Understanding the UK STEM technician workforce – Technical Annex

For the Gatsby Charitable Foundation

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Prepared by TBR's Skills and Labour Market Team

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Introduction

The Gatsby Charitable Foundation has undertaken a number of studies in order to deliver a greater understanding of the UK's technician workforce. Key has been the 2012 publication by Geoff Mason Science, Engineering and Technology Technicians in the UK Economy, which was crucial in exploring cross-sectoral technician employment, education & training.

In 2014 this work has been taken forward and augmented in order to cover the whole spectrum of Science, Technology, Engineering & Mathematics (STEM) workers, covering all four STEM disciplines (plus health where there is significant scientific activity) and workers at managerial level, in addition to technicians and professionals. Additional research has also been undertaken to include occupations in the Creative Industries and Agriculture & Horticulture that are considered to be STEM, key areas of the STEM workforce that have previously been overlooked. The resulting report Understanding the UK STEM technician workforce is therefore the first consistent analysis of STEM Technicians across all sectors of the economy, compared with other all other STEM workers. Two supplementary reports were also created that focused on the STEM workforce within the Creative Industries and within Agricultural & Horticultural industries.

This document is a technical annex to this suite of reports, explaining the methodological approach that was employed across the research programme.

1. Methodological Approach

The research uses data from the Office for National Statistics' (ONS) Annual Population Survey[1] (APS) in an industry/occupation matrix which identifies for each STEM occupation, the sector in which that STEM role is most likely to work. This is an innovative approach, enabling an understanding of the true size and scope of the STEM workforce across the economy, rather than limiting the research to considering STEM roles working in a narrow band of STEM sectors. TBR has employed this methodology to great effect when conducting workforce studies in other sectors that are notoriously difficult to measure and are not easily confined to sectoral definitions.

As previously noted, this research seeks to build on prior research, specifically the 2012 publication by Geoff Mason[2], which covered the SET element of STEM, but excluded financial and health occupations. TBR worked closely with the team at Gatsby to investigate additional occupations that should be incorporated in to the definition of STEM workers. This involved a number of activities:

1. Conversion of the SET definition from the SOC 2000 system to SOC 2010 system.
    - The research by Geoff Mason used data from the APS, but since its publication the survey has switched system to the new 2010 system, as such a conversion was required.

2. Desk research[3] into specific industries of interest (Creative Industries and Agriculture & Horticulture) to identify relevant roles that were previously excluded
    - This stage is explored in more detail in Section 2, page 4.

3. Identification of management occupations that contain STEM workers, used to form an additional 'STEM Managers' group.
    - This involved a review of management occupations and the types of activity that each carries out, the findings were discussed with Gatsby and a final set of STEM Manager occupations agreed.

4. Addition of finance and health based roles previously excluded from the SET Technician research.
    - This stage used Gatsby's research in to Technicians in the healthcare sector[4] to identify relevant occupations as well as those occupations covered by the relevant Sector Skills Councils[5].

5. A review of existing SOC based STEM definitions
    - This final step was used to identify any other inherently STEM based occupations that had not been captured by the previous four steps.

These steps resulted in a set of occupation codes that would then be used to define STEM workers across the UK. All occupations in this research are assigned under the Standard Occupational Classification (SOC 2010) system[6].

The SOC system provides a robust classification of different occupations across the UK. However, some of the classifications can be too generic or capture additional activities that are not relevant. When carrying out the steps above, a number of SOC codes were identified that were likely to contain STEM workers as well as non-STEM workers. In order to resolve this issue a proxy was developed using STEM qualifications, adding an additional sixth step to the list above.

[1] The APS data used for this project was the July 2012 to June 2013 annual dataset.
[2] http://www.gatsby.org.uk/en/Education/Projects/Technician-Numbers.aspx
[3] This included consultation with Sector Skills Councils representing these industries, namely Creative & Cultural Skills, Creative Skillset and Lantra.
[4] Technician and intermediate roles in the healthcare sector – Fuller, Turbin, Unwin, Guile, Wintrup (2013)
[5] Skills for Health and the Financial Skills Partnership
[6] http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/soc2010/index.html

The sixth step involved looking at the subject of degree qualifications (first degree or higher degree) or vocational qualifications. If the qualification was STEM related, the individuals were included, if the qualification was not STEM related the individuals were excluded. This serves to provide a minimum estimate as to the number of people employed in a STEM role within these more generic SOC codes. An example of this filtering process is provided below:

Table 1: Example of filtering an SOC to include only those with a STEM qualification

SOC	Total Employment in SOC	Total Employment with STEM Qualification	% of with STEM qualification	Employment included in study
2114: Social and humanities scientists	13,580	2,700	19.9%	2,700

Once the relevant individuals within SOCs had been identified, the final step was to assign the SOCs to a relevant role (Manager, Professional, Associate Professional Technician or Skilled Worker Technician) based on their position within the SOC system as highlighted below in Table 2.

Table 2: Mapping SOC codes to STEM Role

SOC Code	SOC Description	STEM Role
1	Managers, Directors & Senior Officials	Manager
2	Professional Occupations	Professional
3	Associate Professional & Technical Occupations	Associate Professional
4	Administrative & Secretarial Occupations	Skilled Worker
5	Skilled Trades Occupations	Skilled Worker
6	Caring, Leisure & Other Service Occupations	Skilled Worker
7	Sales & Customer Service Occupations	Skilled Worker
8	Process, Plant & Machine Operatives	Skilled Worker
9	Elementary Occupations	Skilled Worker

The final definition can be viewed in full in Section 3 (Page 11).

This definition of the different STEM roles was then used in conjunction with the wealth of demographic information available within the APS dataset (such as Gender, Age, Location, Wages, etc.) to provide an insight into the Technician, Professional and Manager workforces across the UK.

2. Approach to Desk Research Stage

The desk research stage of the methodology was carried out specifically for the Creative Industries and Agriculture & Horticulture, as these were industries of particular interest to Gatsby.

The initial step was to identify and review a number of reports about the industries to ascertain how STEM skills were used and understood within each sector. Reports reviewed as part of the desk research stage clearly identified that STEM skills were a key requirement for both the Creative Industries and Agriculture & Horticulture; however they unfortunately did not specify which job roles use or require such skills.

In order to develop a full list of STEM relevant roles for each sector, a shortlist of potentially relevant SOCs (i.e. those which might contain some STEM activity) in the Creative industries and Agriculture & Horticulture was created for further review. The shortlist was developed through further desk research and discussions with the relevant sector skills councils (Creative & Cultural Skills and Creative Skillset for Creative Industries and Lantra for Agriculture & Horticulture).

Following the creation of these initial shortlists, the following assessment was undertaken in order to identify those SOCs that should receive serious consideration as containing STEM workers:

- Any SOCs on the shortlists which were also listed as 'primary' or 'secondary' science in the Science Council's 2011 definition[7] were passed through for serious consideration, as they were considered as having strong linkages to STEM.
- Any non-science SOCs (as per the Science Council definition) were then tested in further detail for STEM relevance via the following activities:

  1. The detailed description of the SOC's activities in the UK SOC manual[8] was reviewed to determine the degree of relevance to STEM activities.
  2. A keyword search for STEM related terms[9] was carried out across the Office for National Statistics' SOC index of job titles for each SOC. The results from this were then compared to the overall average across all SOCs.
  3. A review of O*NET's[10] list of occupations requiring STEM education was also carried out.

Based on how each SOC 'performed' against each of these three reviews, it was either classified as containing at least some STEM workers, or excluded altogether.

This resulted in a set of SOC codes being identified as STEM relevant for the Creative Industries and for Agriculture & Horticulture that were outside of Mason's original definition. These additional SOCs were added to the Mason definition along with those identified through the other stages listed in Section 1 (page 2).

More detail on the testing process for the Creative Industries and Agriculture & Horticulture is provided in the following sections.

[7] Dodd et al. (2011), The Current & Future UK Science Workforce
[8] http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/soc2010/index.html
[9] The following keywords with a 'wildcard' were used: Tech*, Scie*, Math*, Analy*, Engi*
[10] The O*NET website (based in the US) provides a list of occupations for which a STEM education is required: http://www.onetonline.org/find/stem?t=0&g=Go

2.1 Creative Occupation Review

Through an initial review of literature around the Creative Industries and discussions with the relevant Sector Skills Councils an initial shortlist of 20 potentially STEM SOC codes was identified. These are provided below:

Table 3: Initial shortlist of Creative STEM SOCs

SOC	Description
1136	Information technology and telecommunications directors
2433	Quantity surveyors
2434	Chartered surveyors
2435	Chartered architectural technologists
2436	Construction project managers and related professionals
3121	Architectural and town planning technicians
3417	Photographers, audio-visual and broadcasting equipment operators
3421	Graphic designers
3422	Product, clothing and related designers
5411	Weavers and knitters
5412	Upholsterers
5413	Footwear and leather working trades
5414	Tailors and dressmakers
5419	Textiles, garments and related trades n.e.c.
5421	Pre-press technicians
5422	Printers
5423	Print finishing and binding workers
5441	Glass and ceramics makers, decorators and finishers
5442	Furniture makers and other craft woodworkers
5449	Other skilled trades n.e.c.

Of these SOC codes, only one (SOC 1136 – IT & Telecoms Directors) was already included in the Science Council's definition of Primary or Secondary workers and therefore did not require further testing. The remaining 19 SOC codes were to be tested as outlined above in Section 2 (page 4). The results of these tests are presented in Table 4 (over the page) for each SOC tested.

Table 4: Testing Creative SOCs against criteria

SOC	Description	SOC Manual	Keywords[11]	O*NET	STEM Relevance
2433	Quantity surveyors	STEM Skills Required	4 out of 11 jobs	N/A	Medium
2434	Chartered surveyors	STEM Skills Required	2 out of 32 jobs	N/A	High
2435	Chartered architectural technologists	STEM Skills Required	1 out of 1 jobs	Engineering related	High
2436	Construction project managers and related professionals	Some STEM Skills	1 out of 12 jobs	N/A	Medium
3121	Architectural and town planning technicians	STEM Skills Required	2 out of 12 jobs	Engineering related	High
3417	Photographers, audio-visual and broadcasting equipment operators	Some STEM Skills	21 out of 80 jobs	N/A	Medium
3421	Graphic designers	STEM Skills Required	3 out of 38 jobs	Computer Science	Medium
3422	Product, clothing and related designers	Some STEM Skills	1 out of 80 jobs	N/A	Medium
5411	Weavers and knitters	No STEM Skills	0 out of 69 jobs	N/A	None
5412	Upholsterers	Few STEM Skills	0 out of 40 jobs	N/A	None
5413	Footwear and leather working trades	No STEM Skills	1 out of 358 jobs	N/A	None
5414	Tailors and dressmakers	Few STEM Skills	0 out of 111 jobs	N/A	None
5419	Textiles, garments and related trades n.e.c.	Few STEM Skills	0 out of 199 jobs	N/A	None
5421	Pre-press technicians	Few STEM Skills	1 out of 121 jobs	N/A	Low
5422	Printers	No STEM Skills	1 out of 88 jobs	N/A	None
5423	Print finishing and binding workers	No STEM Skills	1 out of 134 jobs	N/A	None
5441	Glass and ceramics makers, decorators and finishers	Few STEM Skills	2 out of 404 jobs	N/A	Low
5442	Furniture makers and other craft woodworkers	Few STEM Skills	0 out of 181 jobs	N/A	Low
5449	Other skilled trades n.e.c.	Few STEM Skills	8 out of 420 jobs	N/A	Low

After discussing these results with Gatsby, the decision was to include those Creative SOCs with either a High or Medium STEM relevance (as determined by the tests).

[11] This step assessed how many of the job titles associated with each SOC contained one of the keywords of interest, namely: Tech*, Scie*, Math*, Analy*, Engi*

This resulted in the following final set of Creative STEM SOCs to be added to the original Mason definition:

Table 5: Final set of Creative STEM occupations

SOC 2010	Description	STEM Role
1136	Information technology & telecommunication directors	Manager
2433	Quantity surveyors	Professional
2434	Chartered surveyors	Professional
2435	Chartered architectural technologists	Professional
2436	Construction project managers and related professionals	Professional
3417	Photographers, audio-visual & broadcasting equipment operators	Skilled Worker
3421	Graphic designers	Skilled Worker
3422	Product, clothing & related designers	Skilled Worker

Whilst the final step in the methodology laid out in Section 1 (Table 2, page 3) indicates that SOCs are assigned to STEM roles based on their position within the SOC system, this is not the case for SOCs 3417, 3421 and 3422. In this instance Gatsby felt that placing these occupations in to the Skilled Worker technician category was more appropriate, based on the results from the desk research and the testing process.

Based on this discussion and the results from the desk research, it was also decided that SOCs 3417 and 3422 would be filtered to reach the most STEM relevant people. For SOC 3417 this meant that individuals employed as general photographers (in SIC 74.20) were excluded, and for SOC 3422, individuals employed in Fashion & Textiles industries (in SIC 13) were also excluded. All other SOCs listed above were fully included.

2.2 Agriculture & Horticulture Occupation Review

Through an initial review of literature around Agricultural & Horticultural Industries and discussions with the relevant Sector Skills Council, Lantra, an initial shortlist of 19 SOC codes was identified. These are provided below:

Table 6: Initial shortlist of Agriculture & Horticulture SOCs

SOC	Description
1211	Managers and proprietors in agriculture and horticulture
1213	Managers and proprietors in forestry, fishing and related services
1255	Waste disposal and environmental services managers
2141	Conservation professionals
2142	Environment professionals
2216	Veterinarians
3550	Conservation and environmental associate professionals
5111	Farmers
5112	Horticultural trades
5113	Gardeners and landscape gardeners
5114	Groundsmen and greenkeepers
5119	Agricultural and fishing trades n.e.c.
5443	Florists
6131	Veterinary nurses
6132	Pest control officers
6139	Animal care services occupations n.e.c.
8223	Agricultural machinery drivers
9111	Farm workers
9112	Forestry workers

Of these SOC codes, six fell in to the Primary or Secondary Science list of SOC codes provided in the Science Council's research and therefore were automatically included in the definition:

- 1211 Managers and proprietors in agriculture and horticulture
- 1213 Managers and proprietors in forestry, fishing and related services
- 2141 Conservation professionals
- 2142 Environment professionals
- 2216 Veterinarians
- 6139 Animal care services occupations n.e.c.

The remaining 13 SOC codes were to be tested using the steps laid out in Section 2 (page 4). The results of these tests are presented Table 7 (over the page).

Table 7: Testing Agriculture & Horticulture SOCs against criteria

SOC	Description	SOC Manual	Keywords[12]	O*NET	STEM Relevance
1255	Waste disposal and environmental services managers	Few STEM Skills	0 out of 41 jobs	Engineering related	Low
3550	Conservation and environmental associate professionals	STEM Skills Required	1 out of 24 jobs	Environmental Science	High
5111	Farmers	Some STEM Skills	2 out of 45 jobs	Life Sciences	Medium
5112	Horticultural trades	Some STEM Skills	1 out of 39 jobs	N/A	Low
5113	Gardeners and landscape gardeners	Few STEM Skills	0 out of 15 jobs	N/A	None
5114	Groundsmen and greenkeepers	No STEM Skills	0 out of 16 jobs	N/A	None
5119	Agricultural and fishing trades n.e.c.	Some STEM Skills	0 out of 31 jobs	Life Sciences	Low
5443	Florists	No STEM Skills	1 out of 10 jobs	N/A	None
6131	Veterinary nurses	STEM Skills Required	0 out of 3 jobs	N/A	Medium
6132	Pest control officers	No STEM Skills	2 out of 26 jobs	N/A	None
8223	Agricultural machinery drivers	Few STEM Skills	1 out of 19 jobs	N/A	None
9111	Farm workers	Some STEM Skills	0 out of 47 jobs	Life Sciences	Medium
9112	Forestry workers	Some STEM Skills	1 out of 51 jobs	Life Sciences	Medium

After discussing these results with Gatsby, the decision was to include those SOCs with either a High, Medium or Low STEM relevance (as determined by the tests).

[12] This step assessed how many of the job titles associated with each SOC contained one of the keywords of interest, namely: Tech*, Scie*, Math*, Analy*, Engi*

This resulted in the following final set of Agriculture & Horticulture STEM SOCs to be added to the original Mason definition:

Table 8: Final set of Agriculture & Horticulture STEM occupations

SOC 2010	Description	STEM Role
1211	Managers and proprietors in agriculture and horticulture	Manager
1213	Managers and proprietors in forestry, fishing and related services	Manager
2141	Conservation professionals	Professional
2142	Environment professionals	Professional
2216	Veterinarians	Professional
3550	Conservation and environmental associate professionals	Associate Professional
5111	Farmers	Skilled Worker
5112	Horticultural Workers	Skilled Worker
5119	Agricultural and fishing Workers n.e.c.	Skilled Worker
6131	Veterinary nurses	Skilled Worker
6139	Animal care services occupations n.e.c.	Skilled Worker
9111	Farm workers	Skilled Worker
9112	Forestry workers	Skilled Worker

Based on the desk research and discussion with Gatsby, it was decided that SOCs 1211, 1213, 5111, 5112, 5119, 9111 and 9112 would be filtered to reach the most STEM relevant people. For all seven of these SOCs, this meant that only those individuals with a STEM degree or vocational qualification were included in any analysis, those without a STEM degree or vocational qualification were excluded. All other SOCs (i.e. 2141, 2142, 2216, 3550, 6131, 6139) were fully included.

3. Final Definition of STEM workers

This section provides the final set of Standard Occupational Classification (SOC) codes used to define each of the four STEM roles as well as the STEM Discipline that the SOC has been assigned to. These SOC codes were determined through the five steps laid out in Section 1, Page 2, which included the desk research step (which was explored in more detail in Section 2, page 4).

Table 9: SOCs used to define Manager roles and their discipline

SOC 2010	SOC10 Description	Total Emp	Emp with STEM Qual	% STEM Qualified	Filtered?	Discipline
1122	Production managers and directors in construction	160,260	41,030	25.6%		Engineering
1123	Production managers and directors in mining and energy	15,440	5,280	34.2%		Engineering
1131	Financial managers and directors	232,390	29,000	12.5%	Y	Mathematics
1136	Information technology and telecommunications directors	59,200	25,730	43.5%		Technology
1150	Financial institution managers and directors	97,490	8,620	8.8%	Y	Mathematics
1181	Health services and public health managers and directors	46,700	5,040	10.8%	Y	Health
1211	Managers and proprietors in agriculture and horticulture	20,200	2,550	12.6%	Y	Engineering
1213	Managers and proprietors in forestry, fishing and related services	12,460	*	*	Y	Engineering
1241	Health care practice managers	19,300	1,820	9.4%	Y	Health

Table 10: SOCs used to define Professional roles and their discipline

SOC 2010	SOC10 Description	Total Emp	Emp with STEM Qual	% STEM Qualified	Filtered?	Discipline
2111	Chemical scientists	23,650	15,360	65.0%		Science
2112	Biological scientists and biochemists	80,550	46,450	57.7%		Science
2113	Physical scientists	23,170	16,500	71.2%		Science
2114	Social and humanities scientists	13,570	2,700	19.9%	Y	Science
2119	Natural and social science professionals n.e.c.	41,620	22,480	54.0%		Science
2121	Civil engineers	68,530	42,410	61.9%		Engineering
2122	Mechanical engineers	87,700	38,360	43.7%		Engineering
2123	Electrical engineers	39,960	19,230	48.1%		Engineering
2124	Electronics engineers	35,700	15,470	43.3%		Engineering
2126	Design and development engineers	63,410	35,430	55.9%		Engineering
2127	Production and process engineers	45,820	23,070	50.3%		Engineering
2129	Engineering professionals n.e.c.	81,830	37,070	45.3%		Engineering
2133	IT specialist managers	178,560	61,860	34.6%		Technology
2134	IT project and programme managers	60,500	17,240	28.5%		Technology
2135	IT business analysts, architects and systems designers	106,800	41,750	39.1%		Technology
2136	Programmers and software development professionals	243,530	120,380	49.4%		Technology
2137	Web design and development professionals	65,710	16,880	25.7%		Technology
2139	Information technology and telecoms professionals n.e.c.	162,760	57,560	35.4%		Technology
2141	Conservation professionals	13,850	9,740	70.3%		Science
2142	Environment professionals	32,030	21,250	66.3%		Science
2150	Research and development managers	42,000	18,530	44.1%		Science
2211	Medical practitioners	241,460	17,400	7.2%		Health
2212	Psychologists	36,080	29,190	80.9%		Health
2213	Pharmacists	47,910	3,270	6.8%		Health
2214	Ophthalmic opticians	23,420	*	*		Health
2215	Dental practitioners	38,410	*	*		Health
2216	Veterinarians	16,510	11,340	68.7%		Health
2217	Medical radiographers	29,470	1,570	5.3%		Health
2218	Podiatrists	9,940	*	*		Health

SOC 2010	SOC10 Description	Total Emp	Emp with STEM Qual	% STEM Qualified	Filtered?	Discipline
2219	Health professionals n.e.c.	44,230	7,430	16.8%		Health
2221	Physiotherapists	49,940	3,240	6.5%		Health
2222	Occupational therapists	33,570	2,430	7.2%		Health
2223	Speech and language therapists	13,940	2,540	18.2%		Health
2229	Therapy professionals n.e.c.	37,980	9,580	25.2%		Health
2231	Nurses	585,300	18,460	3.2%	Y	Health
2232	Midwives	38,710	*	*	Y	Health
2421	Chartered and certified accountants	174,330	21,400	12.3%	Y	Mathematics
2423	Management consultants and business analysts	166,020	39,780	24.0%	Y	Mathematics
2425	Actuaries, economists and statisticians	35,310	17,240	48.8%		Mathematics
2426	Business and related research professionals	35,000	9,350	26.7%	Y	Technology
2431	Architects	54,440	33,160	60.9%		Engineering
2432	Town planning officers	18,970	13,370	70.5%		Engineering
2433	Quantity surveyors	35,150	18,940	53.9%		Engineering
2434	Chartered surveyors	60,630	26,250	43.3%		Engineering
2435	Chartered architectural technologists	3,890	2,360	60.6%		Engineering
2436	Construction project managers and related professionals	59,930	22,910	38.2%		Engineering
2461	Quality control and planning engineers	27,830	7,720	27.7%		Engineering
2463	Environmental health professionals	10,490	2,370	22.6%		Engineering

Table 11: SOCs used to define Associate Professional roles and their discipline

SOC 2010	SOC10 Description	Total Emp	Emp with STEM Qual	% STEM Qualified	Filtered?	Discipline
3111	Laboratory technicians	73,500	23,140	31.5%		Science
3112	Electrical and electronics technicians	22,210	7,470	33.6%		Engineering
3113	Engineering technicians	84,950	26,870	31.6%		Engineering
3114	Building and civil engineering technicians	18,130	4,720	26.0%		Engineering
3115	Quality assurance technicians	25,080	6,460	25.8%		Engineering
3116	Planning, process and production technicians	27,950	6,700	24.0%		Engineering
3119	Science, engineering and production technicians n.e.c.	39,660	10,250	25.8%		Science
3121	Architectural and town planning technicians	16,480	8,870	53.9%		Engineering
3122	Draughtspersons	40,660	11,930	29.4%		Engineering
3131	IT operations technicians	104,800	28,330	27.0%		Technology
3132	IT user support technicians	91,300	19,860	21.8%		Technology
3213	Paramedics	23,330	*	*		Health
3216	Dispensing opticians	5,020	*	*		Health
3217	Pharmaceutical technicians	27,220	1,940	7.1%		Health
3218	Medical and dental technicians	34,050	3,580	10.5%		Health
3219	Health associate professionals n.e.c.	47,410	5,050	10.7%	Y	Health
3531	Estimators, valuers and assessors	69,000	11,630	16.9%	Y	Mathematics
3532	Brokers	47,100	3,400	7.2%	Y	Mathematics
3533	Insurance underwriters	30,240	1,990	6.6%	Y	Mathematics
3534	Finance and investment analysts and advisers	176,680	21,200	12.0%	Y	Mathematics
3535	Taxation experts	34,560	3,210	9.3%	Y	Mathematics
3537	Financial and accounting technicians	28,020	2,150	7.7%	Y	Mathematics
3538	Financial accounts managers	118,590	11,680	9.8%	Y	Mathematics
3550	Conservation and environmental associate professionals	7,990	3,340	41.8%		Mathematics
3565	Inspectors of standards and regulations	45,700	12,770	27.9%		Engineering

Table 12: SOCs used to define Skilled Worker roles and their discipline

SOC 2010	SOC10 Description	Total Emp	Emp with STEM Qual	% STEM Qualified	Filtered?	Discipline
3417	Photographers, audio-visual and broadcasting equipment operators	77,620	8,390	10.8%	Y[13]	Technology
3421	Graphic designers	82,070	2,870	3.5%		Technology
3422	Product, clothing and related designers	61,520	3,750	6.1%	Y[14]	Technology
4121	Credit controllers	38,670	*	*	Y	Mathematics
4122	Book-keepers, payroll managers and wages clerks	390,860	30,400	7.8%	Y	Mathematics
4124	Finance officers	37,920	3,410	9.0%	Y	Mathematics
4129	Financial administrative occupations n.e.c.	149,200	7,400	5.0%	Y	Mathematics
5111	Farmers	120,400	5,730	4.8%	Y	Science
5112	Horticultural trades	14,980	*	*	Y	Science
5119	Agricultural and fishing trades n.e.c.	15,930	*	*	Y	Engineering
5211	Smiths and forge workers	5,590	*	*		Engineering
5212	Moulders, core makers and die casters	2,010	*	*		Engineering
5213	Sheet metal workers	17,740	*	*		Engineering
5214	Metal plate workers, and riveters	8,260	*	*		Engineering
5215	Welding trades	58,230	3,380	5.8%		Engineering
5216	Pipe fitters	10,380	*	*		Engineering
5221	Metal machining setters and setter-operators	59,720	4,220	7.1%		Engineering
5222	Tool makers, tool fitters and markers-out	12,940	1,860	14.4%		Engineering
5223	Metal working production and maintenance fitters	185,150	27,380	14.8%		Engineering
5224	Precision instrument makers and repairers	21,590	3,530	16.3%		Engineering
5225	Air-conditioning and refrigeration engineers	13,690	1,960	14.3%		Engineering
5241	Electricians and electrical fitters	227,890	41,290	18.1%		Engineering
5242	Telecommunications engineers	52,400	4,600	8.8%		Engineering
5244	TV, video and audio engineers	13,160	1,840	14.0%		Engineering
5245	IT engineers	35,340	8,600	24.3%		Engineering
5249	Electrical and electronic trades n.e.c.	70,540	14,410	20.4%		Engineering
5250	Skilled metal, electrical and electronic trades supervisors	38,400	7,420	19.3%		Engineering
5314	Plumbers and heating and ventilating engineers	164,070	15,940	9.7%		Engineering
6131	Veterinary nurses	14,210	2,150	15.1%		Health
6139	Animal care services occupations n.e.c.	50,140	2,670	5.3%		Health
6141	Nursing auxiliaries and assistants	299,000	9,510	3.2%	Y	Health
6142	Ambulance staff (excluding paramedics)	17,570	*	*	Y	Health
6143	Dental nurses	44,860	*	*		Health
8111	Food, drink and tobacco process operatives	122,640	2,650	2.2%	Y	Science
8114	Chemical and related process operatives	40,390	3,140	7.8%	Y	Science
8115	Rubber process operatives	6,260	*	*	Y	Science
8116	Plastics process operatives	35,320	*	*	Y	Science
8124	Energy plant operatives	5,300	*	*	Y	Engineering
8131	Assemblers (electrical and electronic products)	33,480	*	*	Y	Engineering
8132	Assemblers (vehicles and metal goods)	39,970	*	*	Y	Engineering
8133	Routine inspectors and testers	64,770	4,150	6.4%	Y	Engineering
9111	Farm workers	58,650	1,630	2.8%	Y	Science
9112	Forestry workers	10,350	*	*	Y	Science

Please note across all tables information has been suppressed with an asterisk (*) to signify where there is a low sample size, within the Annual Population Survey from which all the data is acquired.

[13] Rather than filtering on STEM qualifications, this SOC was filtered to exclude commercial photography (SIC 74.20)
[14] Rather than filtering on STEM qualifications, this SOC was filtered to exclude Fashion & Textile designers (SIC 13)