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Labor Market Analysis

Animal Science



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Prepared by the Central Valley/Mother Lode Center of Excellence

Table of Contents

- Summary..... 2
 - Key findings2
- Introduction 3
- Occupational Demand 4
- Wages 4
- Job Postings 5
 - Salaries6
 - Education.....6
 - Baseline and Specialized Skills.....6
 - Software Skills.....7
 - Certifications7
- Education, Work Experience & Training 8
- Supply 9
- Student Outcomes 10
- Conclusion..... 11
- Recommendation 11
- Appendix A: Methodology & Data Sources 12

COVID-19 Statement: This report includes employment projection data by Lightcast. Lightcast’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.

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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 Animal Science. Four occupations related to Animal Science were identified for College of the Sequoias:

- 11-9013, Farmers, Ranchers, and Other Agricultural Managers
- 19-4012, Agricultural Technicians
- 39-2011, Animal Trainers
- 45-1011, First-Line Supervisors of Farming, Fishing, and Forestry Workers

Key findings:

- **Occupational demand** — There were 24,279 workers employed in jobs related to Animal Science in 2021 in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The largest occupation is farmers, ranchers, and other agricultural managers with 18,958 workers, and it is expected to contract by 1% over the next five years, while still producing 18,667 annual openings.
- **Wages** — First-line supervisors of farming, fishing, and forestry workers earn the highest entry-level wage, \$14.69/hour in the subregion.
- **Employers** — Employers with the most job postings in the subregion are California Public Utilities Commission, Fieldin, and Fresno's Chaffee Zoo.
- **Occupational titles** — The most common occupational title in job postings in the subregion is Agricultural Technicians. The most common job title is Dog Trainer.
- **Skills and certifications** — The top baseline skill is communication skills, the top specialized skill is repair, and the top software skill is Microsoft Office. The most in-demand certification is a applicators license.
- **Education** — A high school diploma or equivalent is typically required for farmers, ranchers, and other agricultural managers, first-line supervisors of farming, fishing, and forestry workers, and animal trainers. An Associate degree is typically required for agricultural technicians.
- **Supply** — Analysis of postsecondary completions shows that on average 119 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 2,588 trained workers in the subregion and 3,662 workers in the region. The Center of Excellence recommends that College of the Sequoias work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of Animal Science workers in the region.

Introduction

The Central Valley/Mother Lode Center of Excellence was asked by College of the Sequoias to provide labor market information for Animal Science. 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 \$11.91/hour.¹ Analysis of the program and occupational data related to Animal Science resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 11-9013, Farmers, Ranchers, and Other Agricultural Managers
- 19-4012, Agricultural Technicians
- 39-2011, Animal Trainers
- 45-1011, First-Line Supervisors of Farming, Fishing, and Forestry Workers

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.

Farmers, Ranchers, and Other Agricultural Managers

Job Description: Plan, direct, or coordinate the management or operation of farms, ranches, greenhouses, aquacultural operations, nurseries, timber tracts, or other agricultural establishments. May hire, train, and supervise farm workers or contract for services to carry out the day-to-day activities of the managed operation. May engage in or supervise planting, cultivating, harvesting, and financial and marketing activities.

Knowledge: Administration and Management, Production and Processing, Biology, Mathematics, English Language

Skills: Critical Thinking, Speaking, Monitoring, Judgment and Decision Making, Time Management

Agricultural Technicians

Job Description: Work with agricultural scientists in plant, fiber, and animal research, or assist with animal breeding and nutrition. Set up or maintain laboratory equipment and collect samples from crops or animals. Prepare specimens or record data to assist scientists in biology or related life science experiments. Conduct tests and experiments to improve yield and quality of crops or to increase the resistance of plants and animals to disease or insects.

Knowledge: Mathematics, Biology, Chemistry, Administration and Management, English Language

Skills: Reading Comprehension, Active Listening, Complex Problem Solving, Critical Thinking, Writing

Animal Trainers

Job Description: Train animals for riding, harness, security, performance, or obedience, or for assisting persons with disabilities. Accustom animals to human voice and contact, and condition animals to respond to commands. Train animals according to prescribed standards for show or competition. May train animals to carry pack loads or work as part of pack team.

Knowledge: Customer and Personal Service, Education and Training, Psychology, Administration and Management, English Language

Skills: Instructing, Learning Strategies, Speaking, Critical Thinking, Active Learning

First-Line Supervisors of Farming, Fishing, and Forestry Workers

Job Description: Directly supervise and coordinate the activities of agricultural, forestry, aquacultural, and related workers.

¹ 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/>.

Knowledge: Administration and Management, Production and Processing, Customer and Personal Service, English Language, Mechanical

Skills: Coordination, Critical Thinking, Monitoring, Speaking, Management of Personnel Resources

Occupational Demand

The SCV/SML subregion employed 24,279 workers in Animal Science occupations in 2021 (Exhibit 1). The largest occupation is farmers, ranchers, and other agricultural managers with 18,958 workers in 2021. This occupation is expected to contract by 1% over the next five years, and still have the greatest number of projected annual openings, 1,867.

Exhibit 1. Animal Science employment and occupational projections in the SCV/SML subregion

Occupation	2021 Jobs	2026 Jobs	5-Year Change	5-Year % Change	Annual Openings
Farmers, Ranchers, and Other Agricultural Managers	18,958	18,753	(205)	(1%)	1,867
First-Line Supervisors of Farming, Fishing, and Forestry Workers	4,432	4,464	33	1%	652
Animal Trainers	555	574	19	3%	72
Agricultural Technicians	335	336	1	0%	43
TOTAL	24,279	24,127	(153)	(1%)	2,635

Wages

Exhibit 2a shows the hourly wages of the Animal Science occupations. First-line supervisors of farming, fishing, and forestry workers earn the highest entry-level wage, \$14.69/hour in the subregion². Please note 10th and 25th percentiles are considered entry-level wages while 75th and 90th are considered experienced wages, either gained by long term employment, received extra training, etc.

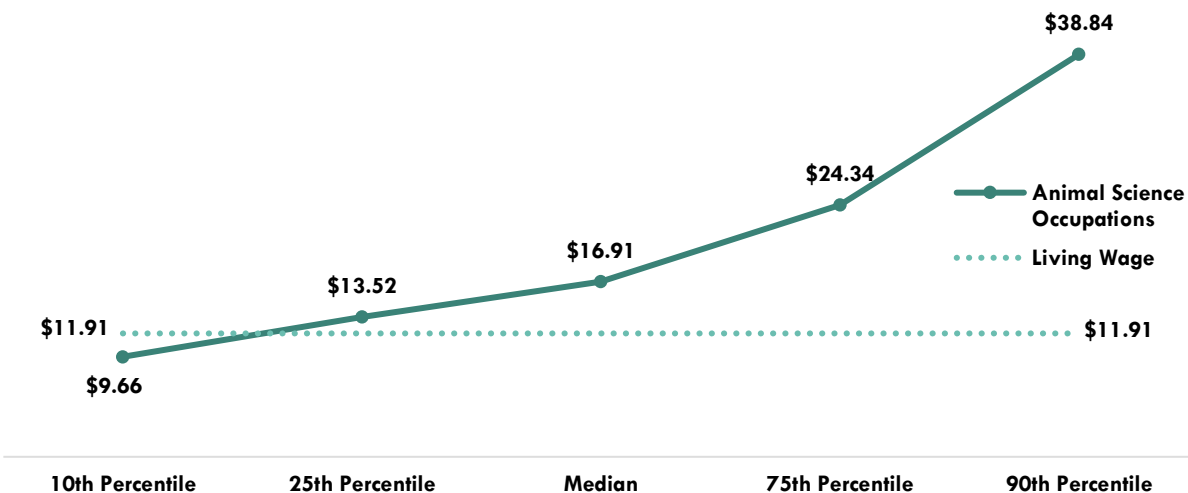
Exhibit 2a. Animal Science hourly wages in the SCV/SML subregion

Occupation	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings
First-Line Supervisors of Farming, Fishing, and Forestry Workers	\$14.69	\$19.88	\$24.94
Agricultural Technicians	\$14.49	\$16.68	\$21.31
Farmers, Ranchers, and Other Agricultural Managers	\$14.00	\$16.78	\$30.02
Animal Trainers	\$10.89	\$14.30	\$21.08

² Entry-level wages are derived from the 25th percentile.

Exhibit 2b shows the average hourly wages for Animal Science occupations, and the average entry-level wage \$13.52 exceeds the average living wage for the South Central Valley/Southern Mother Lode SCV/SML subregion.

Exhibit 2b. Animal Science average hourly wages in the SCV/SML subregion



Job Postings

There were 112 job postings for the four occupations in the SCV/SML subregion from March 2022 to August 2022.³ The employers with the most job postings are listed in Exhibit 3.

Exhibit 3. Top employers of Animal Science by number of job postings

Employer	Job Postings	% Job Postings
California Public Utilities Commission	5	6%
Fieldin	3	3%
Fresnos Chaffee Zoo	3	3%
Fresnos Chaffee Zoo Corp	3	3%
Off Leash K9 Training	3	3%
Off Leash Training	3	3%
PetSmart	3	3%
420 Kingdom	2	2%
Fresno County	2	2%
Fresno Mosquito and Vector Control District	2	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 Agricultural Technicians is listed in 33 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings

³ 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.

include Dog Trainer in eight job postings, Farm Manager in seven job postings, and Fish and Wildlife Technician in six job postings.

Exhibit 4. Top occupational titles in job postings for Animal Science

Occupational Title	Job Postings	% of Job Postings
Agricultural Technicians	33	29%
Farm and Ranch Managers	27	24%
Animal Trainers	16	14%
Nursery and Greenhouse Managers	14	13%
Aquacultural Managers	13	12%
First-Line Supervisors of Agricultural Crop and Horticultural Workers	6	5%
First-Line Supervisors of Animal Husbandry and Animal Care Workers	3	3%

Salaries

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

Exhibit 5. Salaries for Animal Science occupations

Market Salary Percentile	Salary Amount
10th Percentile	\$27,869
25th Percentile	\$31,032
50th Percentile	\$38,524
75th Percentile	\$52,402
90th Percentile	\$63,364

Education

Of the 112 job postings, 48 listed an education level preferred for the positions being filled. Among those, 58% requested high school or vocational training, 44% requested a bachelor’s degree, and 6% requested an associate 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%.

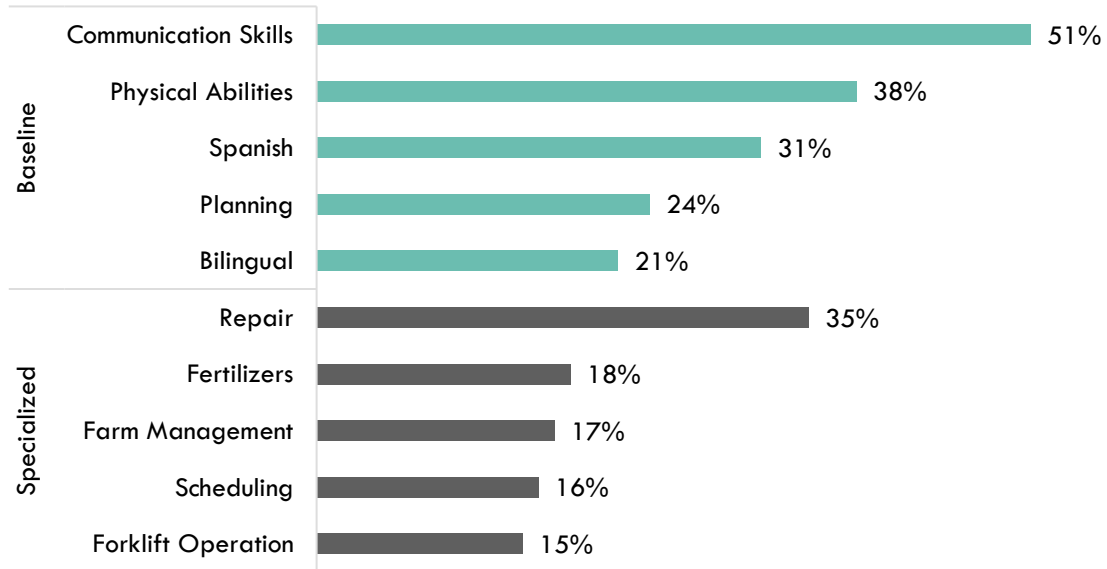
Exhibit 6. Education levels requested in job postings for Animal Science

Education Level	Job Postings	% of Job Postings
High school or vocational training	28	58%
Bachelor's degree	21	44%
Associate's degree	3	6%
Doctoral degree	1	2%

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 skills, 51% of job postings, physical abilities, 38%, and Spanish, 31%. The top three specialized skills are repair, 35% of job postings, fertilizers, 18%, and farm management, 17%.

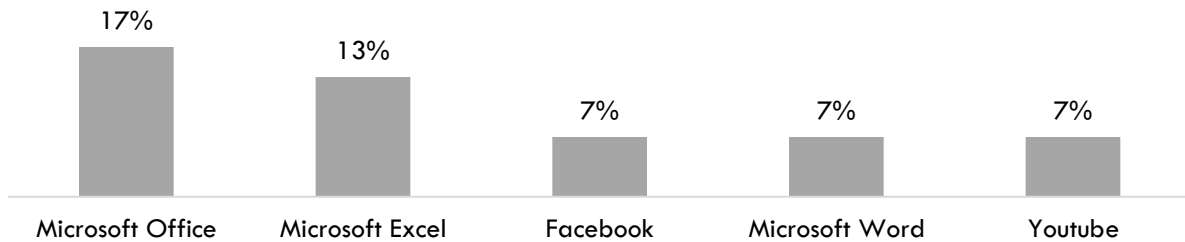
Exhibit 7. In-demand Animal Science baseline and specialized skills



Software Skills

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

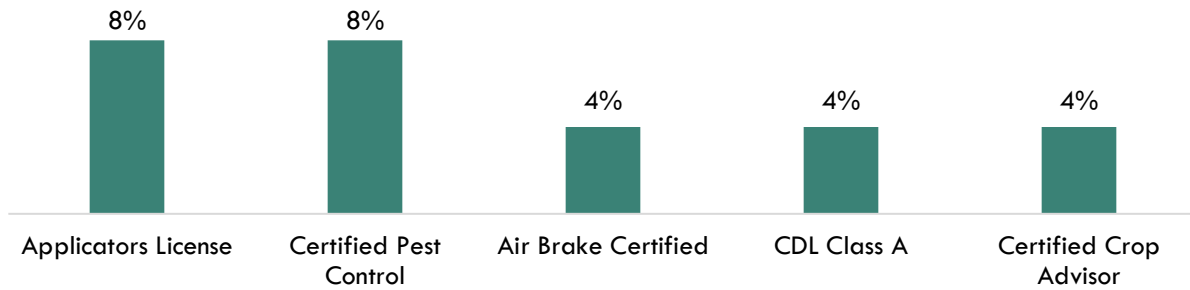
Exhibit 8. In-demand Animal Science software skills



Certifications

Of the 112 job postings, 53 contained certification data. Among those, 8% indicated a need for a applicators license. The next top certifications are certified pest control and air brake certified. (Exhibit 9) Please note 92% of job posting indicated a need for a driver’s license, but it is not a certification.

Exhibit 9. Top Animal Science certifications requested in job postings



Education, Work Experience & Training

A high school diploma or equivalent is typically required for farmers, ranchers, and other agricultural managers, first-line supervisors of farming, fishing, and forestry workers, and animal trainers. An Associate degree is typically required for agricultural technicians (Exhibit 10).

Exhibit 10. Education, work experience, training, and Current Population Survey results for Animal Science occupations⁴

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	5 years or more	None	30.2%
First-Line Supervisors of Farming, Fishing, and Forestry Workers	High school diploma or equivalent	Less than 5 years	None	21.9%
Animal Trainers	High school diploma or equivalent	None	Moderate-term	32.0%
Agricultural Technicians	Associate's degree	None	Moderate-term	N/A

⁴ "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

Supply

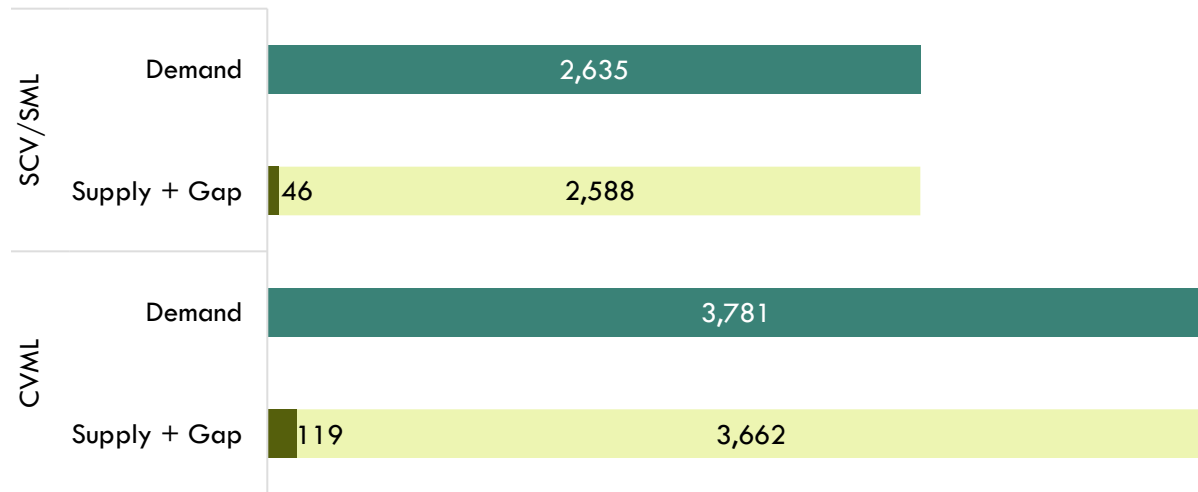
Analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) included the TOP codes and titles: 010200 - Animal Science, 010230 - Dairy Science, and 010240 - Equine Science. Analysis of the last three years of data shows that, on average, 119 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

Exhibit 11. Postsecondary supply for Animal Science occupations in the region

TOP/ CIP Code- Title	College	Associate Degree	Associate for Transfer Degree	Certificate 12 < 18 Semester Units	Certificate 16 < 30 Semester Units	Certificate 18 < 30 Semester Units	Certificate 30 < 60 Semester Units	Certificate 6 < 18 Semester Units	Certificate 8 < 16 Semester Units	Subtotal
010200 - Animal Science	Bakersfield	14	6				2			22
	Merced	9					1			10
	Modesto Junior	20	7							28
	Reedley College	1	11	4	5					22
	Sequoias	5	10				3			18
010230 - Dairy Science	Modesto Junior	3								3
	Sequoias	0						3		3
010240 - Equine Science	Modesto	1		4					0	5
	Reedley College					3	2			5
	Sequoias					1	2			3
TOTAL		53	35	8	9	7	3	3	0	119

There is an undersupply of 2,588 Animal Science workers in the SCV/SML subregion and 3,662 workers in the region (Exhibit 12).

Exhibit 12. Animal Science 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 Animal Science. Of note, 68 animal science students received a degree or certificate or attained apprenticeship journey status; 42 students transferred; 33% of students obtained a job closely related to their field of study; 70% had a median change in earnings; and 48% of students attained a living wage.

Exhibit 13. Regional metrics for the TOP code related to Animal Science

Metric	Animal Science	Dairy Science	Equine Science
	010200	010230	010240
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	68	*	12
Number of Students Who Transferred	42	*	*
Job Closely Related to Field of Study	33%	100%	*
Median Change in Earnings	70%	*	175%
Attained a Living Wage	48%	92%	61%
* denotes data not available.			

Conclusion

The entry-level wages of the four occupations exceed the SCV/SML subregion's average living wage. There were 112 job postings in the past six months for occupations related to Animal Science in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is communication skills, and the top specialized skill is repair.
- The top software skill is Microsoft Office.
- The top certification is a applicators license.

There is an undersupply of trained workers, a shortage of 2,588 in the SCV/SML subregion and 3,662 in the region.

Recommendation

Based on these findings, it is recommended that College of the Sequoias work with the regional director, the college's advisory board, and local industry in the expansion of programs to address the shortage of Animal Science 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. (LIGHTCAST). LIGHTCAST occupational employment data are based on final LIGHTCAST industry data and final LIGHTCAST 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 LIGHTCAST earnings by industry: economicmodeling.com.
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: https://www.bls.gov/emp/tables/educational-attainment.htm .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov .
Job Posting and Skills Data	Burning Glass: burning-glass.com/ .
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: onetonline.org .

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. (LIGHTCAST) 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.