Table 1-9. Nobel Prizes awarded by field for selected countries, 1901-1974

Date	Total	United States	France	Germany[1]	U.S.S.R.	United Kingdom	Other
				Number of prizes in physics			
1901-1910	14	1	4	3	—	2	4
1911-1920	10	—	—	4	—	3	3
1921-1930	12	2	2	3	—	2	3
1931-1940	10	3	—	1	—	3	3
1941-1950	8	2	—	1	—	3	2
1951-1960	20	12	—	1	3	2	2
1961-1970	18	9	2	2	3	—	2
1971-1974	9	5	—	—	—	4	—
Total	101	34	8	15	6	19	19
				Number of prizes in chemistry			
1901-1910	10	—	1	5	—	2	2
1911-1920	8	1	3	3	—	—	1
1921-1930	10	—	—	4	—	3	3
1931-1940	12	2	2	4	—	1	3
1941-1950	11	4	—	3	—	1	3
1951-1960	13	5	—	1	1	5	1
1961-1970	15	4	—	2	—	6	3
1971-1974	7	4	—	1	—	1	1
Total	86	20	6	23	1	19	17
				Number of prizes in physiology/medicine			
1901-1910	12	—	1	4	2	1	4
1911-1920	6	1	1	—	—	—	4
1921-1930	11	1	1	1	—	2	6
1931-1940	13	4	—	3	—	3	3
1941-1950	17	8	—	—	—	3	6
1951-1960	19	12	—	1	—	2	4
1961-1970	26	13	3	1	—	6	3
1971-1974	9	4	—	—	—	1	4
Total	113	43	6	10	2	18	34

[1] Before 1946, includes East Germany.

SOURCE: The Nobel Foundation, *Les Prix Nobel,* annual series.

Table 1-12. Major technological innovations, by selected countries, 1953-73

Period	United States	United Kingdom	West Germany	Japan	France	Total
	Percentage of total					
1953-55	75	14	6	0	5	100
1956-58	82	9	5	0	5	100
1959-61	68	21	2	2	7	100
1962-64	66	17	5	12	0	100
1965-67	55	23	12	8	3	100
1968-70	57	19	8	13	4	100
1971-73	58	16	9	10	8	100
	Number of innovations					
1953-55	63	12	5	0	4	84
1956-58	36	4	2	0	2	44
1959-61	38	12	1	1	4	56
1962-64	55	14	4	10	0	83
1965-67	36	15	8	5	2	66
1968-70	45	15	6	10	3	79
1971-73	46	13	7	8	6	80

NOTE: Detail may not add to totals because of rounding.

SOURCE: Gellman Research Associates, Inc., *Indicators of International Trends in Technological Innovation*, 1975 (A study commissioned specifically for this report).

Table 1-13. Mean time in years between invention and innovation, for selected countries, 1953-73[1]

Period	United States	Japan	West Germany	France	United Kingdom
1953-62	8.4	(2)	5.5	7.5	5.1
1963-73	6.4	3.6	5.6	7.3	7.5

[1] Refers to the date of the innovation.
[2] Sample size does not allow calculation of the time interval.

SOURCE: Gellman Research Associates, Inc., *Indicators of International Trends in Technological Innovation*, 1975 (A study commissioned specifically for this report).

Table 1-15. U.S. receipts and payments for patents, manufacturing rights, licenses, etc., by country, 1960-74[1]
[Dollars in millions]

Year	Total	Western Europe	Japan	Developing nations	Other
1960					
Balance	$210	$105	$48	$25	$31
Receipts	248	140	48	26	33
Payments	38	35	0	1	2
1961					
Balance	201	94	50	25	32
Receipts	244	132	52	26	34
Payments	43	38	2	1	2
1962					
Balance	212	95	51	29	38
Receipts	256	133	53	30	40
Payments	44	38	2	1	2
1963					
Balance	222	98	57	30	37
Receipts	273	144	58	31	39
Payments	51	46	1	1	2
1964					
Balance	241	106	65	33	35
Receipts	301	162	66	34	38
Payments	60	56	1	1	3
1965					
Balance	268	128	65	35	40
Receipts	335	189	66	37	43
Payments	67	61	1	2	3
1966					
Balance	277	119	67	46	46
Receipts	353	186	70	50	48
Payments	76	67	3	4	2
1967					
Balance	289	97	91	48	54
Receipts	393	190	95	51	57
Payments	104	93	4	3	3
1968					
Balance	331	102	126	59	45
Receipts	437	196	130	63	49
Payments	106	94	4	4	4
1969					
Balance	366	115	151	56	44
Receipts	486	222	155	61	49
Payments	120	107	4	5	5
1970					
Balance	459	148	198	61	52
Receipts	573	247	202	68	56
Payments	114	99	4	7	4
1971					
Balance	495	158	219	67	51
Receipts	618	268	223	71	56
Payments	123	110	4	4	5
1972					
Balance	516	150	234	74	58
Receipts	655	270	240	80	65
Payments	139	120	6	6	7
1973					
Balance	549	160	261	71	58
Receipts	725	306	274	81	65
Payments	176	146	13	10	7
1974 (preliminary)					
Balance	601	200	241	91	69
Receipts	781	348	249	107	77
Payments	180	148	8	16	8

[1] Represents U.S. receipts and payments arising out of agreements by U.S. residents with residents or governments of foreign countries to sell or buy outright or provide or be provided with the use of intangible assets or rights such as patents, techniques, processes, formulae, designs, trademarks, copyrights, franchises, manufacturing rights, and other similar intangible property or rights. Excludes fees and royalties connected with U.S. and foreign direct investments and excludes film rentals.

NOTE: Detail may not add to totals because of rounding.

SOURCE: Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, June 1975.

Table 1-18. Unit labor cost[1] in manufacturing industries, by selected countries, 1960-74 (Index, 1960 = 100)

Year	United States	Japan	France	West Germany	United Kingdom
1960	100.0	100.0	100.0	100.0	100.0
1961	100.6	102.8	105.2	105.9	106.9
1962	99.1	112.5	110.7	112.6	109.8
1963	98.4	116.3	115.5	114.2	108.9
1964	98.2	115.3	118.2	114.2	108.8
1965	97.0	124.7	120.4	117.3	115.6
1966	100.0	124.8	119.6	123.0	121.0
1967	105.0	121.8	122.7	122.4	119.0
1968	107.5	125.7	124.9	120.6	119.5
1969	111.7	128.9	127.5	124.2	127.4
1970	118.9	135.8	136.1	139.5	144.9
1971	118.9	151.8	144.8	151.7	158.0
1972	118.8	162.6	151.7	159.2	171.5
1973	120.6	171.3	162.8	168.7	181.7
1974 (est.)	131.2	220.1	180.7	187.5	216.9

[1] In national currency unadjusted for inflation.

SOURCE: P. Capdevielle and A. Neef, "Productivity and Unit Labor Costs in the United States and Abroad", *Monthly Labor Review*, July 1975.

Table 1-19. U.S. trade balance in R&D-intensive and non-R&D-intensive manufactured products, 1960-74 (Dollars in millions)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
R&D-intensive															
Balance	5,891	6,237	6,720	6,958	7,970	8,177	8,020	8,817	9,755	10,471	11,722	11,727	11,012	15,101	23,612
Export	7,597	8,018	8,715	8,975	10,267	11,107	12,203	13,407	15,312	16,955	19,274	20,228	22,003	29,088	41,115
Import	1,706	1,781	1,995	2,017	2,297	2,930	4,183	4,590	5,537	6,484	7,552	8,501	10,991	13,987	17,503
Non R&D-intensive															
Balance	-179	-12	-691	-765	-678	-2,027	-3,325	-3,729	-6,581	-6,698	-8,285	-11,698	-15,039	-15,370	-16,296
Export	4,962	4,730	4,940	5,284	6,121	6,281	6,913	7,437	8,506	9,830	10,069	10,215	11,737	15,643	22,412
Import	5,141	4,742	5,631	6,049	6,799	8,308	10,238	11,166	15,087	16,528	18,354	21,913	26,776	31,013	38,708

SOURCE: U.S. Department of Commerce, Domestic and International Business Administration, *Overseas Business Reports*, April 1975 and April 1972.

Table 2-1. National R&D expenditures, 1960-74
[Dollars in billions]

Year	Current dollars	Constant dollars[1]
1960	$13.6	$15.4
1961	14.3	16.1
1962	15.4	17.1
1963	17.1	18.8
1964	18.9	20.4
1965	20.1	21.3
1966	21.9	22.6
1967	23.2	23.2
1968	24.7	23.7
1969	26.7	23.6
1970	26.0	22.6
1971	25.7	22.2
1972	28.4	22.9
1973	30.4	23.2
1974 (est.)	32.0	22.1

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

SOURCE: National Science Foundation, *National Patterns of R&D Resources, 1953-75* (NSF 75-307).

Table 2-2. Scientists and engineers[1] employed in R&D, by sector, 1961-74
[In thousands]

Yearly average	Total	Federal Government	Industry	Universities and colleges	FFRDC's[2]	Other nonprofit institutions
1961	425.7	51.1	312.0	42.4	9.1	11.1
1965	494.1	61.8	348.4	53.4	11.1	19.4
1968	550.4	68.1	381.9	66.0	11.2	23.2
1969	558.2	69.9	385.6	66.3	11.6	22.8
1970	549.5	69.8	375.4	68.5	11.5	24.3
1971	529.7	66.5	358.3	68.4	11.5	25.0
1972	521.5	65.2	352.6	66.5	12.0	25.2
1973	523.1	62.3	359.2	64.6	12.4	24.6
1974 (est.)	527.8	65.0	359.5	66.8	12.1	24.4

[1] Full-time-equivalent basis, excluding those employed in State and local agencies, calculated as the yearly average. Graduate students are included.
[2] Federally Funded Research and Development Centers administered by universities.

SOURCE: National Science Foundation, *National Patterns of R&D Resources, 1953-75* (NSF 75-307).

Table 2-4. National expenditures for R&D by source, 1960-74
[Dollars in millions]

Year	Total	Federal government	Industry	Universities and colleges	Other nonprofit institutions
			Current dollars		
1960	$13,551	$8,752	$4,508	$149	$142
1961	14,346	9,264	4,749	165	168
1962	15,426	9,926	5,114	185	201
1963	17,093	11,219	5,449	207	218
1964	18,894	12,553	5,880	235	226
1965	20,091	13,033	6,539	267	252
1966	21,894	13,990	7,317	303	284
1967	23,205	14,420	8,134	345	306
1968	24,669	14,952	8,997	391	329
1969	25,686	14,914	9,998	420	354
1970	26,047	14,764	10,434	461	388
1971	26,745	14,982	10,817	529	417
1972	28,402	15,875	11,508	576	443
1973	30,427	16,472	12,880	604	471
1974 (est.)	32,045	16,955	13,916	683	491
			Constant 1967 dollars[1]		
1960	$15,427	$9,964	$5,132	$170	$162
1961	16,124	10,412	5,338	185	189
1962	17,147	11,034	5,685	206	223
1963	18,756	12,310	5,979	227	239
1964	20,410	13,561	6,352	254	244
1965	21,310	13,824	6,936	283	267
1966	22,594	14,438	7,551	313	293
1967	23,205	14,420	8,134	345	306
1968	23,717	14,376	8,650	376	316
1969	23,560	13,680	9,171	385	325
1970	22,648	12,837	9,072	401	337
1971	22,249	12,463	8,998	440	347
1972	22,857	12,776	9,261	464	357
1973	23,186	12,552	9,815	460	359
1974 (est.)	22,143	11,716	9,616	472	339

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *National Patterns of R&D Resources* (NSF 75-307).

Table 2-6. National R&D expenditures, by character of work, 1960-74
[Dollars in millions]

Year	Current dollars			Constant 1967 dollars[1]		
	Basic research	Applied research	Development	Basic research	Applied research	Development
1960	$1,183	$3,057	$9,311	$1,347	$3,480	$10,600
1961	1,378	3,115	9,853	1,549	3,501	11,075
1962	1,695	3,727	10,004	1,884	4,143	11,120
1963	1,974	3,825	11,294	2,166	4,197	12,392
1964	2,301	4,238	12,355	2,486	4,578	13,347
1965	2,572	4,470	13,049	2.728	4,741	13,841
1966	2,825	4,747	14,322	2,915	4,899	14,780
1967	3,029	4,968	15,208	3,029	4,968	15,208
1968	3,286	5,356	16,027	3,159	5,150	15,409
1969	3,378	5,533	16,775	3,099	5,075	15,387
1970	3,548	5,892	16,607	3,085	5,123	14,440
1971	3,544	6,047	17,154	2,948	5,030	14,270
1972	3,705	6,272	18,425	2,982	5,047	14,828
1973	3,800	6,839	19,788	2,896	5,211	15,079
1974 (est.)	3,991	7,460	20,594	2,758	5,155	14,230

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

SOURCE: National Science Foundation, *National Patterns of R&D Resources, 1953-75 (NSF 75-307).*

Table 2-7b. Applied research expenditures by source, 1960-74
[Dollars in millions]

Year	Total	Federal Government	Industry	Universities and colleges	Other nonprofit institutions
	Current dollars				
1960	$3,057	$1,725	$1,228	$66	$38
1961	3,115	1,804	1,197	69	45
1962	3,727	2,127	1,473	70	57
1963	3,825	2,205	1,487	72	61
1964	4,238	2,503	1,596	77	62
1965	4,470	2,653	1,658	88	71
1966	4,747	2,729	1,844	89	85
1967	4,968	2,874	1,895	102	97
1968	5,356	3,020	2,132	97	107
1969	5,533	2,982	2,327	105	119
1970	5,892	3,258	2,406	98	130
1971	6,047	3,313	2,476	115	143
1972	6,272	3,387	2,601	132	152
1973	6,839	3,670	2,835	158	176
1974 (est.)	7,460	3,992	3,080	214	174
	Constant 1967 dollars[1]				
1960	$3,480	$1,964	$1,398	$75	$43
1961	3,502	2,028	1,345	78	51
1962	4,142	2,364	1,637	78	63
1963	4,197	2,419	1,632	79	67
1964	4,578	2,704	1,724	83	67
1965	4,741	2,814	1,759	93	75
1966	4,899	2,816	1,903	92	88
1967	4,968	2,874	1,895	102	97
1968	5,150	2,904	2,050	93	103
1969	5,074	2,735	2,134	96	109
1970	5,123	2,833	2,092	85	113
1971	5,031	2,756	2,060	96	119
1972	5,047	2,726	2,093	106	122
1973	5,211	2,797	2,160	120	134
1974 (est.)	5,154	2,758	2,128	148	120

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

SOURCE: National Science Foundation, *National Patterns of R&D Resources*, (NSF 75-307).

Table 2-8. Federal expenditures[1] for research, development and R&D plant, as a percent of total Federal outlays, and as a percent of the relatively controllable portion of the Federal outlays, 1960-74

Year	Federal R&D expenditures[2]	Total Federal outlays[2]	Expenditures as a percent of total Federal outlays	Expenditures as a percent of controllable outlays
1960	$ 7.7	$ 92.2	8.4	NA
1961	9.3	97.8	9.5	NA
1962	10.4	106.8	9.7	NA
1963	12.0	111.3	10.8	NA
1964	14.7	118.6	12.4	NA
1965	14.9	118.4	12.6	NA
1966	16.0	134.7	11.9	NA
1967	16.9	158.3	10.7	16.4
1968	17.0	178.8	9.5	14.7
1969	16.4	184.5	8.9	14.6
1970	15.7	196.6	8.0	13.7
1971	16.0	211.4	7.6	14.0
1972	16.7	231.9	7.2	13.9
1973	17.5	246.5	7.1	15.1
1974 (est.)	18.6	274.7	6.8	14.8

[1] Reported by Federal agencies.
[2] In billions of current dollars.

NOTE: NA = not available.

SOURCE: National Science Foundation, *Federal Funds for Research, Development, and Other Scientific Activities*, Vol. XXIII (NSF 74-320) and earlier volumes.

Table 2-9. Federal obligations for R&D, by major function, 1969-74
[Dollars in millions]

Function	1969	1970	1971	1972	1973	1974 (est.)
	Current dollars					
Total	$15,641	$15,340	$15,564	$16,512	$16,821	$17,743
National defense	8,354	7,976	8,106	8,898	8,998	9,180
Space	3,732	3,510	2,893	2,714	2,601	2,510
Total civilian R&D	3,556	3,855	4,564	4,900	5,222	6,055
	Constant 1967 dollars[1]					
Total	$14,347	$13,338	$12,947	$13,288	$12,818	$12,260
National defense	7,663	6,935	6,743	7,161	6,857	6,343
Space	3,423	3,052	2,407	2,184	1,982	1,734
Total civilian R&D	3,262	3,352	3,797	3,943	3,979	4,184

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *An Analysis of Federal R&D Funding by Function, 1969-75* (NSF 74-313).

Table 2-11. Federal obligations for civilian R&D, by character of work, 1970 and 1974
[Dollars in millions]

Character	1970	1974 (est.)
	Current dollars	
Total R&D	$3,845.6	$6,040.9
Basic research	1,200.1	1,636.8
Applied research	1,671.4	2,733.5
Development	974.1	1,670.6
	Constant 1967 dollars[1]	
Total R&D	$3,343.8	$4,174.2
Basic research	1,043.5	1,131.0
Applied research	1,453.3	1,888.8
Development	847.0	1,154.4

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

SOURCE: National Science Foundation, special tabulations.

Table 2-12. Proportion of NSF and NIH[1] research project grant funds allocated for permanent laboratory equipment, fiscal years 1966-74
[Percent]

Year	NSF	NIH
1966	11.2	11.7
1967	8.6	11.8
1968	7.5	9.5
1969	7.0	7.5
1970	6.1	5.9
1971	6.3	6.2
1972	5.6	6.6
1973	5.5	4.9
1974	5.4	5.7

[1] Includes the National Cancer Institute, the National Institute of General Medical Sciences, and the National Heart and Lung Institute.

SOURCE: National Science Foundation, *Databook,* annual series, and National Institutes of Health, unpublished data.

Table 2-13. NSF obligations for permanent laboratory equipment, 1966-74
[Dollars in millions]

Year	Current dollars	Constant 1967 dollars[1]
1966	$17.6	$18.2
1967	14.4	14.4
1968	12.8	12.3
1969	12.3	11.3
1970	9.9	8.6
1971	11.0	9.2
1972	13.6	10.9
1973	14.7	11.2
1974	15.2	10.5

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

SOURCE: National Science Foundation, *Databook,* annual series.

Table 2-14. Federal expenditures for R&D plant, 1960-74
[Dollars in millions]

Year	Current dollars	Constant 1967 dollars[1]
1960	$528.3	$596.9
1961	548.5	609.4
1962	779.1	857.1
1963	1,168.3	1,269.9
1964	1,098.5	1,177.4
1965	1,077.4	1,134.1
1966	1,047.8	1,081.3
1967	786.1	786.1
1968	715.9	691.7
1969	652.2	603.9
1970	578.9	508.3
1971	612.7	511.4
1972	564.4	454.4
1973	638.0	494.6
1974 (est.)	894.1	640.9

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

SOURCE: National Science Foundation, *Federal Funds for Research, Development and Other Scientific Activities,* Vol. XXIII (NSF 74-320-A) and earlier volumes.

Table 2-17. Federal obligations for scientific and technical information activities compared with total Federal R&D obligations, 1960-74

Year	Obligations for scientific and technical information activities (in millions)		Ratio of these obligations to total Federal R&D obligations
	Current dollars	Constant 1967 dollars[1]	
1960	$ 76	$ 87	.010
1961	92	103	.010
1962	129	143	.013
1963	165	181	.013
1964	203	219	.014
1965	225	239	.015
1966	278	287	.018
1967	324	324	.020
1968	359	345	.023
1969	362	332	.023
1970	387	336	.025
1971	398	331	.026
1972	419	337	.025
1973	438	334	.026
1974 (est.)	468	323	.026

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

SOURCE: National Science Foundation, *Federal Funds for Research, Development and Other Scientific Activities, Fiscal Years 1973, 1974 and 1975,* Vol. XXIII (NSF 75-320-A) and earlier volumes.

Table 3-1. Basic research expenditures, 1960-74
[Dollars in millions]

Year	Current dollars	Constant 1967 dollars[1]
1960	$1,183	$1,347
1961	1,378	1,549
1962	1,695	1,884
1963	1,974	2,166
1964	2,301	2,486
1965	2,572	2,728
1966	2,825	2,915
1967	3,029	3,029
1968	3,286	3,159
1969	3,378	3,099
1970	3,548	3,085
1971	3,544	2,948
1972	3,705	2,982
1973	3,800	2,896
1974(est.)	3,991	2,758

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

SOURCE: National Science Foundation, *National Patterns of R&D Resources*, 1953-75 (NSF 75-307).

Table 3-3. Basic research expenditure, by source 1960-74
[Dollars in millions]

Year	Total	Federal Government	Industry	Universities and colleges[1]	Nonprofit institutions
			Current dollars		
1960	$1,183	$ 693	$331	$ 72	$ 87
1961	1,378	841	350	85	102
1962	1,695	1,091	382	102	120
1963	1,974	1,310	414	121	129
1964	2,301	1,595	424	144	138
1965	2,572	1,817	448	164	143
1966	2,825	1,986	496	196	147
1967	3,029	2,173	477	223	156
1968	3,286	2,327	518	276	165
1969	3,378	2,386	519	298	175
1970	3,548	2,469	536	350	193
1971	3,544	2,379	556	400	209
1972	3,705	2,528	528	428	221
1973	3,800	2,605	561	416	218
1974(est.)	3,991	2,724	594	434	239
			Constant 1967 dollars[2]		
1960	$1,347	$ 789	$377	$ 82	$ 99
1961	1,549	945	393	96	115
1962	1,884	1,213	425	113	133
1963	2,166	1,437	454	133	142
1964	2,486	1,723	458	156	149
1965	2,728	1,927	475	174	152
1966	2,915	2,050	512	202	152
1967	3,029	2,173	477	223	156
1968	3,159	2,237	498	265	159
1969	3,098	2,189	476	273	161
1970	3,086	2,147	466	304	168
1971	2,947	1,979	463	333	174
1972	2,981	2,034	425	344	178
1973	2,895	1,985	427	317	166
1974(est.)	2,757	1,882	410	300	182

[1] Includes State and local government sources.
[2] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *National Patterns of R&D Resources, 1953-75* (NSF 75-307).

Table 3-5. Federal obligations for basic research, by agency, 1960-74
[Dollars in millions]

Agency	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974 (est.)
								Current dollars							
Total	$610	$825	$1,106	$1,389	$1,567	$1,690	$1,840	$2,004	$2,056	$2,077	$2,042	$2,132	$2,411	$2,420	$2,569
Department of Agriculture	34	41	50	56	68	90	94	100	100	107	116	118	137	143	150
Department of Defense	168	173	204	231	241	263	262	284	263	276	247	262	270	258	253
Department of Health, Education and Welfare	103	137	190	236	274	303	326	372	397	371	388	397	461	458	588
Atomic Energy Commission	104	167	192	219	238	258	281	302	282	285	287	277	268	275	286
National Aeronautics and Space Administration[1]	97	190	316	447	524	528	559	603	656	678	637	680	768	769	734
National Science Foundation	68	77	104	141	155	171	223	239	252	248	245	273	368	392	421
All other Federal agencies	35	39	50	59	66	77	95	104	106	112	122	125	138	125	138
								Constant 1967 dollars[2]							
Total	$694	$927	$1,229	$1,524	$1,693	$1,793	$1,899	$2,004	$1,977	$1,905	$1,775	$1,774	$1,940	$1,844	$1,775
Department of Agriculture	39	46	56	61	73	95	97	100	96	98	101	98	110	109	104
Department of Defense	191	194	227	253	260	279	270	284	253	253	215	218	217	197	175
Department of Health, Education and Welfare	117	154	211	259	296	321	336	372	382	340	337	330	371	349	406
Atomic Energy Commission	118	188	213	240	257	274	290	302	271	261	250	230	216	210	198
National Aeronautics and Space Administration[1]	110	214	351	490	566	560	577	603	631	622	554	566	618	586	507
National Science Foundation	77	87	116	155	167	181	230	239	242	227	213	227	296	299	291
All other Federal agencies	40	44	56	65	71	82	98	104	102	103	106	104	111	95	95

[1] The large amounts reported by NASA for basic research are due to the substantial cost of support equipment such as spacecraft and launch vehicles peculiar to space exploration, and the statistical prorations of costs for tracking and data acquisition.
[2] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Federal Funds for Research, Development and other Scientific Activities, Fiscal Years 1973, 1974, and 1975.* Volume XXIII (NSF 74-320-A) and earlier volumes.

Table 3-6a. Fields and subfields of Federal obligations for basic research

Field of science	Illustrative subfields
Life sciences	Biological sciences: those which, apart from clinical medical and other medical sciences defined below, deal with the origin, development, structure, function, and interaction of living things.
	Clinical medical sciences: those concerned with the study of pathogenesis, diagnosis, or therapy of a particular disease or abnormal condition in living human subjects under controlled conditions.
	Other medical sciences: those concerned with the study of the causes, effects, prevention, or control of abnormal conditions in man or in his environment as they relate to health, except for the clinical aspects defined above.
	Other life sciences: multidisciplinary projects within the broad field and single discipline projects for which a separate field has not been assigned.
Environmental sciences	Atmospheric sciences: aeronomy, solar, weather modification, extraterrestrial atmospheres, and meteorology.
	Geological sciences: engineering geophysics, general geology, geodesy and gravity, geomagnetism, hydrology, inorganic geochemistry, isotopic geochemistry, organic geochemistry, laboratory geophysics, paleomagnetism, paleontology, physical geography and cartography, seismology and soil sciences.
	Oceanography: chemical oceanography, geological oceanography, physical oceanography, and marine geophysics.
	Other environmental sciences: multidisciplinary projects within the broad field and single discipline projects for which a separate field has not been assigned.
Mathematics	Algebra, analysis, applied mathematics, computer science, foundations and logic, geometry, numerical analysis, statistics, and topology.
Engineering	Aeronautical: aerodynamics.
	Astronautical: aerospace, and space technology.
	Chemical: petroleum, petroleum refining, and process.
	Civil: architectural, hydraulic, hydrologic, marine, sanitary and environmental, structural, and transportation.
	Electrical: communication, electronic, and power.
	Mechanical: engineering mechanics.
	Metallurgy and materials: ceramic, mining, textile, and welding.
	Other engineering: multidisciplinary projects within the broad field and single discipline projects for which a separate field has not been assigned, such as agricultural, industrial and management, nuclear, ocean engineering, and systems.

(Continued)

Table 3-7. Basic research expenditures in universities and colleges, by source, 1960-74
[Dollars in millions]

Year	Total	Federal Government	Industry	All other sources
	Current dollars			
1960	$ 433	$ 299	$24	$110
1961	536	382	25	129
1962	659	481	25	153
1963	814	610	25	179
1964	1,003	767	25	211
1965	1,138	879	26	233
1966	1,303	1,009	27	267
1967	1,457	1,124	31	302
1968	1,649	1,251	36	362
1969	1,707	1,275	39	393
1970	1,796	1,296	40	460
1971	1,914	1,349	46	519
1972	2,024	1,419	51	554
1973	2,058	1,461	58	539
1974(est.)	2,151	1,514	64	573
	Constant 1967 dollars[1]			
1960	$ 492	$ 340	$27	$125
1961	602	429	28	145
1962	733	535	28	170
1963	893	669	27	197
1964	1,084	829	27	228
1965	1,207	932	28	247
1966	1,345	1,041	28	275
1967	1,457	1,124	31	302
1968	1,586	1,203	35	348
1969	1,566	1,170	36	360
1970	1,562	1,127	35	400
1971	1,592	1,122	38	432
1972	1,629	1,142	41	445
1973	1,568	1,113	44	411
1974(est.)	1,486	1,046	44	396

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *National Patterns of R&D Resources, 1953-75* (NSF 75-307).

Table 3-8a. (Continued)

	Physics: acoustics, atomic and molecular, condensed matter, elementary particles, nuclear structure, optics, plasma
	Other physical sciences: multidisciplinary projects within physical sciences, and physical sciences disciplines not described above.
Environmental sciences	Atmospheric sciences: aeronomy, solar weather modification, meteorology, extra-terrestrial atmospheres
	Geological sciences: engineering geophysics, geology, geodesy, geomagnetism, hydrology, geochemistry, paleomagnetism, paleontology, physical geography, cartography, seismology, soil sciences
	Oceanography: chemical, geological, physical, marine geophysics, marine biology, biological oceanography
Mathematical sciences	Mathematics: algebra, analysis, applied mathematics, foundations and logic, geometry, numerical analysis, statistics, topology
	Computer sciences: design, development, and application of computer capabilities to data storage and manipulation, information science
Life sciences	Biological sciences: anatomy, biochemistry, biophysics, biogeography, ecology, embryology, entomology, genetics, immunology, microbiology, nutrition, parasitology, pathology, pharmacology, physical anthropology, physiology, botany, zoology
	Agricultural:[1] agricultural chemistry, agronomy, animal science, conservation, dairy science, plant science, range science, wildlife
	Clinical medical: anesthesiology, cardiology, endocrinology, gastroenterology, hematology, neurology, obstetrics, ophthamology, preventive medicine and community health, psychiatry, radiology, surgery, veterinary medicine, dentistry, pharmacy
	Other life sciences: multidisciplinary projects within life sciences
Psychology	Animal behavior, clinical, educational, experimental, human development and personality, social
Social sciences	Economics: econometrics, international, industrial, labor, agricultural, public finance and fiscal policy
	Political science: regional studies, comparative government, international relations, legal systems, political theory, public administration
	Sociology: comparative and historical, complex organizations, culture and social structure, demography, group interactions, social problems and welfare, theory
	Other social sciences: history, cultural anthropology, linguistics, socio-economic geography, research in education
Other sciences	Multidisciplinary and interdisciplinary research not classifiable under a single primary field.

[1] Included with biology prior to 1974.

SOURCE: National Science Foundation, *Expenditures for Scientific and Engineering Activities at Universities and Colleges, Fiscal Year 1973* (NSF 75-316).

Table 3-9. Estimated Federal basic research expenditures in universities and colleges, by field of science, 1964-74
[Dollars in millions]

Field of science[1]	1964	1966	1968	1970	1972	1973	1974[2]
	Current dollars						
Total	$767	$1,009	$1,251	$1,296	$1,419	$1,461	$1,514
Engineering	105	151	181	185	196	203	175
Physical sciences	164	209	223	226	232	222	229
Astronomy	13	17	18	14	14	13	14
Chemistry	50	60	70	69	73	70	75
Physics	95	122	122	126	125	124	128
Other physical sciences	6	10	13	17	21	14	13
Environmental sciences	39	47	71	76	99	102	112
Mathematical sciences	21	26	34	42	41	40	43
Life sciences	371	472	584	605	652	692	752
Biological	126	160	204	215	249	285	283
Clinical medical	218	279	345	352	372	377	433
Other life sciences	27	33	35	38	31	30	36
Psychology	24	30	39	41	54	53	56
Social sciences	37	53	82	82	91	99	105
Other sciences	5	21	37	41	54	49	42
	Constant 1967 dollars[3]						
Total	$829	$1,041	$1,203	$1,127	$1,142	$1,113	$1,046
Engineering	113	156	174	161	158	155	121
Physical sciences	177	216	214	197	187	169	158
Astronomy	14	18	17	12	11	10	10
Chemistry	54	62	67	60	59	53	52
Physics	103	126	117	110	101	94	88
Other physical sciences	6	10	12	15	17	11	9
Environmental sciences	42	49	68	66	80	78	77
Mathematical sciences	23	27	33	37	33	30	30
Life sciences	401	487	561	526	525	527	520
Biological	136	165	196	187	200	217	196
Clinical Medical	235	288	332	306	299	287	299
Other life sciences	29	34	34	33	25	23	25
Psychology	26	31	37	36	43	40	39
Social sciences	40	55	79	71	73	75	73
Other sciences	5	22	36	36	43	37	29

[1] See table 3-8a for descriptions of these fields.
[2] Preliminary data.
[3] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, special tabulations.

Table 3-8. Estimated basic research expenditures in universities and colleges, by field of science, 1964-74
[Dollars in millions]

Field of science[1]	1964	1966	1968	1970	1972	1973	1974[2]
	Current dollars						
Total	$1,003	$1,303	$1,649	$1,796	$2,024	$2,058	$2,151
Engineering	128	185	223	230	265	273	252
Physical sciences	176	228	253	242	282	268	279
Astronomy	13	18	19	15	18	18	19
Chemistry	56	69	82	80	94	91	96
Physics	98	128	137	127	142	141	147
Other physical sciences	9	13	15	20	28	18	18
Environmental sciences	43	52	94	97	133	134	152
Mathematical sciences	23	28	40	51	54	53	57
Life sciences	534	670	804	928	969	1,010	1,092
Biological	238	315	370	414	414	462	482
Clinical medical	259	308	380	436	501	500	561
Other life sciences	36	48	54	78	56	48	47
Psychology	26	31	47	47	68	67	70
Social sciences	61	80	128	130	162	170	182
Other sciences	11	29	61	71	89	82	68
	Constant 1967 dollars[3]						
Total	$1,084	$1,345	$1,585	$1,562	$1,629	$1,568	$1,486
Engineering	138	191	214	200	213	208	174
Physical sciences	190	235	243	210	227	204	193
Astronomy	14	19	18	13	14	14	13
Chemistry	60	71	79	70	76	69	66
Physics	106	132	132	110	114	107	102
Other physical sciences	10	13	14	17	23	14	12
Environmental sciences	46	54	90	84	107	102	105
Mathematical sciences	25	29	38	44	43	40	39
Life sciences	577	691	773	807	780	770	755
Biological	257	325	356	360	333	352	333
Clinical medical	280	318	365	379	403	381	388
Other life sciences	39	50	52	68	45	37	32
Psychology	28	32	45	41	55	51	48
Social sciences	66	83	123	113	130	130	126
Other sciences	12	30	59	62	72	62	47

[1] See Table 3-8a for descriptions of these fields.
[2] Preliminary data.
[3] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, special tabulations.

Table 3-8a. Fields and subfields of R&D expenditures at colleges and universities

Field of science	Illustrative subfields
Engineering	Aeronautical, agricultural, chemical, civil, electrical, industrial, mechanical, metallurgical, mining, nuclear, petroleum, bio-and-biomedical, energy, textile, architecture
Physical sciences	Astronomy: astrophysics, optical and radio, X-ray, Gamma-ray, neutrino
	Chemistry: inorganic, organo-metallic, organic, physical, analytical, pharmaceutical, polymer science (excludes biochemistry)

Table 3-6a. (Continued)

Social sciences	Anthropology: archaeology, cultural and personality, social and ethnology, and applied anthropology.
	Economics: econometrics and economic statistics, history of economic thought, international economics, industrial, labor and agricultural economics, macroeconomics, microeconomics, public finance and fiscal policy, theory, and economic systems and development.
	History: cultural, political, social, and history and philosophy of science.
	Linguistics: anthropological-archaeological, computational, psycholinguistics, and sociolinguistics.
	Political science: area or regional studies, comparative government, history of political ideas, international relations and law, national political and legal systems, political theory, and public administration.
	Sociology: comparative and historical, complex organizations, culture and social structure, demography, group interactions, social problems and social welfare, and sociological theory.
	Other social sciences: multidisciplinary projects within the broad field and single discipline projects for which a separate field has not been assigned, such as research in law and education not elsewhere classified, and socioeconomic geography.
Psychology	Biological aspects: experimental psychology, animal behavior, clinical psychology, comparative psychology, and ethology.
	Social aspects: social psychology, educational, personnel, vocational psychology and testing, industrial and engineering psychology, and development and personality.
	Other psychological sciences: multidisciplinary projects within the broad field and single discipline projects for which a separate field has not been assigned.
Physical sciences	Astronomy: laboratory astrophysics, optical astronomy, radio astronomy, theoretical astrophysics, X-ray, Gamma-ray, and neutrino astronomy.
	Chemistry: inorganic, organo-metallic, organic, and physical.
	Physics: acoustics, atomic and molecular, condensed matter, elementary particles, nuclear structure, optics, and plasma..
	Other physical sciences: multidisciplinary projects within the broad field and single discipline projects for which a separate field has not been assigned.
Other sciences	Multidisciplinary and interdisciplinary projects that cannot be classified within one of the above broad fields of science.

SOURCE: National Science Foundation, *Federal Funds for Research, Development, and Other Scientific Activities, Fiscal Years 1973, 1974, and 1975.* Vol. XXIII (NSF 74-320).

Table 3-6. Federal obligations for basic research, by field of science, 1960-74
[Dollars in millions]

Field of science	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974 (est.)
								Current dollars							
All fields	$610	$825	$1,106	$1,389	$1,567	$1,690	$1,840	$2,004	$2,056	$2,077	$2,042	$2,132	$2,411	$2,420	$2,569
Life sciences	172	238	313	380	424	487	552	612	612	569	576	596	729	758	869
Biological	NA	NA	NA	232	268	328	378	418	418	433	428	450	576	645	728
Clinical medical[1]	NA	NA	NA	148	156	159	174	194	194	134	148	101	128	98	118
Other life sciences	NA	NA	NA	—	—	—	—	—	—	2	—	45	25	15	23
Environmental sciences	319	444	603	252	308	263	291	315	342	309	341	393	454	445	430
Physical sciences				515	566	639	667	713	731	819	704	743	783	796	830
Chemistry	NA	NA	NA	86	101	109	119	124	119	132	143	133	181	195	203
Physics	NA	NA	NA	269	271	327	351	381	389	398	353	387	379	389	400
Astronomy	NA	NA	NA	140	174	177	170	180	205	282	204	217	215	202	202
Other physical sciences	NA	NA	NA	20	20	26	27	28	18	7	4	6	8	10	25
Psychology	17	21	28	36	47	58	53	60	55	55	57	49	58	51	62
Mathematical and computer sciences	18	21	26	42	52	57	60	65	67	57	59	52	63	57	56
Engineering	76	82	116	137	135	147	168	178	185	185	234	220	235	206	209
Social sciences	8	11	18	25	34	37	44	57	61	72	65	70	80	78	91
Other sciences	(2)	8	2	2	2	2	4	4	4	11	4	10	9	28	22
								Constant 1967 dollars[3]							
All fields	$694	$927	$1,229	$1,524	$1,693	$1,793	$1,899	$2,004	$1,977	$1,905	$1,775	$1,774	$1,940	$1,844	$1,775
Life sciences	196	268	348	417	458	517	570	612	588	522	501	496	587	578	600
Biological	NA	NA	NA	255	290	348	390	418	402	397	372	374	464	492	503
Clinical medical[1]	NA	NA	NA	162	169	169	180	194	187	123	129	84	103	75	82
Other life sciences	NA	NA	NA	—	—	—	—	—	—	2	—	37	20	11	16
Environmental sciences	363	499	670	276	333	279	300	315	329	283	296	327	365	339	297
Physical sciences				565	611	678	688	713	703	751	612	618	630	607	574
Chemistry	NA	NA	NA	94	109	116	123	124	114	121	124	111	146	149	140
Physics	NA	NA	NA	295	293	347	362	381	374	365	307	322	305	296	276
Astronomy	NA	NA	NA	154	188	188	175	180	197	259	177	181	173	154	140
Other physical sciences	A	NA	NA	22	22	28	28	28	17	6	3	5	6	8	17
Psychology	19	24	31	39	51	62	55	60	53	50	50	41	47	39	43
Mathematical and computer sciences	20	24	29	46	56	60	62	65	64	52	51	43	51	43	39
Engineering	87	92	129	150	146	156	173	178	178	170	203	183	189	157	144
Social sciences	9	12	20	27	37	39	45	57	59	66	57	58	64	59	63
Other sciences	(2)	9	2	2	2	2	4	4	4	10	3	8	7	21	15

[1] Includes "other medical sciences".
[2] Less than $50,000.
[3] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: NA = not available.

SOURCE: National Science Foundation, *Federal Funds for Research, Development, and Other Scientific Activities, Fiscal Years 1973, 1974, and 1975.* Volume XXIII (NSF 74-320-A) and earlier volumes.

Table 3-4. Federal obligations for basic research as a percent of each agency's R&D obligations, by agency, 1960-74

Year	All agencies	USDA	DOD	HEW	AEC	NASA[1]	NSF	All other agencies
	Basic research as a percent of all R&D obligations							
1960	8	27	3	32	14	26	91	19
1961	9	29	3	32	20	24	92	19
1962	11	32	3	33	19	22	91	20
1963	11	33	3	36	20	16	92	20
1964	11	36	3	35	19	12	91	22
1965	12	40	4	35	21	11	91	22
1966	12	40	4	32	23	11	91	18
1967	12	40	4	32	24	12	91	15
1968	13	39	3	32	21	15	89	17
1969	13	41	4	29	20	17	91	15
1970	13	41	3	32	21	17	85	12
1971	14	39	3	27	21	21	81	9
1972	15	39	3	26	21	24	81	12
1973	14	39	3	25	20	25	82	10
1974(est.)	15	39	3	25	20	24	79	10
	Federal obligations for basic research (Current dollars in millions)							
1960	$ 610	$ 34	$168	$103	$104	$ 97	$ 68	$ 35
1961	825	41	173	137	167	190	77	39
1962	1,106	50	204	190	192	316	104	50
1963	1,389	56	231	236	219	447	141	59
1964	1,567	68	241	274	238	524	155	66
1965	1,690	90	263	303	258	528	171	77
1966	1,840	94	262	326	281	559	223	95
1967	2,004	100	284	372	302	603	239	104
1968	2,056	100	263	397	282	656	252	106
1969	2,077	107	276	371	285	678	248	112
1970	2,042	116	247	388	287	637	245	122
1971	2,132	118	262	397	277	680	273	125
1972	2,411	137	270	461	268	768	368	139
1973	2,420	143	258	458	275	769	392	125
1974(est.)	2,569	150	253	588	286	734	421	138
	Federal obligations for all R&D (Current dollars in millions)							
1960	$ 7,552	$126	$5,712	$ 320	$ 762	$ 369	$ 75	$ 189
1961	9,059	143	6,574	429	850	777	84	202
1962	10,290	157	6,723	577	1,029	1,439	114	251
1963	12,495	168	7,286	656	1,078	2,857	154	295
1964	14,225	189	7,262	777	1,236	4,287	170	305
1965	14,614	225	6,797	869	1,241	4,952	187	344
1966	15,320	235	7,024	1,014	1,212	5,050	244	541
1967	16,529	253	8,049	1,147	1,259	4,867	262	694
1968	15,921	254	7,709	1,252	1,369	4,429	284	625
1969	15,641	260	7,696	1,297	1,406	3,963	274	744
1970	15,340	281	7,360	1,221	1,346	3,800	289	1,043
1971	15,564	305	7,509	1,476	1,303	3,258	337	1,377
1972	16,512	350	8,318	1,751	1,298	3,157	455	1,183
1973	16,821	367	8,404	1,838	1,363	3,061	480	1,309
1974(est.)	17,743	386	8,599	2,347	1,431	3,026	530	1,425

[1] The large amounts reported by NASA for basic research are due to the substantial cost of support equipment such as spacecraft and launch vehicles peculiar to space exploration, and the statistical proration of costs for tracking and data acquisition.

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Federal Funds for Research, Development, and Other Scientific Activities, Fiscal Years 1973, 1974 and 1975.* Volume XXIII (NSF 74-320-A) and earlier volumes.

Table 3-2. Basic research expenditures, by performer, 1960-74
[Dollars in millions]

Year	Total	Universities and colleges	Federal Government	Industry	FFRDC's[1]	Nonprofit institutions
			Current dollars			
1960	$1,183	$ 433	$160	$376	$ 97	$117
1961	1,378	536	206	395	115	126
1962	1,695	659	251	488	136	161
1963	1,974	814	299	522	159	180
1964	2,301	1,003	364	549	191	194
1965	2,572	1,138	424	592	208	210
1966	2,825	1,303	445	624	227	226
1967	3,029	1,457	472	629	250	221
1968	3,286	1,649	502	642	276	217
1969	3,378	1,707	565	618	275	213
1970	3,548	1,796	646	629	269	208
1971	3,544	1,914	535	610	260	225
1972	3,705	2,024	607	579	250	245
1973	3,800	2,058	585	605	297	255
1974(est.)	3,991	2,151	635	640	291	274
			Constant 1967 dollars[2]			
1960	$1,347	$ 492	$182	$428	$110	$133
1961	1,549	602	232	444	129	142
1962	1,884	733	279	542	151	179
1963	2,165	893	328	573	174	197
1964	2,486	1,084	393	593	206	210
1965	2,729	1,207	450	628	221	223
1966	2,915	1,345	459	644	234	233
1967	3,029	1,457	472	629	250	221
1968	3,159	1,586	483	617	265	209
1969	3,098	1,566	518	567	252	195
1970	3,086	1,562	562	547	234	181
1971	2,947	1,592	445	507	216	187
1972	2,981	1,629	488	466	201	197
1973	2,895	1,568	446	461	226	194
1974(est.)	2,757	1,486	439	442	201	189

[1] Federally Funded Research and Development Centers administered by universities.
[2] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *National Patterns of R&D Resources, 1953-75* (NSF 75-307).

Table 2-18. Federal obligations for scientific and technical information activities, by agency, 1960-74

[Dollars in millions]

Agency	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974 (est.)
	Current dollars														
Total	$76	$92	$129	$165	$203	$225	$278	$324	$359	$362	$387	$398	$419	$438	$468
Dept. of Defense	16	23	38	53	84	99	119	139	155	147	145	141	150	161	158
Dept. of Health, Education and Welfare	10	12	24	27	24	24	37	53	60	65	66	73	68	67	82
Dept. of Commerce	23	27	28	31	33	37	42	46	47	52	60	69	78	85	93
Library of Congress	5	6	6	8	9	10	13	13	17	20	22	25	30	32	35
National Aeronautics and Space Administration	1	3	7	14	20	19	23	24	27	28	27	27	27	25	24
Dept. of the Interior	4	4	5	7	8	9	10	12	14	13	13	14	14	16	21
National Science Foundation	7	7	10	10	12	13	16	12	16	12	15	14	12	11	10
Dept. of Agriculture	4	4	4	4	5	6	6	14	8	9	10	10	11	13	13
Other agencies	6	6	7	11	8	8	12	11	15	16	29	25	29	28	32
	Constant 1967 dollars[1]														
Total	$87	$102	$144	$181	$221	$238	$286	$324	$344	$333	$335	$331	$338	$333	$324
Dept. of Defense	18	26	42	58	91	105	123	139	149	135	126	117	121	123	109
Dept. of Health, Education and Welfare	11	13	27	30	16	25	38	53	58	60	57	61	55	51	57
Dept. of Commerce	26	30	31	34	36	39	43	46	45	48	52	57	63	65	64
Library of Congress	6	7	7	9	10	11	13	13	16	18	19	21	24	24	24
National Aeronautics and Space Administration	1	3	8	15	22	20	24	24	26	26	23	22	22	19	17
Dept. of the Interior	5	4	6	8	9	10	10	12	13	12	11	12	11	12	15
National Science Foundation	8	8	11	11	13	14	17	12	15	11	13	12	10	8	7
Dept. of Agriculture	5	4	4	4	5	6	6	14	8	8	9	8	9	10	9
Other agencies	7	7	8	12	9	8	12	11	14	15	25	21	23	21	22

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Federal Funds for Research, Development and Other Scientific Activities, Fiscal Years 1973, 1974 and 1975.* Vol. XXIII (NSF 74-320-A) and earlier volumes.

Table 2-15. Federal obligations for R&D plant, by performer, 1962-74

[Dollars in millions]

Performer	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974 (est.)
	Current dollars												
Total	777.6	1,186.0	1,177.5	1,131.6	858.3	620.1	603.8	669.0	524.4	611.2	602.1	774.3	971.9
Federal intramural	619.9	974.4	974.5	913.0	629.0	239.0	294.2	260.4	166.0	200.0	246.6	323.8	409.5
Industry	NA	NA	NA	NA	NA	NA	81.7	141.7	102.3	167.4	142.4	221.8	339.1
Universities & colleges	NA	NA	97.5	141.6	162.9	111.7	98.1	61.9	56.1	49.2	45.3	42.6	49.2
FFRDC's (administered by universities)	NA	NA	36.0	50.2	31.1	138.8	101.7	176.6	169.0	178.7	130.4	162.3	134.1
Nonprofit institutions	NA	NA	NA	NA	NA	NA	20.9	25.8	28.8	5.8	30.0	18.8	36.2
	Constant 1967 dollars[1]												
Total	864.4	1,301.3	1,272.0	1,200.3	885.8	620.1	580.5	613.6	456.0	508.4	484.5	590.0	671.6
Federal intramural	689.1	1,069.1	1,052.7	968.4	649.1	239.0	282.9	238.0	144.3	166.4	198.5	246.7	283.0
Industry	NA	NA	NA	NA	NA	NA	78.6	130.0	88.9	139.3	114.6	169.0	234.3
Universities & colleges	NA	NA	105.3	150.2	168.1	111.7	94.3	56.8	48.8	40.9	36.5	32.5	34.0
FFRDC's (administered by universities)	NA	NA	38.9	53.2	32.1	138.8	97.8	162.0	146.9	148.7	104.9	123.7	92.7
Nonprofit institutions	NA	NA	NA	NA	NA	NA	20.1	23.7	25.0	4.8	24.1	14.3	25.0

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: NA = not available.

SOURCE: National Science Foundation, *Federal Funds for Research, Development and Other Scientific Activities*, Vol. XXIII (NSF 74-320-A) and earlier volumes.

Table 2-16. Federal obligations for R&D plant as a percent of Federal obligations for total R&D, by performer, 1962-74

Performer	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974 (est.)
	Percent												
Total	8	9	8	8	6	4	4	4	3	4	4	5	5
Federal intramural	30	43	34	30	20	7	8	7	4	5	6	7	8
Industry	NA	NA	NA	NA	NA	NA	1	2	1	2	2	3	4
Universities and colleges	NA	NA	9	12	12	8	7	4	4	3	2	2	2
FFRDC's (administered by universities)	NA	NA	6	8	5	21	14	24	23	25	17	22	17
Nonprofit institutions	NA	NA	NA	NA	NA	NA	3	4	4	1	4	2	4

NOTE: NA = not available.

SOURCE: National Science Foundation, *Federal Funds for Research, Development and Other Scientific Activities*, Vol. XXIII (NSF 74-320-A), and earlier volumes.

Table 2-10. Federal obligations for R&D by function, 1969 and 1974
[Dollars in millions]

Function	1969	1970	1971	1972	1973	1974 (est.)
	Current dollars					
National defense	$8,354	$7,976	$8,106	$8,898	$8,998	$9,180
Space	3,732	3,510	2,893	2,714	2,601	2,510
Health	1,111	1,111	1,319	1,564	1,592	2,085
Environment	321	359	475	547	678	738
Transportation and communication	461	593	782	617	625	689
Science and technology base	518	529	531	606	610	648
Natural resources	412	462	553	625	618	633
Energy development and conversion	328	317	324	383	442	574
Education	158	151	198	208	231	227
Income security & social services	93	102	123	115	151	131
Area & community development & housing	49	91	108	102	117	127
Economic growth & productivity	73	99	109	78	90	117
Crime prevention & control	5	9	10	25	35	52
International cooperation & development	27	32	32	30	33	34
	Constant 1967 dollars[1]					
National defense	$7,663	$6,935	$6,743	$7,161	$6,857	$6,343
Space	3,423	3,052	2,407	2,184	1,982	1,734
Health	1,019	966	1,097	1,259	1,213	1,441
Environment	294	312	395	440	517	510
Transportation and communication	423	516	651	497	476	476
Science and technology base	475	460	442	488	465	448
Natural resources	378	402	460	503	471	437
Energy development and conversion	301	276	270	308	337	397
Education	145	131	165	167	176	157
Income security & social services	85	89	102	93	115	91
Area & community development & housing	45	79	90	82	89	88
Economic growth & productivity	67	86	91	63	69	81
Crime prevention & control	5	8	8	20	27	36
International cooperation & development	25	28	27	24	25	23

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

SOURCE: National Science Foundation, *An Analysis of Federal R&D Funding by Function, 1969-75* (NSF 74-313).

Table 2-7c. Development expenditures by source, 1960-74
[Dollars in millions]

Year	Total	Federal Government	Industry	Universities and colleges	Other nonprofit institutions
			Current dollars		
1960	$9,311	$6,334	$2,949	$11	$17
1961	9,853	6,619	3,202	11	21
1962	10,004	6,708	3,259	13	24
1963	11,294	7,704	3,548	14	28
1964	12,355	8,455	3,860	14	26
1965	13,049	8,563	4,433	15	38
1966	14,322	9,275	4,977	18	52
1967	15,208	9,373	5,762	20	53
1968	16,027	9,606	6,347	17	57
1969	16,775	9,546	7,152	17	60
1970	16,607	9,037	7,492	13	65
1971	17,154	9,290	7,785	14	65
1972	18,425	9,960	8,379	16	70
1973	19,788	10,197	9,484	30	77
1974 (est.)	20,594	10,239	10,242	35	78
			Constant 1967 dollars[1]		
1960	$10,600	$7,211	$3,357	$13	$19
1961	11,075	7,440	3,599	12	24
1962	11,121	7,457	3,623	14	27
1963	12,392	8,453	3,893	15	31
1964	13,347	9,134	4,170	15	28
1965	13,841	9,083	4,702	16	40
1966	14,781	9,572	5,136	19	54
1967	15,208	9,373	5,762	20	53
1968	15,409	9,236	6,102	16	55
1969	15,387	8,756	6,560	16	55
1970	14,440	7,858	6,514	11	57
1971	14,270	7,728	6,476	12	54
1972	14,827	8,015	6,743	13	56
1973	15,079	7,770	7,227	23	59
1974 (est.)	14,230	7,075	7,077	24	54

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

SOURCE: National Science Foundation, *National Patterns of R&D Resources, 1953-75* (NSF 75-307).

Table 2-7a. Basic research expenditures by source, 1960-74
[Dollars in millions]

Year	Total	Federal Government	Industry	Universities and colleges	Other nonprofit institutions
	Current dollars				
1960	$1,183	$693	$331	$72	$87
1961	1,378	841	350	85	102
1962	1,695	1,091	382	102	120
1963	1,974	1,310	414	121	129
1964	2,301	1,595	424	144	138
1965	2,572	1,817	448	164	143
1966	2,825	1,986	496	196	147
1967	3,029	2,173	477	223	156
1968	3,286	2,327	518	276	165
1969	3,378	2,386	519	298	175
1970	3,548	2,469	536	350	193
1971	3,544	2,379	556	400	209
1972	3,705	2,528	528	428	221
1973	3,800	2,605	561	416	218
1974 (est.)	3,991	2,724	594	434	239
	Constant 1967 dollars[1]				
1960	$1,347	$789	$377	$82	$99
1961	1,549	945	393	96	115
1962	1,884	1,213	425	113	133
1963	2,166	1,437	454	133	142
1964	2,486	1,723	458	156	149
1965	2,728	1,927	475	174	152
1966	2,916	2,050	512	202	152
1967	3,029	2,173	477	223	156
1968	3,159	2,237	498	265	159
1969	3,099	2,189	476	273	161
1970	3,085	2,147	466	304	168
1971	2,949	1,979	463	333	174
1972	2,981	2,034	425	344	178
1973	2,895	1,985	427	317	166
1974 (est.)	2,757	1,882	410	300	165

[1] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

SOURCE: National Science Foundation, *National Patterns of R&D Resources; 1953-75* (NSF 75-307).

Table 2-5. National expenditures for R&D by performer, 1960-74
[Dollars in millions]

Year	Total	Federal government	Industry	Universities and colleges	FFRDC's[1]	Other nonprofit institutions
	Current dollars					
1960	$13,551	$1,726	$10,509	$646	$360	$310
1961	14,346	1,874	10,908	763	410	391
1962	15,426	2,098	11,464	904	470	490
1963	17,093	2,279	12,630	1,081	530	573
1964	18,894	2,838	13,512	1,275	629	640
1965	20,091	3,093	14,185	1,474	629	710
1966	21,894	3,220	15,548	1,715	630	781
1967	23,205	3,396	16,385	1,921	673	830
1968	24,669	3,493	17,429	2,149	719	879
1969	25,686	3,503	18,308	2,220	725	930
1970	26,047	3,855	18,062	2,335	737	1,058
1971	26,745	4,156	18,311	2,500	716	1,062
1972	28,402	4,482	19,371	2,675	764	1,110
1973	30,427	4,619	20,937	2,934	817	1,120
1974 (est.)	32,045	4,900	22,020	3,008	865	1,252
	Constant 1967 dollars[2]					
1960	$15,427	$1,965	$11,964	$735	$410	$353
1961	16,124	2,106	12,260	858	461	439
1962	17,147	2,332	12,743	1,005	522	545
1963	18,756	2,501	13,858	1,186	582	629
1964	20,410	3,066	14,597	1,377	679	691
1965	21,310	3,281	15,046	1,563	667	753
1966	22,594	3,323	16,045	1,770	650	806
1967	23,205	3,396	16,385	1,921	673	830
1968	23,717	3,358	16,757	2,066	691	845
1969	23,560	3,213	16,793	2,036	665	853
1970	22,648	3,352	15,705	2,030	641	920
1971	22,249	3,457	15,233	2,080	596	883
1972	22,857	3,607	15,589	2,153	615	893
1973	23,186	3,520	15,954	2,236	623	853
1974 (est.)	22,143	3,386	15,216	2,078	598	865

[1] Federally Funded Research and Development Centers administered by universities.
[2] GNP implicit price deflators used to convert current dollars to constant 1967 dollars.

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *National Patterns of R&D Resources (NSF 75-307).*

Table 2-3. National R&D expenditures as a percent of GNP by source, 1960-74
[Current dollars in billions]

Year	Gross National Product (GNP)	All sources		Federal sources		All other sources	
		Total R&D	R&D as a percent of GNP	Total R&D	R&D as a percent of GNP	Total R&D	R&D as a percent of GNP
1960	$503.7	$13.6	2.70	$8.8	1.75	$4.8	0.95
1961	520.1	14.3	2.75	9.3	1.79	5.1	0.98
1962	560.3	15.4	2.75	9.9	1.77	5.5	0.98
1963	590.5	17.1	2.90	11.2	1.90	5.9	1.00
1964	632.4	18.9	2.99	12.6	1.99	6.3	1.00
1965	684.9	20.1	2.93	13.0	1.90	7.1	1.04
1966	749.9	21.9	2.92	14.0	1.87	7.9	1.05
1967	793.9	23.2	2.92	14.4	1.81	8.8	1.11
1968	864.2	24.7	2.86	15.0	1.74	9.7	1.12
1969	930.3	25.7	2.76	14.9	1.60	10.8	1.16
1970	977.1	26.0	2.66	14.8	1.51	11.3	1.16
1971	1,054.9	26.7	2.53	15.0	1.42	11.8	1.12
1972	1,158.0	28.4	2.45	15.9	1.37	12.5	1.08
1973	1,294.9	30.4	2.35	16.5	1.27	14.0	1.08
1974 (est.)	1,396.7	32.0	2.29	17.0	1.22	15.1	1.08

NOTE: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *National Patterns of R&D Resources, 1953-75* (NSF 75-307) and *The Budget of the United States Government, Fiscal Year 1976.*

Table 1-20. U.S. trade balance in R&D-intensive manufactured products, by product group, 1960-74
(Dollars in millions)

Product	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Chemicals															
Balance	955	1,051	1,104	1,294	1,662	1,633	1,719	1,844	2,158	2,155	2,376	2,224	2,118	3,286	4,831
Export	1,776	1,789	1,876	2,009	2,364	2,402	2,676	2,802	3,287	3,383	3,826	3,836	4,133	5,749	8,822
Import	821	738	772	715	702	769	957	958	1,129	1,228	1,450	1,612	2,015	2,463	3,991
Machinery, nonelectrical															
Balance	2,948	3,288	3,547	3,574	3,989	4,114	4,102	4,218	4,280	4,838	5,583	5,268	5,325	6,904	10,633
Export	3,386	3,743	4,087	4,209	4,860	5,274	5,779	6,181	6,560	7,460	8,686	8,772	9,864	12,556	17,299
Import	438	455	540	635	871	1,160	1,677	1,963	2,280	2,622	3,103	3,504	4,539	5,652	6,666
Electrical machinery															
Balance	804	891	946	1,074	1,222	1,020	883	962	792	729	728	512	321	533	1,602
Export	1,090	1,225	1,361	1,493	1,665	1,660	1,899	2,098	2,284	2,677	2,999	3,067	3,698	5,032	7,019
Import	286	334	415	419	443	640	1,016	1,136	1,492	1,948	2,271	2,555	3,377	4,499	5,417
Aircraft															
Balance	970	766	857	726	791	997	828	1,271	2,015	2,140	2,382	3,049	2,580	3,556	5,256
Export	1,024	903	980	817	874	1,137	1,101	1,519	2,309	2,423	2,656	3,387	2,995	4,119	5,766
Import	54	137	123	91	83	140	273	248	294	283	274	338	415	563	510
Professional and scientific instruments															
Balance	214	241	266	290	306	413	488	522	530	609	653	674	668	822	1,290
Export	321	358	411	447	504	634	748	807	872	1,012	1,107	1,166	1,313	1,632	2,209
Import	107	117	145	157	198	221	260	285	342	403	454	492	645	810	919

SOURCE: U.S. Department of Commerce, Domestic and International Business Administration, *Overseas Business Reports*, April 1975 and April 1972.

Table 1-21. U.S. trade balance with selected nations in R&D-intensive manufactured products, 1966-73
(Dollars in millions)

Nations	1966	1967	1968	1969	1970	1971	1972	1973
Developing nations								
Balance	4,053	4,033	4,430	4,445	4,928	5,087	5,277	6,675
Export	4,316	4,332	4,822	5,002	5,679	5,996	6,765	8,968
Import	263	299	392	547	751	909	1,488	2,293
Western Europe								
Balance	1,890	2,283	2,566	2,986	3,942	3,599	3,089	4,165
Export	3,865	4,359	5,020	5,655	6,927	6,861	7,345	9,597
Import	1,975	2,076	2,454	2,669	2,985	3,262	4,256	5,432
Canada								
Balance	1,800	1,760	1,719	1,914	1,684	1,865	2,333	3,011
Export	2,838	2,963	3,142	3,478	3,513	3,914	4,678	5,741
Import	1,038	1,223	1,423	1,564	1,829	2,049	2,345	2,730
Japan								
Balance	−133	−115	−200	−324	−224	−516	−971	−839
Export	661	772	930	1,180	1,536	1,520	1,639	2,216
Import	794	887	1,130	1,504	1,760	2,036	2,610	3,055

SOURCE: U.S. Department of Commerce, Domestic and International Business Administration, *Overseas Business Reports*, June 1974 and August 1973.

Table 1-16. Real Gross Domestic Product per employed civilian, for selected countries compared with the United States, 1960-74 (Indexes, United States = 100)

Year	United States	France	West Germany	Japan	United Kingdom
1960	100	55.1	52.0	24.4	50.7
1965	100	60.2	55.7	31.7	48.6
1967	100	62.9	56.4	36.3	49.3
1970	100	71.4	67.0	48.7	52.6
1971	100	72.9	67.0	50.4	53.5
1972	100	74.1	67.6	53.3	53.3
1973	100	75.7	69.2	55.9	53.4
1974	100	81.1	73.8	57.4	55.6

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, *Comparative Real Gross Domestic Product, Real GDP per Capita, and Real GDP per Employed Civilian for Six Countries,* July 1975.

Table 1-17. Productivity[1] in manufacturing industries, by selected countries, 1960-74 (Index, 1960 = 100)

Year	United States	Japan	France	West Germany	United Kingdom
1960	100.0	100.0	100.0	100.0	100.0
1961	102.5	113.1	104.7	105.4	100.8
1962	108.3	118.1	109.5	112.2	103.3
1963	112.7	127.6	116.0	118.1	108.9
1964	118.0	144.6	121.8	127.3	116.8
1965	122.7	150.7	128.8	136.1	120.3
1966	124.3	165.9	137.8	141.6	124.6
1967	124.2	190.5	145.6	150.6	130.2
1968	130.2	214.5	162.2	162.0	138.9
1969	133.3	247.6	168.0	171.4	140.8
1970	134.0	279.0	176.4	175.8	142.1
1971	143.1	289.0	185.6	184.2	148.7
1972	151.2	312.2	198.1	195.9	154.8
1973	159.4	368.8	209.6	209.9	165.6
1974 (est.)	160.5	380.8	221.1	215.1	165.8

[1] Output per man-hour.

SOURCE: P. Capdevielle and A. Neef, "Productivity and Unit Labor Costs in the United States and Abroad", *Monthly Labor Review,* July 1975.

Table 1-14. "Radicalness" of innovations by selected countries, 1953-73

Country	Improvement of existing technology	Major technological advance	Radical breakthrough
	Percentage of each country's innovations		
United States	41	31	27
United Kingdom ...	4	40	56
France	12	65	24
West Germany	36	50	14
Japan	38	54	8
	Number of innovations		
United States	98	74	65
United Kingdom ...	2	18	25
France	2	11	4
West Germany	8	11	3
Japan	10	14	2

NOTE: Detail may not add to 100 percent because of rounding.

SOURCE: Gellman Research Associates, Inc., *Indicators of International Trends in Technological Innovation*, 1975 (A study commissioned specifically for this report).

Table 1-10. Patents granted to U.S. nationals by foreign countries[1] and to foreign nationals[1] by the United States, 1966-73

Patents granted	1966	1967	1968	1969	1970	1971	1972	1973
U. S. balance	36,066	34,441	36,045	35,887	33,697	31,445	30,520	25,306
Patents granted to U.S. nationals by foreign countries	45,633	44,350	45,168	47,825	45,918	47,311	47,359	41,186
Patents granted to foreign nationals by the United States	9,567	9,909	9,123	11,938	12,221	15,866	16,839	15,880

[1] Including Canada, West Germany, Japan, United Kingdom, U.S.S.R., Belgium, Denmark, Ireland, Luxembourg, and the Netherlands.

SOURCE: World Intellectual Property Organization, *Industrial Property*, Geneva: 1966-73 (December issues).

Table 1-11. U.S. patent balance with selected countries, 1966-73

Selected country	1966	1967	1968	1969	1970	1971	1972	1973
Canada:								
Balance	15,676	16,592	16,686	18,153	17,598	16,665	16,045	11,619
Granted to U.S.	16,614	17,583	17,583	19,147	18,663	17,992	17,289	12,964
Granted by U.S.	938	991	897	994	1,065	1,327	1,244	1,345
West Germany:								
Balance	-248	-360	362	-40	-1,552	-1,128	-1,153	-639
Granted to U.S.	3,733	3,406	3,804	4,483	2,882	4,393	4,575	4,949
Granted by U.S.	3,981	3,766	3,442	4,523	4,434	5,521	5,728	5,588
Japan:								
Balance	3,561	2,008	3,439	2,505	2,149	1,667	794	546
Granted to U.S.	4,683	3,432	4,903	4,657	4,774	5,700	5,948	5,485
Granted by U.S.	1,122	1,424	1,464	2,152	2,625	4,033	5,154	4,939
United Kingdom:								
Balance	11,440	10,877	10,107	9,503	9,776	9,226	9,837	8,866
Granted to U.S.	14,117	13,676	12,588	12,678	12,728	12,682	13,001	11,717
Granted by U.S.	2,677	2,799	2,481	3,175	2,952	3,456	3,164	2,851
Other E.E.C. countries[1]								
Balance	5,700	5,439	5,481	5,842	5,743	5,143	5,093	4,914
Granted to U.S.	6,483	6,253	6,225	6,777	6,670	6,346	6,287	6,071
Granted by U.S.	783	814	744	935	927	1,203	1,194	1,157
U.S.S.R.:								
Balance	-63	-115	-30	-76	-17	-128	-96	-177
Granted to U.S.	3	0	65	83	201	198	259	205
Granted by U.S.	66	115	95	159	218	326	355	382

[1] Other European Economic Community (E.E.C.) countries include Belgium, Denmark, Ireland, Luxembourg, and the Netherlands. Data from France are not reliable for use in this indicator.

SOURCE: World Intellectual Property Organization, *Industrial Property*, Geneva: 1966-73 (December issues).