113	114	136	162	156	133	118	119	120	125	121	121
Materials science	na	na	na	na	na	na	na	na	na	na	na	na	10	15	17
Physics	160	159	153	143	136	149	154	180	156	166	185	206	203	209	191
Physical sciences nec	36	30	34	25	25	20	24	18	14	25	14	17	16	17	23
Psychology	18	15	18	14	15	24	17	17	21	14	16	14	15	16	16
Social sciences	16	19	14	20	22	26	15	16	11	12	11	10	12	14	13
Anthropology	na	na	na	na	na	na	na	na	na	na	na	na	1	2	2
Economics	2	2	2	2	2	1	1	2	1	3	2	2	4	3	3
Political science and government	2	2	1	1	1	2	1	1	1	1	0	1	1	1	1
Sociology, demography, and population studies	2	3	2	3	2	5	2	2	1	2	2	3	2	2	1
Social sciences nec	9	12	8	15	16	18	10	10	7	7	7	4	4	6	6
Sciences nec	54	53	67	95	71	76	76	74	50	49	39	45	42	41	27
Engineering	394	439	443	428	435	475	511	572	552	663	654	564	611	612	594
Aerospace, aeronautical, and astronautical	21	20	22	22	34	27	35	34	33	35	29	35	44	38	31
Bioengineering and biomedical	19	29	25	27	28	32	40	53	45	47	37	44	53	53	67
Chemical	55	37	39	37	39	48	53	56	54	59	47	46	46	44	42
Civil	34	29	27	29	32	35	38	51	42	61	33	31	31	32	33
Electrical, electronic, and communications	81	91	94	92	88	98	114	139	136	161	113	120	113	130	126

TABLE S5B-1

Current fund expenditures for research equipment at academic institutions, by R&D field: FYs 2004–18

(Millions of current dollars, millions of constant 2012 dollars, and percent distribution)

Field	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Industrial and manufacturing	na	na	na	na	na	na	na	na	na	na	na	na	7	12	24
Mechanical	55	76	84	75	76	77	100	85	84	110	75	77	72	80	86
Metallurgical and materials	38	51	54	54	52	58	51	52	60	63	242	116	50	51	51
Engineering nec	91	106	98	92	85	101	81	101	98	128	78	96	195	172	135
Non-S&E	na	na	na	na	na	na	35	57	59	45	46	51	39	40	42
Business management and business administration	na	na	na	na	na	na	8	6	6	7	4	11	4	4	6
Communication and communications technologies	na	na	na	na	na	na	8	12	13	2	1	5	5	6	4
Education	na	na	na	na	na	na	7	11	7	6	7	6	8	8	6
Humanities	na	na	na	na	na	na	2	2	2	3	3	4	3	7	6
Law	na	na	na	na	na	na	0	0	0	0	0	0	0	1	0
Social work	na	na	na	na	na	na	0	1	0	0	0	0	0	0	0
Visual and performing arts	na	na	na	na	na	na	1	1	1	1	1	2	2	2	1
Non-S&E nec	na	na	na	na	na	na	9	25	28	25	28	23	17	13	17
2012 constant \$millions															
All fields	2,235	2,150	2,028	1,972	1,988	2,049	2,235	2,299	2,040	2,216	1,965	2,025	2,051	2,033	1,943
Science	1,770	1,648	1,535	1,509	1,526	1,549	1,668	1,658	1,430	1,520	1,290	1,437	1,437	1,427	1,367
Computer and information sciences	124	82	78	81	85	95	67	92	73	268	68	84	91	95	81
Geosciences, atmospheric sciences, and ocean sciences	148	141	137	147	153	133	158	117	121	114	112	121	105	99	86
Atmospheric science and meteorology	24	30	38	33	28	18	25	21	20	18	22	19	20	24	15
Geological and earth sciences	51	51	39	39	41	49	54	48	53	46	50	48	40	31	36
Ocean sciences and marine sciences	48	46	49	67	74	55	60	33	29	38	31	44	37	35	30
Geosciences, atmospheric sciences, and ocean sciences nec	25	15	11	7	9	11	18	16	19	12	9	11	9	9	5
Life sciences	987	944	835	796	844	828	945	946	817	734	710	781	799	788	792
Agricultural sciences	93	82	84	85	109	86	84	75	85	78	81	86	84	71	72
Biological and biomedical sciences	410	373	335	295	322	315	412	401	334	307	299	317	345	356	357
Health sciences	444	432	375	367	377	386	405	421	358	311	286	309	320	310	324
Natural resources and conservation	na	na	na	na	na	na	na	na	na	na	na	na	10	10	12
Life sciences nec	40	57	41	49	37	42	44	48	39	38	43	68	40	40	27
Mathematics and statistics	10	10	10	10	9	10	8	7	7	7	6	5	9	7	8
Physical sciences	399	372	366	336	321	351	379	387	331	323	332	380	367	373	348
Astronomy and astrophysics	29	26	22	32	29	31	25	26	28	19	25	52	34	37	28
Chemistry	139	129	135	122	121	143	169	159	133	116	115	115	118	113	109
Materials science	na	na	na	na	na	na	na	na	na	na	na	na	9	14	16
Physics	189	182	170	154	144	157	160	183	156	164	178	197	192	194	173
Physical sciences nec	43	34	38	27	26	21	25	18	14	25	14	16	15	16	21
Psychology	21	17	20	15	16	26	17	17	21	13	15	13	14	15	15

TABLE S5B-1

Current fund expenditures for research equipment at academic institutions, by R&D field: FYs 2004–18

(Millions of current dollars, millions of constant 2012 dollars, and percent distribution)

Field	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Social sciences	18	21	15	22	23	27	15	16	11	12	11	10	11	13	12
Anthropology	na	na	na	na	na	na	na	na	na	na	na	na	1	2	2
Economics	2	3	2	2	2	1	1	2	1	3	2	2	4	3	3
Political science and government	2	2	1	1	1	2	1	1	1	1	0	1	1	1	1
Sociology, demography, and population studies	3	3	3	3	2	5	2	2	1	2	2	3	2	1	1
Social sciences nec	11	14	9	16	17	19	11	11	7	7	6	4	4	6	5
Sciences nec	63	61	75	103	75	79	79	75	50	48	37	43	40	38	24
Engineering	465	502	492	463	462	500	531	583	552	652	631	539	577	568	538
Aerospace, aeronautical, and astronautical	25	23	25	24	36	28	36	35	33	35	28	33	41	35	28
Bioengineering and biomedical	22	33	28	29	30	33	41	54	45	46	36	42	50	49	61
Chemical	65	43	43	40	41	50	55	58	54	58	46	44	44	41	38
Civil	40	33	30	31	34	37	39	51	42	60	32	29	30	30	30
Electrical, electronic, and communications	96	104	105	100	94	103	119	142	136	158	109	115	106	120	114
Industrial and manufacturing	na	na	na	na	na	na	na	na	na	na	na	na	7	11	21
Mechanical	65	87	93	81	80	81	104	87	84	108	72	74	68	74	78
Metallurgical and materials	45	58	60	59	55	61	53	53	60	62	234	111	48	47	46
Engineering nec	107	121	109	99	90	106	84	103	98	126	75	91	184	160	122
Non-S&E	na	na	na	na	na	na	36	59	59	44	44	49	36	37	38
Business management and business administration	na	na	na	na	na	na	8	6	6	7	4	11	4	4	5
Communication and communications technologies	na	na	na	na	na	na	8	12	13	2	1	5	4	5	4
Education	na	na	na	na	na	na	7	11	7	6	7	6	7	7	6
Humanities	na	na	na	na	na	na	2	2	2	3	3	4	3	7	6
Law	na	na	na	na	na	na	0	0	0	0	0	0	0	1	0
Social work	na	na	na	na	na	na	0	1	0	0	0	0	0	0	0
Visual and performing arts	na	na	na	na	na	na	1	1	1	1	1	2	2	1	1
Non-S&E nec	na	na	na	na	na	na	10	26	28	25	27	22	16	12	16
Percent distribution															
All fields	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Science	79.2	76.6	75.7	76.5	76.8	75.6	74.6	72.1	70.1	68.6	65.6	71.0	70.1	70.2	70.4
Computer and information sciences	5.5	3.8	3.9	4.1	4.3	4.6	3.0	4.0	3.6	12.1	3.4	4.1	4.5	4.7	4.2
Geosciences, atmospheric sciences, and ocean sciences	6.6	6.5	6.8	7.4	7.7	6.5	7.0	5.1	5.9	5.2	5.7	6.0	5.1	4.9	4.5
Atmospheric science and meteorology	1.1	1.4	1.9	1.7	1.4	0.9	1.1	0.9	1.0	0.8	1.1	0.9	1.0	1.2	0.8
Geological and earth sciences	2.3	2.4	1.9	2.0	2.1	2.4	2.4	2.1	2.6	2.1	2.5	2.3	1.9	1.5	1.9
Ocean sciences and marine sciences	2.2	2.1	2.4	3.4	3.7	2.7	2.7	1.4	1.4	1.7	1.6	2.2	1.8	1.7	1.5
Geosciences, atmospheric sciences, and ocean sciences nec	1.1	0.7	0.5	0.4	0.5	0.6	0.8	0.7	0.9	0.5	0.5	0.5	0.4	0.5	0.3
Life sciences	44.1	43.9	41.2	40.4	42.5	40.4	42.3	41.1	40.0	33.1	36.1	38.6	38.9	38.8	40.8

TABLE S5B-1

Current fund expenditures for research equipment at academic institutions, by R&D field: FYs 2004–18

(Millions of current dollars, millions of constant 2012 dollars, and percent distribution)

Field	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Social work	na	na	na	na	na	na	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Visual and performing arts	na	na	na	na	na	na	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Non-S&E nec	na	na	na	na	na	na	0.4	1.1	1.4	1.1	1.4	1.1	0.8	0.6	0.8

na = not applicable; separate data for natural resources and conservation, materials science, anthropology, and industrial and manufacturing engineering were not collected before FY 2016, and capitalized equipment expenditures in non-S&E fields were not collected before FY 2010.

nec = not elsewhere classified.

Note(s)

Gross domestic product deflators come from the U.S. Bureau of Economic Analysis and are available at <https://www.bea.gov/national>, accessed August 2019. Because of rising capitalization thresholds, the dollar threshold for inclusion in the equipment category has changed over time. Generally, university equipment that costs less than \$5,000 would be classified under the cost category of "supplies." Detail may not add to total because of rounding.

Source(s)

National Center for Science and Engineering Statistics, National Science Foundation, Survey of R&D Expenditures at Universities and Colleges, and Higher Education Research and Development Survey (HERD).

Science and Engineering Indicators

TABLE S5B-2

Federal share of current funding for research equipment at academic institutions, by R&D field: FYs 2004–18

(Percent)

Field	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
All fields	61.9	62.6	59.6	58.0	56.4	54.4	62.9	62.4	55.9	54.9	44.6	46.5	44.5	45.5	43.7
Science	63.4	64.1	60.2	58.1	56.3	54.1	65.2	65.9	58.3	59.7	49.2	48.6	46.4	47.8	44.1
Computer and information sciences	80.5	79.3	72.5	70.1	78.2	76.3	71.0	73.4	67.6	86.4	68.8	75.1	54.1	61.5	60.4
Geosciences, atmospheric sciences, and ocean sciences	74.3	77.0	73.3	74.3	69.8	65.3	76.7	69.9	70.1	66.2	65.2	65.6	62.6	63.8	57.9
Atmospheric science and meteorology	80.1	88.3	87.7	87.7	84.6	75.0	82.7	79.0	83.6	83.9	79.6	80.9	85.2	92.0	76.9
Geological and earth sciences	67.1	67.6	64.1	64.4	53.6	61.2	68.3	66.4	68.2	63.2	60.2	56.4	51.4	54.7	46.2
Ocean sciences and marine sciences	79.5	79.0	68.4	74.8	74.7	66.6	80.2	66.2	60.4	63.3	66.3	74.0	67.1	58.7	63.6
Geosciences, atmospheric sciences, and ocean sciences nec	73.2	80.4	78.5	61.6	57.4	61.4	82.3	76.4	75.5	60.3	55.2	44.9	43.5	40.1	48.7
Life sciences	60.7	61.7	56.5	53.1	48.6	47.7	62.7	63.2	50.3	46.6	37.4	36.3	36.2	35.8	35.3
Agricultural sciences	39.5	42.5	36.1	30.1	27.4	27.8	30.8	38.5	34.0	31.1	24.0	25.9	23.3	20.3	20.4
Biological and biomedical sciences	63.2	62.5	59.5	56.0	53.7	56.4	70.9	67.8	54.1	52.6	43.0	40.5	41.1	41.1	41.3
Health sciences	62.7	66.4	58.2	53.7	49.6	44.9	61.7	62.9	50.0	44.7	36.9	38.2	35.7	35.4	33.1
Natural resources and conservation	na	na	na	na	na	na	na	na	na	na	na	na	35.7	30.8	18.7
Life sciences nec	60.9	47.9	58.1	71.0	56.2	48.5	56.4	66.2	57.2	45.8	28.0	21.7	25.3	21.4	29.3
Mathematics and statistics	72.9	75.4	69.2	74.8	68.7	63.4	66.5	64.7	68.7	68.8	51.1	55.3	50.7	50.8	49.3
Physical sciences	68.1	69.5	67.1	69.4	70.0	63.9	75.6	77.2	75.9	70.3	67.6	66.1	64.7	69.2	59.1
Astronomy and astrophysics	79.5	77.3	82.0	83.5	77.6	69.7	78.5	78.3	83.4	76.4	59.3	45.2	55.5	64.4	51.6
Chemistry	66.0	70.9	65.0	64.5	62.5	60.2	69.5	72.7	68.5	58.8	51.3	56.0	54.6	57.4	45.3
Materials science	na	na	na	na	na	na	na	na	na	na	na	na	45.3	63.5	56.7
Physics	71.4	73.1	73.0	76.2	78.8	66.1	81.6	81.6	80.9	77.7	79.8	78.0	73.6	79.0	73.0
Physical sciences nec	52.6	39.2	40.1	37.2	47.6	64.4	74.4	69.7	75.8	70.5	60.2	60.9	62.3	49.6	28.7
Psychology	71.7	63.1	68.5	61.1	58.6	60.4	70.6	73.5	69.1	38.6	46.8	57.1	51.3	39.3	50.6
Social sciences	41.1	35.3	34.1	54.5	57.9	66.9	45.8	48.9	46.2	41.6	29.7	25.4	23.7	16.2	16.4
Anthropology	na	na	na	na	na	na	na	na	na	na	na	na	44.0	25.9	33.3
Economics	34.5	39.7	29.7	39.9	37.7	22.5	44.9	31.7	49.6	71.7	28.9	7.7	8.4	6.7	5.3
Political science and government	71.8	56.9	54.2	49.2	30.9	41.3	50.9	41.2	46.7	41.2	38.0	24.1	13.0	11.8	26.1
Sociology, demography, and population studies	48.2	37.7	29.1	52.7	58.1	75.2	56.1	56.6	42.8	28.7	25.8	37.9	27.9	17.1	21.0
Social sciences nec	34.7	31.0	34.0	56.7	62.8	70.2	43.6	52.2	46.3	34.0	30.8	26.5	31.4	19.0	14.9
Sciences nec	20.1	25.6	32.5	25.9	30.3	24.6	20.2	28.3	27.2	32.2	33.3	18.9	25.8	25.2	21.1
Engineering	56.4	57.6	57.7	57.5	56.5	55.2	58.0	56.1	52.8	45.7	36.5	43.7	41.3	41.2	44.5
Aerospace, aeronautical, and astronautical	71.9	67.5	62.7	65.9	72.1	62.3	53.2	56.6	56.3	40.3	40.4	48.1	60.2	61.7	53.8
Bioengineering and biomedical	53.0	43.5	46.1	50.2	53.1	53.7	61.0	53.7	43.5	41.9	50.2	43.9	41.8	47.2	41.2
Chemical	32.4	53.9	57.7	50.9	46.6	44.6	50.0	55.0	45.8	31.1	41.3	45.8	44.7	33.8	37.8
Civil	60.9	58.0	46.1	47.7	49.5	40.8	43.2	39.0	37.1	29.4	36.1	41.3	35.4	35.0	33.9
Electrical, electronic, and communications	69.1	66.7	66.5	66.4	63.4	59.3	67.1	63.8	64.5	57.9	61.6	62.5	59.2	57.9	59.0
Industrial and manufacturing	na	na	na	na	na	na	na	na	na	na	na	na	69.2	49.8	67.6

TABLE S5B-2

Federal share of current funding for research equipment at academic institutions, by R&D field: FYs 2004–18

(Percent)

Field	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Mechanical	65.9	69.7	77.8	72.3	61.9	64.8	55.9	61.5	58.1	53.5	51.6	53.5	45.2	47.7	49.1
Metallurgical and materials	65.1	66.1	58.3	65.2	61.7	54.8	58.8	55.7	52.1	45.1	13.8	20.1	49.0	52.5	59.4
Engineering nec	45.2	40.3	36.9	37.7	43.5	52.8	60.2	51.3	46.4	41.6	45.5	38.8	22.2	18.4	22.7
Non-S&E	na	na	na	na	na	na	28.6	27.2	24.4	26.2	23.0	16.2	19.2	18.9	17.6
Business management and business administration	na	na	na	na	na	na	14.8	37.2	18.4	8.8	9.7	2.9	2.7	4.8	7.1
Communication and communications technologies	na	na	na	na	na	na	12.1	3.2	6.1	40.4	20.1	17.9	14.4	28.1	6.6
Education	na	na	na	na	na	na	65.7	70.1	46.8	60.4	63.8	33.6	25.7	34.9	20.5
Humanities	na	na	na	na	na	na	10.4	11.1	18.5	21.3	6.2	7.1	1.6	1.4	30.2
Law	na	na	na	na	na	na	4.0	82.4	18.9	42.3	9.3	14.8	38.1	33.9	10.1
Social work	na	na	na	na	na	na	19.6	75.2	56.6	55.5	45.2	14.5	50.4	35.8	32.7
Visual and performing arts	na	na	na	na	na	na	1.6	10.1	57.7	9.4	19.9	14.7	11.2	9.9	15.1
Non-S&E nec	na	na	na	na	na	na	34.4	16.8	26.3	23.3	16.5	19.5	25.4	19.5	18.3

na = not applicable; separate data for natural resources and conservation, materials science, anthropology, and industrial and manufacturing engineering were not collected before FY 2016, and capitalized equipment expenditures in non-S&E fields were not collected before FY 2010.

nec = not elsewhere classified.

Note(s)

Because of rising capitalization thresholds, the dollar threshold for inclusion in the equipment category has changed over time. Generally, university equipment that costs less than \$5,000 would be classified under the cost category of "supplies."

Source(s)

National Center for Science and Engineering Statistics, National Science Foundation, Survey of R&D Expenditures at Universities and Colleges, and Higher Education Research and Development Survey (HERD).

Science and Engineering Indicators