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An Overview of Employment and Wages in Science, Technology, Engineering and Math (STEM) Groups

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Abstract
STEM is an acronym often used to refer to occupations, as well as fields of study, in science, technology, engineering, and math. The definition of STEM can vary, depending on the group using it. To develop some standards, the Standard Occupation Classification Policy Committee, made up of representatives of several government agencies, developed options for defining STEM occupations, using the 2010 Standard Occupational Classification (SOC) system. The SOC Policy Committee developed two major domains that contain two subdomains each. The first major domain contains the "core" STEM occupations, and the second domain includes occupations that are dependent upon STEM knowledge.

The domains, subdomains, and the five types of STEM occupations are all groupings based on the type of occupations and the duties associated with each particular type of occupation that should prove useful for workforce planning and development, human resource departments, and jobseekers.

This Beyond the Numbers article describes the employment and wages for these STEM groups, using Occupational Employment Statistics (OES) data from the Bureau of Labor Statistics.

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STEM, employment, wages, workforce

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EMPLOYMENT AND UNEMPLOYMENT

An overview of employment and wages in science, technology, engineering, and math (STEM) groups

By John I. Jones

STEM is an acronym often used to refer to occupations, as well as fields of study, in science, technology, engineering, and math. The definition of STEM can vary, depending on the group using it. To develop some standards, the Standard Occupation Classification Policy Committee, made up of representatives of several government agencies,[1] developed options for defining STEM occupations, using the 2010 Standard Occupational Classification (SOC) system. The SOC Policy Committee developed two major domains that contain two subdomains each. The first major domain contains the "core" STEM occupations, and the second domain includes occupations that are dependent upon STEM knowledge.

Science, Engineering, Mathematics, and Information Technology Domain

1. Life and physical science, engineering, mathematics, and information technology occupations

2. Social science occupations

Science - and Engineering - related Domain

3. Architecture occupations

4. Health occupations

Furthermore, each STEM occupation can be categorized into one of five types of STEM occupations:

A. Research, development, design, or practitioner occupations

B. Technologist and technician occupations

C. Postsecondary teaching occupations

D. Managerial occupations

E. Sales occupations

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This **Beyond the Numbers** article describes the employment and wages for these STEM groups, using Occupational Employment Statistics (OES) data from the Bureau of Labor Statistics.

Employment

Total May 2013 OES employment in all STEM occupations is 16,994,480. This is nearly 13 percent of total national employment (132,588,810). Across the four types of STEM subdomains, health occupations have the most employment

(8,276,100) and architecture occupations have the least employment (156,650). Of the five types of STEM occupations, the largest by far is group A (Research, development, design, or practitioner occupations), with employment of 9,874,110. Next largest is group B (Technologist and technician occupations), with employment of 5,212,070. The remaining three types of STEM occupations each have employment totals less than 1 million. Now, let's take a look at employment estimates for each of the 20 groups.

Table 1. Employment in science, technology, engineering, and math (STEM) occupational groups, May 2013

Type of occupation	Science, engineering, mathematics, and information technology domain		Science- and engineering-related domain		Total
	1. Life and physical science, engineering, mathematics, and information technology occupations	2. Social science occupations	3. Architecture occupations	4. Health occupations	
Total	8,075,270	436,460	156,650	8,276,100	16,944,480
A. Research, development, design, or practitioner occupations	4,777,850	234,590	100,540	4,761,130	9,874,110
B. Technologist and technician occupations	2,107,070	81,930	28,400	2,994,670	5,212,070
C. Postsecondary teaching occupations	237,750	119,940	7,340	220,120	585,150
D. Managerial occupations	534,040	–	20,370	300,180	854,590
E. Sales occupations	418,560	–	–	–	418,560

Note: Occupations shown in the column headings are derived from the Standard Occpational Classification (SOC) system. Dash indicates data not available.
Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics program.

Group 4-A (Health research, development, design, or practitioner occupations) has the largest employment (4,777,850) out of the 20 groups. There are only four groups: 1-A and 1-B (Research, development, design, or practitioner occupations and Technologists and technicians in Life, physical, and social science, engineering, mathematics, and information technology) and 4-A and 4-B (Research, development, design, or practitioner occupations and Technologist and technicians in Health occupations) that have employment greater than 2 million. After these four groups, the next largest group is 1-D (Managerial occupations in life and physical science, engineering, mathematics, and information technology), with employment of 534,040. The three groups with the lowest employment are all located in the architecture subdomain (groups 3-B, 3-C, and 3-D). All have employment below 30,000, with group 3-C (Postsecondary teaching architecture occupations) having the lowest employment (7,340). There are four groups: 2-D (Managerial occupations in social science), 2-E (Sales occupations in social science), 3-E (Sales occupations in architecture), and 4-E (Sales occupations in health) that have no employment, due to the way the groups are defined currently.

Wages

The May 2013 annual average wage for all the STEM occupations is $79,640. This is roughly 1.7 times the national annual average wage for all occupations ($46,440). Out of all five types of STEM occupations, the highest wage is found in the managerial occupations, with an annual average wage of $122,470. In contrast, the lowest paying types of STEM occupations are the technologist and technician occupations ($49,930). Unlike the five types of STEM occupations, the

four domains have average annual wages that do not vary much and are close to the annual average wage ($79,640) for all STEM occupations. The domain with the highest wage ($83,750) is the life and physical science, engineering, mathematics, and information technology occupations. The lowest wage domain, social science occupations, has an annual average wage of $70,880. So the five types of STEM occupations differ by roughly $70,000, but the four domains differ by approximately $10,000. Table 2 lists the annual average wage for the 20 groups.

Table 2. Annual average wages[(1)] in science, technology, engineering, and math (STEM) occupational groups, May 2013

Type of occupation	Science, engineering, mathematics, and information technology domain		Science- and engineering-related domain		Average wage for all domains
	1. Life and physical science, engineering, mathematics, and information technology occupations	2. Social science occupations	3. Architecture occupations	4. Health occupations	
A. Research, development, design, or practitioner occupations	$89,540	$74,900	$77,850	$93,320	$90,900
B. Technologist and technician occupations	[(2)],[(3)] 56,830	[(3)] 45,280	[(2)] 51,250	45,200	49,930
C. Postsecondary teaching occupations	85,560	80,500	80,180	96,760	88,670
D. Managerial occupations	[(2)] 133,810	–	[(2)] 136,540	101,340	122,470
E. Sales occupations	88,150	–	–	–	79,750
Average wage for all occupation types	83,750	70,880	80,770	76,290	79,640

Footnotes:

(1) The annual average wages for each group, except for groups 3-B,C,D and 4-D, are calculated from a weighted annual average wage. Groups 3-B,C,D and 4-D have the same wage estimate as the national annual average wage because the groups each contain only one occupation.
(2)To calculate the weighted annual mean wage for the occupations, 11-9041 Architectural and engineering managers and 17-3011 Architectural and civil drafters, in the groups 1-D and 3-D, as well as 1-B and 3-B, required splitting the employment between the groups since one is architecture and the other is engineering. The method used was suggested by the SOC Policy Committee which consists of using the distribution of industry employment from NAICS 5413 Architectural and engineering services. 11-9041 had the following distribution: 11.1 percent in architecture and 88.9 percent in engineering. 17-3011 had the following distribution: 32 percent in architecture and 68 percent in engineering.
(3) To calculate the weighted annual mean wage for the occupation, 19-4099 Life, physical, and social science technicians, all other, for the groups 1-B and 2-B required splitting the employment between the groups because one is life and physical science, and the other is social science. The method used was suggested by the SOC Policy Committee which consists of using the national employment distribution of the minor groups, 19-1000, 19-2000, and 19-3000. So, employment for 19-4099 was broken out as follows: 70 percent Life and physical science, 30 percent Social science.

Note: Occupations shown in the column headings are derived from the Standard Occpational Classification (SOC) system. Dash indicates data not available.
Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics program.

Managerial occupations have the highest wages (groups 1-, 3-, 4-D) among the 20 groups. The four lowest wages are found in the technologists and technicians occupations (groups 1-, 2-, 3-, 4-B). The highest annual average wage found in the managerial occupations ($136,540) is 3 times the lowest annual average wage found in the technologists and technicians occupations ($45,200). Also, the technologists and technicians are the only type of STEM occupations that have two groups: 2-B (Technologist and technician occupations in social science) and 4-B (Technologist and technician occupations in health) that are slightly below the national annual average wage for all occupations.

Conclusion

STEM occupations are actively promoted by many federal agencies, such as the National Science Foundation, and are viewed as having some of the best opportunities for job growth in the future. Currently, they make up more than 1 out of every 10 jobs in the United States and have wages that are approaching nearly twice the U.S. average.

This **Beyond the Numbers** summary was prepared by John I. Jones, economist in the Office of Employment and Unemployment Statistics, Bureau of Labor Statistics. Email: jones.john@bls.gov. Telephone: (202) 691-5197.

NOTES

[1]For information about the government agencies participating in the Standard Occupation Classification Policy Committee, see www.bls.gov/soc/Attachment_A_STEM.pdf .

[2]To see a finer level of detail, all the occupations in the different STEM groups, with their respective employment and wage estimates, are available on the OES webpage at http://www.bls.gov/oes/2013/may/stem_groups.htm.

[3]Additional 2010 SOC STEM definitions and supporting documentations on definitions and supporting documentation are found at www.bls.gov/soc/. (See the bullets under the heading, “Options for defining STEM occupations under the 2010 SOC.”)

SUGGESTED CITATION

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