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# Science Statistics

Federal Government  
Expenditures on Scientific  
Activities, 2009/2010 (Intentions)



October 2009 Edition



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# Science Statistics

## Federal Government Expenditures on Scientific Activities, 2009/2010 (Intentions)

October 2009 Edition

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## Symbols

The following standard symbols are used in Statistics Canada publications:

- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0<sup>s</sup> value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- p preliminary
- r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- E use with caution
- F too unreliable to be published

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# Highlights

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## Federal Government Expenditures on Scientific Activities, 2009/2010 (intentions)

- The federal government's spending on S&T is expected to reach \$10.7 billion in fiscal year 2009/2010. Intended spending on research and development (R&D) for 2009/2010 will be an estimated \$6.9 billion. Related scientific activities (RSA), which includes: the gathering, processing and analyzing of data; information services; museum services; feasibility and policy studies; and education support will receive \$3.7 billion. (Table 1-1)
- Granting councils lead the major federal departments and agencies that will invest in S&T activities in 2009/10: Natural Sciences and Engineering Research Council (\$1.1 billion); Canadian Institutes of Health Research (\$966 million) and Social Sciences and Humanities Research Council (\$689 million). The four leading departments and agencies in S&T spending will be: National Research Council Canada (\$780 million); Statistics Canada (\$641 million); Environment Canada (\$672 million); and Natural Resources Canada (\$548 million). (Table 3-3)
- The leading federal departments or agencies performing R&D in 2009/2010 will be the National Research Council Canada (\$571 million), Atomic Energy of Canada Limited (\$386 million), National Defence (\$338 million) and Agriculture and Agri-FoodCanada (\$314 million). (Table 7)
- The socio-economic objectives of federal S&T investment differ depending upon whether the spending is by federal departments or agencies (intramural spending) or is funding for S&T activities by non-federal organisations (extramural spending). Based on the level of investment, the leading intramural socio-economic objective in 2007/2008 was social structures and relationships at \$974 million whereas protection and improvement of human health (\$1.6 billion) led for extramural S&T spending. (Table 3-4)

# Analysis

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## Federal Government Expenditures on Scientific Activities, 2009/2010 (intentions)

This bulletin presents statistical information on the performance and funding of federal government expenditures on scientific activities for 2009/2010. The statistics presented are derived from a survey of federal science and technology (S&T) activities of federal departments and agencies. The data in this publication are consistent with expenditures of departments and agencies as reported in the Main Estimates 2009/2010, but do not reflect changes to 2009/2010 spending plans which may result from supplementary estimates or other departmental planning decisions.

The federal government's spending on S&T is expected to reach \$10.7 billion in fiscal year 2009/2010. Intended spending on research and development (R&D) for 2009/2010 will be an estimated \$6.9 billion. Related scientific activities (RSA), which includes: the gathering, processing and analyzing of data; information services; museum services; feasibility and policy studies; and education support will receive \$3.7 billion. (Table 1-1)

S&T expenditures will account for about 4.3% of the total federal government budget in 2009/2010, compared with 5.0%, which was the high-point of this past decade. (Table 1-1)

Federal investment in R&D is expected to account for 2.8% of the total federal budget in 2009/2010. RSA will account for 1.5% of the total federal government budget in 2009/2010, the same share as in the previous two fiscal years. (Table 1-1)

Granting councils lead the major federal departments and agencies that will invest in S&T activities in 2009/10: Natural Sciences and Engineering Research Council (\$1.1 billion); Canadian Institutes of Health Research (\$966 million) and Social Sciences and Humanities Research Council (\$689 million). The four leading departments and agencies in S&T spending will be: National Research Council Canada (\$780 million); Statistics Canada (\$641 million); Environment Canada (\$672 million); and Natural Resources Canada (\$548 million). (Table 3-3)

The leading federal departments or agencies performing R&D in 2009/2010 will be the National Research Council Canada (\$571 million), Atomic Energy of Canada Limited (\$386 million), National Defence (\$338 million) and Agriculture and Agri-Food Canada (\$314 million). (Table 7)

The socio-economic objectives of federal S&T investment differ depending upon whether the spending is by federal departments or agencies (intramural spending) or is funding for S&T activities by non-federal organisations (extramural spending). Based on the level of investment, the leading intramural socio-economic objective in 2007/2008 was social structures and relationships at \$974 million whereas protection and improvement of human health (\$1.6 billion) led for extramural S&T spending. (Table 3-4)

In terms of R&D socio-economic objectives, of the \$2.4 billion federal intramural R&D expenditure in 2007/2008, \$387 million went to the production, distribution and rational utilization of energy; \$337 million to agriculture, and \$258 million to the protection and improvement of human health. These three objectives accounted for almost 41% of total intramural R&D socio-economic objective spending. On the other hand, extramural R&D spending was directed towards protection and improvement of human health (34% or \$1.4 billion) and industrial production and technology (22%, or \$875 million). (Table 4-3)

In terms of RSA socio-economic objectives, of the \$2.5 billion federal intramural RSA expenditure in 2007/2008, \$875 million went to social structures and relationships; \$317 million to protection and improvement of human health; and \$282 million to control and care of the environment. These three objectives accounted for 60% of total intramural RSA socio-economic objective spending. (Table 5-3)



## Related products

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### Selected publications from Statistics Canada

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88-202-X	Industrial Research and Development: Intentions
88-204-X	Federal Scientific Activities
88-221-X	Gross Domestic Expenditures on Research and Development in Canada (GERD), and the Provinces
88-522-X	Science and Technology Activities and Impacts: A Framework for a Statistical Information
88F0006X	Business Special Surveys and Technology Statistics Division Working Papers
88F0017M	Science, Innovation and Electronic Information Division Research Papers

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### Selected CANSIM tables from Statistics Canada

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358-0001	Gross domestic expenditures on research and development, by science type and by funder and performer sector, annual
358-0024	Business enterprise research and development (BERD) characteristics, by industry group based on the North American Industry Classification System (NAICS), annual
358-0026	Intellectual property management, by federal departments and agencies indicators, annual

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### Selected surveys from Statistics Canada

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4201	Research and Development in Canadian Industry
4204	Research and Development of Canadian Private Non-Profit Organizations
4208	Provincial Research Organizations (PRO)
4209	Provincial Government Activities in the Natural Sciences
4210	Provincial Government Activities in the Social Sciences
4212	Federal Science Expenditures and Personnel, Activities in the Social Sciences and Natural Sciences
5109	Higher Education Research and Development Estimates

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## **Selected summary tables from Statistics Canada**

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- *Research and development performed by the business enterprise sector*
- *Domestic spending on research and development (GERD), funding sector, by province*
- *Domestic spending on research and development (GERD), performing sector, by province*
- *Domestic spending on research and development (GERD)*

# Statistical tables

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**Table 1-1  
Federal expenditures on science and technology and its components — In current dollars and in constant 2002 dollars**

	Current dollars				Gross Domestic Product implicit price index <sup>2</sup>	Constant 2002 dollars			
	Science and technology					Science and technology			
	Main Estimates <sup>1</sup>	Total science and technology	Research and development	Related scientific activities		Main Estimates <sup>1</sup>	Total science and technology	Research and development	Related scientific activities
	millions of dollars			index = 2002	millions of dollars				
1998/1999	145,457	5,802	3,578	2,224	92.3	157,592	6,286	3,876	2,410
1999/2000	151,559	6,252	3,890	2,362	93.9	161,405	6,658	4,142	2,516
2000/2001	156,157	6,707	4,150	2,556	97.8	159,670	6,857	4,244	2,614
2001/2002	165,234	8,169	4,989	3,180	98.9	167,072	8,260	5,044	3,216
2002/2003	170,367	8,014	4,927	3,087	100	170,367	8,014	4,927	3,087
2003/2004	175,937	8,765	5,462	3,303	103.3	170,317	8,485	5,288	3,197
2004/2005	183,290	8,934	5,454	3,480	106.6	171,942	8,381	5,116	3,265
2005/2006	194,863	9,449	6,042	3,407	110.1	176,987	8,582	5,488	3,095
2006/2007	207,986	9,633	6,073	3,560	112.9	184,221	8,532	5,379	3,153
2007/2008 <sup>r</sup>	230,772	10,176	6,603	3,573	116.5	198,088	8,735	5,668	3,067
2008/2009 <sup>p</sup>	241,308	10,358	6,631	3,727	121.1	199,263	8,553	5,476	3,078
2009/2010 <sup>p</sup>	248,388	10,664	6,949	3,714	..	..	..	..	..

1. Part 1, Government Expenditure Plan, Estimates.  
 2. CANSIM, Table 380-0056.  
**Note(s):** Due to rounding, components may not add to the totals.

**Table 1-2  
Federal expenditures on science and technology and its components — By growth rate**

	Science and technology		Research and development		Related scientific activities	
	constant 2002 dollars	current dollars	constant 2002 dollars	current dollars	constant 2002 dollars	current dollars
	percent					
1999/2000	5.9	7.8	6.9	8.7	4.4	6.2
2000/2001	3.0	7.3	2.4	6.7	4.0	8.3
2001/2002	20.4	21.8	18.9	20.2	22.9	24.4
2002/2003	-3.0	-1.9	-2.3	-1.2	-4.0	-2.9
2003/2004	5.9	9.4	7.3	10.9	3.6	7.0
2004/2005	-1.2	1.9	-3.3	-0.1	2.1	5.4
2005/2006	2.4	5.8	7.3	10.8	-5.2	-2.1
2006/2007	-0.6	1.9	-2.0	0.5	1.9	4.5
2007/2008 <sup>r</sup>	2.4	5.6	5.4	8.7	-2.7	0.4
2008/2009 <sup>p</sup>	-2.1	1.8	-3.4	0.4	0.4	4.3
2009/2010 <sup>p</sup>	..	3.0	..	4.8	..	-0.3

**Table 2**  
**Federal science and technology spending estimates for major intramural departments and agencies, 2009/2010**

	Sources of expenditures on science				
	Total estimated expenditures	External sources	Other costs	Budgetary sources	
			Indirect non-program costs	Other federal agencies <sup>1</sup>	Own department
	millions of dollars				
Agriculture and Agri-Food Canada	367	0	19	-4	352
Atomic Energy of Canada Limited	387	20	0	0	366
Canadian Space Agency	355	0	5	-9	359
Environment Canada	672	81	43	31	518
Fisheries and Oceans Canada	286	8	17	8	253
Health Canada	536	44	38	-7	461
Industry Canada	445	60	15	4	366
National Defence	534	4	14	-44	560
National Research Council Canada	780	20	24	31	705
Natural Resources Canada	548	58	29	-8	469
Statistics Canada	641	32	67	88	454

1. Negative amounts denote net transfer from budget for science and technology.

**Note(s):** Due to rounding, components may not add to the totals.

**Table 3-1**  
**Federal science and technology spending — By activity**

	2005/2006	2006/2007	2007/2008 <sup>r</sup>	2008/2009 <sup>p</sup>	2009/2010 <sup>p</sup>
	millions of dollars				
<b>Science and technology</b>	<b>9,449</b>	<b>9,633</b>	<b>10,176</b>	<b>10,358</b>	<b>10,664</b>
<b>Research and development</b>	<b>6,042</b>	<b>6,073</b>	<b>6,603</b>	<b>6,631</b>	<b>6,949</b>
Current expenditures	5,611 <sup>1</sup>	5,642 <sup>2,3</sup>	6,170 <sup>4</sup>	6,088 <sup>5</sup>	6,372 <sup>6</sup>
Administration of extramural programs	285	279	294	308	316
Capital expenditures	146	152	139	235	261
<b>Related scientific activities</b>	<b>3,407</b>	<b>3,560</b>	<b>3,573</b>	<b>3,727</b>	<b>3,714</b>
Data collection	1,715	1,870	1,759	1,842	1,785
Information services	676	669	639	650	665
Special services and studies	627	576	743	780	777
Education support	259	298	286	289	318
Administration of extramural programs	59	64	70	74	72
Capital expenditures	70	83	77	91	98

1. Includes \$245 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

2. Includes \$260 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

3. Includes \$30 million for the Agriculture Development Fund project funded by Agriculture and Agri-Food Canada.

4. Includes \$300 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

5. Includes \$315 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

6. Includes \$315 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

**Note(s):** Due to rounding, components may not add to the totals.

**Table 3-2  
Federal science and technology spending — By science and by performing sector<sup>1</sup>**

	2005/2006	2006/2007	2007/2008 <sup>r</sup>	2008/2009 <sup>p</sup>	2009/2010 <sup>p</sup>
	millions of dollars				
<b>Total sciences</b>	<b>9,449</b>	<b>9,633</b>	<b>10,176</b>	<b>10,358</b>	<b>10,664</b>
Intramural	5,024	5,244	5,196	5,385	5,437
Canadian business enterprises	1,044	902	936	913	987
Higher education	2,698 <sup>2</sup>	2,660 <sup>3</sup>	2,990 <sup>4</sup>	3,030 <sup>5</sup>	3,275 <sup>6</sup>
Canadian non-profit institutions	307	305	548	447	412
Provincial and municipal government	19	90 <sup>7,8</sup>	28 <sup>8</sup>	42	47
Foreign	306	301	445	505	465
Other Canadians performers	51	131 <sup>9</sup>	34	36	41
<b>Natural sciences</b>	<b>7,171</b>	<b>7,166</b>	<b>7,594</b>	<b>7,647</b>	<b>7,952</b>
Intramural	3,618	3,729	3,790	3,885	3,970
Canadian business enterprises	1,010	850	898	872	943
Higher education	2,097	1,991	2,301	2,312	2,529 <sup>7</sup>
Canadian non-profit institutions	248	243	326	268	218
Provincial and municipal government	17	82 <sup>7,8</sup>	17 <sup>8</sup>	18	20
Foreign	147	155	241	268	245
Other Canadians performers	34	115 <sup>9</sup>	22	24	27
<b>Social sciences</b>	<b>2,278</b>	<b>2,467</b>	<b>2,582</b>	<b>2,710</b>	<b>2,711</b>
Intramural	1,406	1,515	1,406	1,500	1,467
Canadian business enterprises	34	52	38	41	45
Higher education	601 <sup>2</sup>	668 <sup>3</sup>	689 <sup>4</sup>	718 <sup>5</sup>	746 <sup>6</sup>
Canadian non-profit institutions	59	61	221	179	194
Provincial and municipal government	2	8	11	24	27
Foreign	159	146	204	237	220
Other Canadians performers	18	16	12	11	14

1. As reported by the funder, the federal government, not by the performers.

2. Includes \$245 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

3. Includes \$260 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

4. Includes \$300 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

5. Includes \$315 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

6. Includes \$315 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

7. Includes \$30 million for the Agriculture Development Fund project funded by Agriculture and Agri-Food Canada.

8. Includes funding of the new Business Risk Management Suite which replaces the Agriculture Income Stabilization Program by Agriculture and Agri-Food Canada.

9. Includes funding for a research chair by the Canadian Institute for Health Research.

**Note(s):** Due to rounding, components may not add to the totals.

**Table 3-3**  
**Federal science and technology spending — By major department and agency**

	2005/2006	2006/2007	2007/2008 <sup>r</sup>	2008/2009 <sup>p</sup>	2009/2010 <sup>p</sup>
	millions of dollars				
<b>Total</b>	<b>9,449</b>	<b>9,633</b>	<b>10,176</b>	<b>10,358</b>	<b>10,664</b>
Agriculture and Agri-Food Canada	354	408 <sup>1,2</sup>	366 <sup>2</sup>	360	367
Atomic Energy of Canada Limited	182	289	329	393	387
Canada Foundation for Innovation	437	367	310	372	580
Canadian Institutes of Health Research	808	853 <sup>3</sup>	988	960	966
Canadian International Development Agency	346	344	354	416	368
Canadian Space Agency	281	305	283	314	355
Environment Canada	696	588	660	711	672
Fisheries and Oceans Canada	291	317	292	290	286
Health Canada	291	330	493	503	536
Industry Canada	579	444	549 <sup>4</sup>	429	445
National Defence	434	450	412	435	534
National Research Council Canada	824	769	840	774	780
Natural Resources Canada	541	580	584	544	548
Natural Sciences and Engineering Research Council of Canada	864	900	1,018	1,036	1,056
Social Sciences and Humanities Research Council of Canada	574 <sup>5</sup>	628 <sup>6</sup>	684 <sup>7</sup>	684 <sup>8</sup>	689 <sup>9</sup>
Statistics Canada	703	798	639	693	641
<b>Total of major departments</b>	<b>8,206</b>	<b>8,373</b>	<b>8,801</b>	<b>8,913</b>	<b>9,210</b>
Other	1,243	1,260	1,374	1,445	1,454

1. Includes \$30 million for the Agriculture Development Fund Project funded by Agriculture and Agri-Food Canada.
  2. Includes funding of the new Business Risk Management Suite which replaces the Agriculture Income Stabilization Program by Agriculture and Agri-Food Canada.
  3. Includes funding for a research chair by the Canadian Institute for Health Research.
  4. Includes several Centres of Excellence in Commercialization and Research (CECR) funded by Industry Canada.
  5. Includes \$245 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.
  6. Includes \$260 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.
  7. Includes \$300 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.
  8. Includes \$315 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.
  9. Includes \$315 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.
- Note(s):** The major departments and agencies are those who contributed 2% or more to the total 2007/2008 expenditures. Due to rounding, components may not add to the totals.

**Table 3-4**  
**Federal science and technology spending — By socio-economic objective**

	2005/2006		2006/2007		2007/2008 <sup>r</sup>	
	Intramural <sup>1</sup>	Extramural	Intramural <sup>1</sup>	Extramural	Intramural <sup>1</sup>	Extramural
	millions of dollars					
<b>Science and technology expenditures</b>	<b>4,690</b>	<b>4,425</b>	<b>4,924</b>	<b>4,389</b>	<b>4,885</b>	<b>4,980</b>
Exploration and exploitation of the Earth	448	101	441	74	441	91
Infrastructure and general planning of land use						
Transport	94	32	74	32	92	40
Telecommunication	57	32	56	23	48	30
Other	130	33	139	33	152	38
Control and care of the environment	470	247	452	235	486	295
Protection and improvement of human health	435	1,175	478	1,247	576	1,573
Production, distribution and rational utilization of energy	263	121	372	103	418	144
Agricultural production and technology						
Agriculture	413	114	440	142	440	185
Fishing	168	37	169	26	162	43
Forestry	95	56	93	87	88	90
Industrial production and technology	296	958	291	883	297	936
Social structures and relationships	1,021	336	1,097	348	974	377
Exploration and exploitation of space	176	168	178	183	132	211
Non-oriented research	317	799	315	823	316	652
Other civil research	26	5	28	10	31	110
Defence	265	156	300	140	235	165
Other	17	56	...	...	...	...

1. Non-program (indirect costs) are excluded.

**Note(s):** Due to rounding, components may not add to the totals.



**Table 4-1**  
**Federal research and development spending — By science and by performing sector<sup>1</sup>**

	2005/2006	2006/2007	2007/2008 <sup>r</sup>	2008/2009 <sup>p</sup>	2009/2010 <sup>p</sup>
	millions of dollars				
<b>Total sciences</b>	<b>6,042</b>	<b>6,073</b>	<b>6,603</b>	<b>6,631</b>	<b>6,949</b>
Intramural	2,414	2,496	2,532	2,605	2,692
Canadian business enterprises	791	642	758	733	805
Higher education	2,442 <sup>2</sup>	2,379 <sup>3</sup>	2,709 <sup>4</sup>	2,735 <sup>5</sup>	2,946 <sup>6</sup>
Canadian non-profit institutions	206	224	376	309	258
Provincial and municipal government	10	47 <sup>7,8</sup>	15 <sup>8</sup>	15	18
Foreign	146	167	192	211	204
Other Canadians performers	33	118 <sup>9</sup>	20	23	26
<b>Natural sciences</b>	<b>5,370</b>	<b>5,329</b>	<b>5,686</b>	<b>5,670</b>	<b>5,943</b>
Intramural	2,289	2,340	2,360	2,422	2,499
Canadian business enterprises	788	638	752	729	800
Higher education	1,974	1,864	2,152	2,153	2,346
Canadian non-profit institutions	186	212	270	208	145
Provincial and municipal government	9	45 <sup>7,8</sup>	11 <sup>8</sup>	8	8
Foreign	100	118	127	135	128
Other Canadians performers	23	112 <sup>9</sup>	13	15	17
<b>Social sciences</b>	<b>672</b>	<b>744</b>	<b>916</b>	<b>961</b>	<b>1,006</b>
Intramural	124	156	172	183	193
Canadian business enterprises	3	3	6	4	6
Higher education	468 <sup>2</sup>	514 <sup>3</sup>	557 <sup>4</sup>	583 <sup>5</sup>	600 <sup>6</sup>
Canadian non-profit institutions	20	13	105	101	114
Provincial and municipal government	1	1	4	7	10
Foreign	46	49	65	76	76
Other Canadians performers	10	7	7	7	9

1. As reported by the funder, the federal government, not by the performers.

2. Includes \$245 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

3. Includes \$260 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

4. Includes \$300 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

5. Includes \$315 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

6. Includes \$315 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.

7. Includes \$30 million for the Agriculture Development Fund project funded by Agriculture and Agri-Food Canada.

8. Includes funding of the new Business Risk Management Suite which replaces the Agriculture Income Stabilization Program by Agriculture and Agri-Food Canada.

9. Includes funding for a research chair by the Canadian Institute for Health Research.

**Note(s):** Due to rounding, components may not add to the totals.

**Table 4-2  
Federal research and development spending — By major department and agency**

	2005/2006	2006/2007	2007/2008 <sup>r</sup>	2008/2009 <sup>p</sup>	2009/2010 <sup>p</sup>
	millions of dollars				
<b>Total</b>	<b>6,042</b>	<b>6,073</b>	<b>6,603</b>	<b>6,631</b>	<b>6,949</b>
Agriculture and Agri-Food Canada	327	359 <sup>1,2</sup>	307 <sup>2</sup>	315	316
Atomic Energy of Canada Limited	182	289	329	393	387
Canada Foundation for Innovation	437	367	310	372	580
Canadian Institutes of Health Research	795	838 <sup>3</sup>	970	943	948
Canadian Space Agency	267	290	276	305	345
Environment Canada	253	214	240	258	244
Health Canada	49	49	161	167	176
Industry Canada	478	372	477 <sup>4</sup>	354	365
National Defence	349	343	307	334	435
National Research Council Canada	756	700	772	707	716
Natural Resources Canada	281	259	276	257	259
Natural Sciences and Engineering Research Council of Canada	755	788	891	892	899
Social Sciences and Humanities Research Council of Canada	478 <sup>5</sup>	523 <sup>6</sup>	540 <sup>7</sup>	564 <sup>8</sup>	561 <sup>9</sup>
<b>Total of major departments</b>	<b>5,406</b>	<b>5,391</b>	<b>5,857</b>	<b>5,860</b>	<b>6,231</b>
Other	636	682	745	771	718

1. Includes \$30 million for the Agriculture Development Fund project funded by Agriculture and Agri-Food Canada.
  2. Includes funding of the new Business Risk Management Suite which replaces the Agriculture Income Stabilization Program by Agriculture and Agri-Food Canada.
  3. Includes funding for a research chair by the Canadian Institute for Health Research.
  4. Includes several Centres of Excellence in Commercialization and Research (CECR) funded by Industry Canada.
  5. Includes \$245 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.
  6. Includes \$260 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.
  7. Includes \$300 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.
  8. Includes \$315 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.
  9. Includes \$315 million for indirect costs of university research funded by the Social Sciences and Humanities Research Council of Canada.
- Note(s):** The major departments and agencies are those who contributed 2% or more to the total 2007/2008 expenditures. Due to rounding, components may not add to the totals.

**Table 4-3**  
**Federal research and development spending — By socio-economic objective**

	2005/2006		2006/2007		2007/2008 <sup>r</sup>	
	Intramural <sup>1</sup>	Extramural	Intramural <sup>1</sup>	Extramural	Intramural <sup>1</sup>	Extramural
	millions of dollars					
<b>Total research and development expenditures</b>	<b>2,298</b>	<b>3,628</b>	<b>2,391</b>	<b>3,577</b>	<b>2,421</b>	<b>4,071</b>
Exploration and exploitation of the Earth	110	78	98	58	102	72
Infrastructure and general planning of land use						
Transport	58	28	50	26	52	33
Telecommunication	52	31	51	21	44	28
Other	46	28	40	29	44	33
Control and care of the environment	216	185	188	175	203	198
Protection and improvement of human health	210	1,106	217	1,160	258	1,364
Production, distribution and rational utilization of energy	229	103	339	89	387	107
Agricultural production and technology						
Agriculture	336	102	340	130	337	128
Fishing	47	25	47	19	45	21
Forestry	75	44	76	46	61	65
Industrial production and technology	198	884	196	831	203	875
Social structures and relationships	59	203	81	196	100	228
Exploration and exploitation of space	162	164	163	179	123	208
Non-oriented research	219	496	219	535	239	609
Other civil research	23	4	24	10	18	10
Defence	245	93	261	72	205	91
Other	13	54	...	...	...	...

1. Non-program (indirect costs) are excluded.

**Note(s):** Due to rounding, components may not add to the totals.

**Table 5-1**  
**Federal related scientific activities spending — By science and by performing sector<sup>1</sup>**

	2005/2006	2006/2007	2007/2008 <sup>r</sup>	2008/2009 <sup>p</sup>	2009/2010 <sup>p</sup>
		millions of dollars			
<b>Total sciences</b>	<b>3,407</b>	<b>3,560</b>	<b>3,573</b>	<b>3,727</b>	<b>3,714</b>
Intramural	2,610	2,748	2,664	2,780	2,745
Canadian business enterprises	253	261	177	180	182
Higher education	256	281	281	294	329
Canadian non-profit institutions	101	81	172	138	154
Provincial and municipal government	9	43	13	27	29
Foreign	160	134	253	294	261
Other Canadians performers	19	12	13	13	15
<b>Natural sciences</b>	<b>1,801</b>	<b>1,837</b>	<b>1,908</b>	<b>1,978</b>	<b>2,009</b>
Intramural	1,328	1,389	1,430	1,464	1,471
Canadian business enterprises	221	212	146	143	143
Higher education	123	127	148	159	183
Canadian non-profit institutions	62	32	56	60	74
Provincial and municipal government	8	36	5	10	11
Foreign	47	37	114	133	117
Other Canadians performers	10	3	9	9	10
<b>Social sciences</b>	<b>1,606</b>	<b>1,723</b>	<b>1,665</b>	<b>1,749</b>	<b>1,705</b>
Intramural	1,282	1,358	1,234	1,317	1,274
Canadian business enterprises	31	49	31	37	39
Higher education	133	154	133	135	146
Canadian non-profit institutions	39	49	116	78	80
Provincial and municipal government	1	7	8	17	17
Foreign	113	97	138	161	144
Other Canadians performers	8	9	5	4	5

1. As reported by the funder, the federal government, not by the performers.

**Note(s):** Due to rounding, components may not add to the totals.

**Table 5-2**  
**Federal related scientific activities spending — By major department and agency**

	2005/2006	2006/2007	2007/2008 <sup>r</sup>	2008/2009 <sup>p</sup>	2009/2010 <sup>p</sup>
	millions of dollars				
<b>Total</b>	<b>3,407</b>	<b>3,560</b>	<b>3,573</b>	<b>3,727</b>	<b>3,714</b>
Canadian International Development Agency	288	273	303	357	315
Canadian Museum of Civilization	73	72	72	77	69
Environment Canada	443	374	420	452	427
Fisheries and Oceans Canada	214	232	217	216	213
Health Canada	242	281	332	336	360
Industry Canada	101	72	72	75	80
Library and Archives Canada	100	94	97	116	117
National Defence	85	107	105	100	99
Natural Resources Canada	261	321	308	287	289
Natural Sciences and Engineering Research Council of Canada	110	112	126	144	157
Parks Canada	79	89	92	92	92
Social Sciences and Humanities Research Council of Canada	97	105	144	120	128
Statistics Canada	684	748	582	635	584
<b>Total of major departments and agencies</b>	<b>2,775</b>	<b>2,880</b>	<b>2,870</b>	<b>3,006</b>	<b>2,930</b>
Other	632	680	703	720	784

**Note(s):** The major departments and agencies are those who contributed 2% or more to the total 2007/2008 expenditures. Due to rounding, components may not add to the totals.

**Table 5-3**  
**Federal related scientific activities spending — By socio-economic objective**

	2005/2006		2006/2007		2007/2008 <sup>r</sup>	
	Intramural <sup>1</sup>	Extramural	Intramural <sup>1</sup>	Extramural	Intramural <sup>1</sup>	Extramural
	millions of dollars					
<b>Total related scientific activities expenditures</b>	<b>2,392</b>	<b>797</b>	<b>2,533</b>	<b>812</b>	<b>2,464</b>	<b>909</b>
Exploration and exploitation of the Earth	338	23	343	16	339	19
Infrastructure and general planning of land use						
Transport	35	4	24	6	39	7
Telecommunication	5	1	5	2	4	1
Other	84	5	98	4	109	5
Control and care of the environment	254	62	265	60	282	98
Protection and improvement of human health	225	69	261	86	317	209
Production, distribution and rational utilization of energy	34	17	33	14	30	37
Agricultural production and technology						
Agriculture	77	12	100	12	102	57
Fishing	122	12	122	7	117	22
Forestry	20	11	17	42	26	25
Industrial production and technology	98	74	95	52	94	60
Social structures and relationships	962	133	1,016	151	875	149
Exploration and exploitation of space	14	4	16	4	9	3
Non-oriented research	98	303	95	288	77	43
Other civil research	3	1	4	0 <sup>s</sup>	13	101
Defence	20	64	38	67	30	74
Other	4	2	...	...	...	...

1. Non-program (indirect costs) are excluded.

**Note(s):** Due to rounding, components may not add to the totals.

**Table 6-1**  
**Federal intramural science and technology spending — By activity**

	2005/2006	2006/2007	2007/2008 <sup>r</sup>	2008/2009 <sup>p</sup>	2009/2010 <sup>p</sup>
	millions of dollars				
<b>Science and technology</b>	<b>5,024</b>	<b>5,244</b>	<b>5,196</b>	<b>5,385</b>	<b>5,437</b>
<b>Research and development</b>	<b>2,414</b>	<b>2,496</b>	<b>2,532</b>	<b>2,605</b>	<b>2,692</b>
Current expenditures	1,983	2,065	2,099	2,061	2,115
Administration of extramural programs	285	279	294	308	316
Capital expenditures	146	152	139	235	261
<b>Related scientific activities</b>	<b>2,610</b>	<b>2,748</b>	<b>2,664</b>	<b>2,780</b>	<b>2,745</b>
Data collection	1,588	1,730	1,606	1,686	1,630
Information services	588	579	587	596	612
Special services and studies	304	281	315	332	331
Education support	1	10	10	1	2
Administration of extramural programs	59	64	70	74	72
Capital expenditures	70	83	77	91	98

**Note(s):** Due to rounding, components may not add to the totals.

**Table 6-2**  
**Federal intramural science and technology spending — By major department and agency**

	2005/2006	2006/2007	2007/2008 <sup>r</sup>	2008/2009 <sup>p</sup>	2009/2010 <sup>p</sup>
	millions of dollars				
<b>Total</b>	<b>5,024</b>	<b>5,244</b>	<b>5,196</b>	<b>5,385</b>	<b>5,437</b>
Agriculture and Agri-Food Canada	325	352	351	356	364
Atomic Energy of Canada Limited	172	288	329	393	386
Environment Canada	610	517	577	622	588
Fisheries and Oceans Canada	275	307	269	269	266
Health Canada	263	289	354	367	390
Industry Canada	115	117	118	122	125
National Defence	277	311	248	265	370
National Research Council Canada	696	643	691	630	636
Natural Resources Canada	457	475	464	433	436
Statistics Canada	702	777	631	684	633
<b>Total of major departments and agencies</b>	<b>3,893</b>	<b>4,076</b>	<b>4,031</b>	<b>4,141</b>	<b>4,193</b>
Other	1,131	1,168	1,165	1,244	1,244

**Note(s):** The major departments and agencies are those who contributed 2% or more to the total 2007/2008 expenditures. Due to rounding, components may not add to the totals.

**Table 7**  
**Federal intramural research and development spending by major department or agency**

	2005/2006	2006/2007	2007/2008 <sup>r</sup>	2008/2009 <sup>p</sup>	2009/2010 <sup>p</sup>
	millions of dollars				
<b>Total</b>	<b>2,414</b>	<b>2,496</b>	<b>2,532</b>	<b>2,605</b>	<b>2,692</b>
Agriculture and Agri-Food Canada	302	307	297	312	314
Atomic Energy of Canada Limited	172	288	329	393	386
Canadian Institutes of Health Research	53	55	60	59	59
Canadian Space Agency	133	137	95	107	98
Environment Canada	220	186	208	224	212
Fisheries and Oceans Canada	77	85	74	73	72
Health Canada	45	44	72	74	75
National Defence	257	271	216	233	338
National Research Council Canada	629	574	623	563	571
Natural Resources Canada	218	205	192	179	181
Statistics Canada	19	51	57	58	57
<b>Total of major departments and agencies</b>	<b>2,124</b>	<b>2,203</b>	<b>2,224</b>	<b>2,274</b>	<b>2,364</b>
Other	290	293	308	330	328

**Note(s):** The major departments and agencies are those who contributed 2% or more to the total 2007/2008 expenditures. Due to rounding, components may not add to the totals.

# Data quality, concepts and methodology

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## Methodology

The Federal Government is a principal funder of science and technology in Canada. This report presents information on the disposition of monies and human resources for science and technology (S&T) by federal departments and agencies. The information has been assembled to serve as a reference document for program managers, government officials, the media and the general public. It records the allocation of S&T resources for the last five years.

The statistics are collected through the survey of Federal Science Expenditures and Personnel, which records past, current and proposed expenditures for activities in the natural and social sciences. The survey is designed to correspond as much as possible to the system of budgetary estimates used by the federal government. This is done to ease the response burden, assist in editing and, most importantly, to produce comparable data for policy planning and program evaluation. Thus, the questionnaire covers the same time span as the estimates including: actual expenditures for the past fiscal year, e.g. 2007/2008; forecast expenditures for the current fiscal year, e.g. 2008/2009; and proposed estimates for the fiscal year, e.g. 2009/2010 (as also reported in the Public Accounts).

Over 50 different federal government departments and agencies either perform science and technology (S&T) activities or have a budgetary allocation to fund S&T. In addition to the expenditures attributable to program budgets, there are additional costs attributable to scientific activities which must be included if a full picture of the resources devoted to science activities is to be obtained. These include other sources of funds and other S&T costs which are defined below:

Transfers into the program from other federal government departments and agencies, net of transfers out;

Income from external sources such as industry and provincial governments;

Other S&T costs: Non-Program Costs (indirect costs) are costs that are not part of the budgets of scientific programs and include services provided by other departments, such as:

- accommodation by Public Works and Government Services Canada and own department;
- employer's share of health and employment insurance premiums paid by Treasury Board;
- employee compensation under Workers Compensation Acts paid by Human Resources and Social Development Canada;
- cost of legal services provided by the Department of Justice;
- cheques issue cost by Public Works and Government Services Canada.

Indirect costs are included in departmental totals; however, these costs have not been included in expenditures classified by socio-economic objective.

Historically, Non-Program Costs were obtained for each department from the Main Estimates, Part III. In 2009/10, the format for Part III of the Main Estimates was significantly altered from previous years in that Non-Program Costs were no longer specified. For the publication ***Federal Scientific Activities 2009/2010***, Non-Program Costs were taken from the previous year's Main Estimates, which included projections for planned spending through the 2010/11 fiscal year.

According to international convention, science and technology activities are divided into two fields; natural sciences and engineering (NSE) and social sciences and humanities (SSH). These fields of science are further divided into

research and development (R&D) and related scientific activities (RSA). The Federal Government may choose to perform S&T in its own laboratories (intramural expenditures) or may pay another organization to perform S&T (extramural expenditures). Data are presented in this article on S&T activities funded by the federal government for R&D and RSA and distinguished by performer (that is, intramurally by the government itself or extramurally, by business enterprises (industry), universities, provincial and municipal governments, Canadian non-profit organizations, other performers and foreign performers). Definitions of these terms are provided in the Technical Notes section. Crown corporations which have an industrial function are not included. They are treated as commercial enterprises and the crown corporation expenditures in aggregate are included in the Statistics Canada report, Industrial Research and Development, Catalogue No. 88-202-X.

Considerable effort has been expended to maintain the continuity and compatibility of the data series to permit analysis and study of the impact of scientific activities. Efforts of the departments and agencies in ensuring accurate and complete information are gratefully acknowledged.

## Technical notes

### Scope and limitations of the data

The expenditures data for scientific activities controlled by federal departments and agencies provided in this document correspond to the budgetary expenditures by program presented in Main Estimates for the approval of Parliament. The following kinds of non-budgetary costs or expenditures are not included:

- loans or advances to and investments in Crown Corporations; loans or advances for specific purposes to other governments and international organizations or persons or corporations in the private sector.

### Reliability of the data

All the possible sources of error were examined. Definitions have been taken from a compendium of methods of error evaluation in censuses and surveys, Statistics Canada, catalogue no. 13-564E.

- A complete enumeration is carried out of all federal departments and agencies involved in scientific activities.
- Being a census, coverage and non-response are very minor causes of error.
- No imputation, coding, or sampling is done by Statistics Canada for this exercise.

### Data capture

The data capture operation in a census or survey consists of converting the data received on questionnaires (e.g., respondent answers) or coding forms to a machine readable format.

All data capture for science statistics is through manual intervention, at a computer terminal.

Significant uncorrected data capture errors are unlikely because of the examination of numerous tables and listings prepared for data analysis before publication tables are created. Mistakes in expenditures due to coding error are believed to be less than 1%.

### Edit

The edit procedures usually consist of:

- checking each field of every record to ascertain whether it contains a valid code or entry;
- checking codes or entries in certain predetermined combinations of fields to ascertain whether codes or entries are consistent with one another. Although there are a number of edits, all cases of failed edit checks are corrected after consideration by editors.



## Definitions

### Scope and limitations of the data

According to international convention, science and technology activities are divided into two fields; natural sciences and engineering (NSE) and social sciences and humanities (SSH). These fields of science are further divided into research and development (R&D) and related scientific activities (RSA). The federal government may choose to perform S&T in its own laboratories (intramural expenditures) or may pay another organization to perform S&T (extramural expenditures). Data are presented in this article on S&T activities funded by the federal government for R&D and RSA and distinguished by performer (that is, intramurally by the government itself or extramurally, by business enterprises (industry), the higher education sector, provincial and municipal governments, Canadian non-profit organizations, other performers and foreign performers).

### Definitions applicable to both Natural sciences and engineering and Social science and humanities

#### Scientific research and experimental development (R&D)

Creative work undertaken on a systematic basis in order to increase the stock of scientific and technical knowledge and to use this knowledge in new applications.

The central characteristic of R&D is an appreciable element of novelty and of uncertainty. New knowledge, products or processes are sought. New knowledge involves the integration of newly acquired information into existing hypotheses, the formulation and testing of new hypotheses or the re-evaluation of existing observations.

An R&D project generally has three characteristics:

- a substantial element of uncertainty, novelty and innovation;
- a well-defined project design;
- a report on the procedures and results of the projects.

#### Related scientific activities (RSA)

Those activities which complement and extend R&D by contributing to the generation, dissemination and application of scientific and technological knowledge.

#### Intramural performance

Where the science and technology (S&T) activities are managed and carried out primarily by federal government employees they are classified as intramural S&T. Even where major components of the project are provided by outside agencies, such as computer services, laboratory construction, testing of prototype equipment, if the planning, supervision, reporting, and key operating functions are performed by federal personnel, then the activity is considered to be intramural. This also applies to S&T activities carried out by a department or agency on behalf of another federal department or agency on a cost recovery basis.

The intramural expenditures reported for scientific activities are those direct costs, including salaries, associated with scientific programs. These costs include that portion of a program's contribution to employee benefit plans (e.g. superannuation) which is applicable to the scientific personnel within the program.

Non-program ("indirect") costs, such as the value of services provided by other departments without charge and accommodation provided by the reporting program are to be excluded. Support services (i.e. administration, finance) provided by the reporting program, proportional to S&T expenditures should be included.

### **Extramural performance**

The management and conduct of an S&T activity is entrusted to a non-federal organization. The six extramural performance sectors used in surveying S&T expenditures by the federal government are:

#### **Business enterprise**

This sector is composed of business and government enterprises, including public utilities and government owned firms. Incorporated consultants providing scientific and engineering services are also included. Industrial research institutes located at Canadian universities are considered to be in the Higher education sector.

#### **Higher education**

This sector is composed of all universities, colleges of technology and other institutes of post-secondary education, whatever their source of finance or legal status. It also includes all research institutes, experimental stations and clinics operating under the direct control of, or administered by, or associated with, the higher education establishments.

#### **Canadian non-profit institutions**

Charitable foundations, voluntary health organizations, scientific and professional societies, and other organizations not established to earn profits comprise this sector. Canadian non-profit institutions primarily serving or controlled by another sector should be included in that sector.

#### **Provincial and municipal governments**

Departments and agencies of these governments form this sector. Government enterprises, such as provincial utilities are included in the Business enterprise sector, and hospitals in the Canadian non-profit institutions.

#### **Foreign performers**

All foreign government agencies, foreign companies (including foreign subsidiaries of Canadian firms), international organizations, non resident foreign nationals and Canadians studying or teaching abroad, are included in this sector.

#### **Other performers**

This sector includes provincial research councils, and individuals or organizations in Canada not belonging to any of the above sectors.

### **Type of payment**

#### **Contracts**

These are payments to organizations or individuals outside the federal government for the conduct of S&T by the recipient or to provide support for the federal government's in-house S&T programs.

#### **Grants and contributions**

Awards to organizations or individuals for the conduct of S&T and intended to benefit the recipients rather than provide the program with goods, services or information.

#### **Research fellowships**

Awards to individuals for advanced research training and experience. Awards intended primarily to support the education of the recipients are reported as education support.

## **Socio-economic objectives**

Socio-economic objectives allow departments to classify their S&T resource allocations according to the purpose for which the expenditure is intended. The objectives are listed on the questionnaire at the highest level of aggregation with sub-levels given for clarification of categories. In many cases, projects have multiple objectives and a department should assign its expenditures consistent with the stated objectives of the department. Care must be taken to avoid “double counting”.

The objectives are based on the Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets (NABS) produced by the Statistical Office of the European Communities (Eurostat).

- **Exploration and exploitation of the Earth**

Scientific activities with objectives related to the exploration of the Earth's crust and mantle, seas, oceans and atmosphere, and scientific activities on their exploitation. It also includes climatic and meteorological research, polar exploration and hydrology.

- **Infrastructure and general planning of land use**

Scientific activities on infrastructure and land development, including research on the construction of buildings. More generally, it covers all scientific activities relating to the general planning of land-use. This includes scientific activities into protection against harmful effects in town and country planning but not scientific activities into other types of pollution.

- **Control and care of the environment**

Covers scientific activities into the control of pollution, aimed at the identification and analysis of the sources of pollution and their causes, and all pollutants, including their dispersal in the environment and the effects on man, species (fauna, flora, microorganisms) and biosphere. Development of monitoring facilities for the measurement of all kinds of pollution is included. The same is valid for the elimination and prevention of all forms of pollution in all types of environment.

- **Protection and improvement of human health**

Scientific activities aimed at protecting, promoting and restoring human health broadly interpreted to include health aspects of nutrition and food hygiene. It ranges from preventative medicine, including all aspects of medical and surgical treatment, both for individuals and groups, and the provision of hospital and home care, to social medicine and pediatric and geriatric research.

- **Production, distribution and rational utilization of energy**

Covers scientific activities into the production, storage, transportation, distribution and rational use of all forms of energy. It also includes scientific activities on processes designed to increase the efficiency of energy production and distribution, and the study of energy conservation.

- **Agricultural production and technology**

Covers all scientific activities on the promotion of agriculture, forestry, fisheries and foodstuff production. It includes: scientific research on chemical fertilizers, biocides, biological pest control and the mechanization of agriculture; research on the impact of scientific activities in the field of developing food productivity and technology.

- **Industrial production and technology**

Covers scientific activities on the improvement of industrial production and technology. It includes scientific activities on industrial products and their manufacturing processes except where they form an integral part of the pursuit of other objectives (e.g. defence, space, energy, agriculture).

- **Social structures and relationships**

Scientific activities on social objectives, as analysed in particular by social and human sciences, which have no obvious connection with other objectives. This analysis includes quantitative, qualitative, organizational and forecasting aspects of social problems.

- **Exploration and exploitation of space**

All civil space scientific activities. Corresponding scientific activities in the defence field is classified in the Defence objective. (Although civil space research is not, in general, concerned with particular objectives, it frequently has a specific goal, such as the increase of general knowledge (e.g. astronomy), or relates to particular applications (e.g. telecommunications satellites).

- **Non-oriented research**

Basic activities motivated by scientific curiosity with the objective of increasing scientific knowledge. It also includes funding used to support postgraduate studies and fellowships.

- **Other civil research**

Civil scientific activities which cannot (yet) be classified to a particular objective.

- **Defence**

Covers scientific activities for military purposes. It also includes basic research and nuclear and space research financed by ministries of defence. Civil scientific activities financed by ministries of defence, for example, in the fields of meteorology, telecommunications and health, should be classified in the relevant objectives.

### **Personnel**

Intramural expenditure data should be supported by data on the personnel devoted to scientific activities by all the employees engaged in these activities.

### **Scientific and professional**

People in jobs that require at least one academic degree or nationally recognized professional qualification, as well as those with equivalent experience.

### **Technical**

People in jobs that require specialized vocational or technical training beyond the secondary level (e.g., community colleges and technical institutes) as well as those with experience equivalent to this training.

### **Other**

Clerical, secretarial, administrative, operational and other support personnel.

In regard to personnel resources there are two caveats:

- where the S&T activities are a part of the program being reported only the auxiliary staff relevant to the S&T activities are reported on a prorated basis;
- whenever financial and administrative support is provided from another program that support is allocated to the S&T resources for the program being reported.

### **Full-time equivalent (FTE)**

A measure of the time actually devoted to the conduct of scientific activities. An employee who is engaged in scientific activities for a half a year has a full-time equivalence of 0.5. Personnel data reported should be consistent with expenditure data.

**Administration of extramural programs (AEP)**

AEP identifies the FTEs engaged in the administration of contracts and grants and contributions for scientific activities that are to be performed outside the federal government. These FTEs are broken down by the type of scientific activity supported, i.e., R&D or RSA.

**Definitions specific to Natural sciences and engineering**

The natural sciences and engineering (NSE) field consists of disciplines concerned with understanding, exploring, developing or utilizing the natural world. Included are the engineering, mathematical, life and physical sciences.

**Related scientific activities (RSA)**

The kinds of related scientific activities for the natural sciences are described below.

**Scientific data collection**

The gathering, processing, collating and analyzing of data on natural phenomena. These data are normally the results of surveys, routine laboratory analyses or compilations of operating records.

Data collected as part of an existing or proposed R&D project are charged to research. Similarly, the costs of analyzing existing data as part of a research project are R&D costs, even when the data were originally collected for some other purpose. The development of new techniques for data collection is also to be considered to be a research activity. Examples of scientific data collection are: routine geological, hydrographic, oceanographic and topographic surveys; routine astronomical observations; maintenance of meteorological records; and wildlife and fisheries surveys.

**Information services**

All work directed to recording, classifying, translating and disseminating scientific and technological information as well as museum services. Included are the operations of scientific and technical libraries, S&T consulting and advisory services, the Patent Office, the publication of scientific journals and monographs, and the organizing of scientific conferences. Grants for the publication of scholarly works are also included.

General purpose information services or information services directed primarily towards the general public are excluded, as are general departmental and public libraries. When individual budgets exist, the costs of libraries which belong to institutions otherwise entirely classified to another activity, such as R&D, should be assigned to information services. The costs of printing and distributing reports from another activity, such as R&D, are normally attributable to that activity.

**Sub category under “Information services”****• Museum services**

The collecting, cataloguing, and displaying of specimens of the natural world or of representations of natural phenomena. The activity involves a systematic attempt to preserve and display items from the natural world; in some ways it could be considered an extension of information services. The scientific activities of natural history museums, zoological and botanical gardens, aquaria, planetaria and nature reserves are included. Parks which are not primarily restricted reserves for certain fauna or flora are excluded. In all cases the costs of providing entertainment and recreation to visitors should be excluded (e.g. restaurants, children’s gardens and museums).

When a museum also covers not only natural history but also aspects of human cultural activities, the museum’s resources should be appropriated between the natural and social sciences. However, museums of science and technology, war, etc., which display synthetic or artificial objects and may also illustrate the operations of certain technologies, should be considered as engaged in museum services in social sciences.

### **Special services and studies**

Work directed towards the establishment of national and provincial standards for materials, devices, products and processes; the calibration of secondary standards; non-routine quality testing; feasibility studies and demonstration projects.

**Sub categories under “Special services and studies” include:**

- **Testing and standardization**

Work directed towards the establishment of national and international standards for materials, devices, products and processes, the calibration of secondary standards and non-routine quality testing. The development of new measures for standards, or of new methods of measuring or testing, is R&D and should be reported as such. Exclude routine testing such as monitoring radioactivity levels or soil tests before construction.

- **Feasibility studies**

Technical investigations of proposed engineering projects to provide additional information required to reach decisions on implementation. Besides feasibility studies per se, the related activity of demonstration projects are to be included. Demonstration projects involve the operation of scaled-up versions of a facility or process, or data on factors such as costs, operational characteristics, market demand and public acceptance. Projects called ‘demonstration projects’ but which conform to the definition of R&D should be considered R&D. Once a facility or process is operated primarily to provide a service or to gain revenue, rather than as a demonstration, it should no longer be included with feasibility studies. In all demonstration projects, only the net costs should be considered.

### **Education support**

Grants to individuals or institutions on behalf of individuals which are intended to support the post-secondary education of students in technology and the natural sciences. General operating or capital grants are excluded. The activity includes the support of foreign students in their studies of the natural sciences at Canadian or foreign institutions. Grants intended primarily to support the research of individuals at universities are either R&D grants or research fellowships.

### **Definitions specific to Social sciences and humanities**

The social sciences and humanities (SSH) field embraces all disciplines involving the study of human actions and conditions and the social, economic and institutional mechanisms affecting humans. Included are such disciplines as anthropology, business administration and commerce, information and knowledge management, criminology, demography, economics, geography, history, languages, literature and linguistics, law, library science, philosophy, political science, psychology, religious studies, social work, sociology, and urban and regional studies.

### **Related scientific activities (RSA)**

The kinds of related scientific activities for the social sciences and humanities are described below.

#### **General purpose data collection**

The routine gathering, processing, collating, analysis and publication of information on human phenomena using surveys, regular and special investigations and compilations of existing records. It excludes data collected primarily for internal administrative purposes (e.g., departmental personnel statistics) as well as the collection of data as part of an R&D project.

Data collected as part of an existing or proposed research project are charged to research. Similarly the costs of analyzing existing data as part of a research project are R&D costs, even when the data were originally collected for some other purpose. The development of new techniques for data collection is also considered a research activity.

The institutions involved are generally the statistical bureaus of Canadian governments and the statistical sections of departments and agencies. If there are units whose principal activity is R&D, their costs and personnel should be assigned to R&D; specialized libraries with separate budgets should be assigned to information services.

### **Information services**

All work related to recording, classifying, translating and disseminating scientific and technological information as well as museum services. Included are the operations of scientific and technical libraries, S&T consulting and advisory services, the Patent Office, the publication of scientific journals and monographs, and the organizing of scientific conferences. Grants for the publication of scholarly works are also included.

General purpose information services or information services directed primarily towards the general public are excluded, as are general departmental and public libraries. When individual budgets exist, the costs of libraries which belong to institutions otherwise entirely classified to another activity, such as R&D, should be assigned to information services. The costs of printing and distributing reports from another activity, such as R&D, are normally attributable to that activity.

#### **Sub category under “Information services” include:**

- **Museum services**

The collecting, cataloguing, and displaying of specimens and representations relating to human history, social organization and creations. The activity involves a systematic attempt to preserve and display the works of human beings and to provide information on their works, history, and nature. The scientific activities of historical museums, archaeological displays, and art galleries are included. In all cases, the costs of providing entertainment and recreation to visitors should be excluded (e.g. restaurants, children’s gardens and museums).

When a museum also covers aspects of natural history, the museum’s operation should be divided between the social and natural sciences. However, museums of science and technology, war, etc., which display synthetic or artificial objects and may also illustrate the operations of certain technologies, should be considered as engaged in museum services in social sciences.

### **Special services and studies**

Systematic investigations carried out in order to provide information needed for planning or policy formulation. Demonstration projects are also included.

The work is usually carried out by specialized units in some government departments, by consultants, by royal commissions, and by task forces. The activity is similar to R&D since it may require innovative analyses and a high degree of scientific ability. However, such studies are not intended to acquire new knowledge but to provide specific answers to specific problems (generally immediate, localized and perhaps temporary). The day-to-day operations of units concerned with departmental planning, organization or management are not normally included (i.e. administrative records kept by departments of education) but special projects may be relevant.

#### **Sub categories under “Special services and studies” include:**

- **Economic and feasibility studies**

Investigations of the socio-economic characteristics and implications of specific situations. Such studies are generally limited to a specific problem and involve the application of established social science techniques and methodologies.

- **Operations and policy studies**

The analysis and assessment of departmental programs, policies and operations, the activities of units concerned with the continuing analysis and monitoring of external phenomena (e.g., foreign economic statistics, defence and

security information) as well as studies to provide an information base for policy development. The work is carried out by specialized units in some government departments, by consultants, by royal commissions and by task forces.

**Education support**

Grants to individuals or institutions on behalf of individuals which are intended to support the post-secondary education of students in technology and the social sciences. General purpose grants to educational institutions are excluded. The activity includes the support of foreign students in their studies of the social sciences at Canadian or foreign institutions. Grants intended primarily to support the research of individuals at universities are either R&D grants or research fellowships.