

January 2022

# Labor Market Analysis

## Agriculture Education

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Prepared by the Central Valley/Mother Lode Center of Excellence

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# Contents

Summary .....	2
Key findings .....	2
Introduction.....	3
Occupational Demand .....	3
Wages .....	4
Job Postings .....	4
Salaries.....	5
Education.....	5
Baseline and Specialized Skills.....	6
Software Skills.....	6
Certifications.....	6
Education, Work Experience & Training.....	7
Supply .....	8
Student Outcomes .....	0
Conclusion.....	1
Recommendation .....	1
Appendix A: Methodology & Data Sources .....	2

**COVID-19 Statement:** This report includes employment projection data by Emsi. Emsi’s projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy during the projection period will be at approximately full employment or potential output. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, they may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Other measures such as unemployment rates and monthly industry employment estimates will reflect the most recent information on employment and jobs in the state and, in combination with input from local employers, may help validate current and future employment needs as depicted here.

*If for any reason this document is not accessible or if you have specific needs for readability, please contact us and we will do our utmost to accommodate you with a modified version. To make a request, contact Nora Seronello by phone at (209) 575-6894 or by email [seronellon@mjc.edu](mailto:seronellon@mjc.edu).*

# Summary

Please note the COVID-19 statement on page 2 when considering this report's findings.

This study conducted by the Central Valley/Mother Lode Center of Excellence examines labor market demand, wages, skills, and postsecondary supply for agriculture education. Four occupations related to agriculture education were identified for Reedly College:

- 19-4011, Agricultural and Food Science Technicians
- 19-4099, Life, Physical, and Social Science Technicians, All Other
- 25-3097, Tutors and Teachers and Instructors, All Other
- 45-2011, Agricultural Inspectors

## Key findings:

- **Occupational demand** — Nearly 6,200 workers were employed in jobs related to agriculture education in 2020 in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The largest occupation is tutors and teachers and instructors, all other with 4,571 workers in 2020, a projected growth rate of 5% over the next five years, and 577 annual openings.
- **Wages** — Life, physical, and social science technicians, all other earn the highest entry-level wage, \$20.87/hour in the subregion.
- **Employers** — Employers with the most job postings in the subregion are Anthem Blue Cross, Ventura Coastal Llc, and Pathways of California.
- **Occupational titles** — The most common occupational title in job postings in the subregion is quality control analysts. The most common job title is quality control technician.
- **Skills and certifications** — The top baseline skill is communication, the top specialized skill is quality assurance and control, and the top software skill is Microsoft Excel. The most in-demand certification is a driver's license.
- **Education** — An associate's degree is typically required for the agricultural and food science technicians and life, physical, and social science technicians, all other. A bachelor's degree is typically required for the remaining two occupations.
- **Supply** — Analysis of postsecondary completions shows that on average 179 awards were conferred in the Central Valley/Mother Lode region each year.

Based on a comparison of occupational demand and supply, there is an undersupply of 79 trained workers in the subregion and 193 workers in the region. Please note the occupation tutors and teachers and instructors, all other was not taken into consideration on the comparison of occupational demand and supply since it's not considered community college relevant. The Center of Excellence recommends that Reedly College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of agriculture education workers in the region.

# Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Reedly College to provide labor market information for agriculture education. The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional demand and supply data has been included for broader applicability and use. The average living wage for a single adult in the SCV/SML subregion is \$13.67/hour.<sup>1</sup> Analysis of the program and occupational data related to agriculture education resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 19-4011, Agricultural and Food Science Technicians
- 19-4099, Life, Physical, and Social Science Technicians, All Other
- 25-3097, Tutors and Teachers and Instructors, All Other
- 45-2011, Agricultural Inspectors

The occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O\*NET OnLine are shown below. O\*Net data was not available for agricultural and food science technicians and tutors and teachers and instructors, all other.

## **Life, Physical, and Social Science Technicians, All Other**

**Job Description:** All life, physical, and social science technicians not listed separately.

**Knowledge:** N/A

**Skills:** N/A

## **Agricultural Inspectors**

**Job Description:** Inspect agricultural commodities, processing equipment, and facilities, and fish and logging operations, to ensure compliance with regulations and laws governing health, quality, and safety.

**Knowledge:** Customer and Personal Service, Administration and Management, Administrative, Law and Government, Mathematics

**Skills:** Quality Control Analysis, Active Listening, Monitoring, Reading Comprehension, Critical Thinking

# Occupational Demand

The SCV/SML subregion employed 6,195 workers in agriculture education occupations in 2020 (Exhibit 1). The largest occupation is tutors and teachers and instructors, all other with 4,571 workers in 2020. This occupation is projected to grow by 5% over the next five years and has the greatest number of projected annual openings, 577.

**Exhibit 1. Agriculture education employment and occupational projections in the SCV/SML subregion**

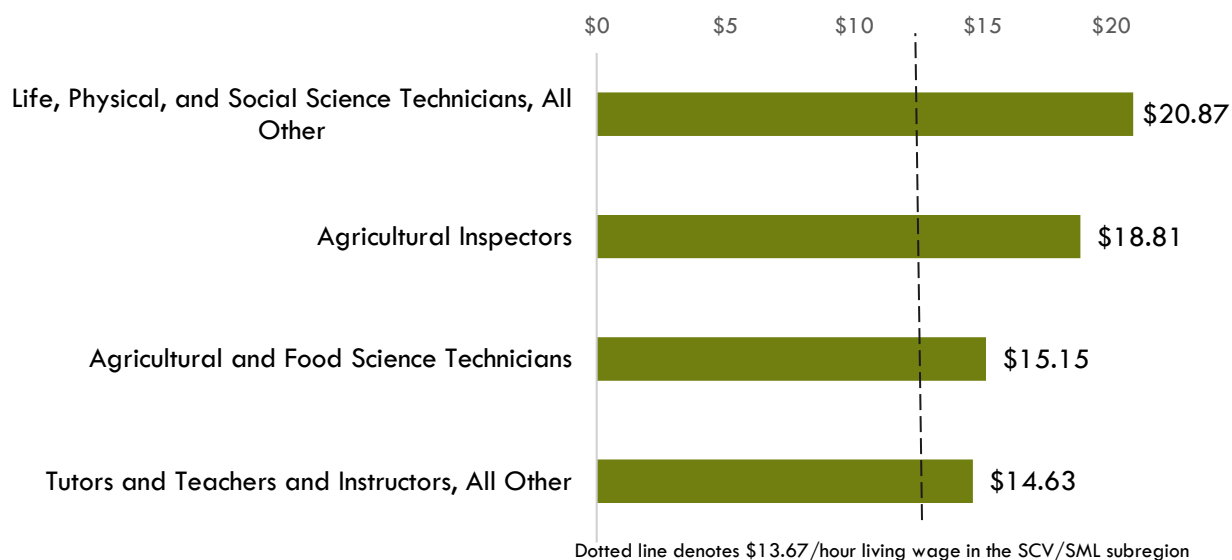
Occupation	2020 Jobs	2025 Jobs	5-Year Change	5-Year % Change	Annual Openings
Tutors and Teachers and Instructors, All Other	4,571	4,811	240	5%	577
Agricultural Inspectors	608	608	(0)	(0%)	99
Agricultural and Food Science Technicians	656	652	(5)	(1%)	87
Life, Physical, and Social Science Technicians, All Other	359	374	15	4%	47
<b>TOTAL</b>	<b>6,195</b>	<b>6,445</b>	<b>250</b>	<b>4%</b>	<b>811</b>

<sup>1</sup> The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: <https://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

# Wages

Exhibit 2 shows the entry-level hourly wages of the agriculture education occupations. Life, physical, and social science technicians, all other earn the highest entry-level wage, \$20.87/hour in the subregion. Entry-level wages are derived from the 25<sup>th</sup> percentile.

**Exhibit 2. Agriculture education entry-level wages in the SCV/SML subregion**



# Job Postings

There were 260 job postings for the four occupations in the SCV/SML subregion from July 2021 to December 2021.<sup>2</sup> The employers with the most job postings are listed in Exhibit 3.

**Exhibit 3. Top employers of agriculture education by number of job postings**

Employer	Job Postings	% Job Postings
Anthem Blue Cross	13	6%
Ventura Coastal Llc	8	4%
Pathways Of California	6	3%
Vulcan Materials Company	6	3%
PAE Incorporated	5	2%
Western Milling	5	2%
Actalent	4	2%
California Dairies Incorporated	4	2%
Cooperative Agricultural Support Services Authority	4	2%
Mission Foods	4	2%

Exhibit 4 shows how job postings for the targeted occupations in the SCV/SML subregion are distributed across seven O\*NET OnLine occupations. The occupational title quality control analysts is listed in 207 job

<sup>2</sup> Other than occupation titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

postings. Note how this occupational title dominates the job posting results. Common job titles in postings include quality control technician in 35 job postings, quality assurance technician in 32 job postings, and quality improvement coordinator in seven job postings.

**Exhibit 4. Top occupational titles in job postings for agriculture education**

Occupational Title	Job Postings	% of Job Postings
Quality Control Analysts	207	80%
Agricultural Technicians	27	10%
Food Science Technicians	11	4%
Life, Physical, and Social Science Technicians, All Other	7	3%
Precision Agriculture Technicians	4	2%
Agricultural Inspectors	3	1%
Remote Sensing Technicians	1	0%

**Salaries**

Exhibit 5 shows the “Market Salaries” for agriculture education occupations that are calculated by Burning Glass which uses a machine learning model built off of millions of job postings every year, and accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

**Exhibit 5. Salaries for agriculture education occupations**

Market Salary Percentile	Salary Amount
10th Percentile	\$28,864
25th Percentile	\$32,558
50th Percentile	\$38,641
75th Percentile	\$46,353
90th Percentile	\$63,229

**Education**

Of the 260 job postings, 172 listed an education level preferred for the positions being filled. Among those, 65% requested high school or vocational training, 40% requested an associate degree, and 19% requested associate’s degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below may total more than 100%.

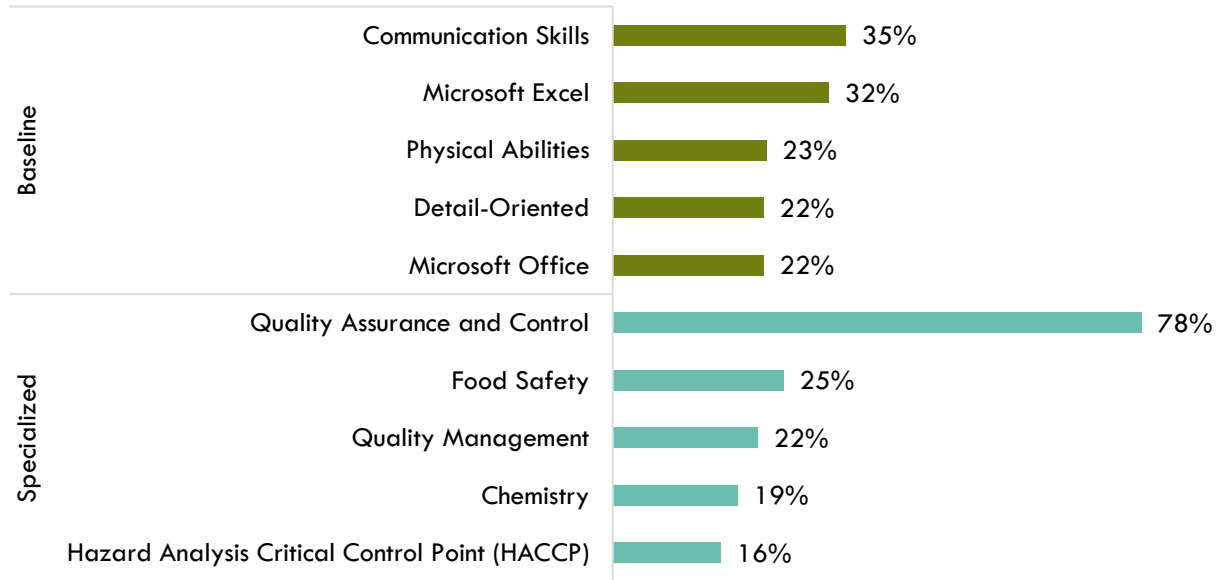
**Exhibit 6. Education levels requested in job postings for agriculture education**

Education Level	Job Postings	% of Job Postings
High school or vocational training	112	65%
Bachelor's degree	69	40%
Associate's degree	32	19%
Master's degree	13	8%

### Baseline and Specialized Skills

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are communication, 35% of job postings, Microsoft Excel, 32%, and physical abilities, 23%. The top three specialized skills are quality assurance and control, 78% of job postings, food safety, 25%, and quality management, 22%.

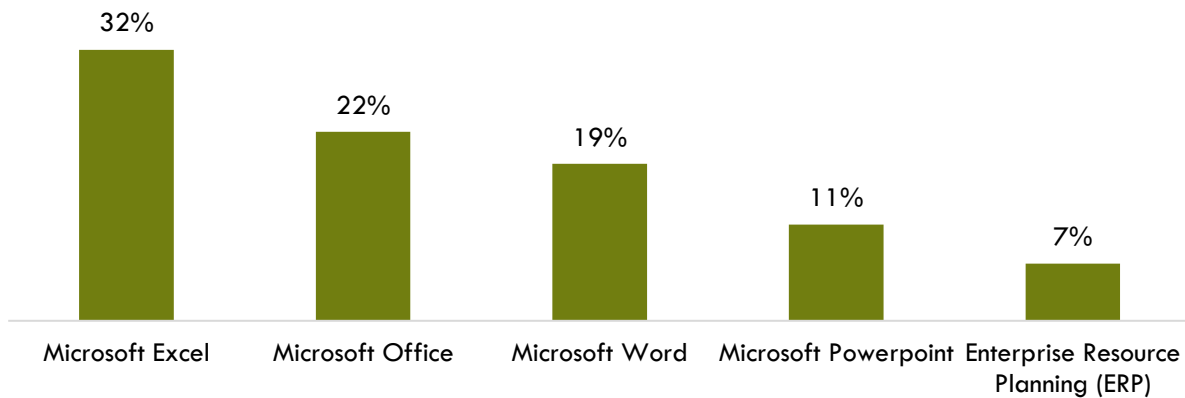
**Exhibit 7. In-demand agriculture education baseline and specialized skills**



### Software Skills

Analysis also included the software skills most in demand by employers. Microsoft Excel and Office were the top two software skills identified in job postings (Exhibit 8).

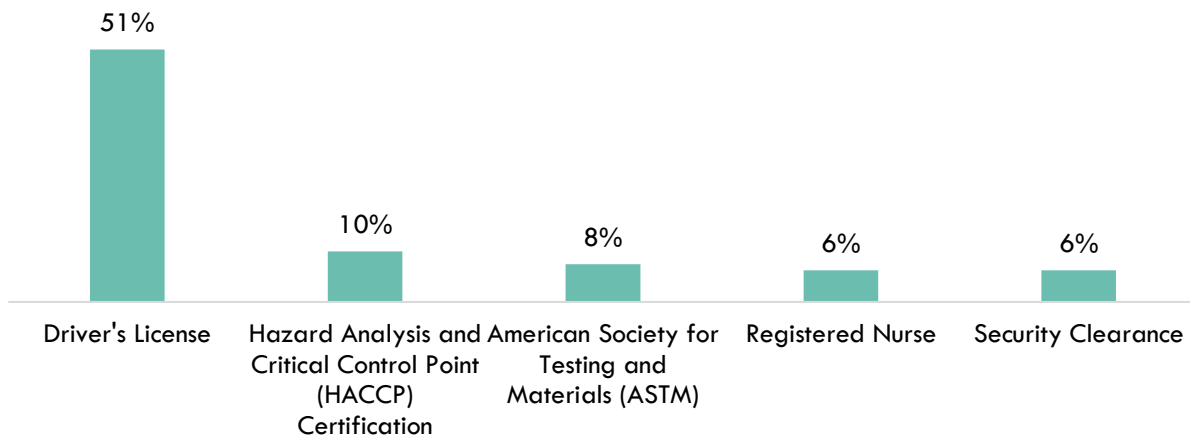
**Exhibit 8. In-demand agriculture education software skills**



### Certifications

Of the 260 job postings, 78 contained certification data. Among those, 51% indicated a need for a driver's license. The next top certifications are a hazard analysis and critical and American society for testing (Exhibit 9). (Due to the low number of job postings with certifications listed, the chart below may not be representative of the full sample.)

**Exhibit 9. Top agriculture education certifications requested in job postings**



## Education, Work Experience & Training

A high school diploma or equivalent is typically required for the two occupations (Exhibit 10).

**Exhibit 10. Education, work experience, training, and Current Population Survey results for agriculture education occupations<sup>3</sup>**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Tutors and Teachers and Instructors, All Other	Bachelor's degree	None	None	17.7%
Agricultural Inspectors	Bachelor's degree	None	Moderate-term	41.1%
Agricultural and Food Science Technicians	Associate's degree	None	Moderate-term	40.5%
Life, Physical, and Social Science Technicians, All Other	Associate's degree	None	None	36.6%

<sup>3</sup> "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.



# Supply

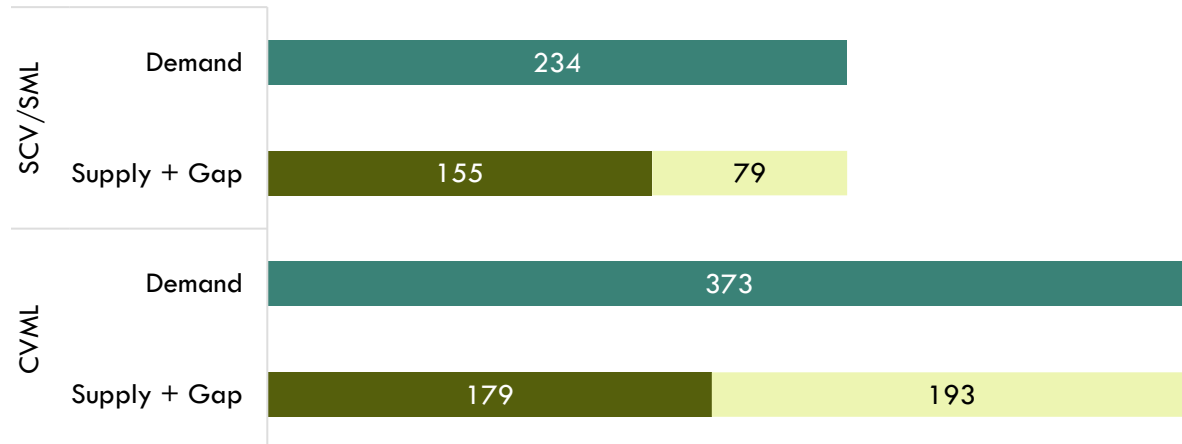
Analysis of program data from the California Community Colleges Chancellor’s Office Data Mart included the TOP and CIP codes and titles: 01.0102 - Agribusiness/Agricultural Business Operations, 01.9999 - Agriculture, Agriculture Operations and Related Sciences, Other, 010100 - Agriculture Technology and Sciences, General, and 019900 - Other Agriculture and Natural Resources. Analysis of the last three years of data shows that, on average, 179 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

**Exhibit 11. Postsecondary supply for agriculture education occupations in the region**

TOP/CIP Code- Title	College	Associate Degree	Bachelor's Degree	Certificate 18 < 30 Semester Units	Certificate 6 < 18 Semester Units	Certificate 8 < 16 Semester Units	Grand Total
01.0102 - Agribusiness/Agricultural Business Operations	California State University-Bakersfield		6				6
	California State University-Fresno		128				128
	California State University-Stanislaus		5				5
010100 - Agriculture Technology and Sciences, General	Merced	9					9
	Modesto	6				0	6
	Porterville	9					9
	Reedley College	1		1			2
	West Hills Coalinga	2		1	1		4
	Modesto	9					9
019900 - Other Agriculture and Natural Resources	Modesto	9					9
<b>TOTAL</b>		<b>36</b>	<b>139</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>179</b>

There is an undersupply of 79 agriculture education workers in the SCV/SML subregion and 193 workers in the region. Please note the occupation tutors and teachers and instructors, all other is not community college relevant hence it has been removed from the gap analysis (Exhibit 12).

**Exhibit 12. Agriculture education workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill gap in the SCV/SML subregion and region**



## Student Outcomes

Exhibit 13 summarizes employment and wage outcomes from the California Community College Chancellor’s Cal-PASS Plus LaunchBoard for the TOP code related to agriculture education. Of note, 25 agriculture technology and sciences, general students received a degree or certificate or attained apprenticeship journey status; 81 students transferred; 65% of students obtained a job closely related to their field of study; a 43% median change in earnings was reported; and 53% of students attained a living wage.

**Exhibit 13. Regional metrics for the TOP code related to agriculture education**

Metric	Agriculture Technology and Sciences, General 010100	Other Agriculture and Natural Resources 019900
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	25	12
Number of Students Who Transferred	81	15
Job Closely Related to Field of Study	65%	*
Median Change in Earnings	43%	55%
Attained a Living Wage	53%	46%
* denotes data not available.		

# Conclusion

The entry-level wages of the four occupations exceed the SCV/SML subregion's average living wage. There were 260 job postings in the past six months for occupations related to agriculture education in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is communication, and the top specialized skill is quality assurance and control.
- The top software skill is Microsoft Excel.
- The top certification is a driver's license.

There is an undersupply of trained workers, a shortage of 79 in the SCV/SML subregion and 193 in the region.

# Recommendation

Based on these findings, it is recommended that Reedly College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of agriculture education workers in the region.

# Appendix A: Methodology & Data Sources

## Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor’s Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (EMSI). EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level EMSI earnings by industry: <a href="http://economicmodeling.com">economicmodeling.com</a> .
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: <a href="https://www.bls.gov/emp/tables/educational-attainment.htm">https://www.bls.gov/emp/tables/educational-attainment.htm</a> .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: <a href="http://labormarketinfo.edd.ca.gov">labormarketinfo.edd.ca.gov</a> .
Job Posting and Skills Data	Burning Glass: <a href="http://burning-glass.com/">burning-glass.com/</a> .
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: <a href="http://onetonline.org">onetonline.org</a> .

## Key Terms and Concepts

**Annual Job Openings:** Annual openings are calculated by dividing the number of years in the projection period by total job openings.

**Education Attainment Level:** The highest education attainment level of workers age 25 years or older.

**Employment Estimate:** The total number of workers currently employed.

**Employment Projections:** Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (EMSI) formula that includes historical employment and economic indicators along with national, state and local trends.

**Living Wage:** The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children.

**Occupation:** An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

**Percent Change:** Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

**Replacements:** Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

**Total Job Openings (New + Replacements):** Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs, or retain the current employment level, number of openings will equal replacements.

**Typical Education Requirement:** represents the typical education level most workers need to enter an occupation.

**Typical On-The-Job Training:** indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.