ORS Collection Guide

Detailed Definitions, Explanations, and Examples

Volume 1, April 2013

Introduction

The Social Security Administration (SSA) came to BLS, specifically NCS, because of the data NCS already collects on work characteristics in the modern economy. SSA and BLS signed an interagency agreement on April 18, 2012 to begin the process of trying to collect new data on occupational information for use in the disability programs. Economists from the National Compensation Survey (NCS) program are testing questions (i.e., the Occupational Requirements Survey) designed to ascertain the primary physical attributes, environmental conditions, and vocational preparation requirements of occupations within selected establishments that are representative of the broader economy.

The following document outlines standard operations and collection guidance where information is incomplete or vague. Specifically, this collection guide provides answers to frequently asked questions in areas of general collection concepts, specific vocational preparation, physical demands, and environmental conditions. This collection guide is unlike the Technical Memorandums issued for each ORS collection phase as it does not include phase specific collection instructions (e.g., collection dates, general instructions for contacting establishments, debrief processes, data review and analysis, etc.). As there is no ORS collection manual, this document provides broad collection and coding instructions to be applied across all ORS collection activities and includes detailed data element definitions, explanations, and examples.

The table of contents is hyperlinked to the content of the guide to allow for quick access to each topic. All references are cited within the document and are hyperlinked to source documents.

Table of Contents

Section 1 – Core Concepts

This section provides information on the core concepts utilized in the Occupational Requirements Survey (ORS). While the collection guidelines and concepts covered in this section are more general in nature (rather than specific to one the three data element categories) they are the fundamental foundation of the survey.

1_01 Required vs. Incidental

The collection of ORS data elements should be based upon the premise of whether an individual data element is required in the performance of the occupation. This is one of the most important concepts in ORS collection. Essential (or required) job duties are so fundamental to the position that one cannot do the job without performing the duties. If an individual does not have the ability to perform a given data element and the data element is truly required, the establishment would not hire the individual (or would have to make special accommodations).

Key Concept:
To be **required**, an element must meet the following conditions:

- Deemed a core function of the job as defined by the respondent.
- Necessary and essential to complete the duties and responsibilities of an occupation.
- Needed for entry into the occupation.

Incidental duties of an occupation are those that occur by chance and are not core functions of the occupation. As such, ORS data elements performed incidentally by an occupation are excluded.

Examples	Required	Incidental
Meat Cutter – Extreme Cold: Cuts, trims, and grinds beef in a room kept at 35 degrees. ➢ Exposed to cold temperatures more than 2/3 of the day. ➢ Exposure is a core function of the job; meat must be stored at cool temperatures to prevent spoilage	X	
Grocery Store Clerk – Extreme Cold: Uses electronic scanners and cash register to tabulate purchases and process payments. May be asked by customer to assist with getting an item out of the freezer case. ➢ Working in the freezer case is not a regular, core function of the clerk.		X
Nursing Assistant – Pushing/Pulling: Pushes/pulls wheelchairs to transport residents between locations. ➢ Even if not all nursing assistants are expected to transport patients in wheelchairs, someone must do so such that pushing and pulling are required functions of the job.	X	
Secretary – Pushing/Pulling: Pushes/pulls a cart to move supplies to a meeting. ➢ The pushing and pulling of the cart is not an occupational requirement; it merely facilitates the work to be performed by the secretary.		X
Mailroom Worker – Pushing/Pulling: Pushes/pulls cart to deliver mail to individual suites in an office building. ➢ The use of a cart is part of the worker's regular duties in delivering mail and would be required.	X	
Hospital Housekeeper - Speaking: Engages in small talk with patients and other staff members while cleaning hospital rooms. ➢ The information exchange with others is not necessary and essential in performing the required cleaning duties.		X

1_02 Accommodation

Accommodation is a modification or adjustment to a job or change in the work environment that enables a person with a disability to compete equally or perform the essential functions of the position. One of the goals of ORS is to collect occupational requirements information to facilitate the settlement of disability claims. This occupational information will help the Social Security Administration (SSA) compare claimants' functional abilities with the demands of their past work and assist in determining whether there are other types of work in the national economy that a claimant can perform. With regards to accommodations:

- Accommodations are changes an employer makes to accommodate an employee's disability.
- Not all employers can offer the same accommodations.
- Work performed with an accommodation is not how an occupation is generally performed in the economy.
- Respondents may qualify their responses to reflect their ability to make such changes or accommodations; educate respondents on the role of accommodations to avoid this issue.

Key Concept: The presence of data elements should be based upon required job duties as they are performed **without** accommodations.

Common Accommodations:

- Elevators
- Avoidance (assigning a core task or function to another employee)
- Providing seating for a job that is normally performed standing
- Allowing standing for a job that is normally performed while sitting

Exception: When collecting vision and hearing data elements, the use of common devices such as **eyeglasses, contact lenses, and hearing aids are not considered accommodations**. Such devices are not provided by the employer, nor is it likely that an employer would not permit an employee to use such devices to correct hearing and/or vision impairments.

1_03 Frequency Definitions

In the collection of ORS data elements, not only must the presence of a data element be determined but also the frequency of its occurrence. Both the interval (e.g., daily, weekly, quarterly) and work schedule should be taken into account when determining frequency of occurrence. There are five categories used to determine frequency of occurrence: Never, Seldom, Occasionally, Frequently and Constantly.

Frequency of Occurrence Scale		
Never	Does Not Exist	
Seldom	Up to 2% of the time	• Up to 9.6 minutes in 8-hour day. • Up to 5.2 days in 260-day work year.
Occasionally	From 2% up to 1/3 of the time	• From 2% up to 33% of the time • From 9.6 minutes up to 2.6667 hours in 8-hour day
Frequently	From 1/3 up to 2/3 of the time	• From 33% up to 67% of the time • From 2.6667 hours to 5.3333 hours in 8-hour day
Constantly	2/3 or more of the time	• More than 67% of the time • More than 5.3333 hours in 8-hour day

1_04 Frequency: Repetition vs. Duration

Consideration must be given to data elements that are performed regularly throughout the day but in which the task itself takes little time to complete. Although an individual task may be performed often throughout the day, the total time spent performing the task or data element may not actually be that much. As such, quantify the total time actually spent performing the activity (data element) to determine frequency of occurrence. If the respondent is unable to determine frequency coding or has provided a questionable answer, use the following procedure:

- Determine the number of daily repetitions of the activity.
- Determine the time spent on each repetition.
- Calculate total time spend on the activity (repetitions x time of each repetition)
- Calculate frequency as percent of daily hours (total activity time / daily hours)

Key Concept: Frequency of occurrence is the measure of total time spent performing the activity, or **duration.** It is not the number of times the activity is performed throughout the day.

1_05 Frequency: Tasks Not Performed Everyday

Where an employee is *required* to lift a certain weight or must be exposed to a certain environmental condition, it does not matter if the work is periodic or seasonal as opposed to daily or weekly. Even if the physical demand or environmental condition exposure is only periodic, it must be included in the frequency of occurrence coding if it is a core function of the occupation (i.e., required). In these situations, use the following procedure:

- Code the highest level of physical demand all incumbents are required to perform or the harshest environmental condition to which all incumbents must be exposed in order to complete their duties.
- After coding the highest level of required physical demands or environmental conditions exposure, collect the total amount of time (i.e., duration) over the course of a typical year in which an employee may be required to perform at that level or is exposed to the environmental condition.

Example 1: Physical Demands
If a firefighter does not have to climb a ladder every day but he/she does so more than 2% of the time but less than one-third of the time over the course of a year, the climbing element is coded occasionally.

Example 2: Environmental Conditions
A firefighter may not be exposed to the extreme heat of a fire on a typical day. Over the course of a year, however, firefighters may spend more than one-third but less than two-thirds of the time exposed to the extreme heat. In this case, the extreme heat element is coded frequently.

1_06 Threshold

ORS Environmental Conditions is a threshold system. A threshold is defined as a level at which something will take place and below which it will not. In the collection of Environmental Conditions, a data element must meet the required threshold level in order to code frequency. If the data element does not meet the associated threshold, it must be coded not present (never). Also, it is important to remember that while an environmental condition may exist or be present, it may not be relevant to the core functions of the occupation.

Environmental Condition	Threshold
Extreme Cold	• Non-weather only. • 40 degrees or below when exposed constantly. • 32 degrees or below when exposed less than constantly.
Extreme Heat	• Non-weather only. • Above 90 degrees in a dry environment. • Above 85 degrees in a humid environment.
Wetness	• Constant contact with water or liquids. • Non-weather related only.
Humidity	• Non-weather only. • Constant and oppressive
Fumes, Odors, Dusts, Gases, Poor Ventilation	• Exposure that negatively affects the respiratory system, eyes, or skin.
Toxic, Caustic Chemicals	• Exposure that is harmful to one's health if inhaled, ingested, or absorbed through the skin. • Exposure that can burn or destroy living tissue.
Moving Mechanical Parts	• Must present a risk of bodily injury from moving mechanical parts of equipment, tools, or machinery.
Vibration	• Heavy, whole-body vibration only.
High, Exposed Places	• Exposure to possible bodily injury from falling.

1_07 Structure: Climbing Ramps or Stairs

The structure of an establishment may play a role in determining the presence (or absence) of a data element. When determining whether to include or exclude structure in the coding of climbing ramps or stairs, consider the following:

- Is the activity requiring climbing required or incidental?
- Is the structure in question the worker's regular place of business?
- Does the worker perform all or part of the job at someone else's home or business?

Example 1
Scenario: A dental hygienist works in a dental office that is a converted house. The hygienist goes to the basement to get supplies as needed.
Coding: Restocking supplies is incidental; it is not one a core function of the dental hygienist position. Subsequently, climbing stairs is incidental in this example. Because the house is the hygienist's regular place of business, the structure should not be included.

Example 2
Scenario: A residential municipal building inspector visits construction sites to verify projects are being completed in accordance to code. The inspector must visit the houses' basements and second floors to inspect wiring, plumbing, and other construction processes.
Coding: The climbing in this example is done while performing inspections, a core function of a job, and it is being done outside of the inspector's office. Therefore, the structure should be considered and climbing stairs should be coded.

1_08 Structure: Extreme Heat/Cold

Weather is not included in extreme heat and extreme cold. When the structure of a work facility does not mitigate outdoor temperatures, the temperatures should not be considered. These temperatures should not be considered in extreme heat and cold as they are related to the structure in which the work takes place, not the temperature associated with the required duties of the job.

Example 1: Extreme Heat (Not Related to Structure – Include)
A commercial oven operator at a food manufacturing plant works near the commercial oven, placing items in and taking items out of the very hot ovens throughout the day.

Example 2: Extreme Heat (Structure – Do Not Include)
A warehouse worker moves freight to and from loading docks in a warehouse. Since the warehouse is not climate controlled, it may be very warm in the summer and very cold in the winter.

Exception: If the warehouse cannot be/or must be heated or air conditioned due to the nature of the product being stored, the exposure to extreme heat/cold would be included.

Section 2 – Specific Vocational Preparation

This section provides information on guidelines and concepts utilized in the collection of Specific Vocational Preparation (SVP). Getting a clear, complete picture of what the core tasks of a job are is the first step in getting the best SVP information along with a good base of NCS leveling.

- Attempt to do PSO ahead of time and look on the ONET to review the core task for the jobs you have selected.
- When discussing SVP with a respondent begin the discussion by getting a clear, total picture of what the job involves.
- When possible take a tour of the location so you can see the jobs being performed.
- Remember that SVP is a summation of all SVP factors and can include more than one of each factor.
    - For example, a job may require two certifications, an Associate's Degree and three years essential experience in previous jobs.
- SVP is different than leveling NCS Knowledge as SVP measures time and NCS Knowledge measures skill level of the job.
- SVP is more precise at lower levels of the scale with much broader levels towards the top of the scale
    - When working with low level SVP jobs it is essential to get very precise measurements for SVP components as the difference between levels is not large.
    - When working with higher level SVP jobs it is not as essential to get precise measurements as the scale is much wider at higher SVP levels.

2_01 Definition and Sources

Specific Vocational Preparation (SVP) is the amount of ***lapsed time*** (i.e., calendar time) required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average performance in a specific job/worker situation. Vocational or specialty education that is specific to the job performed is included, although it may be counted at a reduced rate.

Exclusions

- Time required of a fully qualified worker to become accustomed to the establishment policies, work place rules, and corporate culture of a new job. Required orientation sessions typically fall into this category and are not included in SVP, unless they teach skills essential for the performance of the occupation.
- General education (i.e., time spent learning reasoning, language, and mathematical skills that are necessary for a person to function in society) is often obtained in high school and not applicable to SVP. Only post-high school education, training, and work experience is included in SVP.

Sources of SVP

There are five sources of SVP: apprenticeship training, in-house training, on-the-job training, essential experience in previous jobs and vocational education:

Apprenticeship Training

- Only formal apprenticeships count toward SVP.
- Apprenticeship lengths vary greatly by state, locality, and/or sponsoring organization.
- Collect the amount of time needed to complete the apprenticeship as required by the sampled company.
- Coded as *Training, License or Certification*.

Example: Apprentice Electrician
Scenario: In Oregon, requires 8000 hours of experience spread over 5 years. Sits for journeyman exam after completion.
Coding: Time counted toward SVP is 5 years.

In-House Training

- Organized classroom study provided by an employer.
- Coded as *Time to Average Performance*.

Example: NCS Field Economist
Scenario: Attends the one week training entitled NCS 1 Training for an Economist at BLS.
Coding: Time counted toward SVP is 1 week.

On-the-Job Training

- Serving as a learner or trainee on the job under the instruction of a qualified worker.
- Formal mentoring within a company.
- Coded as *Time to Average Performance.*

Example: Salesperson
Scenario: A new salesperson spends one year working under the tutelage of an experienced salesperson, receiving guidance and instruction, doing day-to-day work on an account, and learning how to handle more complex situations from the mentor.
Coding: Time counted toward SVP is 1 year.

Essential Experience in Other Jobs

- Serving in less responsible jobs which lead to a higher grade job or serving in other jobs which qualify you for the higher grade job.
- Coded as *Prior Work Experience.*

Example: Nursing Department Manager
Scenario: A local hospital requires that all Nursing Department Managers have a minimum of 4 years prior experience as an RN.
Coding: Time counted toward SVP is 4 years.

Vocational Education

- Commercial or shop training, technical school, art school, and part of college training which is organized around a specific vocational objective.
- General education does not count.
- Secondary-level vocational education may count, but only when directly applicable to the occupation and required for the job.
- Coded as *Education*.

Example: Accountant
Scenario: The accountant at a manufacturing facility is required to have a 4 year Bachelor's degree in Accounting.
Coding: Time counted toward SVP is 2 years (do not count the 2 years of general education, only the 2 years of vocational training count toward SVP).

2_02 SVP Calculation: Education

Degree	What Counts	How Much
High School	This does not count for SVP.	0 years
High School Vocational Education	Counts if the vocational courses taken are directly applicable to the job and required for entry into the occupation (i.e. pre-apprenticeship coursework for an apprenticeable occupation).	Time counted on a 2-to-1 basis. Ex: 2 classroom hours = 1 hour SVP
Associate's Degree	Standard Associate's Degree includes general education credits which do not count towards SVP.	Time counted on a 2-to-1 basis. Ex: 2-yr Associate's Degree = 1 year SVP
Vocational Associate's Degree	Associate's Degree geared towards a specific professional occupation that includes only coursework pertaining to that occupation (e.g., Associate's in Nursing).	Time counted on a 1-to-1 basis. Ex: 2-yr Vocational Associate's Degree = 2 years SVP
Bachelor's Degree	Four-year college degrees typically include two years of general education credits. Do not include these two years in SVP.	Bachelor's Degree = 2 years of SVP Ex: (4-yr degree) – (2 yrs general education) = 2 yrs SVP
Master's Degree	Each year of graduate school counts as a year of specific vocational preparation.	Master's Degree = 4 years of SVP Ex: (2 yrs SVP for Master's) + (2 yrs for Bachelor's Degree pre-requisite) = 4 years SVP
Professional Degree	Each year of graduate education counts as a year of SVP. Medical Degrees, other than DPharm, can be considered to take 4 years for coursework (excludes time as an intern, as that would fall under on-the-job training).	2 years of SVP for pre-requisite Bachelor's Degree + years required for Professional Degree *Example:* Law Degree (JD) (2 years SVP for Bachelor's) + (3 years SVP for JD) = 5 years SVP *Example:* Medical Degree (MD) (2 years SVP for BS) + (4 years SVP for MD) = 6 years SVP for education only *Note: Calculate any intern time based on state/local requirements and practice area; add to total SVP on a 1:1 basis*
Doctorate Degree	Each year of graduate education counts as a year of SVP. Academic research doctorates can be considered 4 years of coursework and thesis.	2 years SVP for pre-requisite Bachelor's Degree + years required for Doctorate. *Example:* PhD (2 years SVP for BS) + (4 years SVP for PhD and Thesis) = 6 years SVP

Literacy
Whatever language is being used in the particular plant/facility being visited can count for literacy as long as the job is getting done and no special accommodations are being made. For example, if everyone working on the factory floor is reading in Spanish and that is how this company operates that would also be coded for literacy.

2_03 SVP Calculation: Training

There are two basic types of training that count towards SVP: Apprenticeships and Post-Employment Training. All other training would fall under education or licensures and certifications.

Apprenticeships
Generally, apprenticeships are governed by formal agreement, registered with the state or with a state authority, and are regulated according to a professional standard. They are most commonly found in blue collar trade jobs like carpenters, electricians, and welders.

Example 1: Journeylevel Plumber at Harry's Plumbing, Inc. in Providence, RI
Scenario: All new hires must be journeyman plumbers who have passed the state exam and completed a full apprenticeship. In order to sit for the exam, you must have completed an apprenticeship as a plumber by either (A) completing 8000 hours of on-the-job training under a master plumber and 576 hours of classroom training over 5 years, or (B) completing a 2 year degree (Associates) in Plumbing or Sanitation Engineering and completing 2 years working as an apprentice under a master plumber.
Coding: Because the respondent requires completion of the full apprenticeship program, code based on the apprenticeship requirements. 8000 hours OJT and 576 hours classroom over 5 years = 5 years SVP

Example 2: Journeylevel Welder at Fouty Tank Manufacturing in Indianapolis, IN
Scenario: All new hires must be journeyman welders and part of the Boilermakers Local #374. The International Brotherhood of Boilermakers requires a period of apprenticeship of 6,000 hours of on-the-job training and 576 hours of classroom training.
Coding: Because the time to complete the apprenticeship is unavailable, it is necessary to use the hours needed to complete the apprenticeship and convert them from work time to lapsed time. 6000 OJT hours + 576 classroom hours = 6,576 total apprenticeship hours 6,576/173.33 (hours/month) = 37.94 months to complete apprenticeship Note: In this example hours were converted into months. It is also acceptable to convert into days, weeks, or years.

Post-Employment Training

Post-Employment training includes both classroom training provided by employers and on-the-job training. Most of this training will occur soon after hiring a new candidate and further employment by the company may be dependent upon successful completion of the training.

Keep in mind that only training directly related to a job's core functions will count for SVP, so in most cases orientation trainings will not count towards SVP since they tend to discuss company organization, corporate culture, or specific administrative policies.

On-the-job training may include serving as a learner or a trainee under the instruction of a qualified worker, job shadowing, formal mentoring within the company, or tiered review procedures for work. Some companies may give trainees tasks that are either closely related to or the same as tasks they would be required to complete as core functions of their job, but have the worker use only made up data or information.

Possible Questions:

- Is there a formal training program for this job
- How long does it usually take for someone to finish all the on-the-job training you do for this job?
- Is there a formal mentoring process?
- Does this training include orientation time when employees learn about benefits offered and workplace policies? How much time is spent on that portion of the training?

Example 1: Engineer at Carlson Aviation Design
Scenario: All engineers are required to take diversity and sensitivity training that describes workplace discrimination and sexual harassment policies.
Coding: In this case, the training is not directly applicable to the core functions of the job, so it does not count toward SVP. Zero time added to SVP.

Example 2: NCS Economist
Scenario: All new economists attend NCS 1 training where they learn the core concepts, rules, and collection procedures for NCS. The training is one week long.
Coding: In this case, the training is directly applicable to the core functions of the job, so it does count toward SVP. One week added to SVP.

Example 3: Human Resources Assistant at Hersey General Hospital
Scenario: There is no formal classroom training for this position, but new hires are expected to watch their supervisors do the reports they will be required to do in the future. They take notes and afterwards try to replicate the work which the boss checks for errors and completeness. The process of learning how to do all of the relevant tasks required for the job takes two months.
Coding: In this case, the training is directly related to the core functions of the job, so it would count towards SVP.

Two months added to SVP.

Example 4: Warehouse Order Selector at Harney Electronics
Scenario: All new warehouse order selectors go through a fourteen-week training program that teaches the storage scheme of warehouse, procedures for methods to move merchandise, how to fill orders, how to operate equipment in the warehouse, and the workplace polices about tardiness, asking for time off, discrimination, harassment, proper communication and benefits selection. The time spent on workplace policies is one week spread throughout the fourteen weeks.
Coding: In this case, most of the training is directly related to the core functions of the job, so all of the time not spent learning the administrative portions not related to the job would count for SVP. 14 total weeks – 1 week work policies = 13 weeks added to SVP

2_04 SVP Calculation: Licensures & Certifications

Many jobs require a license or certification for hire, like a CPA, a Series 7 insurance license, or a food preparation certification by the board of health. Some of these certifications and licenses count towards SVP and some do not.

Certifications and licenses only count when classroom hours are required to be completed prior to taking a test. Time spent studying or preparing for a test outside of a *required* classroom portion does not count towards SVP.

If the company allows a non-certified person to be hired and prepare for the certification on the job, that time should be included in SVP, as long as the certification is required for adequate performance of the job. In some cases, a worker is required by law to have a certification, but the worker has a period of time to obtain it while working in the position. If the time it takes to obtain the certification exceeds the amount of time for the worker to reach adequate performance, then only the time to adequate performance would be included in the SVP calculation.

Since SVP is a lapsed time-based element, the most important item to note is how long it takes for a worker to obtain the necessary licenses and certification(s) for the job.

Possible questions:

- How long does the certification process generally take?
- What is the amount of time the company allots for acquiring the certification(s)?

Example 1: Assistant Manager at Lindsey's Restaurant
Scenario: New York City's Department of Health and Mental Hygiene requires supervisors of food service establishments to obtain the NYC food Protection Certificate and that there be at least one person holding a certificate on duty at all times during the establishment's hours of food preparation and operation. In order to sit for the exam to

get the certification, one must complete a 15 hour course given by the Department or an authorized vendor. The city's version is given over three days or offered online.
Coding: In this case, the time spent on the certification counts towards SVP. 15 hours over 3 days = 3 days added to SVP

Example 2: Associate Lawyer at Rowinski Law Firm
Scenario: All new associates must have passed the State of Tennessee Bar Exam prior to hire and must be in good standing with the ABA. Most new hires have spent at least 3 months studying for the bar and probably have taken a prep course through a test prep company.
Coding: In this case, the time spent earning the certification, 3 months studying and taking a course, does not count towards SVP. The time taken to obtain the law degree required for admittance to the Bar would count and should already have been accounted for under education. However, since the test to pass the bar is only a test and does not have a required classroom component specifically attached, any time spent preparing for the test does not count towards SVP. Zero time added to SVP.

2_05 SVP Calculation: Essential Experience

Companies often require prospective workers to have a certain amount of experience in a lower-level occupation in order to adequately perform the core functions of the job. Many jobs require workers to have developed a specific skill set before they can obtain the skill specific to the core functions of the job.

When they describe this requirement, a company will often provide a range of experience preferred for an occupation (e.g., five to seven years). Use the lower end of the range and verify with respondent that the previous work experience is actually required.

Additionally, many lower level white collar jobs do not actually require previous experience. It is just a preference of the employer but *not essential in performing the work required by the job*. In instances in which a job does require previous experience, it is important not to overstate the amount of experience actually required to perform the occupation.

Possible questions:

- Would you hire a new graduate for this position and train the new hire instead of requiring experience?
- If there was a candidate with two years experience (the company is requiring three years), would the candidate not be hired under any circumstances?
- What is the minimum amount of experience that someone coming onto the job would need in order to understand and perform the essential duties of the job?

Collection Tips:

- Think in terms of what the worker would need (i.e., required) in order to do the job rather than what the respondent would like to see in a job applicant (i.e., individual).
- When you collect SVP information for a job, be sure to collect all related past work experience needed to get to the job level of the selected job.

Example 1: Store Manager at Alisha's Closet
Scenario: To be hired as a store manager, the incumbent must have 2 years experience as a sales clerk at Alisha's Closet or another reputable clothing boutique.
Coding: In this case, the time spent on the certification counts towards SVP. Two years added to SVP.

Example 2: Engineering Manager at Pochert Construction & Design
Scenario: All Engineering Managers must have at least a Bachelor's degree in Engineering and 5-10 years of experience in civil engineering and structural design.
Coding: Five years added to SVP.

Example 3: Controller at Litschgi Imports, Inc.
Scenario: This position requires 2 years of experience working as a controller. The respondent also says that to get to be a controller, you need to work 3 years as an accountant.
Coding: Five years added to SVP.

2_06 SVP Calculation: Time to Average Performance

Time to average performance in an occupation is the amount of time it takes a new employee to be minimally successful in a job. This element reflects the amount of time it takes a new employee to acquire the skills necessary to complete the major duties and core functions of the position, not the amount of time it takes for the employee to complete all of these activities.

It is important to emphasize that this element is looking at minimum performance levels, i.e., the least the employer would expect from someone in a position to work without supervision. When respondents hear the phrase "Average Proficiency," they may overstate the amount of time for this element because they are not necessarily thinking about getting a worker to minimal proficiency, but rather are thinking about "average" as a measure of competency. Do not confuse probationary periods with average proficiency. An employee may be in probationary status for one year but be able to do their job independently after one month.

Possible Questions:

- How long must someone work in this job to minimally be able to do this job independently?
- How long would it take a new hire to be able to perform all of the core functions for this job at an adequate level?

Example 1: Line Cook at Hilery's By the Sea
Scenario: It takes new cooks about a week to be able to minimally do the work I need them to, but they really aren't a good cook until they've completed at least two months of work. Then you can really trust them to make pretty good food.
Coding: One week added to SVP. Time to average performance only measures the time it takes for an employee to perform work at a minimally successful level so the two months should not be counted.

2_07 Computing SVP Level

To determine the SVP level, add together the calendar time from each of the sources and then use the below chart to select the level:

Level	Time
1	Short Demonstration Only
2	Anything beyond short demonstration up to and including 1 month
3	Over 1 month up to and including 3 months
4	Over 3 months up to and including 6 months
5	Over 6 months up to and including 1 year
6	Over 1 year up to and including 2 years
7	Over 2 years up to and including 4 years
8	Over 4 years up to and including 10 years
9	Over 10 years

The most important thing to remember when calculating the SVP Level is that all time should be lapsed or calendar time, and not work time. The most common conversions will be from hours or days to other time measures. If a measure in days is less than five days, it does not need to be converted, but if it is more, remember to convert so that weekend days are taken into account in the lapsed time. The table below provides conversion guidance. The table is based on a 8/40/52 work schedule. The same principles may be applied to convert to a different work schedule if needed.

	To Days	To Weeks	To Months	To Years
Hours (8 hr work schedule)	÷ 8	÷ 40	÷ 173.33	÷ 2080
Days	-------	÷ 5	÷ 21.67	÷ 260

2_08 SVP Examples

Example 1: Paul's Wine Bar in Alexandria, VA

Job Title: Sommelier

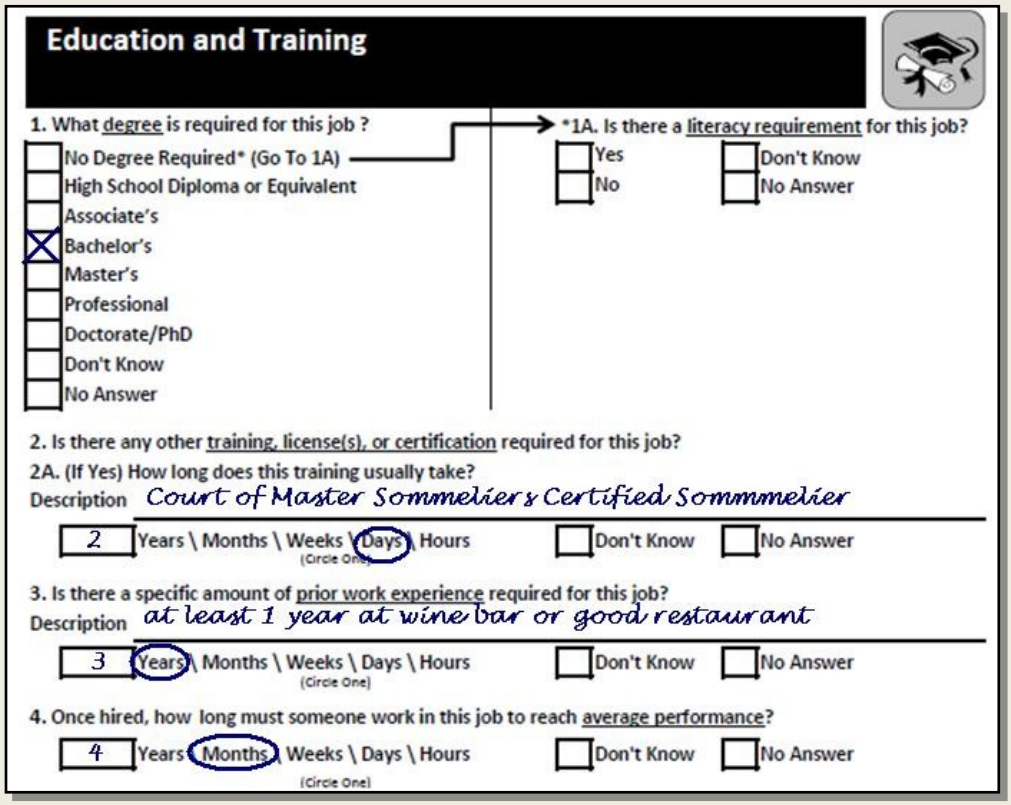
Job Description Requirements:

Applicants must have a BA in business, hospitality, French, Italian, or Spanish; must be a Court of Master Sommeliers Certified Sommelier, and have at least 3 years experience, with at least one year experience at a wine bar or fine dining establishment.

Respondent provided information:

The respondent indicates certification requires taking an intro course and two exams. The first exam comes at the end of a 2 day course. The second exam is one day long and is held after taking the first course but requires no extra classroom time. In order to take the intro course, 3 years experience in the wine or service industry is required, and the respondent said that that time would count for his requirement of previous work experience, as long as one year was spent at a good restaurant or a nice wine bar.

Collection Tool:



Education and Training

1. What degree is required for this job ?
- [ ] No Degree Required* (Go To 1A)
- [ ] High School Diploma or Equivalent
- [ ] Associate's
- [x] Bachelor's
- [ ] Master's
- [ ] Professional
- [ ] Doctorate/PhD
- [ ] Don't Know
- [ ] No Answer

*1A. Is there a literacy requirement for this job?
- [ ] Yes
- [ ] No
- [ ] Don't Know
- [ ] No Answer

2. Is there any other training, license(s), or certification required for this job?

2A. (If Yes) How long does this training usually take?

Description: Court of Master Sommeliers Certified Sommmelier

2 | Years \ Months \ Weeks \ (Days) \ Hours (Circle One) | [ ] Don't Know | [ ] No Answer

3. Is there a specific amount of prior work experience required for this job?

Description: at least 1 year at wine bar or good restaurant

3 | (Years) \ Months \ Weeks \ Days \ Hours (Circle One) | [ ] Don't Know | [ ] No Answer

4. Once hired, how long must someone work in this job to reach average performance?

4 | Years \ (Months) \ Weeks \ Days \ Hours (Circle One) | [ ] Don't Know | [ ] No Answer

SVP Calculations and Level

Bachelors Degree = 2 years of SVP = 730 days of SVP
Master Sommelier Certificate = 2 days of SVP
Prior Work Experience = 3 years = 1095 days of SVP
Average Performance = 4 months = 120 days

SVP Calculation → Education + Training + Certification + Work + Avg Performance = SVP

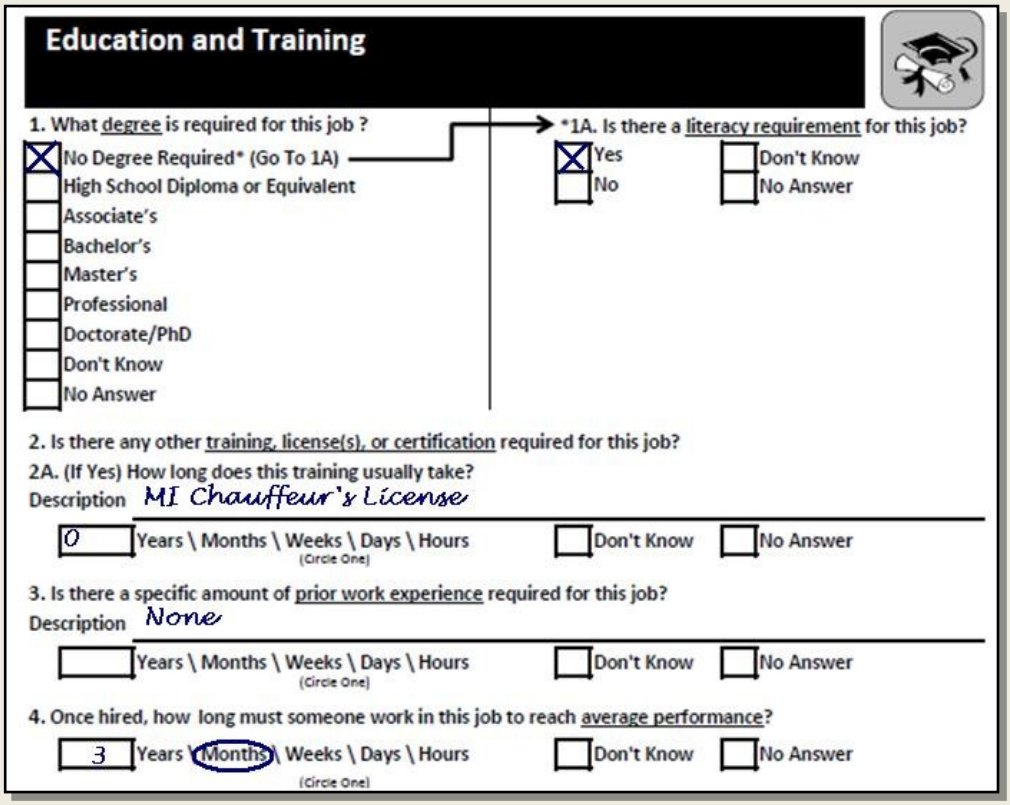
730 + 0 + 2 + 1095 + 120 = 1947 days
1947 days ÷ 365 = 5.33 years = SVP Level of 8

Example 2: Jason's Taxi Service in Detroit, MI

Job Title: Driver
Job Requirements: Valid MI Chauffeur License

Respondent Provided Information: No previous experience is required for being a driver here, although you do have to have a valid MI Chauffeur's License. You don't even need a degree, as long as you can read. We don't really do any training now that there is a GPS in every car. It still takes about 3 months to really be entirely independent with the job though.

Collection Form:



Education and Training

1. What degree is required for this job ?
- [X] No Degree Required* (Go To 1A)
- [ ] High School Diploma or Equivalent
- [ ] Associate's
- [ ] Bachelor's
- [ ] Master's
- [ ] Professional
- [ ] Doctorate/PhD
- [ ] Don't Know
- [ ] No Answer

*1A. Is there a literacy requirement for this job?
- [X] Yes
- [ ] No
- [ ] Don't Know
- [ ] No Answer

2. Is there any other training, license(s), or certification required for this job?
2A. (If Yes) How long does this training usually take?
Description: MI Chauffeur's License
0 Years \ Months \ Weeks \ Days \ Hours (Circle One) [ ] Don't Know [ ] No Answer

3. Is there a specific amount of prior work experience required for this job?
Description: None
[ ] Years \ Months \ Weeks \ Days \ Hours (Circle One) [ ] Don't Know [ ] No Answer

4. Once hired, how long must someone work in this job to reach average performance?
3 Years \ (Months) \ Weeks \ Days \ Hours (Circle One) [ ] Don't Know [ ] No Answer

SVP Calculations and Level
No degree, only literacy = 0 SVP
Chauffeur's license is only a test = 0 SVP
Average Performance = 3 Months

SVP Calculation → Education + Training + Certification + Work + Avg Performance = SVP

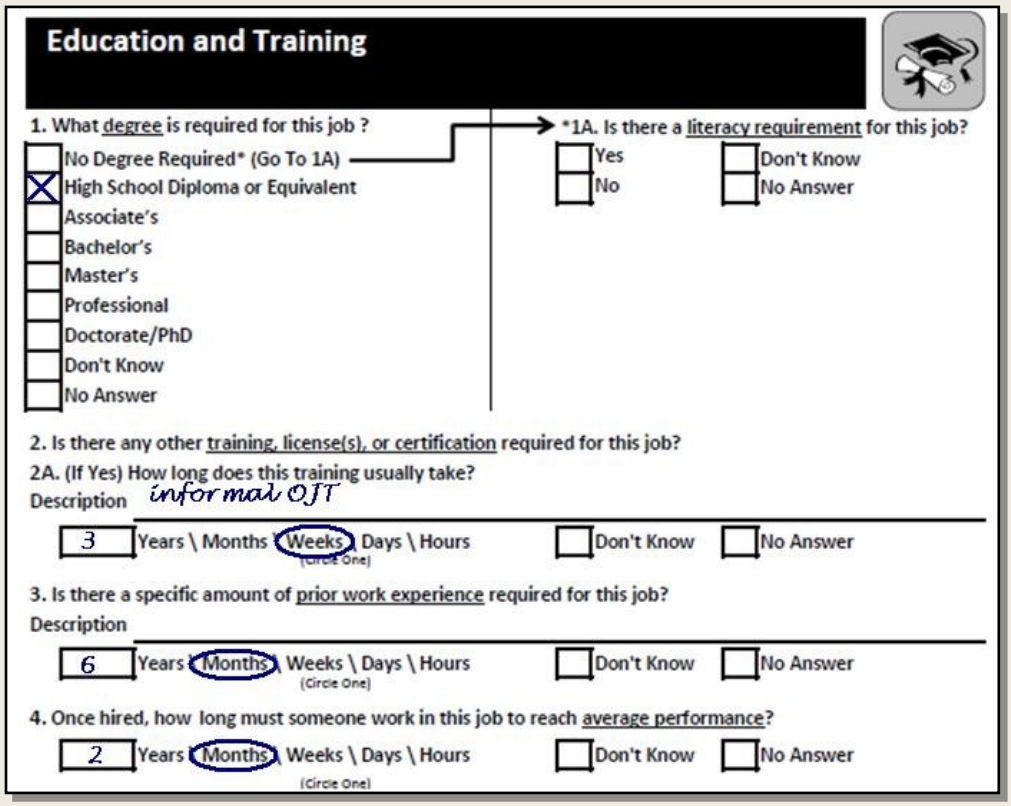
0 + 0 + 0 + 0 + 90 = 90 days
90 days = 3 months = SVP Level 3

Example 3: Brad's West Coast Taxidermy in Orange County, CA

Job Title: Bookkeeper
Job Description Requirements: At least 6 months experience in bookkeeping

Respondent Provided Information: They have to have a high school diploma or GED, and then they work with my assistant who shows them how to do everything they'd need to do, which takes about 3 weeks. After the 3 weeks are completed, it takes them about 2 months to be effective.

Collection Form:



Education and Training

1. What degree is required for this job ?
- [ ] No Degree Required* (Go To 1A)
- [x] High School Diploma or Equivalent
- [ ] Associate's
- [ ] Bachelor's
- [ ] Master's
- [ ] Professional
- [ ] Doctorate/PhD
- [ ] Don't Know
- [ ] No Answer

*1A. Is there a literacy requirement for this job?
- [ ] Yes
- [ ] No
- [ ] Don't Know
- [ ] No Answer

2. Is there any other training, license(s), or certification required for this job?
2A. (If Yes) How long does this training usually take?
Description: informal OJT
3 Years \ Months \ (Weeks) \ Days \ Hours (Circle One) [ ] Don't Know [ ] No Answer

3. Is there a specific amount of prior work experience required for this job?
Description:
6 Years \ (Months) \ Weeks \ Days \ Hours (Circle One) [ ] Don't Know [ ] No Answer

4. Once hired, how long must someone work in this job to reach average performance?
2 Years \ (Months) \ Weeks \ Days \ Hours (Circle One) [ ] Don't Know [ ] No Answer

SVP Calculations and Level
High School only = 0 SVP
OJT = 3 Weeks SVP
Prior Work Experience = 6 Months SVP = 26 Weeks SVP
Average Performance = 2 Months SVP = 8.67 Weeks SVP

Calculation → Education + Training + Certification + Work + Avg Performance = SVP
0 + 3 + 0 + 26 + 8.67 = 37.67 Weeks

37.67 Weeks = 8.70 Months = SVP Level 5

Section 3 – Physical Requirements

This section provides guidance on the coding and concepts of the physical requirements questions.

3_01 Strength

One of the core physical demands being measured by ORS is strength. Given its complexity, several components are utilized in determinining strength and include the following: Sitting, Standing, Walking, Lifting, Pushing, Pulling, and Controls (Hand/Arm, Foot/Leg). Each component measures different aspects of how an employee's strength is used in performing core job functions. As for many physical demands, the duration of activity performed is measured. These components will be combined to determine the overall level of Strength. In the Dictionary of Occupational Titles (DOT), these components were considered together and combined to create overall categories of Sedentary, Light, Medium, Heavy and Very Heavy work levels. In the future, the Social Security Administration may choose to make these work level designations using the information supplied by BLS.

Sitting, Standing, Walking

Sitting is remaining in a seated position. Standing is remaining on one's feet in an upright position at a work station without moving about. Walking is moving about on foot.

Coding Alternate Sitting/Standing:

Code Yes	Code No
Worker may stand or sit at will	Worker must stand
Worker primarily sits but may stand or walk at will	Worker must sit
Worker primarily stands but may sit at will	Worker has core functions that require sitting at specific times (no employee choice regarding when)
Worker has core functions that require sitting or standing but the worker may shift between those functions at will	Worker has core functions that require standing at specific times (no employee choice regarding when) – someone other than the worker determines when sitting or standing is required (e.g., supervisor, customer, guard that must get up if there is an intruder).

Collection Tips for Sit/Stand Hours:

- Even if you code the choice to sit or stand yes, collect the typical number of hours (or a percentage of the shift) that the average worker stands and that the average worker sits.
- An employee may have a choice to sit or stand at will, but their required job functions may require that they are standing or sitting for a period of time.
- In those cases where an employee may choose to stand or sit throughout their entire work day, code the shift as sitting alone.

Example – Sit/Stand
Scenario: Tellers in a bank may use a stool to sit throughout the day or may perform their duties standing.
Coding: Code as 8 hours sitting.

As for all physical demands, consider only required job functions as they are normally performed.

Lifting and Carrying

Lifting is raising or lowering an object from one level to another (includes upward pulling). Carrying is transporting an object, usually by holding it in the hands, arms or on the shoulder.

Example 1: Assembly Line Worker (Food Manufacturing)
Lifts cans jars, or bottles from cardboard box and places items on conveyor.

Example 2: Laborer
Carries lumber around construction worksite.

Lift/Carry – Occasionally/Frequently/Constantly

In most cases, the amounts lifted occasionally will be the highest and the amounts lifted frequently and constantly will get progressively lower as it requires more strength to lift for a longer period of time. Respondents may list tasks that are performed in time periods other than a day (week, month, year or other time period). If data is given is for a week, then consider frequencies in terms of that period of time.

Example – Lifting/Carrying (Less often than daily)
Scenario: A part-time salesperson with a 20 hour per week work schedule lifts very little normally, but must spend 4 hours per week lifting 25 pound boxes when new shipments come into the store.
Coding: 4 hours of lifting/20 hours per week = 20% of time spent lifting 25 pounds 20% of time would fall between 2% and 1/3 of the time. Therefore, the range coded for the amount lifted/carried occasionally should be the range of 21-50 pounds

If even one worker in a job is required to lift a certain weight, code that weight.

Example – Lifting/Carrying (Required by some workers but not all)
Scenario: There are 3 workers in a job. One worker must carry 40 pound boxes from one area of the work site to another for 3 hours per day. The other workers in the job do not need to lift 40 pounds.
Coding: Calculate the duration by averaging the time the task is performed by all workers. 0 hours + 0 hours + 3 hours = 3 hours/3 workers = 1 hour per day 1 hour per day/8 hours per day = .125 or 12.5% of the day. Because 12.5% falls between 2% and 1/3 (33.3%), code the question occasionally. Code the 21 -50 pounds range that includes 40 pounds. This is true even though not all workers in the job are required to lift 40 pounds.

When a worker lifts/carries weight at a frequency, code it at every applicable lower frequency. The amount coded for Occasionally (up to 1/3 of the time) should be equal to or greater than the amount coded as the most weight ever lifted.

Example – Lifting/Carrying at higher frequency/duration
Scenario: The most weight a worker lifts is 20 lbs. He spends 4 hours of every day lifting 20 lbs. No constant lifting is done.

Coding: Constant - None Frequent - 11-25 lbs, Occasionally- 11-20 lbs.

Pushing and Pulling
Pushing is exerting force upon an object so that the object moves away from the force (includes slapping, striking, kicking, and treadle actions). Pulling is exerting force upon an object so that the object moves toward the force (includes jerking).

Collection:
With pushing and pulling, there must be a threshold amount. Pushing open a normal door or pulling open a standard filling cabinet drawer does not meet the threshold for coding. The threshold for pushing or pulling is exertion beyond the level of day-to-day household movements. For example, pulling open a heavy industrial garage door would meet the threshold if the door was heavy and employees must exert their strength to open it. Pushing and pulling are measuring strength, not dexterity, and can only be coded for those situations where strength is required to deal with weight or resistance. Both legs and arms are used to push items like carts or other objects that require the worker to walk.

Example 1: Metal Worker
Pushes and pulls sheet metal pieces into place for fabrication.

Example 2: Automotive Technician
Rolls tires, usually weighing approximately 20 pounds and occasionally weighing up to 50 pounds, to repair areas.

Hand/Arm and Foot/Leg Controls
Hand/Arm and Foot/Leg controls cover the use of buttons, knobs, pedals, levels and cranks that require force to operate or require the worker to modulate their strength, such as using a pedal to control the speed at which a machine operates.

Example 1: Machinist
Pulls the control lever of an arbor press (an arbor press is a small hand operated press, often used to perform smaller jobs such as staking, riveting, installing and removing bearings) exerting about five pounds of force to fit metal parts together while sitting at a bench.

Example 2: Industrial Sewing Machine Operator
Starts, stops, and controls speed of a sewing machine, using a pedal or knee lever, while sitting at a table.

3_02 Postural Questions
The following questions identify the postural requirements of occupations. These questions are asked in terms of the frequency with which they are performed.

Movements that Require Getting Low to the Ground
Many occupations require workers to access the ground. Some duties require a specific movement while others may be done in a number of ways and the employee may choose the way that best suits his/her needs. First, it is necessary to identify whether a selected occupation needs to get low to the ground. If the occupation does not need to access low levels, proceed to the next group of questions. If getting low to the ground is a core

requirement, then it is necessary to identify which movement(s) are required or if the employee may choose the method.

In some situations, an employer may specify the manner in which employees should get low to the ground but the employees may disregard the specification in practice. In these situations, code for how the job is correctly performed, i.e., the way the employer has specified.

Stooping
Bending the body downward and forward by bending the spine at the waist, requiring full use of the lower extremities and back muscles.

Example 1: Strawberry Picker
Stoops between plant rows to reach for and pull, twist, or cut harvestable berries.

Example 2: Janitor
Stoops while cleaning, waxing, and polishing floors, using waxing machine.

Crouching
Bending body downward and forward by bending legs and spine.

Example 1: Bricklayer
Crouches to spread mortar and position bricks on lower parts of walls.

Example 2: File Clerk
Crouches when filing correspondence in lower drawers of filing cabinets.

Kneeling
Bending legs at knees to come to rest on knee or knees.

Example 1: Carpet Installer
Kneels while pressing carpet firmly in place over tackless strips, using hand tools.

Example 2: Electrician
Kneels to connect wiring to fixtures located in cramped places.

Employee Choice (in getting low to ground)
The employee may choose any method of getting low to the ground (i.e., stooping, crouching, or kneeling).

Example 1: Groundskeeper
May stoop, crouch, or kneel at his/her own discretion to weed flowerbeds.

Example 2: Library Clerk
May stoop, crouch, or kneel at his/her own discretion to shelve library books

Crawling
Moving about on hands and knees or hands and feet.

Example 1: Concrete Worker
Crawls while smoothing and finishing surface of poured concrete sidewalks, using straightedge.

Example 2: HVAC Repairperson
Crawls through narrow spaces to reach all parts of furnace when clearing or repairing

furnace.

Climbing

First, it is necessary to identify whether an occupation ascends or descends anything using feet and legs or hands and arms. If no climbing is necessary, then continue to the next set of questions. If climbing is necessary, then it is necessary to identify the type(s) and frequency of climbing. In some cases, the type of climbing required may not directly correspond to the two options. In these cases, consider the types of movements required and what is being climbed and match the climbing motion to the choice that it most closely resembles. Document the reason for the choice.

Ramps or Stairs

Ascending or descending ramps or stairs primarily using feet and legs. Arms and hands may be used for balance (i.e., to hold a stair railing) but they are not used to propel the body forward in the ascent or decent.

Structure is an important factor to consider when coding the climbing of ramps or stairs. If workers have a regular place of business and normally work within that place of business, then the structural features of that place of business should not be considered when coding for climbing ramps or stairs. Mentally picture the building as being one level (no upper floors or basements) and code as if the job were working in this imagined one level building. For instance, if a teacher's classroom is located on the second floor of a building, do not consider his/her ascent and decent to get to the classroom when coding. These stairs are part of the structure of the building. Climbing stairs is not a requirement of a teacher's job. When workers must work outside of their regular place of business, climbing ramps and stairs generally are a requirement of the job. For example, a paramedic must be able to climb stairs in structures to reach people in need of medical attention. Another example is a delivery truck driver (e.g., delivery truck driver) who must be able to climb entry stairs in order to deliver packages.

Example 1: Police Officer
Climbs stairs in commercial and residential properties to provide protective service assistance as needed.

Example 2: Home Health Aide
Climbs stairs to enter home and/or access different floors within the home of patient in the course of providing care.

Example 3: Apartment Property Manager
Ascends steep driveways in the process of maintaining and showing tenants rental properties.

Climbing Ladders, Ropes, or Scaffolds

Ascending or descending ladders, scaffolding, poles, and ropes using feet and legs or hands and arms. When climbing these items, the use of both upper body and lower body is typically required in some capacity.

Example 1: Lineperson
Ascends poles to install or repair telephone or electrical power lines.

Example 2: Plasterer
Climbs ladder to plaster a ceiling.

Example 3: Truckdriver (Semi)
Climbs ladder using arms and legs to ascend into cab of truck.

There are many different types of stools and ladders; the movements involved in using each type as well as their visual appearance varies as noted below:

Single Step Stool: A small one step stool often used to reach a higher level cabinet in a kitchen or used by a child to access a countertop. A stool such as this is one step up and requires no use of the upper body. Use of such a stool is most accurately coded as climbing ramps or stairs.
Household Double Step Stool: These devices typically fold out into two steps that are staggered such that they mimic stairs. The ascent is moving forward and up rather than completely vertical and the use of the upper body is not required. Use of such a device is most accurately coded as climbing ramps or stairs.
Step Ladder: These ladders are typically between eight and twelve feet tall. The steps are treads that fit most of the foot. The ladder is designed to ascend vertically, rather than mimicking the structure of a stairs. The upper body is used while ascending and descending. Use of such a ladder is most accurately coded as climbing ladders, ropes, or scaffolds. While the steps are wide, the structure is a true ladder and requires use of both upper body and lower body when climbing.
Traditional Ladder: These ladders come in a wide range of heights, including extension ladders designed to reach the tops of structures. Typically, rungs are present in place of steps. Climbing requires use of both the upper and lower body. These are true ladders and should be coded as climbing ladders, ropes, or scaffolds.

3_03 Manipulative Questions

These questions all relate to motor skills. They are coded in terms of frequency.

Reaching

Reaching is extending the hand(s) or arm(s) in any direction. Reaching may be done in two different dimensions: height and directional. Heights are considered in terms of above the shoulder and at/below the shoulder. Directions are considered in terms of forward (i.e., in front of the body) and lateral (i.e., to the side of the body). Each reaching motion must consider both height and direction. There is also a summary question regarding reaching in all directions. The amount of reaching done in each of the four component questions should be considered when answering this question. After coding for the frequency of each set of reaching motions, it is then necessary to identify whether the movements require the use of only one hand/arm (unilateral) or of both hands/arms (bilateral). In most cases, writing is not included as reaching. A possible exception is writing on a large chalkboard or a whiteboard mounted on a wall. If a worker has to fully extend his/her arm to write on the upper and lower parts of the board then this writing motion would be included in reaching.

Reaching Threshold:

- To be considered a reaching motion for ORS, the elbow must be straightened.
- When coding for "Reaching above the Shoulder," the elbow must be above the shoulder, not just the hand.

Definitions:
Above the Shoulder (Overhead) Reaching - 150 to 180 degrees in a vertical arc

At/Below the Shoulder Reaching - 0 up to 150 (not inclusive) degrees in a vertical arc

Forward Reaching - above 30 up to 150 degrees in a horizontal arc; the shoulder is not rotated when extending the elbow while reaching

Lateral Reaching - 0 to 30 degrees and 150 to 180 degrees in a horizontal arc; the shoulder is externally rotated when extending the elbow while reaching

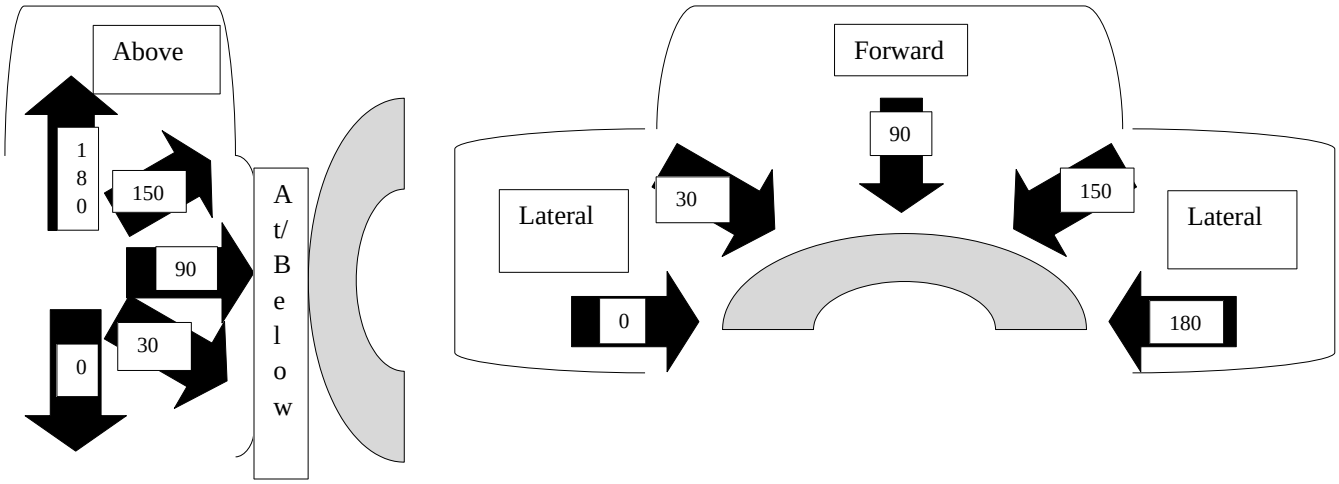
Forward & Above Shoulder

Forward & At/Below Shoulder

Lateral & Above Shoulder

Lateral & At/Below Shoulder

Vertical Arc **Horizontal Arc**



Example 1: Orchard Employee
Reaches forward and above the shoulder to pick apples from trees.

Example 2: Gymnastics Instructor
Reaches laterally and above the shoulder to spot for children on the beam or uneven bars.

Example 3: File Clerk – Reaching in All Directions
Scenario: The file clerk spends 25% of the day reaching at/below shoulder level and in front to file papers at midrange and low levels. He spends 15% of the day reaching above shoulder level and in front to file papers at high levels.
Coding: 25% + 15% = 35% Code Frequently (1/3 to 2/3 of time).

Fine Manipulation (Using Fingers)
Picking, pinching, or otherwise working primarily with fingers rather than with the whole hand or arm. Examples of fingering in an office environment include keyboarding, clipping files, writing (fingering and handling). Other examples of fingering include moving small parts on a production line, adjusting calibration equipment, sorting through a bin of screws or nails to find the correct size, and picking up several glasses together with fingers.

Example 1: Bank Teller
Uses fingers to count and sort coins and paper money.

Example 2: Tailor
Uses fingers to cut, pin, and sew garments.

Gross Manipulation (Handling)
Seizing, holding, grasping, turning or otherwise working with hand(s). Fingers are involved only to the extent that they are an extension of the hand, such as to turn a switch or shift automobile gears. Writing is included in handling. Driving and keyboarding (including use of a mouse) are both components of handling (see below).

Handling includes grasping tools, turning steering wheel, operating gear shift. It also includes holding parts and tools. Generally, a worker must handle something in order to lift it. Therefore, if lifting is present, handling should also be coded (one exception would be if lifting is done with a part of the body other than the hands – carrying weight in a pack on the back). Handling in an office environment includes carrying files, keyboarding, filing, and moving materials around desks as needed to accomplish work.

Example 1: Hairstylist
Handles and grasps combs, scissors, razors, and lotions while providing salon services.

Example 2: Cabinet Maker
Holds parts and handles tools and lumber when building and repairing cabinetry.

3_04 Vision

ORS measures three ways an employee may use vision to complete required job functions: near acuity, far acuity and peripheral vision (field of vision).

Near Acuity

Near acuity is clarity of vision at 20 inches or less. Include vision required to view a computer monitor.

Example 1: Bookkeeper
Enters numerical data in bookkeeping ledgers.

Example 2: Quality Inspector
Examines components for scratches, chips, and other defects, using a magnifier.

Example 3: Tailor
Guides material under a needle and continuously checks the alignment and accuracy of stitching.

Far Acuity

Far acuity is defined as clarity of vision at 20 feet or more.

Example 1: Chauffeur
Reads traffic signs at distances up to 200 feet while driving.

Example 2: Production Worker
Identifies machine jams at distance of 20 to 35 feet.

Example 3: Park Ranger
Observes forests from remote fire-lookout stations to locate forest fires.

Peripheral Vision (Field of Vision)

Peripheral vision is defined as observing an area that can be seen up and down or to right or left while the eyes are fixed on a given point.

As part of the definition, the worker must keep his/her eye fixed on a given point. If the respondent is unsure if employees need peripheral vision, consider asking if the worker may turn his/her head or move their eyes in

order to be able to accomplish their work tasks. Code this element only if the employee must both keep his/her eyes fixed on a given point and needs to see up, down, left or right.

Example 1: Security Guard
Watches all doors and TV monitors to look for unusual activities.

Example 2: Referee
Observes actions of participants in sporting events to detect infractions of the rules.

Example 3: Delivery Truck Driver
Drives a truck in city traffic.

3_05 Communicative Questions

These questions focus on speech and hearing requirements in occupations. These questions are all coded only for incidence (i.e., yes/no).

Speaking

Expressing or exchanging ideas by means of the spoken word to impart information to clients or the public and to convey detailed spoken instructions to other workers accurately, loudly, or quickly.
Sometimes a job may require an employee to speak, but not all speaking is required. For instance, a hairstylist is required to speak to customers to discuss hairstyles, treatments, and products. It is not a required function of the job to make small talk with customers though, despite the fact that it is usually done. When choosing the frequency/duration for speaking, include only the time spent on required speaking.

Example 1: News Anchor
Speaks in a pleasant, well-controlled voice to present programs to a television audience.

Example 2: Project Manager
Interprets specifications, blueprints, and job orders to workers.

Distinguishing Moderate Sounds

Ability to hear and distinguish between different moderate sounds. If there is only a single moderate sound that is necessary to distinguish, still code yes. Moderate sounds include conversational speech. Most workers use their sense of hearing while working. However, for this question to be coded yes, hearing moderate sounds must be a required duty of the job.

Example 1: Secretary
Listens to take dictation and answer the telephone.

Example 2: Mechanic
Test drives vehicles and listens for rattles, squeaks, or other noises reported by customer, indicating malfunctioning or loose components.

Distinguishing Loud Sounds

The definition for this element has changed since Phase 2 based on SSA guidance. Distinguishing loud sounds is the ability to distinguish between different loud sounds. Loud sounds include sirens and alarms. If there is only a single loud sound that it is necessary to hear, in most cases, code no. For this question to be coded yes,

hearing loud sounds must be a required duty of the job and the employee must distinguish between two or more loud sounds.
Usually alarms and other loud sounds have indicators (such as flashing lights) in addition to sounds. In rare situations, one loud sound may be present with absolutely no accompanying lights or other non-auditory indicators. In these cases, this element may be coded yes.

Example 1: Maintenance Person
Must be able to hear fire and carbon monoxide detectors to identify problems and must differentiate between the sounds to identify which may be malfunctioning.

3_06 Combinations of Physical Requirements

The following activities are often required of workers. When present, they may require coding under multiple ORS elements.

Keyboarding

Keyboarding includes both fingering and handling. All aspects of using a computer are considered under keyboarding so mouse usage is included as a part of keyboarding. Consider the frequency of keyboarding and use of the mouse to be the same. No matter what is being used to keyboard, fingering and handling should be coded. For example, delivery drivers making rounds using a handheld device to enter delivery information are keyboarding. This requirement especially involves handling if the device must be held in one hand while the other is keyboarding. The use of a tablet, mobile phone, or other device with a virtual keyboard is also considered keyboarding. When asking about keyboarding, it is important to inquire as to what devices are being used (e.g., computer keyboard, tablet, mobile phone, or other device).

When keyboarding is present, near visual acuity will often be present. If keyboarding requires near visual acuity (e.g., seeing a computer monitor or screen on another electronic device), then code near visual acuity yes.

Driving

Physical demands for driving include operating hand/arm and foot/leg controls. It does not meet the threshold for pushing with feet as the strength required to operate pedals is not enough for the push/pull threshold. Do not assume driving includes reaching as the elbow is not normally straightened when driving except with some manual transmissions.

When asking about driving, it is important to inquire as to the type of vehicle being driven (e.g., size, transmission). Do not assume the presence or frequency of any physical demands because of vehicle type. Most modern versions of large trucks, buses and equipment sometimes require little or no more physical exertion than driving a passenger car.

If possible, collect driving as the specific hours spent or percentage of the day. Driving will be the base frequency/duration for hand/arm and foot/leg controls. To capture the total amount of hand/arm and foot/leg controls, it will be necessary to add any non-driving activity to driving. Without precise amounts it will be difficult to compute these frequencies.

Note on Keyboarding and Driving: The presence of keyboarding and driving affects the coding for many of the questions asked. These two tasks have been separated out in order that their presence may be clearly identified and field economists may include their frequency as a baseline in all of the questions that they affect.

Writing
Writing includes both handling and fingering. Writing is not done as much in many work environments due to increased use of computers, but remains present. Ask the amount of time in a work day spent writing and add this time into both fingering and handling with other fine and gross manipulation activities.

Writing does not typically include reaching. The reaching threshold is the full extension of the elbow. A worker sitting at a desk and writing usually would not need to fully extend the elbow. Reaching may be present when writing in other situations, such as a teacher writing on a chalkboard or whiteboard that may require full extension of the elbow to write at the top or bottom of the board.

Combined Examples
The following are examples that show how to add together activities to arrive at the total time spent on an ORS element.

Example 1: Donut Shop Worker (Info provided as time spent per day)

Scenario: A full-time donut shop worker works an eight hour day. She performs the following tasks requiring gross manipulation, fine manipulation, use of hand/arm controls and use of foot/leg controls in a day:

- Drives the donuts to supermarkets where the donuts are sold using an automatic box truck for one hour per day.
- Operates an industrial mixer one hour per day.
- Moves trays in and out of the oven two hours per day
- Write down customer orders and places them along with writing down what supplies are needed in the storeroom to make supply orders twice per week. In an average work day she writes for five minutes.

Coding:

Gross Manipulation (Handling)
1 hour (60 minutes) driving + 1 hour (60 minutes) operating mixer + 2 hours (120 minutes) moving trays + 5 minutes writing = 245 minutes or 4.083 hours per day
4.083/8 hours = .5104 or 51% - code Frequently (1/3 to 2/3)

Fine Manipulation (Fingering)
1 hour (60 minutes) driving + 5 minutes writing = 65 minutes or 1.083 hours per day
1.083/8 = .1354 or 13.54% - code Occasionally (>2% to 1/3)

Hand/Arm Controls
1 hour driving + 1 hour operation of industrial mixer = 2 hours
2/8 hours = .25 or 25% - code Occasionally (>2% to 1/3)

Foot/Leg Controls
1 hour driving = 1/8 = .125 or 12.5% – code Occasionally (>2% to 1/3)

Example 2: Library Clerk (Info provided as percent of day)

Scenario: A full-time library clerk works eight hours per day. The Library Clerk does the following tasks requiring gross and fine manipulation:

- Shelves books for 25% of the day
- Keyboards for about 15% of the day
- Files small items (fingering) for about 5% of the day
- Writes for approximately 5% of the day to record book orders and complete other library forms

Coding:

Gross Manipulation (Handling)
25% shelving books + 15% keyboarding + 5% writing = 45%
Code Frequently (1/3 to 2/3)

Fine Manipulation (Fingering)
15% keyboarding + 5% filing small items + 5% writing = 25%
Code Occasionally (>2% to 1/3)

Section 4 – Environmental Conditions

Environmental conditions are the surroundings in which an occupation is performed. The following criteria are to be used in determining the presence of any environmental condition:

- Exposure is required of the occupation.
- Environmental condition is specific and related to the occupation.
- Exposure as experienced without the use of personal protective equipment.
  - For example, exposure to fumes in a chemical plant as experienced without the use of a respirator.

Environmental conditions is a threshold system such that a predetermined level of exposure must be reached before an environmental factor is deemed present and coded for duration. Threshold is defined as a level, point, or value above which something is true or will take place and below which it is not or will not. While threshold guidance will be provided for each environmental factor in this section, the Revised Handbook for Analyzing Jobs (RHAJ) examples can also be used to further analyze exposure.

4_01 Weather

Exposure to outdoor atmospheric conditions such as heat, cold, rain, snow, or wind.

Note: Exposure is considered separate from Extreme Heat and/or Extreme Cold.

Exposure Included	Exposure Excluded
Lineman Erects and repairs electrical power lines and is exposed to hot, cold, wet, or windy conditions.	**Pharmaceutical Sales Representative** Exposed to rain upon exiting car and prior to entering medical office.
Route Delivery Driver Delivers packages to residential locations with exposure to varying weather conditions.	**Receptionist** Sits near establishment entrance to greet customers; exposed to cold outdoor temperatures each time the door opens and closes.
Airline Pilot Walks around plane prior to flight to visually inspect equipment regardless of weather conditions.	**Flight Attendant** Exposed to outdoor temperatures when plane doors are open to grant entry/exit to passengers.
Groundskeeper Mows lawns and trims shrubs, frequently in heat of sun, continuing during periods of light rain.	**Elementary Teacher** Watches over children while outdoors for recess.
Car Hop Attendant Delivers food to customer cars regardless of weather conditions.	**Fast Food Worker – Drive Thru** Passes food to customers through window.

4_02 Extreme Cold

Exposure to cold temperatures (non-weather) as defined by duration.

Threshold:

- Exposure must be related to the job not weather conditions.
- Constant Exposure: Extreme cold defined as 40 degrees
- Occasional/Frequent Exposure: Extreme cold defined as 32 degrees
- Structure should be removed from consideration.*

Exposure Included	Exposure Excluded
Meat Cutter Works in 40 degree cooler to cut beef carcasses into standard cuts.	**Surgeon** Performs surgical procedures in cool operating room (66 degrees Fahrenheit).
Refrigerated Warehouse Worker Sorts fresh produce at grocery warehouse; pack pallets for delivery to store locations. Warehouse must be kept cold to prevent spoilage of fresh produce.	**Florist** Opens and closes storage coolers to retrieve flowers for use in floral designs.
Freeze Tunnel Operator Tends freeze tunnel to quick freeze food products.	**Mining Machine Operator** Operates shuttle car to transport materials in underground mine (58 degrees Fahrenheit).

*If for some reason a warehouse cannot be/or must be heated or air conditioned due to the nature of the products being store, structure would then be a consideration and exposure core to a job's function.

4_03 Extreme Heat

Exposure to hot temperatures (non-weather) as defined by non-weather atmosphere.

Threshold:

- Exposure must be related to the job not weather conditions.
- Dry Atmosphere: Extreme heat defined as above 90 degrees.
- Humid Atmosphere: Extreme heat defined as above 85 degrees.
- Structure should be removed from consideration (see note in Extreme Cold section).
- Role of heavy protective gear in warm environments require additional discretion.

Exposure Included	Exposure Excluded
Asphalt Machine Operator Spreads hot asphalt on streets and roads; intense heat produced by machine's heating mechanism.	**Airline Ramp Agent** Loads and unloads baggage and freight on hot tarmac during summer months.
Commercial Laundry Worker Reaches in and removes partially cooled articles; constantly works around hot tumblers.	**Warehouse Worker** Moves freight and stock in warehouse that is not climate controlled. Products do not require any special conditions for storage.
Restaurant Cook Works close to hot stove during cooking operations (e.g., agitating, testing, and draining cooking mixture).	**Salon Worker** Works around steam, hot wax and hot towels while giving facials and waxings.
Asbestos Abatement Worker Wears asbestos suit while removing asbestos in a warm environment.	**Police Dog Trainer** Wears protective clothing indoors while training police dogs attack techniques

4_04 Wetness

Contact with water or other liquids.

Threshold:

- Exposure must be related to the job not weather conditions.

- Requires constant contact and/or working in a wet area.

Exposure Included	Exposure Excluded
Dishwasher Washes pots, pans, and trays by hand.	**Nurse** Washes hands prior to patient care.
Cannery Worker Feeds food products into washing machine preparatory to cooking and canning.	**Route Delivery Driver** Delivers packages in rainy conditions.
Commercial Fisherman Removes wet fish from freshwater tank; cleans and cuts into pieces of specified size.	**Dental Hygienist** Cleans teeth using ultrasonic instrument that loosens tartar and sprays water to wash away debris.

4_05 Humidity

Exposure to air containing a high amount of water or water vapor.

Threshold:

- Exposure must be related to the job not weather conditions.
- Exposure must be constant and oppressive.

Exposure Included	Exposure Excluded
Garment Presser Presses damp garments using pressing machine in which oppressive humidity results from steam emitted.	**Police Officer (Bike)** Rides bike to patrol pedestrian areas during humid, summer months.
Commercial Laundry Worker Loads damp articles into tumblers and removes hot, dried articles from tumblers, working in a humid atmosphere.	**Waiter/Waitress** Retrieves food prepared for customers from kitchen which may be humid from both food preparation and dishwashing activities.

4_06 Fumes, Odors, Dust, Gases and Poor Ventilation

Exposure to such conditions as fumes, noxious odors, dusts, mists, gases, and/or poor ventilation that affect the respiratory system, eyes, or skins. For a list of potential hazards, see Appendix 1.

Threshold:

- Requires heavy concentration of atmospheric condition(s) such as strong/disagreeable odors and skin irritants.
- Exposure has negative impact upon respiration, eyes, and/or skin.
- Employers with such exposures typically have procedures in place to protect employees from exposure.
  - If employer is unsure, more than likely there is no exposure.
- Exposure may be present but not important to core job functions.

Exposure Included	Exposure Excluded
Automotive Mechanic Repairs and overhauls automobiles with exposure to fumes/odors from grease, oil, gas, and engine exhaust.	**Route Delivery Driver** Encounters fumes from vehicles in ordinary traffic amounts; discomfort or injury to respiratory system unlikely given limited exposure amount.
Metal Finishing Plant Worker Pours pigment, paint paste, and thinner into can and stirs with paddle; worker breathes fumes and odors of paint ingredients.	**Paint Store Clerk** Mixes paint in retail store; only exposed to fumes when mixing small amounts of paint as ordered by customers.
Cosmetologist Applies bleach, dye, or tint to color hair; exposed to strong odors/skin irritants from various hair preparations and lotions.	**Elementary Teacher** Uses chalkboard which results in chalk dust in classroom; unlikely to cause injury to respiratory system.

Example 1: Farmworker
Scenario: Farmworkers stack hay and grain with a pitchfork for 50% of their work schedule throughout the year. This exposes them to lots of dust from the grain.
Coding: Code frequent (1/3 to 2/3 of time) exposure.

4_07 Toxic, Caustic Chemicals

Exposure to possible bodily injury from toxic or caustic chemicals. See Appendix 1.

Threshold:

- Requires exposure to substances which may be harmful to one's health if inhaled, ingested, or absorbed through the skin (toxic) or can burn/destroy living tissue (caustic).
- Exposure should be coded only if there is a real chance of exposure; thus household cleaners would be excluded.
- Exposure may be present but not important to core job functions.

Toxic Chemical – Chemical that, when absorbed (through the skin, blood stream or inhaled), causes illness, disease, or death. Amount of exposure is critical in determining hazardous effects.

- Keratin treatments meet the threshold for exposure to toxic/caustic chemicals. Cosmetologists giving Keratin treatments would be coded as having exposure to toxic chemicals.

Flammable Chemical – Chemical that, when exposed to a heat ignition source, results in combustion.

Corrosive Chemical – Chemical that, when comes into contact with skin, metal, or other materials, damages the materials. For example, acids and bases.

Exposure Included	Exposure Excluded
Semiconductor Equipment Operator Tends equipment that clean semiconductor wafers using cleaning solutions made of sulfuric acid, hydrochloric acid, etc.	**Hotel Housekeeper** Cleans hotel rooms using common household cleaning agents such window and tile cleaners.
Textile Dye Machine Operator Tends equipment that mixes chemicals (strong acids and anhydrous ammonia) for use in bleaching and finishing carpets/rugs.	**Family Practice Physician** Uses salicyclic acid to remove a patient's planter wart.
Pest Control Worker Apply chemical solutions and toxic gases to kill pests from infested buildings.	**Tank Truck Driver** Drives tank trucks to deliver industrial application gases to customers.

Example 1: Glassworker
Scenario: Glenn's Glass Shop specializes is acid etched glass. They do things the old fashioned way using historic methods that have workers working very closely with acid that can burn their skin, the workers must use care to do their job properly and not get splashed with any acid. They work around the acid bathes two hours out of an eight hour work day.
Coding: Code occasional exposure to toxic, caustic chemicals.

Collection Note: Toxic, Caustic Chemicals is closely related to Fumes, Odors, Dusts, Gases and Poor Ventilation in that exposure to many types of chemicals would be rated in both areas. Bio-hazards such as blood and other bodily fluids do not meet this threshold as they are not a caustic, toxic chemical.

4_08 Moving Mechanical Parts

Exposure to materials, mechanical parts, settings, or any moving objects (most commonly moving machinery or equipment) that could cause bodily harm.

Threshold:

- Exposure exists only when there is a risk of bodily injury.
- Machinery or equipment includes those in proximity to a worker or operated by the worker.
- Risks associated with standard office equipment do not meet the threshold (present but not important to core job functions).

Exposure Included	Exposure Excluded
Woodworking Machine Operator Operates machines to surface, cut, and shape lumber. Cuts, injury to eyes, and loss of extremities possible.	**Accountant** Disposes sensitive documents using a shredder. Clothing could get caught causing possible injury.
Sheet Metal Worker Operate fabricating machines to shape and bend metal plates. Injury from machines may include crushed hands, fractures, and hernia.	**Deli Worker** Operates deli slicer to slice meats and cheeses to varying degrees of thickness as requested by customers.
Landscaper Uses chipper/shredder to mulch branches and tree debris.	**School Cafeteria Cook** Operates industrial mixers to prepare food items for lunch.

4_09 Vibration

Exposure to a shaking object or surface.

Threshold:

- Exposure exists only when there is full-body vibration.
- Vibration must be heavy vibration.
- Excludes office machines, clippers, and other small hand tools.

Exposure Included	Exposure Excluded
Jackhammer Operator Operates compressed air, rock drilling machine in which there is continuous vibrations.	**Cosmetologist** Uses small clippers to trim hair along the neck.
Printing Press Operator Operates cylinder-type printing press that produces continuous vibration when in operation.	**General Maintenance Worker** Performs routine maintenance repairs at apartment complex requiring the use of a handheld drill.
Bulldozer Operator Moves and grades earth using bulldozer. Intense vibration a blade is forced into ground and bulldozer driven forward.	**Elementary School Teacher** Uses electric pencil sharpener to sharpen pencils for use by students.

4_10 High, Exposed Places

Exposure to possible bodily injury from falling.

Threshold:

- Exposure is such that there is a greater risk of bodily injury from such a fall than normally encountered in most work environments.

Exposure Included	Exposure Excluded
Painter Applies coats of paint, varnish, stain, or lacquer to exterior and interior surfaces, working from ladders or scaffolding.	**Retail Sales Clerk** Uses step ladder to reach items on upper shelves for customers.
Lineman Repairs power lines, working from buck of cherry picker or after climbing pole.	**Construction Superintendent** Performs site inspections at high-rise construction project in which walls are not enclosed.
Tree Trimmer Cuts away dead or excess branches from trees using tree canopies and truck-mounted lifts.	**Overhead Crane Operator** Operates mechanical boom to lift and move materials onto trucks.

4_11 Noise Intensity Level

Intensity of the noise level to which the worker is exposed in the job environment.

Threshold:

- Consider the examples provided for each level for insight into the nature of the specific levels.
- When noise intensity level varies within the work environment (e.g. moderate during day shift vs. quiet during night shift), code for the highest level.

Noise Intensity Level	Examples
Very Quiet	• Isolation Booth (for hearing test) • Deep Sea Diving • Forest Trail
Quiet	• Library (especially Law or Medical Libraries) • Private Offices • Mortuary (Funeral Reception) • Golf Course • Art Museum
Moderate	• Business Offices (especially sales or offices that work with the public) • Department Store • Grocery Store • Light Traffic • Fast Food Restaurant (off hours)
Loud	• Can Manufacturing Department • Large Earth-moving Equipment • Heavy Traffic
Very Loud	• Rock Concert (front row) • Jackhammer Work • Rocket Engine Testing Area (during test)

Example 1: Librarian
Scenario: The library is quiet some of the day but is moderate during children's story hour.
Coding: Code moderate.

Example 2: Production Baker
Scenario: Production baker works in a grocery store behind the bakery counter. Mixing equipment is state of the art and is quiet. The respondent insists that the noise intensity is loud using the scale, however the FE is in the grocery store and it is no louder than the library during story time that he visited in the morning.
Coding: Code moderate and document the reason why.

Note: Each individual establishment functions differently and may not always be coded as expected based upon the examples. Libraries, for example, are an example of "Quiet." In prior testing, however, most library respondents indicated their specific libraries to be more accurately reflected by the "Moderate" noise level.

Collection Tip Sheet

Required

- Include: Only data elements required to perform the occupation.
- Exclude:
  - Data elements for practices that are unique to an establishment.
  - Data elements incidental to an occupation.
  - Data elements as a condition of employment.

Accommodations

- Only collect data on required job duties as they are performed **without** accommodations.
- If conditions are mitigated by the employer, do not include them.

Physical Demands

- Keyboarding and Driving
  - Ask about each separately. If present, code their frequency as the baseline for related elements.
    - Keyboarding: Gross & Fine Manipulation
    - Driving: Handling, Hand/Arm Controls, Foot/Leg Controls
  - Document the item on which keyboarding is done.
  - Document the type of car driven.
- Reaching
  - If any of the reaching questions are coded, then reaching in all directions must also be coded.
- Pushing/Pulling
  - Collect frequency of pushing/pulling.
  - Collect whether done with upper body or lower body.
  - Do not include incidental pushing/pulling (e.g., opening a desk drawer).

Environmental Conditions

- Include only non-weather related exposure to extreme heat and extreme cold.
- Humidity must be constant and oppressive to code.
- Vibration must be whole body vibration to code.
- Moving, mechanical parts must present a risk of bodily injury to code.
- Do not consider minor or incidental wetness, such as handwashing.

Specified Vocational Preparation

- Include only education specifically vocational in nature. For example, a Bachelor's Degree (i.e., 4 years) would only count as two years SVP; two years are general education and two years are career specific.
- For SVP, time is measured as actual time lapsed rather than work time lapsed.
- Consider only required experience, not preferred experience.
- When the respondent provides an experience range, use the low end of the range as that would be the minimum amount of experience required.

Appendix 1: List of Potential Hazards

Air Contaminants			
Acetaldehyde	Diborane	Limestone	Phenylmethyl
Acetic acid	Dibutyl phosphate	Lindane	Phosdrin (Mevinphos)
Acetic anhydride	Dibutyl phthalate	Lithium hydride	Phosgene (Carbonyl)
Acetone	Dichlorodifluoromethane	LPG (Liquified)	Phosphate
Acetonitrile	Dichlorodiphenyltri-	Magnesite	Phosphine
Acetylene	Dichloroethyl ether	Magnesium oxide fume	Phosphoric acid
Acetylene dichloride;	Dichloromethane; see	Malathion	Phosphorus
Acetylene tetrabromide	Dichloromonofluoro-	Maleic anhydride	Phosphorus (yellow)
A-Chloroacetophenone	Dichlorotetrafluoro-	Malononitrile	Phosphorus pentasulfide
Acridine, chrysene	Dichlorvos (DDVP)	Manganese compounds	Phosphorus trichloride
Acrolein	Dicyclopentadienyl iron	Manganese fume (as Mn)	Phthalic anhydride
Acrylamide	Dieldrin	Marble	Picloram
Acrylonitrile	Diethyl ether	Mercaptan	Picric acid
Aldrin	Diethylamine	Mercury (aryl)	Pindone (2-Pivalyl-1)
Allyl alcohol	Difluorodibromomethane	Mercury (organo) alkyl	P-isomer
Allyl chloride	Diglycidyl ether (DGE)	Mercury (vapor) (as Hg)	Pitch volatiles
Allyl glycidyl ether	Dihydroxybenzene	Mesityl oxide	Plaster of paris
Allyl propyl disulfide	Diisobutyl ketone	Metal	Platinum (as Pt)
Alpha-Alumina	Diisobutyl ketone	Methane	P-Nitroaniline
Alpha-Methyl styrene	Diisopropylamine	Methanethiol	P-Nitrochlorobenzene
Alpha-Naphthylamine	Dimethoxymethane	Methoxychlor	Portland cement
Aluminum Metal (as Al)	Dimethyl acetamide	Methyl acetate	P-Phenylene diamine
Ammonia	Dimethyl sulfate	Methyl acetylene	Precipitated and gel
Ammonium sulfamate	Dimethyl-1,2-dibromo-2	Methyl acetylene	Propadiene mixture
Aniline and homologs	Dimethylamine	Methyl acrylate	Propane
Anisidine	Dimethylaminobenzene	Methyl alcohol	Propyl ketone
Anthracene, BaP	Dimethylaniline	Methyl amyl alcohol	Propylene dichloride
Antimony and compounds	Dimethylbenzene	Methyl bromide	Propylene imine
ANTU (alpha)	Dimethylformamide	Methyl butyl ketone	Propylene oxide
applicable in the	Dimethylphthalate	Methyl cellosolve	Propyne; see Methyl
Arsenic, inorganic	Dinitrate	Methyl cellosolve	P-tert-Butyltoluene
Arsenic, organic	Dinitrobenzene	Methyl chloride	Pyrethrum
Arsine	Dinitro-o-cresol	Methyl chloroform	Pyridine
Asbestos	Dinitrotoluene	Methyl ether	pyrophosphaate)

Air Contaminants			
Azinphos-methyl	Dioxane	Methyl ethyl ketone	quartz, respirable
Barium sulfate	Diphenyl (Biphenyl)	Methyl formate	Quinone
Barium, soluble	Diphenylmethane	Methyl hydrazine	RDX: see Cyclonite
Benomyl	Dipropylene glycol	Methyl iodide	Rhodium (as Rh),
Benzene	Di-sec octyl phthalate	Methyl isoamyl ketone	Rhodium (as Rh), metal
Benzidine	Dust	Methyl isobutyl	Ronnel
Benzo(a)pyrene	Dusts and mists	Methyl isobutyl ketone;	Rotenone
Benzoyl peroxide	Emery	Methyl isocyanate	Rouge
Benzyl chloride	Endrin	Methyl mercaptan	Selenium compounds
Beryllium and	Epichlorohydrin	Methyl methacrylate	Selenium hexafluoride
Beryllium compounds	EPN	Methyl n-amyl ketone	Silica, amorphous
Beta-Chloroprene	Ethanethiol	methyl nitramine	Silica, crystalline
Beta-Naphthylamine	Ethanolamine	Methyl propyl ketone	Silica, fused
Beta-Propriolactone	ether (IGE)	Methylal	Silicates (less than 1%)
Biphenyl; see Diphenyl	Ethyl acetate	Methylamine	Silicon
Bis(Chloromethyl)	Ethyl acrylate	Methylcyclohexane	Silicon carbide
Bismuth telluride	Ethyl alcohol (Ethanol)	Methylcyclohexanol	Silver, metal and
Boron oxide	Ethyl amyl ketone	Methylene bisphenyl	Soapstone, respirable
Boron trifluoride	Ethyl benzene	Methylene chloride	Soapstone, total dust
Bromine	Ethyl bromide	Mica (respirable)	Soapstone
Bromoform	Ethyl butyl ketone	Mica; see Silicates	Sodium fluoroacetate
Butadiene	Ethyl chloride	M-isomer	Sodium hydroxide
Butanethiol	Ethyl ether	Mixture, vapor	Starch
Butyl mercaptan	Ethyl formate	Molybdenum (as Mo)	Stibine
Butylamine	Ethyl mercaptan	Monomethyl aniline	Stoddard solvent
Butyl-m-cresol	Ethyl mercaptan	Monomethyl hydrazine	Strychnine
Cadmium (as Cd)	Ethyl silicate	Morpholine	Styrene
Calcium Carbonate	Ethylamine	N-Amyl acetate	Succinonitrile
Calcium hydroxide	Ethylene chlorohydrin	Naphtha (Coal tar)	Sucrose
Calcium oxide	Ethylene chlorohydrin	Naphthalene	Sulfur dioxide
Calcium silicate	Ethylene dibromide	Naphthylthiourea	Sulfur hexafluoride
Calcium sulfate	Ethylene dibromide	N-Butyl alcohol	Sulfur monochloride
Camphor, synthetic	Ethylene dichloride	N-Butyl glycidyl ether	Sulfur pentafluoride
Carbaryl (Sevin)	Ethylene dichloride	N-butyl ketone	Sulfuric acid
Carbinol	Ethylene glycol	N-Butyl-acetate	Sulfuryl fluoride
Carbinol	Ethylene glycol methyl	N-Ethylmorpholine	Systox; see Demeton

Air Contaminants			
Carbon black	Ethylene oxide	N-Hexane	Talc; see Silicates
Carbon dioxide	Ethylenediamine	Nickel carbonyl (as Ni)	Tantalum, metal and
Carbon disulfide	Ethyleneimine	Nickel, metal	TEDP (Sulfotep)
Carbon monoxide	Ethylidene chloride	Nickel, soluble	Tellurium
Carbon tetrachloride	Ferbam	Nicotine	Tellurium hexafluoride
Carbon tetrachloride	Ferrovanadium dust	Nitramine	Temephos
Cellosolve acetate	Fluorides (as F)	Nitric acid	TEPP (Tetraethyl)
Cellulose	Fluorine	Nitric oxide	Terphenylis
Chlordane	Fluoromethane	Nitrobenzene	Tetrachloromethane
Chlorinated camphene	Fluorotrichloromethane	Nitroethane	Tetrachloronaphthalene
Chlorinated diphenyl	Formaldehyde	Nitrogen dioxide	Tetrachoroethylene
Chlorine	Formic acid	Nitrogen trifluoride	Tetraethyl lead (as Pb)
Chlorine dioxide	Fume (as Cu)	Nitroglycerin	Tetrahydrofuran
Chlorine trifluoride	Fume (as V2O5)	Nitromethane	Tetramethyl
Chloroacetaldehyde	Fume and insoluble	Nitrotoluene	Tetramethyl lead,
Chlorobenzene	Furfural	Nitrotrichloromethane	Tetranitromethane
Chlorobromomethane	Furfuryl alcohol	N-Nitrosodimethylamine	Tetryl (2,4,6-Trinitro-
Chlorodiphenyl	Glycerin (mist)	N-Propyl acetate	Thallium, soluble
Chlorodiphenyl	Glycidol	N-Propyl alcohol	Thiram
Chloroethane (DDT)	Glycol monoethyl ether	N-Propyl nitrate	Tin, inorganic
Chloroethylene	Grain dust (oat, wheat)	O-Chlorobenzylidene	Tin, organic compounds
Chloroform	Graphite, natural	Octachloronaphthalene	Titanium dioxide
Chloromethyl methyl	Graphite, synthetic	Octane	Toluene
Chlorophenoxyacetic	Guthion	O-Dichlorobenzene	Toxaphene
Chloropicrin	Gypsum	Oil mist, mineral	Tremolite
Chloropropane (DBCP)	Hafnium	O-isomer	Tributyl phosphate
Chromates (as CrO(3))	Heptachlor	O-Methylcyclohexanone	Trichloroethylene
Chromic acid	Heptane (n-Heptane)	Osmium tetroxide	Trichloromethane
Chromium (II) compounds	Heptanone	O-Toluidine	Trichloronaphthalene
Chromium (III)	Hexachloroethane	Oxalic acid	Tridymite
Chromium (VI) compounds	Hexachloronaphthalene	Oxide dust	Triethylamine
Chromium metal	Hexone (Methyl)	Oxides (as Sn)	Trifluorobromomethane
Chrysene; see Coal tar	Hydrazine	Oxyacetic acid	Triorthocresyl
Clopidol	Hydrogen bromide	Oxygen difluoride	Triphenyl phosphate
Coal dust	Hydrogen chloride	Ozone	Tripoli (as quartz)

Air Contaminants			
Coal tar pitch	Hydrogen cyanide	Paraquat, respirable	Turpentine
Cobalt metal, dust	Hydrogen fluoride	p-Benzoquinone	Uranium (as U)
Coke oven emissions	Hydrogen peroxide	p-Dichlorobenzene	Vanadium
Copper	Hydrogen selenide	Pentaborane	Vegetable oil mist
Cotton dust (e)	Hydrogen sulfide	Pentachloride	Vinyl benzene
Crag herbicide (Sesone)	Hydroquinone	Pentachloronaphthalene	Vinyl chloride
Cresol, all isomers	Iodine	Pentachlorophenol	Vinyl cyanide
Cristobalite	Iron oxide fume	Pentaerythritol	Vinyl toluene
Crotonaldehyde	Isobutyl acetate	Pentane	Warfarin
Crystalline silica	Isobutyl alcohol	Perchloroethylene	Xylenes
Cumene	Isobutyl ketone	Perchloromethyl	Xylidine
Cyanides (as CN)	Isocyanate (MDI)	Perchloryl fluoride	Yttrium
Cyclohexane	Isomyl acetate	Petroleum distillates	Zinc chloride fume
Cyclohexanol	Isomyl alcohol	Petroleum gas	Zinc oxide
Cyclohexanone	Isophorone	Phenanthrene	Zinc oxide fume
Cyclohexene	Isopropyl acetate	Phenol	Zinc stearate
Cyclopentadiene	Isopropyl alcohol	Phenyl ether, vapor	Zirconium compounds
Decaborane	Isopropyl ether	Phenyl ether-biphenyl	
Demeton (Systox)	Isopropyl glycidyl	Phenyl glycidyl ether	
Diacetone alcohol	Isopropylamine	Phenylethylene	
Diatomaceous earth	Kaolin	Phenylhydrazine	
Diazomethane	Ketene		
	Lead inorganic (as Pb)		

Toxic Substances	Mineral Dusts
Benzene	Silica
Beryllium and beryllium compounds	Crystalline
Cadmium fume	Quartz
Cadmium dust	Cristobalite
Carbon disulfide	Amorphous
Carbon tetrachloride	Silicates
Chromic acid and chromates	Mica
Ethylene dibromide	Soapstone
Ethylene dichloride	Talc
Fluoride as dust	Tremolite, asbestiform
Formaldehyde	Graphite
Hydrogen fluoride	Coal Dust
Hydrogen sulfide	
Mercury	
Methyl chloride	
Methylene Chloride	
Organo (alkyl) mercury	
Styrene	
Tetrachloroethylene	
Toluene	
Trichloroethylene	

Appendix 2: Weights of Different Objects

Weight (lbs.)	Description
4-7	Laptop computer
9	Gallon of milk
10	2” x 4” x 8’ Douglas Fir lumber
12	1 gallon of interior house paint (Glidden Brilliance Interior Flat)
16	2” x 6” x 8’ Douglas Fir lumber
17	Household gas grill propane tank (empty)
21	2” x 8” x 8’ Douglas Fir lumber
23	Mid-size passenger car tire (Ford Fusion; Michelin Pilot HX MXM4 P225/50R17)
24	40” LED television (Samsung 5000 Series TV with stand)
33	Household gas grill propane tank (full)
37	8” x 8” x 16” common cement block
39	Light truck tire (Ford F-150; Goodyear Wrangler SR-A P275/65R18)
45	8’ x 4’ x ½” Sheet of plywood
51	8’ x 4’ x ½” Sheet of drywall
52	12” x 8” x 16” common cement block
52	Case of copy paper (20 lb.)
60	5 gallons of interior house paint (Glidden Brilliance Interior Flat)
60	Standard bag of concrete mix
60	1/6 keg of beer
62	Pre-mixed all-purpose joint compound (5 gallons)
68	8’ x 4’ x 3/4” Sheet of plywood
72	60” Plasma television (Samsung 6500 Series Smart TV with stand)
80	Large bag of concrete mix