Occupational Requirements Survey (ORS)

Collection Manual

Second Edition

Instructions in this manual became effective May 2016. It includes updated procedures information from Procedure Alerts through #161, Technical Memorandums through #310, and applicable ORS SO-70s through #15.

U. S. Department of Labor Bureau of Labor Statistics Washington, D. C. 20212	Office of Compensation and Working Conditions May 2016

Table of Contents

Table of Contents ..... **i**
Preface ..... **v**
Introduction ..... **vi**
Information Reference Guide ..... **vii**
Major Changes to ORS Manual (May 2016) ..... **viii**
Chapter 1: Collection Strategies **1**
1_01 Overview 2
1_02 Collect job descriptions and other descriptive documents ahead of time 2
1_03 Identify a collection approach 3
1_04 Identify potential data elements ahead of time 3
1_05 Prioritize collection for accuracy and efficiency 3
1_06 Take advantage of opportunities to observe workers on jobs 4
Chapter 2: Fundamentals **5**
2_01 Understanding Work as Generally Performed 6
How to apply the concept 'work as generally performed': 6
2_02 Understanding Job Definition 8
2_03 Understanding Duration 9
How to choose the correct method for collecting 'Duration' 9
How to code duration for tasks that occur less than daily 10
How to proceed when respondent answers are incomplete 10
References for coding duration 11
Duration Formula 11
2_04 Understanding Accommodation 12
2_05 Understanding Mitigation 13
2_06 Understanding Thresholds 14
2_07 Understanding SOCs in ORS 15
How to code an O*NET SOC that does not follow SOC rules 15
2_08 Understanding Documentation Requirements 16
Chapter 3: Occupational Information **17**

3_01 How to collect combination jobs 18
3_02 Collecting non-levelable NCS jobs 19
3_03 How to collect traveling occupations 20
3_04 How to collect occupational characteristics 21
Chapter 4: Task Lists 22
4_01 Overview 23
4_02 How to use questions to identify important tasks 23
4_03 Documenting tasks 25
How to document tasks 25
4_04 How to compare task lists to the O*NET 27
4_05 Collecting 'Driving' 28
Chapter 5: Specific Vocational Preparation (SVP) 29
5_01 Overview 30
5_02 Collecting 'Minimum Education' 31
How to collect 'Minimum Education' 32
5_03 Collecting 'Pre-employment Training' 35
Collecting duration for 'Pre-employment Training' 35
5_04 Collecting 'Experience' 37
5_05 Collecting 'Post-employment Training' 38
Collecting post-employment training for non-standard work schedules 38
5_06 Avoiding errors that can result in over- or understatement 40
When to use "Unknown" and "Not required" 40
Coding a non-levelable job 40
Collecting concurrent SVP time 41
5_07 Computing SVP Level 42
Understanding SVP levels and job skill levels 42
Calculating SVP – an example 42
Chapter 6: Cognitive Elements 44
6_01 Overview 45
6_02 Collecting 'Decision-making' 46
6_03 Collecting 'Work Review' 48
6_04 Collecting 'Pace' 50
How to collect 'Pace of Work' 50
How to collect the 'Control of Workflow' 51

6_05 Collecting ‘Adaptability’ 53
6_06 Collecting ‘Work-Related Personal Interactions’ 56
How to collect frequency of contact 57
How to collect the purpose of interaction 57
Chapter 7: Physical Demands 60
7_01 Overview 61
Concurrent Physical Demands 61
How to collect Physical Demands 61
7_02 Collecting ‘Sitting vs. Standing/Walking’ 63
How to collect ‘Sitting’ vs. ‘Standing/Walking’ 63
When to collect ‘Sitting vs. Standing/Walking at Will’ 64
7_03 Collecting ‘Lifting/Carrying’ 66
How to collect Lifting/Carrying: 66
When to use ‘Negligible’ and ‘None’ 68
7_04 Collecting ‘Pushing/Pulling’ 70
Understanding thresholds for ‘Pushing/Pulling’ 70
How to collect ‘Pushing/Pulling’ 72
7_05 Collecting ‘Reaching’ 74
7_06 Collecting ‘Keyboarding’ 76
How to collect ‘Keyboarding’ 76
7_07 Collecting ‘Manipulation’ 78
7_08 Collecting ‘Stooping’, ‘Crouching’, ‘Kneeling’, and ‘Crawling’ 80
7_09 Collecting ‘Climbing’ 82
How to collect ‘Climbing Ramps or Stairs’ 82
How to collect ‘Climbing Ladders, Ropes, or Scaffolds’ 83
Determining the type of ‘Climbing’ with Stools and Ladders 83
7_10 Collecting ‘Vision’ 85
7_11 Collecting ‘Communicating Verbally’ and ‘Hearing Requirements’ 86
Chapter 8: Environmental Conditions 88
8_01 Overview 89
Collect the following Environmental Conditions: 89
When to collect duration for Environmental Conditions: 89
How to collect Environmental Conditions 89

8_02 Collecting ‘Outdoors’ 91
8_03 Collecting ‘Extreme Cold’ 92
8_04 Collecting ‘Extreme Heat’ 93
8_05 Collecting ‘Wetness’ 94
8_06 Collecting ‘Humidity’ 95
8_07 Collecting ‘Hazardous Contaminants’ 96
8_08 Collecting ‘Proximity to Moving Mechanical Parts’ 98
8_09 Collecting ‘Heavy Vibration’ 99
8_10 Collecting ‘High, Exposed Places’ 100
8_11 Collecting ‘Noise Intensity Level’ 101
Appendix 1 103
List of Potential Hazards 103
Air Contaminants 103
Toxic Substances 106
Mineral Dusts 106
Appendix 2 107
Common Objects and Their Weights 107
Glossary 108

Preface

The Occupational Requirements Survey (ORS) Collection Manual is the primary document providing instructions on survey procedures, data collection, and coding for the Occupational Requirements Survey. This document provides broad collection and coding instructions applicable across all ORS collection activities and includes detailed data element definitions, explanations, and examples.

This Manual reflects current concepts, definitions, and practices. It will be updated periodically and supplemented by Technical Memoranda and Procedures Alerts issued from the Office of Compensation Levels and Trends (OCLT). See specific changes listed in the Major Changes table.

Introduction

The Social Security Administration (SSA) administers two large national programs that provide disability benefits to individuals who cannot work due to mental or physical disabilities. SSA uses an adjudication process to determine if individuals meet eligibility requirements to receive benefits. To support this adjudication process, SSA needs information about the requirements of work as it is generally performed in the national economy.

SSA and BLS signed an interagency agreement to begin collecting new occupational requirements data for use in SSA's disability programs. SSA chose the BLS, specifically the National Compensation Survey (NCS), because the NCS collects quality data on work characteristics in the economy. As a result, BLS established the Occupational Requirements Survey (ORS) as a test survey in late 2012. The goal of ORS is to collect and publish occupational information that meets the needs of SSA at the level of the eight-digit Standard Occupational Classification (SOC) that is used by the Occupational Information Network (O*NET).

In FY 2013, economists from the NCS program began feasibility testing that included collecting data on primary physical attributes, environmental conditions, and vocational preparation requirements of occupations within establishments representative of the broader economy. BLS added mental and cognitive demands of work to the data collection in FY 2014. In FY 2015, BLS completed pre-production testing and the survey went into production in FY 2016.

The focus of this manual is to provide clear survey definitions and procedures to ensure consistent application during production data collection. This manual outlines fundamental collection concepts and technical procedures for collecting the data elements, including: task lists, specific vocational preparation, cognitive demands, physical demands, and environmental conditions.

Information Reference Guide

Useful contact information and references are shown below. Each region may have additional procedures determining when it is acceptable to send an SO-70, or email a user group, and who is authorized to do so.

To comment on this Volume send an email to:
PPD

To access the ORS Collection Manual, or any of the NCS manuals, electronically, go to:
http://ocwcinet.ocsp.bls.gov/isyslib/ncs/manuals/ncs_manuals_index.htm

To submit an SO-70 send an email to:
ORS.SO-70

To contact the Statistical Methods Group (SMG), send email to:
NCSSMG

To obtain technical help for the CIERA system, send email to:
IDCHELP

References:

To view the CIERA User Guide:
http://ocwcinet.ocsp.bls.gov/ISYSLib/NCS/Other_Procedures/CIERA_User_Guide_2015.docx

To view the ORS Public Website:
http://www.bls.gov/ors/

To view the Standard Occupational Classification:
http://www.bls.gov/soc/

To view the O*Net SOC Crosswalk:
http://www.onetonline.org/crosswalk/

To view information on SSA's Occupational Information System Project:
https://www.ssa.gov/disabilityresearch/occupational_info_systems.html

For definitions of numerous ORS terms, see the Glossary.

Major Changes to ORS Manual (May 2016)

The ORS Production Manual continues to experience significant revisions. New sections have been added and some existing sections have undergone extensive change. Please continue to read the Manual as new and review the Major Changes Table for specific guidance on new material for 703 Collection.

Chapter	Source	Section Number and Action
Preface	PPD Maintenance	Background information moved to Introduction
Introduction	PPD Maintenance	New section
Information Reference Guide	PPD Maintenance	New Section
Collection Strategies (1)	PPD Maintenance	Expanded information on approach to data collection. Review the entire chapter
Fundamentals (2)	PPD Maintenance	2_01Added the definition for "work as generally performed," and instructions on when to use professional judgment when documenting
	PPD Maintenance	2_02 Added examples to the reasons ORS variations may occur and rewrote for clarity. Updated the coding instructions in the Examples of Narrowly defined Jobs chart
	SO-70 #13, Dividing time between stoop, crouch, and kneel	2_03 Updated instructions for the Fallback Methods. Instructions for Range of Hours reflect SO-70 instructions
	PPD Maintenance	2_05 Added definitions for PPE and mitigation. Changes are extensive. Read the entire section
	PPD Maintenance	2_06 This section is reorganized. Read entire section

	PPD Maintenance	2_07 This is a new section with instructions on coding SOCs in ORS -- Understanding SOCs in ORS. Read entire section
	TM 311	2_08 This is a new section. Read entire section
Occupational Information (3)	PPD Maintenance	3_01 Adjusted examples and provided some instructions from NCS Volume 1
	PPD Maintenance	3_03 Broadened the instructions on collecting travel to include other forms of transportation that is not part of a normal commute.
Task Lists (4)	PPD Maintenance	4_01 Revised the definition of a task
	PPD Maintenance	4_02 Added instructions that relate task lists to cognitive elements, and other examples that are not cognitive
	TM 311	4_03 Added instructions for task list documentation
	PPD Maintenance	4_05 Moved 4_04 Collecting Driving to 4_05
	S0-70 #7, Driving	4_05 Added clarification to the definition of driving
	PPD Maintenance	4_05 Modified the description of physical demands involved in driving
Specific Vocational Preparation/SVP (5)	This chapter experienced significant changes. Review the entire chapter	
Cognitive Elements (6)	This chapter experienced significant changes. Review the entire chapter	
Physical Demands (7)	ORS.S0-70#5	7_02 Added instruction on coding sitting/standing and updated examples
	PPD Maintenance	7_04 Added clarification on coding Pushing/Pulling
	PPD Maintenance	7_04 Added clarification to the duration of pushing/pulling to the librarian example. Corrected the

		Instructions for collecting a textile worker
	PA #156 Overhead Reaching	7_05 Added additional information on thresholds and clarified definitions for overhead reaching
	PA #156 Overhead Reaching	7_05 Removed the office worker example
	ORS SO-70#10	7_06 Updated the definition of keyboarding and revised the examples
	ORS SO-70#10	7_07 Revised the definitions of Manipulation to clarify the distinction between keyboarding
	SO-70 #13, Dividing time between stoop, crouch, and kneel	7_08 Updated instructions on coding when workers can choose their body positions
	PA #149 Stooping	7_08 Updated definition of Stooping. Added an example
	PPD Maintenance	7_09 added a clarification in the definition of a structure
	PPD Maintenance	7_11 Added examples of remote communications devices
	PPD Maintenance	7_11 Added instructions to document other sounds
Environmental Conditions (8)	PPD Maintenance	8_01 Added information on PPE and instructions on documentation
	PPD Maintenance	8_02 Modified examples: archeologist in a tent and pharmaceutical sales rep
	ORS.SO-70 #6 Tobacco Smoke	8_07 Added the example of a casino worker exposed to second hand smoke
Glossary – several terms have been added or revised	PPD Maintenance	**Terms added or revised**: Adaptability Certification

		Change in Work Location Change in Work Task Controlling Workflow Credit-hour Decision-making Driving Educational Certificate Foot/Leg Controls License Pace Pace of Work Passenger Vehicle Personal Protective Equipment (PPE) Professional Degree Sitting Sitting vs. Standing/Walking at Will Stooping Task Task List Touchscreen Keyboard Work as Generally Performed Work-Related Personal Interactions Work Review Work Location Work Schedule Work Task

Chapter 1: Collection Strategies

1_01 Overview 2
1_02 Collect job descriptions and other descriptive documents ahead of time 2
1_03 Identify a collection approach 3
1_04 Identify potential data elements ahead of time 3
1_05 Prioritize collection for accuracy and efficiency 3
1_06 Take advantage of opportunities to observe workers on jobs 4

1_01 Overview

The goal of ORS, like NCS, is to collect as much quality data as possible in an efficient manner. Strategies for success rely on positive respondent feedback, knowledgeable field economists, and expedited collection procedures. Good response rates are the foundation of reliable statistical data. Field economists collect high quality data by obtaining cooperation from a large portion of sampled establishments and ensuring the respondents at these establishments provide complete and accurate data.

ORS presents a unique collection opportunity because most people are familiar with the Social Security Administration (SSA) programs. While it does not guarantee cooperation, this familiarity may help field economists get quality information for both ORS and NCS.

The following tactics, explained further in this chapter, can help make a field economist successful:

- Collect job descriptions and other descriptive documents ahead of time.
- Identify a collection approach.
- Identify potential data elements ahead of time.
- Prioritize collection for accuracy and efficiency.
- Take advantage of opportunities to observe workers on jobs.

1_02 Collect job descriptions and other descriptive documents ahead of time

Use descriptive documents to improve data quality and shorten appointment times.

Use job descriptions to:

- Validate information provided by the respondent.
- Identify overlooked information.
- Fill gaps in respondent-provided information.
- Launch discussions on occupational task lists, ORS data elements, and leveling.
- Provide information on job codes, work schedules, supervisory information, and educational requirements.

Job descriptions may not be useful as a primary information source because they are not always current or accurate. Job descriptions, or any other company documentation, are aids to collection and do not substitute for an interview.

Other establishment documents (such as Workers Compensation forms, OSHA/workplace safety forms, and organizational charts) can provide valuable collection information. All establishment documents are valuable tools in expediting collection, provided field economists confirm their accuracy with respondents.

1_03 Identify a collection approach

Each field economist should determine the best collection approach based on personal preference, establishment size, industry, and respondent personality. Options include collecting:

- One quote at a time.
- Multiple quotes concurrently.
- A portion of the interview for one quote and a portion for multiple quotes concurrently.
- Data from additional respondents such as supervisors, and occupational safety managers.

1_04 Identify potential data elements ahead of time

The presence of ORS data elements may be evident from the occupational information obtained from job descriptions and respondent discussion.

Invest in research ahead of time to identify:

- Standard Occupational Classification (SOC) coding decisions
- Task list information
- Leveling information
- Educational, training, certification, licensure, and experience requirements for Specific Vocational Preparation (SVP)
- Mental and cognitive information
- Incidence of physical demand elements (e.g., writing is present, so fine manipulation must be present)
- Incidence of environmental condition elements (e.g., tasks performed entirely in an office so working outdoors is not present)

Clarify any conflicting information that arises between respondent information collected early in the interview or through job descriptions and answers provided later on. Confirm with the respondent that the researched information applies to the matched occupations. Resolve discrepancies with the respondent.

1_05 Prioritize collection for accuracy and efficiency

Efforts must be made to collect all data for occupations. Sometimes that is not possible due to respondent constraints. Use professional judgment to decide between collecting all data for one quote versus some data for many quotes. Without knowing the specific industry and occupations selected by PSO, it is not possible to provide a single answer

which is “better.” The answer could also vary during the collection cycle as new data are collected.

Apply the following collection priorities:

These three elements inform the conversation and coding for all of the other elements. Collect these elements first:

- Task Lists
- SVP
- Cognitive

Collect these physical demand elements next:

- Sitting vs. Standing/Walking and Sit/Stand at Will
- Lifting/Carrying
- Pushing/Pulling: hand/arm, foot/leg, and feet only

Collect the remaining elements to the greatest extent possible. At a minimum, attempt to collect the presence or absence of each item.

Conversational interviewing techniques can increase efficiency. Use information provided throughout the interview to support coding decisions. For example, if the task list for an occupation includes use of a computer, near visual acuity is present.

1_06 Take advantage of opportunities to observe workers on jobs

- Notice workers and what they are doing while walking to and from the respondent’s office.
- Accept offers for a company tour.
- Ask about seeing the work if the respondent is unsure of answers.
- Document how your observations affect coding selections.

Chapter 2: Fundamentals

2_01 Understanding Work as Generally Performed 6
How to apply the concept ‘work as generally performed’:
2_02 Understanding Job Definition..... 8
2_03 Understanding Duration 9
How to choose the correct method for collecting ‘Duration’
How to code duration for tasks that occur less than daily
How to proceed when respondent answers are incomplete
References for coding duration
Duration Formula
2_04 Understanding Accommodation..... 12
2_05 Understanding Mitigation..... 13
2_06 Understanding Thresholds..... 14
2_07 Understanding SOCs in ORS 15
How to code an O*NET SOC that does not follow SOC rules
2_08 Understanding Documentation Requirements..... 16

2_01 Understanding Work as Generally Performed

ORS collection captures work as the workers in the surveyed occupations generally perform it. **Work as generally performed** refers to the way in which most workers normally complete the duties, tasks, and responsibilities as assigned. Collection should include occupational information representative of the typical duties performed. Work as generally performed may be different from one establishment to another.

How to apply the concept 'work as generally performed':

Obtain clarification on tasks during the establishment interview.

- Confirm the tasks an occupation performs in a typical day.
- Determine how workers perform these tasks.
- Identify the tools and equipment workers need to perform these tasks.
- Determine if all workers in the occupation are expected and required to perform these tasks.

Categorize important tasks performed daily, occasionally, or infrequently. This optional step helps determine appropriate duration coding later.

Exclude:

- Activities that are specific to a worker and are not an expectation or function of the occupation.
- Activities that occur by chance or are voluntary.

Document:

- When data is contradictory and upheld by the respondent. Use professional judgment when information upheld by the respondent seems incorrect.
- When data is inconsistent with the expected occupational duties and supported by additional probing.

Examples of Types of Tasks

Example	Include work as generally performed			Exclude
	Daily task	Occasional task	Infrequent task	
Accountant at a small leasing office	Handles company bookkeeping, payroll and tax reporting.	Replaces toner on her personal printer.	Along with other staff, shows units, gives keys to new tenants, and performs unit upkeep as needed.	Changes the network printer toner while the IT Tech is at lunch.
Receptionist at a chamber of commerce	Performs reception duties.	Orders and picks up snacks for staff meetings as directed.	Attends and preps facilities for town festival once a year.	Voluntarily brings in donuts. Staff rotate bringing treats.
Human Resource Specialist	Writes documents and corresponds by email.	Lifts boxes of recruiting materials for job fair.	Conducts orientation for new employees twice annually.	Lifts the water bottle onto the office cooler.
Evidence Clerk	Files evidence.	Packages and mails items of property or evidence, when necessary.	Drives a vehicle to pick up bulk property or evidence items.	Voluntarily waters plants in common areas.
Delivery Truck Unloader	Loads and unloads packages.	Cleans the truck twice a month.	Drives the truck to a maintenance garage.	Cleans personal materials out of the glove compartment.
Outside Salesperson	Uses a laptop computer to document sales calls and send bids.	Attends networking meetings.	Mentors a new employee.	Follows LAN instructions on replacing a broken laptop keyboard.

2_02 Understanding Job Definition

Occupations can vary based on characteristics other than Union/Non-Union, Time/Incentive, or Full-time/Part-time. This can happen within a SOC-6 or SOC-8 grouping.

When ORS elements vary within a job title, identify the reasons and how the employees are assigned to the work.

Reasons ORS variations may occur include:

- **Work preferences.** For example, workers can choose phone or email for communications.
- **Different tasks assigned on a regular basis**. For example, workers rotate through three specific roles that share the same title
- **The same tasks are performed at known different frequencies**. For example, workers with the same title have different shifts that create variation in frequency.

Collect and code the full range of ORS element variation within the company job title when the differences are due to individual employee preference, routine task differences, or the employees are assigned by the company to rotate through all situations. When employees within an establishment job title are assigned to a specific situation and do not rotate regularly, identify the narrowest job and follow the hit for ORS collection.

Examples: Narrowly defined jobs

Scenario	Action	Reason
A company has day and night shift janitors that do not rotate. During PSO, 'janitor' was hit twice, one for each shift. NCS leveling is the same, but the frequency of physical demands for lifting and push/pull differ.	Collect and code these janitors separately.	The frequency of the element is different by the shift and workers do not rotate between shifts.
A company has crews of 'landscapers' that include generic crew workers and crew leaders. All perform the same work, but crew leaders have higher responsibility. During PSO, three 'landscapers' were hit – two of which were generic crew and one was a crew leader.	Collect the generic crew as one narrowly defined job and crew leader as a separate narrowly defined job.	Some work tasks and responsibilities are different.
Nursing assistants rotate through shifts. Day shift has more interaction with patients and families.	Code the full range experienced.	Workers are expected to rotate between the various shifts.

2_03 Understanding Duration

Collect the presence for all ORS physical demands and environmental conditions elements. In addition, for many ORS elements, collect duration.

Duration is the total time a worker experiences a physical demand or exposure to an environmental condition. Collection of duration is extremely important and coding "PDU" (present, but duration unknown) should occur only after trying fallback approaches.

Calculate duration using an interval of time (e.g. daily, weekly, quarterly) and work schedule.

If the respondent indicates that an element is not experienced, and duration is zero, code "NP" (not present).

Note: Lifting/Carrying is an exception to duration coding. See section 7_03.

How to choose the correct method for collecting 'Duration'

There are two preferred methods and two fallback methods. Preferred methods result in detailed statistics.

Preferred Methods:

1. **Hours spent performing an activity** – Use this method when the respondent can provide the actual hours spent on an activity.
   Example:

   A registered nurse stoops 3 hours per 12-hour shift. Code '3 hours of stooping' in CIERA.

2. **Percent of time spent performing an activity** - Use this method when the respondent can provide:
   - A percentage of time spent on an activity, or
   - The number of hours spent on an activity during a larger time-period.

   This method may be helpful when a worker has an unusual or variable work schedule.

   Example:

   A sheet metal worker crawls for four hours per month while installing HVAC systems in various styles of industrial, residential and commercial buildings. The work schedule is 8/40/52.

   4 hrs. per month / 173.33 hours worked per month = 2.31%

Fallback Methods:

1. **Range of hours, or range of percentage of time, spent performing an activity** – Use this method when the respondent is unable to provide specific hours or percentages. The percent of the total day covered by the range may not exceed 50% (e.g. 4 to 6 hours of an 8-hour day is 25% of the day and acceptable).

2. **SSA Duration Scale** – Use this method when there is no other means of obtaining the data. Have the respondent identify the appropriate classification for the activity duration.
    - Seldom: up to 2% of the day
    - Occasional: 2% up to 1/3 of a day
    - Frequent: 1/3 up to 2/3 of a day
    - Constant: 2/3 or more of a day

    Note: This method is preferred to coding duration unknown.

How to code duration for tasks that occur less than daily

If a physical demand or environmental condition occurs annually, seasonally, monthly, or weekly, calculate the hours or percent of time spent performing an activity and code duration.

Example:

Once per week the clerk drives to the post office to buy stamps. It takes 10 minutes each way to drive there. The clerk works 8/40/52.

Foot/leg control coding = 10 minutes x 2 (there and back) = 20 minutes/5 days = 4 minutes per day/60 minutes per hour = .07 hours.

Do not collect one-time physical demands or unusual environmental conditions that are not part of work as generally performed.

How to proceed when respondent answers are incomplete

Use the task list as a reference to probe unknown answers with the respondent.

If a respondent is unable to provide the duration of an element, but is able to verify the element is present, code “PDU” (present, but duration unknown).

Only use “PDU” after trying all other methods to establish a duration.

If a respondent is unable to confirm that an element is present, code UNK (unknown).

Note: The “UNK” option is available for all questions in CIERA.

References for coding duration

CIERA does not accept time entered in minutes. Use the chart for conversions.

Minutes to Hours Conversion Chart	
Minutes	Hours
5	.08
10	.17
15	.25
20	.33
25	.42
30	.50
35	.58
40	.67
45	.75
50	.83
55	.92

Duration Formula

To calculate duration, use the duration formula:

Percent of Time = [(# of repetitions per time period x time to perform each repetition/time period]

Example:

A receptionist answers about 100 phone calls per day. He reaches two seconds each time to retrieve and replace the phone. The receptionist works an 8/40/52 schedule.

Calculation (Time Spent Answering Phones):

Number of Repetitions = 100 calls/day x (1 retrieval per call + 1 replacement per call) = 200 repetitions

Duration = 200 repetitions x 2 seconds per repetition

= (400 seconds) / (3600 seconds per hour)

= .1111 hours

= .1111 hours/8 hours per day

= 1.39% of 8-hour day

2_04 Understanding Accommodation

Accommodations are modifications that an employer makes to meet the needs of an individual worker with a disability or other work constraints. Not all employers can offer the same accommodations.

ORS collects data elements based on required job duties as generally performed by all workers in the occupation. Collect how work is performed **without** accommodation.

Examples	Accommodation	Reason
Allowing a worker to avoid an important task for the job	Yes	Employer modification for one worker
Allowing selective standing for a job performed sitting	Yes	Employer modification for one worker
Providing selective access to elevators	Yes	Employer modification for one worker
Providing selective seating for a job performed standing	Yes	Employer modification for one worker
Reassigning an important task for the job	Yes	Employer modification for one worker
Allowing all workers the option to stand for a job generally performed sitting	No	Offered to all workers
Allowing workers to use building stairs or elevators	No	Offered to all workers
Stool offered to all workers	No	Offered to all workers
Tools such as eyeglasses, contacts, hearing aids	No	Employer does not provide or restrict their use

2_05 Understanding Mitigation

Mitigation occurs when the employer installs devices or requires the use of personal protective equipment (PPE) that fully or partially eliminate potentially hazardous conditions or exposures.

Personal protective equipment (PPE) is gear used or worn to minimize exposure to serious workplace injuries and illnesses. Examples of PPE include gloves, boots, helmets, goggles earplugs, respirators, and protective clothing such as lab coats.

Collect and code the presence of PPE for all elements. Document the type of PPE and how it mitigates.

The presence of PPE for the following environmental conditions requires special coding in CIERA:

- Hazardous Contaminants
- Proximity to Moving Mechanical Parts
- High, Exposed Places
- Noise Intensity Level

Refer to 8_01 for specific instructions on how to collect Environmental Conditions.

If an employer installs devices or requires protective equipment, collect the duration of exposure as it is actually experienced.

If, according to the respondent, protective equipment or devices eliminate exposure, document the use of PPE and code the occupation as fully mitigated.

Examples	Action
A ramp agent loads and unloads plane cargo on a tarmac with exposure to loud noise. The company requires the worker to wear noise-cancelling headsets.	Collect 'Noise Intensity Level' as quiet or moderate, depending on the level of mitigation provided by PPE.
Workers wear fully enclosed protective suits while identifying and disposing of asbestos in buildings.	Collect time (or duration) exposed to Hazardous Contaminants as "Fully Mitigated" and "Yes" for PPE.

2_06 Understanding Thresholds

Many ORS data elements must meet a threshold before duration can be collected and coded. A **threshold** is a magnitude or intensity that must be met or exceeded for a certain condition to occur.

Thresholds exist for the following elements:

Physical Demands

- Pushing and Pulling
- Reaching

Environmental Conditions

- Extreme Cold
- Extreme Heat
- Wetness
- Humidity
- Hazardous Contaminants
- Proximity to Moving Mechanical Parts
- Heavy Vibration
- High, Exposed Places

Refer to the section on each element for a description of the relevant threshold.

If a data element meets or exceeds the threshold, collect and code the duration. If the data element does not meet the associated threshold, code as not present.

2_07 Understanding SOCs in ORS

ORS needs occupational data coded at the most detailed level available. Use the eight-digit Standard Occupational Classification (SOC) from the Occupational Information Network (O*NET). Refer to section 4_04 for specific instructions on how to use O*NET in SOC determination.

If an 8-digit SOC code exists for an occupation in the O*NET, you *must* code that occupation at the 8-digit SOC level in CIERA. For NCS/ORS overlap schedules, update any 6-digit SOC's to the 8-digit SOC level. Document any situation where an 8-digit SOC was available and not used.

> *Example:* A small shipyard has a combination Marine Engineer SOC 17-2121.01 and Marine Architect SOC 17-2121.02 occupation. The occupation performs both functions equally and the occupational work levels (4-Factors) are the same. Instead of choosing one of the two eight-digit codes, match the occupation to the 6-digit (combination) SOC 17-2121.00. Document your reason for not coding at the 8-digit SOC level.

How to code an O*NET SOC that does not follow SOC rules

During collection, it is possible to encounter situations where there may be conflicts between IDC coding (and edits) and CIERA coding. This can include O*NET codes or crosswalks that appear to conflict with the SOC coded in IDC.

There are four identified situations where the O*NET SOC does not follow SOC rules. Beyond these four, if a discrepancy is found between the O*NET SOC and the traditional SOC, please send a question to ORS.SO-70. Do not use this group for routine SOC selection questions.

Occupations that do not follow the SOC rules

O*NET SOC	ORS – Code As
19-1020.01 Biologists	19-1029.91 Biologists
29-2011.03 Histotechnologists and Histologic Technicians	29-2011.93 Histotechnologists 29-2012.93 Histologic Technicians
33-9099.02 Retail Loss Prevention Specialists	33-9032.92 Retail Loss Prevention Specialists – pending final approval
51-8099.04 Hydroelectric Plant Technician	51-8013.94 Hydroelectric Plant Technician – pending final approval

2_08 Understanding Documentation Requirements

Follow the standard NCS documentation requirements as outlined in NCS Procedures Manual – Appendix M, including thorough documentation of changes to ownership, NAICS, SOC, work-schedule, worker characteristics, and all unusual situations.

As a general practice document:

- Anything not evident from the task list.
- When data is contradictory and upheld by the respondent. Use professional judgment when information upheld by the respondent seems incorrect.
- When data is inconsistent with the expected occupational duties and supported by additional probing.

Chapter 3: Occupational Information

3_01 How to collect combination jobs 18
3_02 Collecting non-levelable NCS jobs 19
3_03 How to collect traveling occupations 20
3_04 How to collect occupational characteristics 21

3_01 How to collect combination jobs

Some workers perform jobs that span more than one occupation. These **combination jobs** are difficult to classify in one SOC code.

When classifying a combination job, follow NCS procedures for SOC selection (Volume 1, 4_06).

- Select the SOC that matches the highest skill level in the occupation.
- When there is no perceptible difference in skill levels, classify the SOC based on the duties performed most often .

Document the correct secondary SOC code and associated duties.

Collect and code ORS elements based on how the worker generally performs the entire job.

Examples	Combination Job	Action	Reason
Receptionist/Secretary handles phones, reception, correspondence, and scheduling.	Yes	Select secretary SOC. Document the receptionist SOC and collect all duties.	The Secretary is the job with the higher skill level.
Teacher/janitor teaches shop during the school year; cleans the school during the summer.	No	Split the jobs at PSO.	The two jobs are unrelated and could be held by two different people.

3_02 Collecting non-levelable NCS jobs

In NCS collection, eighteen jobs cannot be leveled. Those jobs are not excluded from ORS collection.

When collecting non-levelable jobs, code the ORS data elements based on how a worker generally performs the job.

Coding non-levelable jobs for SVP requires special instructions. See 5_06 for details.

Non-levelable NCS Jobs	
SOC Code	Occupational Title
11-1031	Legislators
23-1021	Administrative Law Judges, Adjudicators, and Hearing Officers
23-1022	Arbitrators, Mediators, and Conciliators
23-1023	Judges, Magistrate Judges, and Magistrates
27-1013	Fine Artists, including Painters, Sculptors, and Illustrators
27-2011	Actors
27-2012	Producers and Directors
27-2021	Athletes and Sports Competitors
27-2022	Coaches and Scouts
27-2023	Umpires, Referees, and Other Sports Officials
27-2031	Dancers
27-2032	Choreographers
27-2041	Music Directors and Composers
27-2042	Musicians and Singers
27-2099	Entertainers and Performers, Sports and Related Worker, All Others
27-3011	Radio and Television Announcers
27-3012	Public Address Systems and Other Announcers
41-9012	Models

3_03 How to collect traveling occupations

When occupations require work-related travel, collect the presence and duration of all activities involved in work as generally performed.

Include:

- Driving required for work that is not a regular commute
- Walking through an airport
- Lifting/carrying or pushing/pulling work-related displays, sales materials, or equipment
- Sitting on a plane or other form of transportation that is not part of a normal commute
- Outdoor exposure while working

Exclude:

- Commuting to a job
- Lifting or pushing/pulling personal luggage

Examples	Include Durations for:	Exclude Durations for:
A computer consultant travels by car and plane to client sites, carrying a laptop in a shoulder bag and wheeled personal luggage.	Sitting while flying Walking between airport and car, client sites and car, and around airport Driving elements - sitting, gross manipulation, far visual acuity, foot/leg controls Lifting/carrying laptop Outdoor exposure between client sites, car and airport	Pushing/pulling personal luggage is excluded because the worker can choose what to bring.
A pharmaceutical sales rep drives to doctors' offices carrying sample cases.	Driving elements -- sitting, gross manipulation, far visual acuity, foot/leg controls Walking to and from the car while working Lifting/carrying sample cases Outdoor exposure between car and doctors' offices	Traveling to and returning from a work office or residence as part of a commute.

3_04 How to collect occupational characteristics

The definitions for Full-time/Part-time, Union/Non-Union, and Time/Incentive are the same as NCS. Refer to NCS Volume 1, section 4_01

Chapter 4: Task Lists

4_01 Overview 23
4_02 How to use questions to identify important tasks 23
4_03 Documenting tasks 25
How to document tasks
4_04 How to compare task lists to the O*NET 27
4_05 Collecting 'Driving' 28

4_01 Overview

Collecting tasks lists aids in understanding the relationship of ORS elements to an occupation. A **task** is a distinct activity assigned to or performed by workers in an occupation that results in a meaningful outcome. A **task list** itemizes the typical tasks performed within an occupation.

Task lists are similar to job duties used in NCS leveling and the information used to select SOCs for occupations. For guidance on how to collect task lists, draw on prior experience with NCS.

Steps for creating a task list:

1. Identify important tasks.
2. If the selected quote is a combination job, include all tasks assigned.
3. Document typical tasks.

4_02 How to use questions to identify important tasks

Ask the following questions:

Why does the job exist?

This question identifies the function of the job or the reason that the job is present within the organization. The answer to this question may provide information on cognitive and physical elements, among others.

For example, "delivers lessons to students," suggests that the worker communicates verbally to regular contacts.

What tasks do the workers in this occupation perform?

This question determines the action of the occupation.

How are these tasks performed?

This question clarifies the manner in which a worker executes a task. The answer to this question may be more significant at some locations than others. For example:

- "Moves materials by manually pushing carts," provides additional information related to the physical demands required by the job.
- "Responds to customer inquiries by phone at a help-desk," provides information on whether or not the worker can intervene and control the flow of work.

With what do workers in an occupation work?

The types of data, tools, and/or equipment may have implications for a worker's tasks.

For example: Linus and Lucy are both research assistants, but Linus conducts survey research using computers and analytical software. Lucy works in a biology lab using robotic liquid handling systems and bio analyzers. Without the additional detail on the type of equipment used, the two jobs may seem similar.

With whom do workers in an occupation work?

Learning about the people with whom workers interact helps inform cognitive data elements.

For example, if a worker needs to check in with a supervisor frequently before starting new tasks, the occupation may have lower levels of decision-making and higher levels of work review.

When do workers perform tasks?

This question helps identify the frequency at which workers perform tasks and clarifies the description of a worker's day.

From where are the materials/information coming?

This question addresses the source of materials or information used in work. It may provide insights into some of the environmental conditions present or physical tasks performed by the occupation. Is the worker gathering the materials needed to complete the job or is someone delivering them?

For example, a butcher needs to enter a freezer to obtain meat products.

To where are the materials/information going?

This question addresses the destination of the materials or information used in work, and provides insight into some of the environmental conditions present or physical tasks performed by the occupation.

Is the worker delivering the product to the next location? Is the location of the work the product's final destination? Does the product go to another location by another means?

For example, a forklift driver moves wood planks from the manufacturing floor to the lumber yard for storage prior to customer delivery.

4_03 Documenting tasks

Document typical tasks for every usable quote. Required task list documentation includes:

- The tasks performed as a function of the job.
- How the tasks are performed.
- The types of data, tools, and/or equipment used.
- With whom the workers interact.
- When or how regularly the tasks are performed.
- Where materials/information come from and go to

Include the following items in task list documentation when any associated ORS element coding is present:

- Examples of items lifted/carried.
- Examples of items pushed/pulled.
- Examples that illustrate coding choices for cognitive elements.
- Duration of driving and the type of vehicle.
- Exposure to environmental conditions and how the exposure meets the definition of the environmental condition.

Copying/pasting entire job descriptions, the O*NET task list, the O*NET definition, or the SOC Manual definition is not acceptable documentation by itself.

How to document tasks

Field economists are not required to follow a certain format when documenting tasks, but using a simple approach similar to the one used by O*NET makes comparisons more straightforward:

- Start with a verb to state the action.
- State the object of the action (if any) and, when relevant, the frequency.
- State the purpose of the action (if relevant).
- Keep bulleted items brief and uniformly formatted.
- Enter task lists in the Task List text box on the SVP screen in CIERA.

Example: Using the approach above as a guide, a field economist discusses with a respondent the tasks of a janitor in an elementary school.

Respondent says:

"The janitor cleans all of the classrooms and public spaces such as hallways, rest rooms, and some outside areas. He reports to the Maintenance Supervisor. One of the biggest jobs is emptying the waste receptacles throughout the building. This includes emptying all of the classroom trash cans as well as the large cans in the hallways and cafeteria daily.

Additionally, he has to empty recycle containers throughout the building as needed. The janitor routinely uses a commercial vacuum to clean floors in classrooms and public areas, and waxes floors using a buffer as needed.

Since the building is full of children, there are many spills requiring spot cleaning. He also uses a small snow blower and/or a shovel to clear the entryway into the building, so the children may safely enter and exit the building. The janitor maintains and makes minor repairs to the boiler system as needed.

The duties of this occupation are typically performed after the children have left school for the day, as it would be difficult to do many of the tasks with children present."

Sample Task List Documentation:

- Empties all building waste receptacles daily, including large cans in the cafeteria and hallways.
- Empties all building recycle bins as needed.
- Vacuums all building spaces routinely using a commercial vacuum.
- Maintains and makes minor repairs to boilers.
- Waxes building floors using a buffer.
- Spot cleans as needed.
- Clears snow from building entry using snow blower and/or shovel.

Note: In this example, the janitor interacts with the supervisor, but has few interactions otherwise. In other jobs, where working with others is an important part of duties, indicate these interactions in the task list.

4_04 How to compare task lists to the O*NET

Compare the collected ORS task lists to the task list for the selected occupation in O*NET. This will help provide verification that the best 8-digit SOC has been selected.

After the appointment, do the following:

1. Identify the eight-digit SOC for the occupation and locate the O*NET task list.
2. Compare the list provided by the respondent to the first ten items on the O*NET list.
3. Identify any unexpected tasks not appearing in the O*NET list.

NOTE: The task lists collected can be used as part of SOC verification. If the task list provided by the respondent is significantly different from the O*Net list, review the SOC coding.

O*NET tasks are *very* detailed and will likely be more detailed than the ORS task list. Use professional judgment to determine whether a specific O*NET task reasonably falls within a broader task obtained during collection. For ORS, it is not necessary to capture tasks at the same level of detail as O*NET.

4_05 Collecting 'Driving'

Driving, a type of task, is the operation of a motorized passenger vehicle or other conveyance. A **passenger vehicle** is an automobile, van, or bus.

Collect the presence of driving and the type of vehicle (passenger or other).

If the vehicle type is "other," document the type of vehicle. Other vehicles may include equipment (e.g. forklifts), trains, or aircraft.

Code driving as "Yes, passenger" when the occupation operates both passenger and other types of vehicles. Include a description of all types of vehicles driven in the task list documentation.

Exclude riding non-motorized conveyances, such as riding an animal or bicycle.

Driving involves the following physical demand elements:

- Far Visual Acuity. Far Visual Acuity is assumed when Driving is present.
- Gross Manipulation. Time spent driving will be the base duration for Gross Manipulation.

Driving may also include the following physical demand elements (workers often need these to drive, but do not assume their presence):

- Foot/leg controls.
- Near Visual Acuity and Peripheral Vision.
- Pushing/Pulling foot/leg, if the minimum threshold is met. Secure verification from the respondent and document.
- Reaching.

Do not assume the presence or duration of any physical demand based upon vehicle type. Many modern large trucks, buses, and equipment may require little physical exertion or no more than is needed for driving a passenger car.

Chapter 5: Specific Vocational Preparation (SVP)

5_01 Overview 30
5_02 Collecting ‘Minimum Education’ 31
How to collect ‘Minimum Education’
5_03 Collecting ‘Pre-employment Training’ 35
Collecting duration for ‘Pre-employment Training’
5_04 Collecting ‘Experience’ 37
5_05 Collecting ‘Post-employment Training’ 38
Collecting post-employment training for non-standard work schedules
5_06 Avoiding errors that can result in over- or understatement 40
When to use “Unknown” and “Not required”
Coding a non-levelable job
Collecting concurrent SVP time
5_07 Computing SVP Level 42
Understanding SVP levels and job skill levels
Calculating SVP – an example

5_01 Overview

Specific Vocational Preparation (SVP) is the amount of preparation time required by a typical worker to learn the techniques, acquire the information, and develop the aptitude needed for average performance in a specific occupation.

SVP measures the vocational preparation time needed for an occupation, not the type of knowledge required.

ORS collects the following four elements:

- Minimum Education
- Pre-Employment Training
- Experience
- Post-Employment Training

If a company provides a range of time or several combinations of education, training, or experience, collect the option that involves the least amount of time. For example, if a respondent says a new employee must have at least five years of experience or a Bachelor's degree, collect the Bachelor's degree.

Note: All four elements are needed to calculate SVP. If a respondent cannot provide information on one of the SVP elements, probe further before coding "Unknown."

5_02 Collecting 'Minimum Education'

'Minimum Education' measures the lowest level of formal coursework required of an occupation.

If an establishment requires a diploma or degree, regardless of academic discipline, collect:

- Type of degree requirement
- Vocational time to complete coursework relevant to the occupation

When coding minimum education, use the list of degrees and associated vocational time in the Education SVP Chart.

Education SVP Chart

Degree	Vocational Time	Reason
4 years of High School	None	All time is general education
4 years Vocational High School	2 of 4 years	2 years are general education
2 years Associate's Degree	1 of 2 years	1 year is general education
2 years Vocational Associate's	2 years	All time is vocational
4 year Bachelor's	2 of 4 years	2 years are general education
5-Year Bachelor's/Master's	3 of 5 years	2 years are general education
Master's	All post-grad. years (usually 1-2 years)	All time is vocational
Professional	All post-grad. years (usually 2-4 years)	All time is vocational
Doctorate	4 years	All time is vocational

Modified from *The Revised Handbook for Analyzing Jobs*, U.S. Department of Labor, Employment, and Training Administration, 1991, Chapter 8.

How to collect 'Minimum Education'

1. If no formal education is required, collect the requirements for reading and writing. The ability to read and write includes any language used in the establishment.

   Always verify reading and writing requirements and do not infer the ability to read or write based on other requirements. For example, even when a state requires a driver's license, it may not require a written drivers' license test.

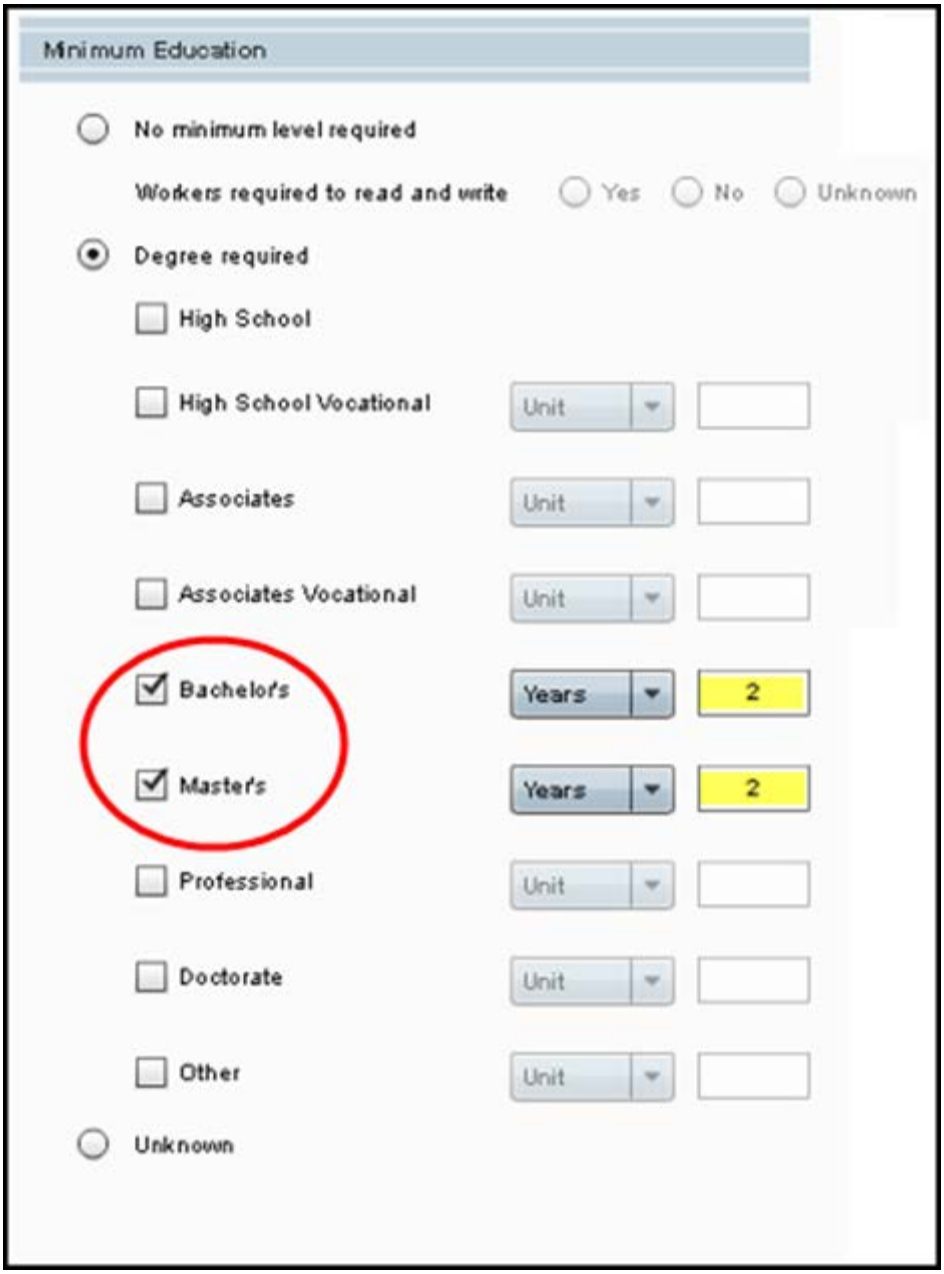
2. Collect the presence of a degree and the vocational time to complete coursework relevant to the occupation. Exclude the portion of time for general education.

3. If a Master's, Professional, and/or Doctorate degree are present, a Bachelor's degree must also be coded.

   A **Professional Degree** is a credential that recognizes completion of academic requirements that emphasize skills and practical analysis over theory. Most, but not all, professional degrees are in professions that require licensing through recognized accrediting agencies in order to practice in the field.

   Examples of professional degrees include Doctor of Dental Science (D.D.S.), Doctor of Jurisprudence (J.D), Master of Divinity (M. Div.) and Doctor of Medicine (M.D.).

4. Do not place certifications, educational certificates, or licenses in the 'Other' category. Code these under 'Pre-employment Training.'


Minimum Education
No minimum level required
Workers required to read and write
Yes
No
Unknown
Degree required
High School
High School Vocational
Unit
Associates
Unit
Associates Vocational
Unit
Bachelor's
Years
2
Master's
Years
2
Professional
Unit
Doctorate
Unit
Other
Unit
Unknown

Examples of 'Minimum Education'	Action	Reason
An accountant at a manufacturing facility is required to have a 4-year Bachelor's degree in Accounting.	Code "Degree required." Select "Bachelor's."	This counts as 2 yrs. of minimum education. Exclude 2 years of general education
A research biologist is required to have a PhD in the biological sciences. The respondent says that after a Bachelor's degree, a PhD typically requires 3 years of coursework and between 1 to 5 years to complete a dissertation. Average time to complete a dissertation is 3 years.	Code "Degree required." Select "Bachelor's as well as "Doctorate."	2 years Bachelor's; 3 years Doctorate, plus 1 year for dissertation - count only the minimum time required.

5_03 Collecting 'Pre-employment Training'

'**Pre-employment Training'** is the amount of time needed to complete training required as a condition for hiring. This type of training often can result in a credential such as certification or a license.

Capture the presence of pre-employment training along with any required classroom time and associated credentials.

Credentials are classified based on the purpose and issuing body, not their title. There are four categories applicable for 'Pre-employment Training':

1. **Certification** is a time-limited credential awarded by a certification body after an examination process. The exam can be either written, oral, or performance-based.
2. A **license** is a time-limited credential awarded by a government agency that constitutes legal authority to do a specific job. Licenses are based on some combination of degree, certification, assessment, or work experience.
3. An **educational certificate** is a credential awarded by a training provider or educational institution based on completion of all requirements for a program of study, including coursework and tests or other performance evaluations. Educational certificates are typically awarded for life (like a degree).
4. **Other** is for training that does not result in a certification, license, or educational certificate.

When collecting 'Pre-employment Training' include:

- Apprenticeships
- Vocational training
- Non-credit courses
- Credit courses that do not result in a degree

Exclude:

- Certifications that are not a job requirement
- Certificates of attendance or participation for training that is not vocationally relevant

<u>Collecting duration for 'Pre-employment Training'</u>

Collect only the time needed to earn the initial credential, not any ongoing education or development time to maintain the credential.

Do not include independent preparation time, time spent on optional exam prep classes, or time spent taking an exam when estimating duration of pre-employment training.

If the same pre-employment training occurs in different configurations (i.e., hours, days, months, years), capture the pre-employment training time in hours.

There are situations where a credential is required, but there is no training duration. This occurs when:

1. Time is already reflected in minimum education or prior experience.
2. No training time is required. There is an application and/or test only.

Examples of 'Pre-Employment Training'	Action
A truck driver must have a commercial driver's license that does not require classroom training.	Code yes for license. Code no training time is required; application or test only.
A journey-level welders must complete 3-months of classroom training, a 4-year apprenticeship, and pass a test to receive a state-issued journeyman certificate before working.	Code yes for license, because it is state-issued. Code 51 months duration. (Assume an 8/40/52 work schedule).
A dental assistant must have CPR certification (25 hrs. Red Cross training), a certificate from an accredited specialty school, and a state-issued x-ray license. Coursework takes 7 months and includes prep for the state licensing exam.	Code yes for certification, license and educational certificate. Code 25 hrs. duration for certification; 7 months for the educational certificate and no training time for the licensing exam.
A bartender takes classes and gets a certificate from bartending school. The employer and the state do not require the certificate.	Code no, not required. Certification is not required.

5_04 Collecting ‘Experience’

‘Experience’ measures the amount of prior relevant work activity.

Include:

- Skills acquired or used in a similar job
- Progressively responsible levels of work
- Broad, yet related, vocational capabilities

Exclude:

- Non-vocational experience requirements, such as attendance history or a general requirement of previous employment.

If the respondent provides a range, document the range and code the least amount of time required.

If a company requires either education or experience, collect the option that involves the least time and code under the appropriate component.

Do not code minimum education and minimum experience unless the company requires that combination.

Examples of ‘Experience’	Action	Reason
An office requires that secretaries have at least one year of prior clerical experience.	Collect one year	Skills acquired at a similar job prior to being hired.
A police captain must have one-year of experience as a sergeant and one year of experience as a patrol officer.	Collect two years	Skills acquired through progressively responsible levels of work.
A fast food worker must have a history of good work attendance.	Do not collect	Non-vocational experience.
A cashier must have one year of general work experience to demonstrate reliability.	Do not collect	Non-vocational experience.

5_05 Collecting 'Post-employment Training'

'**Post-employment Training'** measures the amount of training time occurring after an employee has been hired.

Include:

- Time an employee takes to learn basic job tasks while being actively taught by a supervisor or more experienced employee
- On-the-job training with verbal and written instruction, demonstration and observation, hands-on practice, or imitation
- Vocationally relevant classes or training needed to do the job, including in-plant or internal company training
- Time spent shadowing

Exclude:

- Continuing education
- Time spent learning tasks that are beyond the basic requirements of the job
- Orientation on topics such as company policies, work place rules, or company benefits
- Time during the probationary period that does not overlap active training
- Coaching for job development

Collecting post-employment training for non-standard work schedules

If a work schedule is **not** 8/40/52 and post-employment training time is less than 1 month:

- Clarify whether training time follows the work schedule or has a unique schedule. For example, a part-time worker may work full-time on training days.
- Collect and code the total number of *hours* of training.

Coding post-employment training based on work schedule

Training	Full Time Standard (8/40/52)	Full Time Non-standard (12/36/52)	Part Time (4/20/52)
1 week	1 week	36 hours	20 hours
1 day	1 day	12 hours	4 hours
2 weeks	2 weeks	72 hours	40 hours

Examples of 'Post-Employment Training'	Action	Reason
A meat cutter working an eight-hour shift five days per week is required to take a one-week food safety course during the first month of employment.	Code as 1 week	This is a standard FT work schedule
A newly hired custodian working an 8/40/52 schedule shadows a lead worker for one day to learn how to operate a buffing/waxing machine and use chemicals.	Code as 1 day	This is a standard FT work schedule.
New restaurant servers working 36 hours per week receive OJT from experienced servers on a 3-hour lunch shift.	Code as 3 hours	This is a non-standard work schedule, collect training time in hours
New teachers are assigned an experienced teacher as a mentor that provides guidance throughout the new teacher's first year.	Do not collect	Coaching for job development
New and experienced firefighters are required to do 3 hours of training per shift on an ongoing basis.	Do not collect	Continuing education

5_06 Avoiding errors that can result in over- or understatement

When to use "Unknown" and "Not required"

An SVP component that cannot be determined is different from an SVP component that is not required. Coding "not required" for an SVP component when presence or duration is unavailable may understate the actual SVP.

If an SVP component is present, but cannot be determined or is unavailable, code it "unknown" in CIERA.

ONLY use "not required" in CIERA when an SVP element is not present.

> *Example:* Respondent does not know if there is a minimal educational requirement, but can confirm a requirement for one-year prior experience.
>
> **Code: '**Minimum Education' is "Unknown" and 'Experience' is 1 year.

Coding a non-levelable job

If a job is non-levelable and it is not possible to collect an SVP component accurately, code the SVP element as "unknown."

Coding "0" or "not required" will give the job an artificially low SVP level.

Example: Lead Actor in a Theatre Company

Preparation Required	Code As:
None specified, but respondent states that they would not cast someone with no prior acting experience as the lead actor.	Experience "Unknown"
Four yr. drama degree. Five yrs. prior acting experience and 2 yrs. experience as an actor with the company.	Bachelor's degree: 2 years; Experience: 7 years

Collecting concurrent SVP time

Count overlapping time elements (‘Experience’, ‘Pre-’ and ‘Post-Employment Training’ time) once to avoid overstating the SVP requirements of the occupation.

Code overlapping time between ‘Pre-employment Training’ and ‘Experience’ as ‘Experience.’ Code only the presence of the certification or license requirement.

Examples of Concurrent SVP Time	Code	Reason
A police detective must have a minimum of two years experience as a police officer, along with required coursework and an exam. Required coursework is completed while a police officer.	Code ‘2 years’ for ‘Experience’. Code ‘Yes’ for ‘Pre-employment Training/Other.’	Concurrent experience and pre-employment training time. Pre-employment training time is reflected in ‘Experience.’
A worker needs a minimum of five years prior experience in project management and PMP certification. Certification requires at least 3 years prior experience, 35 hours of training, and an exam.	Code ‘5 years’ for ‘Experience’. Code ‘Yes’ for ‘Pre-employment Training/Certification.’	Concurrent experience and certification. The time for certification is already reflected in ‘Experience.’
A BLS field economist (FE) spends 6 months completing on-the-job training and completes one week of National Office collection training.	Code ‘6 months’ for on the job training.	Concurrent post-employment training. There is no separation of post-employment training types.

5_07 Computing SVP Level

Field economists do not need to calculate the overall SVP level of an occupation. CIERA assigns the overall SVP level by summing the time entered for each of the four individual SVP elements.

Note: If any of the four SVP elements is coded as "Unknown," the system cannot compute an overall SVP level.

Understanding SVP levels and job skill levels

It is essential to have a conceptual understanding of how each element sums to derive an overall SVP. Lower- skilled jobs have shorter preparation times than higher-skilled jobs. As a result, a small increase in preparation time can significantly change the SVP level for unskilled and semi-skilled occupations, while having little impact on the SVP levels for skilled occupations.

SVP Calculations and Levels

Skill Level	SVP Level	Preparation-Time
Unskilled	1	Short Demonstration Only (4 hours or less)
	2	Anything beyond short demonstration up to and including 1 month
Semi-skilled	3	Over 1 month up to and including 3 months
	4	Over 3 months up to and including 6 months
Skilled	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

Calculating SVP – an example

The example below illustrates what is included and excluded from SVP as well as how overall SVP level is calculated.

Job Title: Bookkeeper

Job Description Requirements: At least 6 months experience in bookkeeping or an Associate's degree

Additional Information Provided by Respondent:

- Works a standard work schedule
- Needs a high school diploma or GED

- Works with an assistant who demonstrates what to do for about 3 weeks.
- 90 day probationary period
- Verified accuracy of job description

SVP Calculations and Level

When either experience or education will meet requirements, count the one that involves the least time. Do not include probationary periods.

Minimum Education = High School only = 0 SVP

Pre-Employment Training = None = 0 SVP

Experience = 6 Months = 26 Weeks SVP

Post-Employment Training = 3 Weeks OJT = 3 Weeks SVP

SVP = Education + Pre-Employment Training + Experience +Post-Employment Training

0 + 0 + 26 + 3 = 29 Weeks

29 Weeks = 6.692 Months = SVP 5

NOTE: In the example above, the probationary period is not counted as post-employment training.

Chapter 6: Cognitive Elements

6_01 Overview 45
6_02 Collecting ‘Decision-making’ 46
6_03 Collecting ‘Work Review’ 48
6_04 Collecting ‘Pace’ 50
How to collect ‘Pace of Work’
How to collect the ‘Control of Workflow’
6_05 Collecting ‘Adaptability’ 53
6_06 Collecting ‘Work-Related Personal Interactions’ 56
How to collect frequency of contact
How to collect the purpose of interaction

6_01 Overview

Some key cognitive demands of an occupation are the need to use judgment, make decisions, and adapt to changes in the job.

ORS collects the following cognitive demand elements:

- Decision-making
- Work Review
- Pace
- Adaptability
- Work-related Personal Interactions

It is common for the demands of a specific cognitive element to range widely. For example, pace may vary dramatically during the day or over a period of days or months. Specific guidelines for handling ranges are reflected in each section.

To determine which level to capture, apply the following rules:

- Code the highest frequency (shortest interval) for Work Review, Adaptability/change in work tasks, Adaptability/change in location, and Work-related Personal Interactions/Contacts.
- Code the highest level expected for Decision-making, Pace of work, and Work-related Personal Interactions/purpose of personal interaction. The full intent of a level must be met for it to be coded.

Include documentation and examples that illustrate why coding choices were made.

6_02 Collecting 'Decision-making'

'Decision-making' measures the type and scope of decisions the occupation is expected to make.

It is common for occupations to include a range of decision making. Collect the highest level of independent judgment a worker is expected to use to perform the tasks of the occupation.

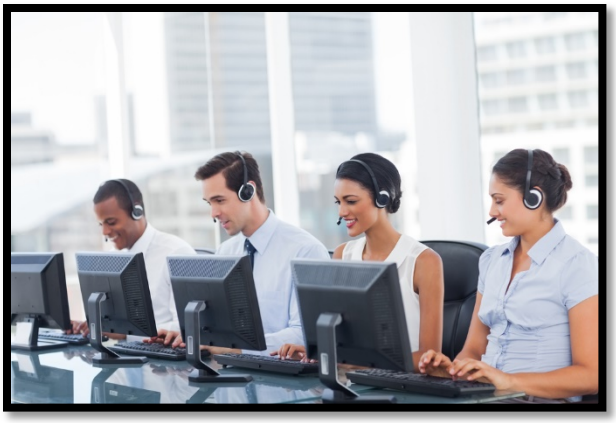
There are three levels of decision-making. The levels are not comprehensive, but instead represent key break points of applying independent judgment to make decisions. The three levels are:

1. **Employee uses independent judgment to select from a limited number of predetermined actions.**
    - The worker is trained to recognize the situations and to respond in a specific way based on the facts.
    - The facts needed to make the decision are apparent and there is a clear logical path to follow to identify the end action.
2. **Employee uses independent judgment to determine the most appropriate course of action in situations that do not have set responses.**
    - The worker is expected to identify the situation and determine the relevant facts from the information available.
    - The worker uses independent judgment to determine possible responses, evaluate options, and determine the best response.
    - The worker can use independent judgment to tailor the response to fit the specific situation.
3. **Employee uses independent judgment to make decisions by choosing from a large number of possibilities in situations where a high degree of uncertainty or complexity may exist.**
    - The worker considers the information available and recognizes that there are multiple relationships, reactions, or unknowns.
    - The worker must use independent judgment to make assumptions about relationships and reactions, consider how these could impact the result, and select a course of action.
    - Judgment at this level can be applied within administrative and technical areas. It is not limited to professional and managerial decisions.

Examples of 'Decision-Making'

Level of Decision Making	Office Worker	Restaurant Worker	Construction Worker
1. Select from a limited number of predetermined actions	The worker sorts incoming mail and dispatches to the correct employee's mailbox. The worker collects outgoing mail and dispatches to a central location for pick up.	The worker carries dirty dishes from dining room to the kitchen and wipes tabletops and chairs. The worker replaces silverware and soiled table linens and sets tables with clean silverware and glassware.	The worker loads construction material set out by his supervisor onto the truck for delivery to a construction site. The worker unloads unused materials from trucks returning from a construction site.
	The worker answers incoming telephone calls and greets customers. Determines who to call when customers come into the establishment based on customer request and a list of contacts.	The worker takes orders, and may give recommendations. The worker requests identification from customers when legal age is questionable. The worker computes bills and accepts payments	The worker decides the appropriate tools to use for mixing concrete and installing a fence.
2. Determine the most appropriate course of action in situations that do not have set responses	The worker answers incoming telephone calls and greets customers. Opens mail not addressed to specific individuals and determines whether to throw out or forward to other employees. Decides how and where to purchase office supplies.	The worker decides the number of servers to schedule based on historical patterns. Determines whether customer special requests can be addressed and how to resolve customer complaints about food or service.	The worker corrects locations for footings to accommodate issues not originally identified; and determines how much concrete to mix to install a fence, and how to adjust work planned for the day.
3. Choose from a large number of possibilities in situations where a high degree of uncertainty or complexity may exist	The worker analyzes and creates office procedures, and organizes office operations. Also evaluates office production and coordinates the activities of other clerical workers to minimize waste.	The worker plans menus and related activities. The worker may hire or fire restaurant personnel. The worker ensures that the restaurant has the necessary supplies to continue rendering services, and makes purchases based on cost, demand, and availability.	The worker designs fences and drafts specifications according to customer requests, and ensures the design meets all applicable building codes. Makes decisions on proper materials based on cost and design considerations, intended use, and site specifications.

6_03 Collecting ‘Work Review’



‘Work Review’ measures the frequency at which a machine, supervisor, or lead worker checks an individual’s work to ensure performance standards are being met.

‘Work review’ can occur in person or remotely.

Exclude automated recorders such as cameras that serve only as security measures.

Collect the highest frequency of work review that a worker receives in an occupation under normal circumstances. Do not consider the highest level to be what the establishment would perform on a worker with known or suspected unsatisfactory performance. Use the following frequency categories:

- More than once per day
- Once per day
- At least once per week, but less than daily
- Less than weekly

Examples of 'Work Review'

Supervision	Description of Work Review
More than once per day	A data processor enters and validates policy information for a large insurance firm. Systems constantly monitor the number of errors and corrections made, speed of work and time away from the desk. Workers receive ongoing feedback on the quality and quantity of work.
	A machinist, producing parts, has his worked randomly checked and measured by quality control staff. Two parts per day get inspected.
	A telemarketer makes outbound calls to generate and follow up on sales leads. Work is under constant random monitoring to ensure adherence to law and policy. Workers are told when performance does not meet expectations.
Once per day	A canvasser receives instruction and a new list of contacts at the beginning of the day. Results are evaluated at the end of each day and workers are provided feedback.
	A convenience store cashier counts the till at the end of every shift and must balance within $1 or an 'infraction' is recorded on her record.
	A construction worker hangs drywall in residential construction. He receives a review daily from the site manager. Workers are told when performance does not meet expectations.
At least once per week, but less than once daily	A junior sales representative sells color imaging equipment and manages customer prospect profiles. The supervisor ensures objectives are met and provides performance feedback weekly.
	A pharmaceutical sales rep's regional manager comes to town once per month to ride along on calls. Staff are told when performance does not meet expectations.
	A waiter sells food and drink at a busy restaurant. The manager monitors wait staff sales amounts and customer service on a weekly basis. Staff are told does not meet expectations.
Less than weekly	A factory plant director has full plant responsibilities. Work is evaluated on efficiency and achievement of company objectives. Performance reviews are conducted annually.
	A senior sales representative is responsible for generating new accounts and growing the revenue stream for the establishment. Performance is reviewed quarterly based on new customer rates and overall dollar volume achieved.

6_04 Collecting ‘Pace’

‘Pace’ is the physical and cognitive speed needed to perform work tasks.

‘Pace’ can be the actual rate required of workers to complete repetitious tasks, or the rate at which workers are expected to respond to a variety of in-coming projects.

There are two components to ‘Pace’:

- **Pace of work** measures the rate at which a worker must process new or incoming information, or to take physical action based on new information.
- **Controlling workflow** means that a worker can prioritize work tasks or can adjust the amount of time it takes to complete them.

How to collect ‘Pace of Work’

Determine if the pace of work varies by asking if there are faster and slower periods of work. There is no time threshold applied to code “yes” for the variation: it may vary within a few hours or vary based on seasons of the year.

Collect the fastest pace at which work is expected to be performed. There are three different rates of pace:

- Rapid with no periods of waiting
- Steady with rare periods of waiting
- Unhurried with much time spent observing or waiting, rushed periods rarely or never occur

If a worker in an occupation works at a steady pace at certain times of the year, but the rest of the year experiences long periods of waiting, code this as steady with rare periods of waiting.

If a worker spends most of his day working at a rapid pace with no waiting, but works at a slower pace at the beginning and end of the workday, code this as rapid.

Examples of 'Pace of Work'

Pace of Work	Description
Rapid with no periods of waiting	A customer service representative answers incoming calls from an automated queue. Calls are constant.
Steady with rare periods of waiting	A building security guard at a secure facility screens employees and visitors entering the facility; and walks standard patrols on a rotating basis with other guards.
	A high-school teacher teaches classes, prepares lesson plans, and sponsors a school organization. The teacher maintains a regular schedule of classes.
Much time is spent observing or waiting	A front-desk security guard for a condominium watches over property or people. Large portions of time are spent waiting and monitoring from a stationary location.
	A lab technician monitors experiments and tests, assists in running equipment and endures long pauses while testing proceeds.

How to collect the 'Control of Workflow'

Collect the presence of a worker's ability to control the workflow.

Controlling workflow means that a worker can prioritize work tasks or can adjust the amount of time it takes to complete them. There may be tight, broad, or no deadlines, but the worker has some control over the amount of work completed within any specific time period. Work tasks are the regular duties of an occupation. Exclude tasks that are voluntary or occur by chance.

A worker may be able to control workflow even when the worker is not able to leave a physical location. For example, a telemarketer at a call center may go offline to take a break, without leaving the workstation.

When external factors determine workflow, the worker has limited or no control. This may happen when business processes, production line speeds or customer demands control workflow.

If the employee has some control over workflow for certain tasks but not over others, code this as "No".

For example, a store clerk restock shelves and works the cash register. When stocking shelves the clerk can adjust the amount of time that it takes to complete the task, but while working the register the flow of customers controls the workflow. Code this as "No."

Examples of 'Control of Workflow'

Description	Collect As	Reason
A firefighter responds to emergency calls	No	External demand
A retail sales person responds to customer needs	No	External demand
An elementary school teacher monitors kids on the playground at recess	No	External demand
A website technician creates and uploads links to content within 4 hours of receiving assigned material	Yes	There may be tight deadlines, but the worker has some control over the amount of work completed within a time period
A high-school teacher monitors a class and teaches lessons	Yes	The worker has some control over the amount of work completed within any specific time period
A sales representative determines whether to schedule appointments or write up schedules, number of calls per day, etc. to meet goals	Yes	The worker can adjust when and how quickly tasks are completed
A researcher determines the overall project timeline, tasks, and work accomplished on specific days	Yes	Worker controls the schedule

6_05 Collecting ‘Adaptability’

‘Adaptability’ measures characteristics of an occupation that cause a worker to adjust to changes in work routines.

Collect changes in three different areas: work tasks, work schedule, and work location.

Work tasks are the regular duties of an occupation. A change in work task requires the worker to remember new instructions, procedures, or similar information. A change in work task includes:

- New work assignments
- Tasks that occur infrequently throughout the year
- Irregular/variable tasks

Supervisors or lead workers directing an individual to switch between assigned tasks is not considered a change in work tasks. For example, do not consider a grocery assistant switching from bagging customer orders to collecting carts from the parking lot, at a manager’s request, as a change in work tasks. These are part of the expected core duties of that occupation.

Use the following aids when collecting work tasks:

- Task list
- Scope of the job
- Specific physical actions required to complete work
- How and with what (tools, equipment) tasks are completed

Collect the highest rate of change in Work Tasks. Use the following frequencies**:**

- At least once per day
- At least once per week, but less than daily
- At least once per month, but less than weekly
- Less than monthly, including never

Work Schedule is the regular recurring work hours and days for the occupation set by the employer. To be considered a change in the work schedule, the change must be directed by the employer. When a change in work schedule is present, code 'Yes'.

Include:

- Unscheduled overtime
- Unexpected weekend hours
- An unexpectedly shortened workday

Exclude:

- Employee driven flexibility
- Work schedules that follow an established pattern

Flexibility in the hours, or days, that an employee works is not a change by itself. For example, a server choosing her shift at a restaurant experiences a schedule change only when the employer reconfigures the work schedule in a way that changes regular recurring work hours or workdays.

Rotating shifts or standard variable shifts, such as those experienced by nurses or police, are not counted as a change in work schedule. Although the days or hours vary over pay periods, they follow a repeating known pattern.

Work Location is the physical site where a worker performs the typical duties of the occupation. A change in work location is a change to a new worksite or from a discontinued worksite. Changes in work location may accompany changes in work tasks or schedule.

Include:

- Location changes that are required by the job, but are not a part of a set route, such as when emergency workers respond to calls
- Changing to a new work site, such as a construction crew changing sites
- Switching assigned client sites
- Location changes that are part of a route with no set stops, such as a parcel delivery driver

Exclude:

- Moves to different buildings located in the same vicinity (such as a campus)
- Location changes that are part of a route with set stops

Collect the highest frequency of change in work location during a work year. It may vary within a few hours or vary based on the seasons of the year. Use the following categories:

- Does not change unless it is permanent
- Changes up to four times a year
- Changes more than four times a year

Examples of 'Adaptability'

Job Description	Work Tasks	Work Schedule	Work Location
An elementary school music teacher teaches classes at ABC elementary on M, W, F, and XYZ elementary on T, TH from 9 AM to 3 PM each day.	Less than monthly, including never	No	Does not change unless it is permanent
A cashier at a pizza parlor works the register. Once a month, if she fills in for other staff, she may be asked to make deliveries or to stay later than normal.	At least once per month, but less than weekly	Yes	Changes more than four times per year
A crewmember on the landscaping staff for a Golf Course rotates between the lawnmower, string trimmer, and leaf blower around the course grounds throughout the day. Shifts vary seasonally.	Less than monthly, including never	Yes	Less than monthly, including never
A firefighter fights fires in high-rise commercial buildings or private residences. Throughout the course of the year, the firefighter rotates through various roles on the truck and may assist with forest fires. They work fixed rotating schedules.	At least once per month, but less than weekly	No	Changes more than four times a year
An administrative worker works in a temporary office support pool for various university departments. Can be assigned to different departments during the day. Responsibilities range from answering phones to maintaining databases, generating reports, processing budget requests or handling special projects.	At least once per day	Yes	Does not change unless it is permanent

6_06 Collecting 'Work-Related Personal Interactions'

'**Work-Related Personal Interactions'** is the requirement of the occupation to cooperate with others, handle conflict, and respond to social cues, requests, and criticism.

Collect both the frequency and purpose of work-related verbal interactions.

There are two types of work-related personal interactions:

- Regular contacts
- Other contacts

Regular contacts are those people with whom a worker has an established working relationship. Regular contacts include:

- Co-workers, supervisors, and managers with whom the worker regularly works
- Clients, customers or students seen on a regular basis
- All other contacts with whom the occupation regularly works

Regular contacts may not include everyone in the worker's organization or work location.

People with whom the worker has no established working relationship, including the public, fall in the "**Other**" category.

Examples of Types of Contacts

Types of Contacts	Collect As
An accountant works with a clerk assigned to his/her department.	Regular
A store manager orders goods from a regular supplier.	Regular
An elementary teacher works with students in his/her class.	Regular
A sales clerk at a Walmart talks to customers while ringing up their orders.	Other
A nurse and a doctor both work at the same hospital, but do not work together.	Other

How to collect frequency of contact

Collect the highest frequency of work-related verbal contact that a worker has with regular contacts and other contacts.

If the frequency of contact changes during the work schedule, code the most frequent level experienced and document the circumstances. Use the following frequency categories:

- Constantly, every few minutes
- More than once per hour, but not constantly
- More than once per day, but not more than once per hour
- No more than once per day, includes never

Do not differentiate between individuals within a category. For example, a receptionist may interact with an unfamiliar client once per visit, but is greeting such individuals several times per hour. The correct frequency is more than once per hour.

Exclude optional social contacts that are not required to perform the work.

How to collect the purpose of interaction

Collect the reason for work-related verbal interaction with regular contacts and other contacts. If there is variation, code the highest level of interaction expected for the occupation. Use the following categories:

- Exchanging straightforward, factual information
- Coordinating work with others; solving recurring problems with cooperative parties
- Some gentle persuading or soft selling; discussing
- Influencing; hard selling; asserting control in situations
- Resolving controversial or long-range issues; defending; negotiating

Type of Interaction in a Fast Food Restaurant	Description
Exchanging straightforward, factual information	A fast food worker notifies another worker that customer food orders are ready.
Coordinating work with others; solving recurring problems with cooperative parties	A shift manager coordinates the tasks and breaks of fast food crew members.
Some gentle persuading or soft selling; discussing	A store manager resolves worker issues, and discusses strategies for meeting franchise sales goals with shift managers and crew members.
Influencing, hard selling; asserting control in situations	A regional manager increases sales by engaging store managers and staff in new sales strategies; leads meetings to explain policy changes; and implements changes.
Resolving controversial or long-range issues; defending; negotiating	A franchise owner negotiates with the corporate office for a better deal, and works with regional managers to resolve issues that have a long-term impact on franchise growth and sales.

Examples: How to Collect 'Work-Related Personal Interactions'

Description	Regular or Other	Frequency of Contact	Type of Contact
A tollbooth worker takes payments and makes change for more than 500 drivers passing through the toll lanes during an eight-hour shift. Each day the worker attends a ten-minute staff meeting where the supervisor reviews basic information and safety issues. Employees discuss safety issues and suggest procedures changes.	Regular contacts (supervisor, co-workers)	No more than once per day; includes never	Coordinating work with others
	Other contacts (public)	Constantly, every few minutes	Exchanging straightforward, factual information
A psychologist meets with clients seeking help with personal issues. Most clients schedule recurring appointments. However, once every few weeks, a client comes once and never returns.	Regular contacts (recurring clients)	More than once per day, but not more than once per hour	Some gentle persuading or soft selling
	Other contacts (one-time clients)	No more than once per day; includes never	Some gentle persuading or soft selling

Chapter 7: Physical Demands

7_01 Overview 61
Concurrent Physical Demands
How to collect Physical Demands
7_02 Collecting ‘Sitting vs. Standing/Walking’ 63
How to collect ‘Sitting’ vs. ‘Standing/Walking’
When to collect ‘Sitting vs. Standing/Walking at Will’
7_03 Collecting ‘Lifting/Carrying’ 66
How to collect Lifting/Carrying:
When to use ‘Negligible’ and ‘None’
7_04 Collecting ‘Pushing/Pulling’ 70
Understanding thresholds for ‘Pushing/Pulling’
How to collect ‘Pushing/Pulling’
7_05 Collecting ‘Reaching’ 74
7_06 Collecting ‘Keyboarding’ 76
How to collect ‘Keyboarding’
7_07 Collecting ‘Manipulation’ 78
7_08 Collecting ‘Stooping’, ‘Crouching’, ‘Kneeling’, and ‘Crawling’ 80
7_09 Collecting ‘Climbing’ 82
How to collect ‘Climbing Ramps or Stairs’
How to collect ‘Climbing Ladders, Ropes, or Scaffolds’
Determining the type of ‘Climbing’ with Stools and Ladders
7_10 Collecting ‘Vision’ 85
7_11 Collecting ‘Communicating Verbally’ and ‘Hearing Requirements’ 86

7_01 Overview

Physical Demands are the physical activities required of an occupation. We collect the following ten categories:

- Sitting vs. Standing/Walking
- Lifting/Carrying
- Pushing/Pulling
- Reaching
- Keyboarding
- Manipulation
- Stooping, Crouching, Kneeling, Crawling
- Climbing
- Vision
- Communication

Concurrent Physical Demands

There are many situations where an occupational task includes more than one physical demand. While it is important to look at the total amount of time coded for an occupation, it is not automatically "wrong" if the total of some elements adds up to more than the daily work hours.

Examples:

- Writing involves both gross manipulation and fine manipulation.
- Pushing a heavy cart while standing up includes, among other things, pushing with hands/arms, pushing with feet/legs, gross manipulation, and standing/walking.
- Making a phone call may include holding the receiver (gross manipulation) with one hand while dialing the phone with the other (fine manipulation), while speaking with another person (communicating verbally).

How to collect Physical Demands

1. Collect presence of physical demand elements.
2. Collect the duration for all elements except for Vision or Hearing. See section 2_03 for details on calculating duration.
3. Certain elements have unique collection guidelines:
    - Lifting/Carrying has unique collection guidelines. See section 7_03.
    - Climbing Ramps/Stairs - Structure has unique collection guidelines. See section 7_09.

4. Apply thresholds to Pushing/Pulling and Reaching Overhead.
5. Do not collect the physical demands related to a worker's commute.
6. Collect the presence of 'One or Both' hand/arm (foot/leg) for the following physical demand data elements:
    - Pushing/Pulling – hand/arm, foot/leg, and feet only
    - Manipulation – Gross, Fine and Foot/Leg Controls
    - Reaching – At/Below Shoulder and Overhead

    Collect work as generally performed. Exclude accommodations.

    If ANY task requires BOTH hands/arms (feet/legs), <u>code as BOTH</u>.

    <u>Code as ONE</u> only if ALL of the work can be completed using one hand/arm (foot/leg).
7. To avoid overstatement, do not break the Physical Demands elements into narrower individual components.
    Example:

    Code an Administrative Assistant typing on a computer as Keyboarding only, and do not include this time in Gross and Fine Manipulation.

7_02 Collecting ‘Sitting vs. Standing/Walking’

There are three components to this element:

- Sitting
- Standing/Walking
- Sitting vs. Standing/Walking at Will

A worker is always either ‘sitting’ or ‘standing/walking.’ Stooping can be done while either sitting or standing.

‘Sitting’ is present when one of three conditions exists:

- A worker remains in a seated position. This includes active sitting. For instance, a bicyclist sits but pushes/pulls with his feet/legs.
- A worker is inactive and seated or prone. For instance, a medical resident on call for a thirty-hour shift taking a strategic nap is sitting.
- The worker may choose between sitting and standing for a given task. For example, an office worker can choose a standing desk.

‘Standing/Walking’ is present whenever a worker is not sitting or prone. Include time spent crawling, kneeling, or crouching.

Examples - Choosing Between ‘Sitting’ and ‘Standing/Walking’	
Sitting	An OTR truck driver drives a tractor- trailer.
	A police officer rides a bicycle to patrol traffic.
	A landscaper mows a residential lawn with a seated mower.
Standing/Walking	A pest control worker crawls in an attic to apply pesticides.
	A landscaper stands on a zero-turn-mower to mow residential lawns.

How to collect ‘Sitting’ vs. ‘Standing/Walking’

Collect the actual daily hours that a worker spends sitting OR standing/walking. The total amount of time coded for sitting and standing/walking **must** add up to the daily work schedule.

Example:

A teller chooses to sit rather than stand for 3 hours per day while working at the drive-thru window. The rest of the day the teller is either standing at the counter,

stooping from a standing position to access the under-counter safe, or walking to escort customers to safety deposit boxes. The work schedule is 8/40/52.

Collect:

Sitting: 3 hours per day

Standing/Walking: 5 hours per day

Total: Sitting for 3 hrs. + Standing for 5 hrs. = 8 hour work day.

If a workers spends a portion of the day sitting and the rest standing, but the respondent can only provide a range, use the mid-point to calculate the time adjustment between 'Sitting' and 'Standing/Walking.'

When to collect 'Sitting vs. Standing/Walking at Will'

Collect the presence (yes/no) of 'Sitting vs. Standing/Walking at Will.'

The ability to alternate between sitting and standing/walking at will is present when the following conditions exist:

- A worker has the flexibility to choose between sitting and standing throughout the day.
- There is no assigned time during the day to sit or stand/walk.
- No external factors determine whether an employee must sit or stand/walk.

When collecting for this element, include documentation for the activities described in the typical day.

Exclude scheduled breaks and lunch breaks.

Note: Driving does not necessarily negate the ability to sit/stand/walk at will. If the employee may stop as needed, the ability to alternate between sitting and standing/walking at will is present.

Examples of 'Sitting vs. Standing/Walking At Will'	Collect As	Reason
A pharmaceutical sales rep driving to clients can choose when to make trips and additional stops.	At Will is 'Yes'	Worker's choice
An office clerk can choose when to file and typically stands while filing invoices.	At Will is 'Yes'	Worker's choice
An event parking lot attendant must stand when cars are entering the parking lot to accept payment and direct cars.	At Will is 'No'	External factors
A security guard chooses to sit or stand, except when he walks to investigate suspicious situations.	At Will is 'No'	Worker does not choose
An over-the-road truck driver must meet a delivery schedule. He stops only for fuel and weigh stations.	At Will is 'No'	Worker does not choose

7_03 Collecting 'Lifting/Carrying'

'Lifting' is raising or lowering an object from one level to another. This includes upward pulling.

Example:

An assembly line worker lifts cans, jars, or bottles from cardboard boxes and places them on a conveyor.

'Carrying' is transporting an object, usually by holding it in the hands, arms, or on the shoulders.

Example:

A construction worker wears a tool belt to carry a hammer, flat bar, screwdriver and other hand tools.

<u>How to collect Lifting/Carrying:</u>

1. Collect the presence and duration of task-related lifting/carrying that is required for work as generally performed. Use the duration levels to categorize the data. The duration levels are:
    - Seldom: up to 2% of the day
    - Occasional: 2% up to 1/3 of a day
    - Frequent: 1/3 up to 2/3 of a day
    - Constant: 2/3 or more of a day
2. Document when lifting/carrying an object does not require hands. For example, a worker wearing a tool belt experiences gross manipulation when lifting the belt and zero gross manipulation while carrying it. Collect all time spent wearing the tool belt toward the lifting/carrying element and document the gross manipulation.
3. Ask the following questions when collecting data:

    What is the most weight ever lifted/carried by the occupation?

    It takes more strength to lift something for longer lengths of time, so the weight that a worker lifts 'up to 2% of the day' is often heavier than that lifted more frequently.

    How often is this weight lifted/carried?

    Verify that the weight lifted and duration are an expectation of the occupation and are not by chance or voluntary.

    What is the most weight carried at every other duration level?

    As the frequency of a task increases, workers often carry less weight. The maximum weight collected may decrease as duration increases.

4. Use the Weight and Duration Chart below to code the weight lifted/carried by duration. Always round weight up to a whole number.

Weight and Duration Chart

Constantly (2/3 or more)	Frequently (1/3 up to 2/3)	Occasionally (2% up to 1/3)	Seldom (Up to 2%)
None	Negligible (up to 1 lb.)	Up to 10 lbs.	Up to 10 lbs.
Negligible (up to 1 lb.)	Up to 10 lbs.	11-20 lbs.	11-20 lbs.
Up to 10 lbs.	11 to 25 lbs.	21 to 50 lbs.	21 to 50 lbs.
11-20 lbs.	26 to 50 lbs.	51 to 100 lbs.	51 to 100 lbs.
>20 lbs.	>50 lbs.	>100 lbs.	>100 lbs.

The most weight lifted ever will be the same as the most weight lifted seldom. Using the duration chart, select the appropriate weight range in the **Seldom** column and code this in the 'Up to 2%' category in CIERA.

Code the most weight collected **Constantly** in the '2/3 or more' category in CIERA. This will be the same or less than the amount collected at the **Frequently** duration level.

Code the most weight lifted **Frequently** in the '1/3 up to 2/3' category in CIERA. This weight will be the same or less than the amount collected for **Occasionally**.

Code the most weight lifted **Occasionally** in the '2% up to 1/3' category in CIERA. This weight will be the same or less than the amount collected for **Seldom**.

Example 1:

A worker seldom lifts 50 lbs. This is the most he ever lifts. He spends 4 hours of every eight-hour day lifting 20 lbs., but never lifts anything constantly.

Lifting/Carrying (Max Weight Lifted...)				
Ever	2/3 or more	1/3 up to 2/3	2% up to 1/3	up to 2%
50 Lbs	None	11-25 lbs	11-20 lbs	21-50 lbs

Example 2:

As part of a landscape crew**,** workers, performing detail trim and clean-up work, operate either weed trimmers or leaf blowers. Workers lift/carry the **12-pound** gas-powered lawn equipment the entire day. Three times per day, for 10 minutes, the workers must lift portable fuel tanks to refuel equipment. The portable fuel tanks hold 5 gallons of gas and weigh approximately **30 pounds**. The workers do not need to lift or carry anything else. The work schedule is 8 hours/day, 40 hours/week, 52 weeks/year.

Lifting/Carrying (Max Weight Lifted...)				
Ever	2/3 or more	1/3 up to 2/3	2% up to 1/3	up to 2%
30 Lbs	11-20 lbs	11-25 lbs	21-50 lbs	21-50 lbs

When to use 'Negligible' and 'None'

Use the terms 'negligible' and 'none' when collecting weight for specific duration categories.

'None' means there is no weight lifted or carried. 'None' can only be used when coding weight lifted 2/3 of the time or more.

'Negligible' means the weight is so small that measurement is not meaningful. For instance, the weight of a pen, or a few sheets of paper, is not meaningful. If an object weighs more than one pound, it is NOT 'negligible'.

Use 'negligible' only when coding weight lifted 1/3 of the time or more.

Example:

A sales representative, while visiting customers throughout a typical day, lifts pens and paper. Sometimes the representative needs to lift cabinet samples, weighing six pounds each, to show potential clients design and color choices. The cumulative time spent lifting the cabinet samples is less than 2 hours and 40 minutes per day.

The sales representative must also lift boxes of display materials while setting up a booth at the annual sales show. The boxes weigh 30 pounds each and the total time spent lifting these is 10 minutes. The representative does not lift any object for more than 5 hours and 20 minutes in a day. The work schedule is 8 hours/day, 40 hours/week, 52 weeks/year.

Duration	Max Weight Collected
2/3 or more	None

1/3 up to 2/3	Negligible
2% up to 1/3	6 pounds
Up to 2%	30 pounds

7_04 Collecting 'Pushing/Pulling'

'Pushing' is exerting force upon an object so that the object moves away from the force.

'Pulling' is exerting force upon an object so that the object moves toward the force.

Understanding thresholds for 'Pushing/Pulling'

'Pushing/Pulling' is a measure of strength, not dexterity. Force or exertion must meet a threshold for 'Pushing/Pulling' to be present.

Pushing/Pulling is present when one of two conditions exist:

- A worker uses ten pounds of force or more.
- A worker uses any amount of force at a **production rate** 2/3 or more of time.

A **production rate** includes a constant repetition of a negligible amount of force, requiring considerable strength at any weight.

Any pushing or pulling done for less than 2/3 of the time requires greater force to meet the push/pull threshold. **Do not include** duration for push/pull that uses less than ten pounds of force unless total duration exceeds 2/3 of the day.

Force is an interaction that changes the motion of an object. Factors affecting the amount of force needed are:

- Weight of object(s) being pushed/pulled
- Friction, specifically pushing/pulling on a smooth vs. coarse surface
- Incline

Example:

The amount of force required for a worker to push/pull a dolly with a weight on it across a flat surface or a 30-degree incline is (approximately):

Weight	Flat Surface	Incline
25 lbs.	2 force pounds	11 force pounds
50 lbs.	6 force pounds	14 force pounds
100 lbs.	11 force pounds	18 force pounds

Meeting the Threshold of 'Pushing/Pulling'

Examples	Meets the Threshold	Reason
Pulls down a garage door manually.	Yes	Meets the force threshold
Pulls open large drawers containing cadavers in the county morgue.	Yes	Meets the force threshold
Pushes a patient in a wheelchair.	Yes	Meets the force threshold
Pushes/pulls a chipper/shredder machine.	Yes	Meets the force threshold
Pushes/pulls a commercial floor waxing machine	Yes	Meets the force threshold
Pushes a treadle when using an industrial sewing machine 80% of the day.	Yes	Meets the production rate threshold
Pulls open an office desk drawer, occasionally.	No	Does not meet either threshold
Pushes a brake pedal in a passenger vehicle, driven occasionally.	No	Does not meet either threshold
Pushes an IV stand across a patient's room, occasionally.	No	Does not meet either threshold
Pushes open a typical household door, occasionally.	No	Does not meet either threshold

How to collect 'Pushing/Pulling'

Collect the presence and duration of pushing and pulling together.

- When pushing/pulling is present for less than 2/3 of the day and involves force-pounds equal to ten pounds or more, code pushing/pulling as present and code duration.
- When pushing/pulling is present for less than 2/3 of the day and involves less than 10 lbs. of force, code pushing/pulling as 'Not Present."
- When pushing/pulling involves varying amounts of force, some of which do not meet the threshold, probe to get information on the type and duration of pushing/pulling. If pushing/pulling is present for more than 2/3 of the day, code the total duration. If less than 2/3 of the day, code duration only for the higher force.

Separate pushing and pulling based on the part of the body used. Collect as:

- **Hands/Arms,** when the upper body is used.
- **Feet/Legs,** when the lower body is used.
- **Feet Only,** when the pushing is done primarily by the feet from a seated position and upper leg muscles do not create the force.

Most pushing and pulling that occurs while walking uses arms and legs to apply force. Types of Pushing/Pulling using arms and legs include:

- Wheelchairs
- Commercial carpet cleaners
- Carts
- Walk-behind lawn mowers

If a task that requires a worker to operate foot/leg controls meets the minimum threshold for pushing/pulling, collect as 'Pushing/Pulling/feet/legs' or 'feet only' AND 'Manipulation/Foot/Leg Controls'.

Exclude pushing/pulling actions involved in climbing ropes, ladders or scaffolding, as the time spent pushing/pulling when performing this physical demand is included in it.

Examples of ‘Pushing/Pulling’	Collect One/Both	Collect Duration
A technician sits and pushes, with one hand, a 100 lbs.-equipment cart. The total time pushing is 30 min. per day.	One hand/arm only. No legs, because the worker sits.	30 minutes
A librarian walks behind and pushes a very heavy two-shelf cart full of books for 3 hours per day.	Hands/arms and feet/legs; both sides of the body for each.	3 hours
A swim instructor swims 4 hours out of an 8-hour day.	Hands/ arms and feet/legs; both sides of the body for each.	4 hours
A textile worker stands at a commercial loom pushing/pulling with two hands to weave fabric for 7 hours of an 8-hour day.	Both hands/arms. *A rare example* of pushing/pulling from a non-seated position with hands/arms only.	7 hours
A police officer patrols a very hilly city on a bicycle for 1 hour of an 8-hour day.	Both feet/legs. A rare example of push/pull feet/legs; no hands/arms.	1 hour
An excavating machine operator uses arms and legs to operate controls and pedals (clutch) for 6 hours of an 8-hour shift.	Both arms and both legs	6 hours

7_05 Collecting ‘Reaching’

‘Reaching’ is extending the hand(s) and arm(s) in any direction.

‘Reaching’ requires the straightening and extension of the arm and elbow and the engagement of the shoulder. A worker can bend his arm at any time while reaching.

Collect the duration for the entire range of motion for ‘Reaching’, not just the time at full extension.

To avoid overstatement, do not collect reaching that is involved in ‘Crawling’ or ‘Climbing Ladders, Ropes, and Scaffolding.’

There are two types of ‘Reaching’:

- Overhead Reaching
- At/Below the Shoulder Reaching

‘Overhead’ and ‘At/Below the Shoulder Reaching’ can be present in the same task.

‘**Overhead Reaching**’ is extending the arm(s) with the hand higher than the head AND one of two conditions:

Condition 1:

- A person bends the elbows, and the angle at the shoulders is about 90 degrees or more.

Condition 2:

- A person keeps the elbow extended, and the angle at the shoulder is about 120 degrees or more.

When collecting Overhead Reaching, capture time associated with “Standing” and “Climbing Ramps or Stairs,” as appropriate.

‘At/Below the Shoulder Reaching’ is present when there is ‘Reaching’, but it does not meet the threshold for ‘Overhead’.

If a worker can stand as needed, use a stepladder, or use another strategy to avoid overhead reaching, collect the task as ‘At/Below the Shoulder Reaching.’

Examples of ‘Reaching’:	Collect As:	Reason
Picking apples from the tops of mature trees.	Overhead	Meets the threshold
Spotting children on uneven bars.	Overhead	Meets the threshold
Hanging an IV bag on a stand.	Overhead	Meets the threshold
Opening and closing stage curtains with a rope and pulley.	Overhead	Meets the threshold
Pruning trees and shrubs.	Both types of Reaching	Meets all criteria
Attaching drywall to studs.	Both types of Reaching	Meets all criteria
Filing folders in uppermost overhead cabinets. Worker can stand or use a step stool.	At/Below Shoulder	Present, below threshold for ‘Overhead Reaching’
Reaching across a desk to answer the phone.	At/Below Shoulder	Present, below threshold for ‘Overhead Reaching’
Checking a car’s oil.	At/Below Shoulder	Present, below threshold for ‘Overhead Reaching’
Reaching in bins for sandwich ingredients.	At/Below Shoulder	Present, below threshold for ‘Overhead Reaching’
Loading a commercial dishwasher.	At/Below Shoulder	Present, below threshold for ‘Overhead Reaching’
Inserting screws into widgets.	At/Below Shoulder	Present, below threshold for ‘Overhead Reaching’
Reaching for the control to open a bus door.	At/Below Shoulder	Present, below threshold for ‘Overhead Reaching’

7_06 Collecting ‘Keyboarding’

‘Keyboarding’ is a repetitive motion requiring the use of the whole hand to enter data by means of a keyboard device.

‘Keyboarding’ is a *separate element* that involves ‘Fine’ and ‘Gross Manipulation,’ and sometimes ‘Reaching.’

Do not include keyboarding or the use of a mouse in the duration for ‘Gross’ or ‘Fine Manipulation’, or ‘Reaching’.

How to collect ‘Keyboarding’

Collect the presence and duration of ‘Keyboarding’ by device:

Traditional Keyboard – a panel of keys used as the primary input device on a computer or typographic machine. Include:

- Stenographer’s machines
- Typewriters
- Laptops
- All aspects of using a desktop computer, including a mouse

10-Key Pad – a numeric keypad where multiple fingers are used to enter data. Include:

- Adding machines
- Calculators

Touchscreen Keyboard – a touch sensitive keyboard display on a computer or other electronic device that uses repetitive finger or thumb motion, and using the whole hand, for data entry. Include:

- Tablet computers
- Touch screen mobile phones
- Touch screen point of sale devices

Other - Keyboarding devices that do not fit into one of the other categories. When collecting Other keyboarding devices, include documentation in the remarks section.

If the respondent cannot identify the type of device being used, code duration under Traditional Keyboard.

If a worker uses multiple devices, capture the duration for each device. If the respondent cannot break out the duration from multiple devices, code duration under Traditional Keyboard.

If a worker must use a computer monitor or a screen on another electronic device, then code Near Visual Acuity "yes" as a default.

Exclude activities that require hitting only a few keys and do not involve multiple fingers on the hand. For example, code as 'Fine Manipulation' key-entries on traditional phone; fax, copy and time-clock machines; and touch-screen devices where data is entered with fingers only.

To distinguish 'Keyboarding' from 'Fine Manipulation,' determine how work is generally performed in an occupation.

- Collect as 'Keyboarding' when a worker in an occupation uses one or both hands and repetitive finger motions while concentrating on inputting data.
- Collect as Fine Manipulation when a worker is touching, picking or otherwise working primarily with fingers rather than the whole hand.

Examples of 'Keyboarding'	**Code As**
A customer service rep spends 5 hours per day entering information into an order system on a desktop computer.	Traditional keyboard
An accounting clerk uses an adding machine to settle accounts.	10-Key Pad
A receptionist at a spa uses a typing motion on a touchscreen device to book services and send customized messages to clients.	Touchscreen
A bartender puts an order into a touchscreen order-system using **multiple fingers in a typing motion**	Touchscreen
A bartender puts an order into a touchscreen order-system using **one finger to press icons** one at a time	Fine Manipulation; Reaching
A salesperson communicates with customers using a Blackberry.	Other- document
A cashier at a grocery store uses a register with a hybrid keyboard that has 72 flat keys and a 10-key pad.	Other – document

7_07 Collecting ‘Manipulation’

There are three types of ‘Manipulation’:

- Gross Manipulation
- Fine Manipulation
- Foot/Leg Controls

‘Gross Manipulation’ is seizing, holding, grasping, turning, or otherwise working with the hand(s). It is often present when lifting involves the hands.

For ‘Gross Manipulation’, fingers are involved only to the extent that they are an extension of the hand to hold or operate a tool such as tin snips or scissors.

Example: A worker uses fingers to turn a switch or shift automobile gears.

Collect the presence and duration of gross manipulation. Code the use of one or both hands.

When coding ‘One or Both’ hands for gross manipulation, always code ‘Both’ if **any** task requires the use of both hands. Confirm that **all** typically performed tasks are being considered and not just the most common tasks.

Exclude:

- Gross Manipulation involved in Keyboarding or the use of a mouse
- Gross manipulation involved in ‘Climbing Ropes, Ladders, and Scaffolds’
- Lifting that involves a part of the body other than hands

‘Fine Manipulation’ is touching, picking, pinching, or otherwise working primarily with fingers rather than with the whole hand or arm, as in ‘Gross Manipulation’.

Collect the presence and duration of ‘Fine Manipulation.’ Code the use of one or both hands.

A worker can use both gross manipulation and fine manipulation while performing a task.

Example:

A worker grasps a tape roll with one hand and pinches the tape lead with the other.

Include data-entry on touchscreen devices that use a finger in a touching motion.

Exclude:

- Keyboarding or the use of a mouse.
- Duration for touchscreen devices already counted under ‘Keyboarding’.

‘Foot/Leg Controls’ is the use of one or both feet or legs to move controls on machinery or equipment. Controls include, but are not limited to, pedals, buttons, levers, and cranks.

If time operating foot/leg controls meets the threshold for pushing/pulling, collect it for Foot/Leg Controls *and* Pushing/Pulling. See section 7_04.

Examples of ‘Manipulation’	
Gross	Handling a conventional phone receiver.
	Grasping combs and scissors in a salon.
	Holding lumber and handling tools when building cabinetry.
	Lifting and moving packages.
	Driving a delivery van using a steering wheel.
	Using a pipe wrench.
Fine	Pushing buttons on a copy machine.
	Counting coins and paper money.
	Pinning and sewing garments.
	Separating groups of documents with paper clips.
	Inserting small parts on a production line.
	Adjusting calibration equipment.
	Sorting through bins of eyeglass screws.
	Stringing small beads on a wire to make a bracelet.
	Collecting tickets and handing-out receipts.
Gross and Fine	Writing.
Foot/Leg	Stepping on a lever to lower and raise salon chairs.
	Pressing a floor button to raise a dental chair.
	Pressing a gas pedal to drive a passenger vehicle.
	Pressing a knee lever to operate a sewing machine.

7_08 Collecting ‘Stooping’, ‘Crouching’, ‘Kneeling’, and ‘Crawling’

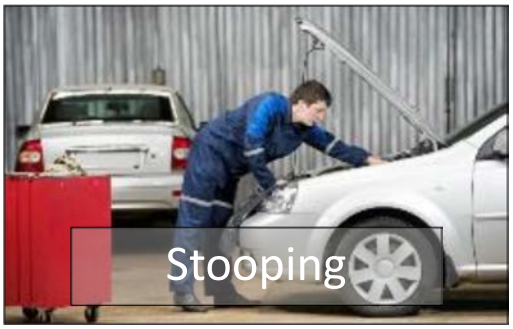
There are four posture positions:

- Stooping
- Crouching
- Kneeling
- Crawling

Workers may use these postures to lower themselves, position themselves over something, or get closer to the ground. A worker cannot stoop, crouch, kneel, or crawl at the same time.

The demands of a job may dictate, or the establishment may require, the use of a specific movement. In some cases, workers may choose the position they assume to perform tasks.

When workers choose their body position, collect the position typically used to perform the job. If it is difficult to determine the position typically used, and more than two positions are common, code this ‘present duration unknown’. If only two positions are typically used, split the duration between the two elements.



‘Stooping’ is bending the body forward and down, bending the spine at the waist and leaning down towards an object or the ground. Stooping can occur in a seated position, although it occurs most often while standing.

Examples:

- A mechanic stoops over a car engine while making repairs.
- A janitor stoops while emptying trashcans.
- A hairstylist stoops while washing hair.
- A pedicurist, seated while performing a pedicure, stoops from a seated position to retrieve supplies.

'Crouching' is bending the body downward and forward by bending the legs and spine.

Examples:

- A bricklayer crouches to spread mortar and position bricks on lower parts of walls.
- A clerk crouches when using the lower drawers of file cabinets.
- An HVAC repairperson crouches to inspect a malfunctioning air conditioner.
- A physical education teacher crouches to demonstrate the catcher position while playing softball.

'Kneeling' is bending the legs at the knees to come to rest on the knee or knees.

Examples:

- A carpet installer kneels while pressing carpet firmly in place over strips without tacks, using hand tools.
- An electrician kneels to connect wiring to fixtures located in cramped places.
- A plumber kneels while installing piping for a radiant floor heating system.
- A pest control worker kneels while placing live traps under a deck.

'Crawling' is moving about on hands and knees or hands and feet.

Examples:

- A concrete worker crawls while smoothing and finishing the surface of poured concrete sidewalks.
- An HVAC repairperson crawls through narrow spaces to reach all parts of a furnace.
- An insulation installer crawls through a home's crawlspace.

7_09 Collecting 'Climbing'

'Climbing' is the act of ascending or descending stairs, ramps, ladders, ropes or scaffolding and similar structures using feet, legs, hands, and/or arms.

There are two types of climbing:

- Climbing Ramps or Stairs
- Climbing Ladders, Ropes, or Scaffolds

If the type of climbing present does not directly correspond to either of the two data elements, select the element that most closely resembles the action performed by the worker and document accordingly.

Note: Do not include the use of hands, arms, and legs associated with climbing in the durations for gross manipulation, pushing/pulling, and reaching. These physical demands are contained within both types of 'Climbing'.

How to collect 'Climbing Ramps or Stairs'

'Climbing Ramps or Stairs' is present when a worker ascends or descends ramps or stairs primarily using feet and legs. A worker may use arms and hands for balance only, as in holding a stair railing.

When 'Climbing Ramps or Stairs' is present, determine if it is **work related** or **structure related**, and code accordingly. Work related means that the job would require climbing regardless of the company's building.

Climbing is work related if**:**

- A worker would need to climb ramps or stairs to perform occupational duties in a single-level workplace.
- A worker climbs ramps or stairs while making deliveries, home visits or visiting other businesses.
- A worker uses a stepladder with wide treads and low rise, similar to stairs, to access materials on upper shelves.

When **climbing is work related,** collect duration.

If work related climbing is present for an occupation that typically works in only one place, document how the climbing relates to work.

Examples:

- A home health worker climbs stairs to enter a home or access different floors within the home of a patient.
- An apartment property manager ascends steep driveways while maintaining rental properties.

- A machine operator climbs stairs to access the machine platform.
- A worker climbs a ramp to load and unload material from a truck.

Climbing is structure-related if a single-level workplace would eliminate the need to climb ramps or stairs. A structure is a building, and not equipment.

If climbing is structure-related, collect presence. Do NOT collect duration.

Examples:

- A teacher escorts children up and down stairs in a three-story building.
- An office manager must use stairs to access files and supplies located on another floor.

How to collect 'Climbing Ladders, Ropes, or Scaffolds'

'Climbing Ladders, Ropes, or Scaffolds' is present when a worker ascends or descends ladders, scaffolding, ropes, or poles, using feet/legs, and hands/arms.

A worker typically uses both upper body and lower body in some capacity when climbing ladders, ropes, or scaffolds.

If workers must climb something that requires the use of both the upper and lower body to climb, include it in this element.

Examples:

- Ascending poles to install or repair power lines.
- Climbing scaffolding to plaster a ceiling.
- Climbing a short ladder using arms and legs to reach the cab of a (semi) truck.
- Using arms and legs to scale the rock wall at a gym.

Determining the type of 'Climbing' with Stools and Ladders

There are many different types of stools and ladders. The movements involved in using each type as well as their visual appearance varies.

Categorize stools and ladders as follows:

Type	Description	Collect As
Single Step Stool	A small stool with one-step often used to reach a higher-level cabinet in a kitchen or used to access the top shelf in a library. A worker does not need to use the upper body.	Climbing ramps/stairs
Household Double Step Stool	A stool that folds out into two stair-like steps. Ascent is forward and up rather than vertical. A worker does not need to use the upper body.	Climbing ramps/stairs
Step Ladder	A ladder, typically between eight and twelve feet tall, with steps that fit most of the foot. Ascent is vertical rather than stair-like. A worker must use the upper and lower body.	Climbing ladders, ropes, or scaffolds
Traditional ladder	Ladders, including extension ladders, designed to reach the tops of structures, with rungs rather than steps. A worker must use both the upper and lower body.	Climbing ladders, ropes, or scaffolds

7_10 Collecting ‘Vision’

There are three vision elements:

- Near Visual Acuity
- Far Visual Acuity
- Peripheral Vision

‘Near Visual Acuity’ is clarity of vision at approximately 20 inches or less, as when working with small objects or reading small print. Always collect near visual acuity when using a computer, regardless of distance.

Examples:

- A watch repairperson must see small parts within the watch.
- A payroll clerk enters information in HR software.
- A technician must read small numbers printed on electronic parts such as circuit board components.

‘Far Visual Acuity’ is clarity of vision at 20 feet or more. This includes the ability to see a person or object at a distance and to recognize features.

Examples:

- A park ranger observes a forest from a remote fire lookout station.
- A delivery truck driver drives a truck in city traffic.
- A surveyor must see distances to locate property lines.

Code “Yes” for near visual acuity and far visual acuity when a worker is required to see with clarity at designated distances.

Code “No” for near visual acuity and far visual acuity when a worker is required to have vision but not clarity.

Always code ‘Far Visual Acuity’ for driving.

‘Peripheral Vision’ is what is seen above, below, to the left or right by the eye while staring straight ahead. Peripheral vision may be present with driving. If it is, confirm its presence with the respondent and document.

Examples:

- A security guard watches all doors and TV monitors to look for unusual activities.
- A warehouse worker must stay clear of forklifts.
- A heavy equipment operator must keep watch in all directions to ensure safety.

7_11 Collecting ‘Communicating Verbally’ and ‘Hearing Requirements’

‘Communicating Verbally’ is using the spoken word to exchange information with clients, the public, or coworkers.

Include:

- The ability to give detailed spoken instructions to other workers accurately, loudly or rapidly.
- One directional speaking, such as lectures, broadcasts and other public speaking activities.

When ‘Communicating Verbally’ is present, collect the amount of *total* conversation time, not just the time in which the worker is actually speaking.

Examples:

- A TV news anchor reports news in a pleasant, well-controlled voice.
- A human resources manager explains benefits to a new employee.

‘Hearing Requirements’ are the ability to hear, understand, and distinguish speech and/or other sounds, such as machinery alarms or medical codes/alarms. Collect the presence of ‘Hearing Requirements’ needed to complete work as generally performed. There are five types:

- One-on-one (in person).
- Group or conference (in person).
- Telephone (and similar remote communication devices such as radios and walkie-talkies). Include the ability to hear a ringing telephone, or similar device, before it is answered.
- **Passage of hearing test**. This refers to an occupational requirement to pass a hearing test prior to employment in order to perform occupational duties. Exclude hearing tests that simply determine pre-employment hearing levels.
- **Other sounds**. Collect job-related safety alarms on machinery in ‘Other Sounds,’ and document. Exclude alarms that are not job-related, such as fire, tornado, weather, and other public safety alarms.

Examples of Hearing Requirements	
One-on-One	A pollster talks with a respondent to collect data.
	A sales representative hears a customer's request.
	A hospital nurse, discharging patients, listens to and answers questions while providing instructions.
Group Conference	A secretary takes minutes during a board meeting.
	A politician participates in a town hall style debate and responds to audience comments.
Telephone	A dispatcher answers 911 calls and sends help to the given location.
	A bus driver uses a walkie-talkie to communicate with her operator regarding the route status.
Hearing Test	A pilot must pass a hearing test prior to hire.
Other Sound	A veterinary tech identifies problems by listening to sounds from animals under care.
	An RN must hear and respond to patient alarms.
	A machine operator listens for alarms to stop the machine and clear jams.
	A day care center worker listens for a crying baby.
Do Not Collect	A teacher must be able to hear a tornado alarm to get children to safety.
	Workers in a Florida company must be able to hear and respond to a hurricane warning.
	A factory worker takes a hearing test prior to start and then annually to measure work-related hearing loss.

Chapter 8: Environmental Conditions

8_01 Overview 89
Collect the following Environmental Conditions:
When to collect duration for Environmental Conditions:
How to collect Environmental Conditions
8_02 Collecting 'Outdoors' 91
8_03 Collecting 'Extreme Cold' 92
8_04 Collecting 'Extreme Heat' 93
8_05 Collecting 'Wetness' 94
8_06 Collecting 'Humidity' 95
8_07 Collecting 'Hazardous Contaminants' 96
8_08 Collecting 'Proximity to Moving Mechanical Parts' 98
8_09 Collecting 'Heavy Vibration' 99
8_10 Collecting 'High, Exposed Places' 100
8_11 Collecting 'Noise Intensity Level' 101

8_01 Overview

Collect the following Environmental Conditions:

Environmental conditions are the surroundings in which a job is performed. We collect ten conditions:

- Outdoors
- Extreme cold
- Extreme heat
- Wetness
- Humidity
- Hazardous contaminants
- Proximity to moving mechanical parts
- Heavy vibration
- High, exposed places
- Noise intensity level

When to collect duration for Environmental Conditions:

- A worker experiences the condition while performing typical occupational duties.
- Conditions meet any of the specified thresholds.
- Personal protective equipment (PPE) required by the employer only partially mitigates exposure. PPE is equipment used or worn to minimize exposure to serious workplace injuries and illnesses.

How to collect Environmental Conditions

Collect the duration of exposure for all environmental conditions, except 'Noise Intensity Level'. Measure exposure as the worker experiences it with protective equipment.

Document the use and type of the use of personal protective equipment (PPE) for occupations that include exposure to Hazardous Contaminants, Moving Mechanical Parts, High Exposed Places, and Noise Intensity Level.

A **threshold** is a magnitude or intensity that must be met or exceeded for a certain condition to occur.

Thresholds for Environmental Conditions	
Environmental Condition	**Threshold**
Outdoors	None (must meet requirements in definition)
Extreme Cold (indoor and job related outdoor exposure only)	40 degrees or below when exposed 2/3 or more of the time, or 32 degrees or below when exposed up to 2/3 of the time
Extreme Heat (indoor and job related outdoor exposure only)	Above 90 degrees in a dry environment, or Above 85 degrees in a humid environment
Wetness (non-weather only)	Any contact with water or liquids and/or working in a wet area
Humidity (non-weather only)	Must be oppressive atmosphere
Hazardous Contaminants	Exposure that negatively affects the respiratory system, eyes, skin, or other living tissue via inhalation, ingestion, or contact
Proximity to Moving Mechanical Parts	Must present a risk of bodily injury
Heavy Vibration	Exposure to shaking or vibration that causes a strain on the body or extremities
High, Exposed Places	Must be exposed and at risk of falling five feet or more from workers center of gravity. Must be at risk of bodily injury from falling
Noise Intensity Level	None (must meet requirements in definition)

8_02 Collecting ‘Outdoors’

‘Outdoors’ is present when two conditions exist:

Condition 1

- A worker performs typical job duties outdoors, or
- A worker moves between different work sites during the workday.

Condition 2

- A worker is unprotected and exposed to the elements**.**

Note: A work site is considered protected when it has a roof and at least three sides.

Examples	Action	Reason
A teacher watches children while outdoors for recess.	Collect	Meets conditions
A groundskeeper mows lawns and trims shrubs.	Collect	Meets conditions
A pharmaceutical sales rep walks to and from the car with each client visit.	Collect walking as outdoors. Do not collect driving as outdoors.	Walking to the car meets conditions
An employee commutes to and from the workplace.	Do not collect	Not work-related
A miner works in an underground mine.	Do not collect	Not outdoors
An archeologist inspects artifacts in a three-sided tent at the dig site.	Do not collect	Not exposed

8_03 Collecting ‘Extreme Cold’

‘Extreme Cold’ is present when two conditions exist:

Condition 1

- Workers are exposed to 40 degrees F or colder temperatures for 2/3 or more of the workday, or
- Workers are exposed to 32 degrees F or colder temperatures for less than 2/3 of the workday.

Condition 2

- The worker’s exposure is related to job duties and not due to weather, or
- Workers are indoors in locations that are not climate controlled.

Most jobs will not have outdoor exposure to cold, non-weather related temperatures. When it is present, collect for the element, and document.

Examples	Action	Reason
A meat cutter works in a 40 degree cooler to carve beef carcasses for more than 3/4 of the day.	Collect	Meets conditions
A forklift operator works in an unheated warehouse that is always below 40 degrees in the winter.	Collect	Meets conditions
A freeze tunnel operator, wearing protective clothing, works for short periods in -34 degree F temperatures.	Collect	Meets conditions
A building maintenance worker shovels snow from sidewalks in 10-degree temperatures.	Collect as ‘Outdoors’	Weather-related
A mining machine operator drives a shuttle car to transport materials in an underground mine that is 58 degrees.	Do not collect	Does not meet the threshold

8_04 Collecting ‘Extreme Heat’

‘Extreme Heat’ is present when two conditions exist:

Condition 1

- The atmosphere is dry with temperatures above 90 degrees F, or
- The atmosphere is humid with temperatures above 85 degrees F. **Humid** means a high level of water vapor in the air.

Condition 2

- The worker’s exposure is related to job duties and not due to weather, or
- Workers are indoors in a location that is not climate controlled.

‘Extreme Heat’ includes localized sources of heat that change atmospheric temperatures to levels that exceed the threshold.

Most jobs do not have outdoor exposure to hot, non-weather temperatures. When it is present, collect the duration of exposure and document.

Examples	Action	Reason
An asphalt machine operator spreads hot asphalt on streets and roads. The machine produces intense heat.	Collect and document	Meets conditions
A commercial laundry worker reaches into dryers. Dryers create humidity and raise temperatures above 85 degrees.	Collect	Meets conditions
A warehouse worker moves freight and stock in a warehouse that is not climate controlled and is above 90 degrees.	Collect	Meets conditions
A restaurant cook works close to a hot commercial stove and oven in a kitchen with no air conditioning.	Collect	Meets conditions
An airline ramp agent loads and unloads baggage on a hot tarmac.	Collect as ‘Outdoors’	Weather-related
A salon worker is exposed to steam, hot wax, and hot towels while giving facials and waxings.	Do not collect	Does not meet the threshold

8_05 Collecting ‘Wetness’

‘Wetness’ is present when two conditions exist:

Condition 1

- The worker has any contact with water or liquid, including working in a wet environment.

Condition 2

- The worker’s exposure is related to job duties and **not due to weather**.

Examples	Action	Reason
A dishwasher cleans pots, pans, and trays by hand.	Collect	Meets conditions
A cannery worker reaches under jets of water when feeding food products into a washing machine that preps the items for cooking and canning.	Collect	Meets conditions
A nurse washes hands between patients.	Collect	Meets conditions
A waiter wipes down tables with a wet rag and does not use a glove.	Collect	Meets conditions
A dog walker works in rainy weather.	Collect as ‘Outdoors’	Weather-related
A pharmaceutical sales rep walks from a physician’s office to the car in snow.	Collect as ‘Outdoors’	Weather-related

8_06 Collecting ‘Humidity’

‘Humidity’ is present when three conditions exist:

Condition 1

- The worker’s exposure is related to job duties and not due to weather.

Condition 2

- The worker experiences air containing a high amount of water or water vapor.

Condition 3

- The atmosphere is oppressive.

Examples	Action	Reason
A garment presser uses a pressing machine that discharges steam to iron damp clothing.	Collect	Meets conditions
A gym attendant works in and around a sauna.	Collect	Meets conditions
A bicycle police officer patrols pedestrian areas during humid, summer months.	Collect as ‘Outdoors’	Weather-related.
A server retrieves orders from a restaurant kitchen where food preparation and dishwashing activities generate humidity. The kitchen has a commercial ventilation system.	Do not collect	Mitigated, not oppressive

8_07 Collecting ‘Hazardous Contaminants’

‘Hazardous Contaminants’ are present when the following condition is met:

Condition 1

- Workers are exposed to substances that may have a negative impact upon respiration, eyes, skin, or other living tissue.
- Exposure may be through inhalation, ingestion, or physical contact.

Exposure needs to be present, but does not have to be from primary job functions.

Employers may have protective procedures in place when these hazards exist. Collect the presence and type of personal protective equipment when the employer provides it.

Household cleaners do not present the level of negative impact needed to be considered Hazardous. Do not include biohazards such as blood and other bodily fluids in this element.

Note: For a list of potential hazards, see List of Potential Hazards in Appendix 2. Note this list is not exhaustive and typically, respondents will not know or provide these chemical names as listed. Collect Material Safety Data Sheets from the employer, if available, and document the chemical(s) present.

Examples	Action	Reason
An automotive mechanic breathes fumes from grease, oil, gas, and engine exhaust while working.	Collect	Meets conditions
A casino worker is exposed to second hand smoke from tobacco that contains benzene, arsenic, carbon monoxide, chromium metal, lead, and nicotine	Collect	Meets conditions
A cosmetologist applies strong chemicals such as bleach, dye, and tint to color hair.	Collect	Meets conditions
A farm worker, stacking hay and grain with a pitchfork, inhales large amounts of dust.	Collect	Meets conditions
An equipment operator tends machines that clean semiconductor wafers using cleaning solutions made of sulfuric acid and hydrochloric acid. Operators are not required to wear protective clothing.	Collect	Meets conditions

	A textile dye-machine operator works without protective clothing, tending equipment that mixes strong acids and anhydrous ammonia for use in bleaching and finishing carpets.	Collect	Meets conditions
	A glassworker at a historical museum uses old-fashioned methods to apply acids to etch glass.	Collect	Meets conditions
	A worker in a busy open-air tollbooth breathes auto exhaust all day.	Collect	Meets conditions
	An industrial metal finishing worker, wearing a respirator, pours pigments, paint paste, and thinner into cans and stirs with a paddle.	Do not collect duration	Mitigated by PPE. Does not meet threshold
	A tank truck driver drives trucks to deliver industrial application gases to customers.	Do not collect	Does not meet the threshold
	A paint store clerk breathes fumes while mixing small amounts of latex, low-VOC paint in a retail store.	Do not collect	Does not meet the threshold
	A teacher inhales chalk dust while using the blackboard.	Do not collect	Does not meet the threshold
	A hotel housekeeper cleans rooms using common household cleaning agents, such as window cleaner, tile cleaner, and furniture polish.	Do not collect	Does not meet the threshold
	A lifeguard works in a chlorinated swimming pool.	Do not collect	Does not meet the threshold

8_08 Collecting ‘Proximity to Moving Mechanical Parts’

‘Moving mechanical parts’ refers to moving materials, mechanical parts, settings, or any moving objects that could cause bodily injury.

‘Proximity to Moving Mechanical Parts’ are present when one of the following conditions exists:

Condition 1

- Equipment operated by the worker presents a risk of bodily injury.

Condition 2

- Machinery, equipment or any moving object near the worker could cause bodily injury.

Collect the presence and type of personal protective equipment when the employer provides it.

The mere presence of equipment in a work area, such as forklifts, cars, or other moving objects, does not meet the threshold. In such cases, the operator of the equipment bears primary responsibility for safe operation and protecting others from the associated hazard.

Risks associated with standard office equipment, such as shredders and copiers, also do not meet the threshold.

Examples	Action	Reason
A deli worker operates a slicer to cut meats and cheeses. Even with required safety guards in place, injury is possible.	Collect	Meets conditions
A landscaper uses a chipper/shredder to mulch branches and tree debris.	Collect	Meets conditions
The off-bearer of production machinery works close to the machine and could be injured if he lost consciousness.	Collect	Meets conditions
An accountant us a crosscut shredder. Snagged clothing could cause injury.	Do not collect	Does not meet the threshold
A cafeteria cook operates industrial mixers, with impenetrable protective guards, to prepare food items for lunch.	Do not collect duration	Mitigated

8_09 Collecting ‘Heavy Vibration’

‘Heavy Vibration’ is present when two conditions exist:

Condition 1

- Exposure to a shaking object or surface causes a strain on the body or extremities.

Condition 2

- Vibration is heavy.

Office machines, hair clippers and other small hand tools do not meet the threshold.

Examples	Action	Reason
A jackhammer operator runs a compressed air, rock-drilling machine that has continuous vibration.	Collect	Meets conditions
A printing press operator uses a cylinder type press that has continuous vibration while running.	Collect	Meets conditions
A bulldozer operator experiences intense vibration when the blade hits the ground and the bulldozer moves forward.	Collect	Meets conditions
A barber uses small clippers to trim hair along the neck.	Do not collect	Does not meet the threshold
A residential maintenance worker performs routine repairs with a handheld drill.	Do not collect	Does not meet the threshold
A teacher uses an electric pencil sharpener.	Do not collect	Does not meet the threshold

8_10 Collecting ‘High, Exposed Places’

‘High, Exposed Places’ is present when two conditions exist:

Condition 1

- The worker’s center of gravity is at least five feet off the ground, or
- The worker is at ground level and at risk of falling several feet below ground level.

Condition 2

- The worker is exposed and at risk of bodily injury from falling.
- There are no walls or railings surrounding a worker to lessen the possibility of falling.

Collect the presence and type of personal protective equipment when the employer provides it. Safety harnesses or tethers do not remove the possibility of injury.

Examples	Action	Reason
A painter works from ladders or scaffolding.	Collect	Meets conditions
A lineperson repairs power lines, working from the bucket of a cherry picker or climbing the pole.	Collect	Meets conditions
A tree trimmer cuts branches using canopies and truck-mounted lifts.	Collect	Meets conditions
Loading-dock workers are exposed and at risk of falling five feet or more.	Collect	Meets conditions
A retail sales clerk uses a step stool to reach items on upper shelves.	Do not collect	Does not meet the height threshold
A construction superintendent performs site inspections at high-rise construction projects. Not all walls or railings are complete but the superintendent never walks near the edges.	Do not collect	Not exposed.
A lifeguard, in a tower, is surrounded by a 5-foot railing.	Do not collect	Not exposed.

8_11 Collecting ‘Noise Intensity Level’

‘Noise Intensity Level’ is the amount of noise that a worker experiences while working. All work environments have a noise level. Collect the incidence of any hearing protection. Consider the examples provided below for each level of intensity.

Quiet

- Private office
- Mortuary
- Golf course
- Art museum

Moderate

- Business office
- Department store
- Fast food restaurant
- Grocery store

Loud

- Can manufacturing department
- Large earth moving equipment
- Heavy traffic

Very Loud

- Rock concert
- Jackhammer work
- Rocket engine testing area

Actual noise levels may not always match expectations (for example, a loud library). Collect actual levels that workers experience.

If noise levels vary within the work environment, collect the typical level. Do not automatically code the loudest level.

Collect the presence of personal protective equipment when the employer provides it. If a worker is required to use equipment that lessens *all* exposure, collect exposure as quiet.

Examples	Action
An accountant works in a private office with minimal noise and few interruptions.	Collect as quiet
A librarian works in a library that is quiet when no activities are taking place, but moderate during children's story hour, adult book club, and summer reading program. Activities occur more than half of each day.	Collect as moderate
A stone quarry worker hears explosions and heavy machinery throughout the day. Even with required hearing protection, sounds are loud.	Collect as loud
A landscaper uses chainsaws, chipper/shredders, and wet saws to cut pavers. The landscaper is not required to wear hearing protection.	Collect as very loud

Appendix 1

List of Potential Hazards

Air Contaminants

Acetaldehyde
Acetic acid
Acetic anhydride
Acetone
Acetonitrile
Acetylene
Acetylene dichloride;
Acetylene tetrabromide
A-Chloroacetophenone
Acridine, chrysene
Acrolein
Acrylamide
Acrylonitrile
Aldrin
Allyl alcohol
Allyl chloride
Allyl glycidyl ether
Allyl propyl disulfide
Alpha-Alumina
Alpha-Methyl styrene
Alpha-Naphthylamine
Aluminum Metal (as Al)
Ammonia
Ammonium sulfamate
Aniline and homologs
Anisidine
Anthracene, BaP
Antimony and compounds
ANTU (alpha)
Arsenic, inorganic
Arsenic, organic
Arsine
Asbestos
Azinphos-methyl
Barium sulfate
Barium, soluble
Benomyl
Benzene
Benzidine
Benzo(a)pyrene
Benzoyl peroxide
Benzyl chloride
Beryllium and
Beryllium compounds
Beta-Chloroprene
Beta-Naphthylamine
Beta-Propriolactone
Biphenyl; see Diphenyl
Bis(Chloromethyl)
Bismuth telluride
Boron oxide
Boron trifluoride
Bromine
Bromoform
Butadiene
Butanethiol
Butyl mercaptan
Butylamine
Butyl-m-cresol
Butyraldehyde (butanal)
Cadmium (as Cd)
Calcium Carbonate
Calcium hydroxide
Calcium oxide
Calcium silicate
Calcium sulfate
Camphor, synthetic
Carbaryl (Sevin)
Carbinol
Carbinol
Carbon black
Carbon dioxide
Carbon disulfide
Carbon monoxide
Carbon tetrachloride
Carbon tetrachloride
Cellosolve acetate
Cellulose
Ceramic fibers
Chlordane
Chlorinated camphene
Chlorinated diphenyl
Chlorine
Chlorine dioxide
Chlorine trifluoride
Chloroacetaldehyde
Chlorobenzene
Chlorobromomethane
Chlorodiphenyl
Chlorodiphenyl
Chloroethane (DDT)
Chloroethylene
Chloroform
Chloromethyl methyl
Chlorophenoxyacetic
Chloropicrin
Chloropropane (DBCP)
Chromates (as CrO(3))
Chromic acid
Chromium (II) compounds
Chromium (III)
Chromium (VI) compounds
Chromium metal
Chrysene; see Coal tar
Clopidol
Coal dust
Coal tar pitch
Cobalt metal, dust
Coke oven emissions
Copper
Cotton dust (e)
Crag herbicide (Sesone)
Cresol, all isomers
Cristobalite
Crotonaldehyde
Crystalline silica
Cumene
Cyanides (as CN)
Cyclohexane
Cyclohexanol
Cyclohexanone
Cyclohexene
Cyclopentadiene

Decaborane
Demeton (Systox)
Diacetone alcohol
Diatomaceous earth
Diazomethane
Diborane
Dibutyl phosphate
Dibutyl phthalate
Dichlorodifluoromethane
Dichlorodiphenyltri-
Dichloroethyl ether
Dichloromethane; see
Dichloromonofluoro-
Dichlorotetrafluoro-
Dichlorvos (DDVP)
Dicyclopentadienyl iron
Dieldrin
Diethyl ether
Diethylamine
Difluorodibromomethane
Diglycidyl ether (DGE)
Dihydroxybenzene
Diisobutyl ketone
Diisobutyl ketone
Diisopropylamine
Dimethoxymethane
Dimethyl acetamide
Dimethyl sulfate
Dimethyl-1,2-dibromo-2
Dimethylamine
Dimethylaminobenzene
Dimethylaniline
Dimethylbenzene
Dimethylformamide
Dimethylphthalate
Dinitrate
Dinitrobenzene
Dinitro-o-cresol
Dinitrotoluene
Dioxane
Diphenyl (Biphenyl)
Diphenylmethane
Dipropylene glycol
Di-sec octyl phthalate
Dust
Dusts and mists
Emery
Endrin
Epichlorohydrin
EPN
Ethanethiol
Ethanolamine
Ether (IGE)
Ethyl acetate
Ethyl acrylate
Ethyl alcohol (Ethanol)
Ethyl amyl ketone
Ethyl benzene
Ethyl bromide
Ethyl butyl ketone
Ethyl chloride
Ethyl ether
Ethyl formate
Ethyl mercaptan
Ethyl mercaptan
Ethyl silicate
Ethylamine
Ethylene chlorohydrin
Ethylene chlorohydrin
Ethylene dibromide
Ethylene dibromide
Ethylene dichloride
Ethylene dichloride
Ethylene glycol
Ethylene glycol methyl
Ethylene oxide
Ethylenediamine
Ethyleneimine
Ethylidene chloride
Ferbam
Ferrovanadium dust
Flour dust (inhalable)
Fluorides (as F)
Fluorine
Fluoromethane
Fluorotrichloromethane
Formaldehyde
Formic acid
Fume (as Cu)
Fume (as V2O5)
Fume and insoluble
Furfural
Furfuryl alcohol
Glycerin (mist)
Glycidol
Glycol monoethyl ether
Grain dust (oat, wheat)
Graphite, natural
Graphite, synthetic
Guthion
Gypsum
Hafnium
Heptachlor
Heptane (n-Heptane)
Heptanone
Hexachloroethane
Hexachloronaphthalene
Hexamethylene diisocyanate
Hexone (Methyl)
Hydrazine
Hydrogen bromide
Hydrogen chloride
Hydrogen cyanide
Hydrogen fluoride
Hydrogen peroxide
Hydrogen selenide
Hydrogen sulfide
Hydroquinone
Iodine
Iron oxide fume
Isobutyl acetate
Isobutyl alcohol
Isobutyl ketone
Isocyanate (MDI)
Isomyl acetate
Isomyl alcohol
Isophorone
Isopropanol
Isopropyl acetate
Isopropyl alcohol
Isopropyl ether
Isopropyl glycidyl
Isopropylamine
Kaolin
Ketene
Lead inorganic (as Pb)
Limestone
Lindane
Lithium hydride
LPG (Liquified)
Magnesite
Magnesium oxide fume
Malathion
Maleic anhydride
Malononitrile
Manganese compounds
Manganese fume (as Mn)
Marble
Metalworking fluids aerosol
Mercaptan
Mercury (aryl)
Mercury (organo) alkyl
Mercury (vapor) (as Hg)

Mesityl oxide
Metal
Methane
Methanethiol
Methoxychlor
Methyl acetate
Methyl acetylene
Methyl acetylene
Methyl acrylate
Methyl alcohol
Methyl amyl alcohol
Methyl bromide
Methyl butyl ketone
Methyl cellosolve
Methyl cellosolve
Methyl chloride
Methyl chloroform
Methyl ether
Methyl ethyl ketone
Methyl formate
Methyl hydrazine
Methyl iodide
Methyl isoamyl ketone
Methyl isobutyl
Methyl isobutyl ketone;
Methyl isocyanate
Methyl mercaptan
Methyl methacrylate
Methyl n-amyl ketone
Methyl nitramine
Methyl propyl ketone
Methylal
Methylamine
Methylcyclohexane
Methylcyclohexanol
Methylene bisphenyl
Methylene chloride
Mica (respirable)
Mica; see Silicates
M-isomer
Mixture, vapor
MOCA 4, 4'-Methylenebis#2-chloroaniline#
Molybdenum (as Mo)
Monomethyl aniline
Monomethyl hydrazine
Morpholine
N-Amyl acetate
Naphtha (Coal tar)
Naphthalene
Naphthylthiourea
N-Butyl alcohol
N-Butyl glycidyl ether
N-butyl ketone
N-Butyl-acetate
N-Ethylmorpholine
N-Hexane
Nickel carbonyl (as Ni)
Nickel, metal
Nickel, soluble
Nicotine
Nitramine
Nitric acid
Nitric oxide
Nitrobenzene
Nitroethane
Nitrogen dioxide
Nitrogen trifluoride
Nitroglycerin
Nitromethane
Nitrotoluene
Nitrotrichloromethane
N-Nitrosodimethylamine
N-Propyl acetate
N-Propyl alcohol
N-Propyl nitrate
O-Chlorobenzylidene
Octachloronaphthalene
Octane
O-Dichlorobenzene
Oil mist, mineral
O-isomer
O-Methylcyclohexanone
Osmium tetroxide
O-Toluidine
Oxalic acid
Oxide dust
Oxides (as Sn)
Oxyacetic acid
Oxygen difluoride
Ozone
Paraquat, respirable
p-Benzoquinone
p-Dichlorobenzene
Pentaborane
Pentachloride
Pentachloronaphthalene
Pentachlorophenol
Pentaerythritol
Pentane
Perchloroethylene
Perchloromethyl
Perchloryl fluoride
Petroleum distillates
Petroleum gas
Phenanthrene
Phenol
Phenyl ether, vapor
Phenyl ether-biphenyl
Phenyl glycidyl ether
Phenylethylene
Phenylhydrazine
Sodium hydroxide
Stoddard Solvent
Styrene
Tetrafluoroethylene
Tin, organic compounds
Titanium dioxide
Toluene
Toxaphene
Tremolite
Tributyl phosphate
Trichloroethylene
Trichloromethane
Trichloronaphthalene
Tridymite
Triethylamine
Trifluorobromomethane
Triorthocresyl
Triphenyl phosphate
Tripoli (as quartz)
Turpentine
Uranium (as U)
Vanadium
Vegetable oil mist
Vinyl benzene
Vinyl chloride
Vinyl cyanide
Vinyl toluene
Warfarin
Wood dust, all species except Western Red Cedar
Xylenes
Xylidine
Yttrium
Zinc chloride fume
Zinc oxide
Zinc oxide fume
Zinc stearate
Zirconium compounds

Toxic Substances

Benzene
Beryllium and beryllium compounds
Butyraldehyde (butanal)
Cadmium fume
Cadmium dust
Carbon disulfide
Carbon tetrachloride
Chromic acid and chromates
Ethylene dibromide
Ethylene dichloride
Fluoride as dust
Formaldehyde
Gasoline
Hydrogen fluoride
Hydrogen sulfide
Mercury
Methyl chloride
Methylene Chloride
MOCA 4,4'-Methylenebis#2-chloroaniline#
Organo (alkyl) mercury
Styrene
Sulfuric Acid
Tetrachloroethylene
Tetrahydrofuran
Toluene
Trichloroethylene

Mineral Dusts

Silica
Crystalline
Quartz
Cristobalite
Amorphous
Silicates
Mica
Soapstone
Talc
Tremolite
Asbestiform
Graphite
Coal Dust

Derived from https://www.osha.gov/SLTC/hazardoustoxicsubstances/index.html

Appendix 2

Common Objects and Their Weights

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 (standard thickness)
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

Glossary

Accommodation

A modification or adjustment to a job or change in the work environment that enables a person with a disability to compete equally or carry out the position's work (e.g., tasks, duties, responsibilities) as generally performed.

Adaptability

Measures the characteristics of an occupation that cause a worker to adjust to changes in work routine.

Associate's Degree

An undergraduate academic degree (Associate of Arts or Associates of Science) awarded upon completion of a course of study usually lasting two years. Only one of the two years is vocational education and counted toward SVP as the other year is considered general education. This is in contrast with vocational associate's degrees in which both years are vocational in nature and are included in SVP.

At Will

Timing of performing an activity is dictated by the employee's discretion.

Carrying

Transporting an object, usually by holding it in the hands, arms or on the shoulders.

Certification

A credential awarded by a certification body based on an individual demonstrating through an examination process that he or she has acquired the designated knowledge, skills, and abilities to perform a specific job. The examination can be either written, oral, or performance based. Certification is a time-limited credential that is renewed through a recertification process.

Change in Work Location

A change to a new worksite or from a discontinued work site.

Change in Work Task

The worker must remember new instructions, procedures, or similar information. This includes new work assignments, tasks that occur infrequently throughout the year, and irregular/variable tasks.

CIERA

The Compensation Information Entry and Review System is the data entry system for ORS.

Climbing Ladders/Ropes/Scaffolding

Ascending or descending ladders, scaffolding, ropes, poles and the like using feet and legs and/or hands and arms.

Climbing Ramps/Stairs

Ascending or descending ramps and/or stairs using feet and legs. Hands and arms may be used for balance (i.e., to hold a railing).

Combination Jobs

Jobs that encompass two or more distinct set of duties. Requires the coding of a primary SOC and the documentation of a secondary SOC.

Communicating Verbally

Expressing or exchanging ideas by means of the spoken word to impart oral information to clients or the public and to convey detailed spoken instructions to other workers accurately, loudly, or quickly.

Constant

2/3 or more of the time

Controlling Workflow

A worker can prioritize work tasks or can adjust the amount of time it takes to complete them.

Crawling

Moving about on hands and knees or hands and feet

Crouching

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

Credit-hour

One hour of classroom time each week for an entire semester (15 weeks).

Decision-making

A measure of the type and scope of decisions a worker in an occupation is expected to make.

Dictionary of Occupational Titles (DOT)

An occupational classification system developed by the U.S. Department of Labor's Employment Training Administration (ETA) used by the Social Security Administration in their disability programs.

Driving

Driving is the operation of a motorized passenger vehicle or other conveyance. A passenger vehicle is an automobile, van, or bus. Other vehicles may include trains and airplanes.

Duration

Measures the cumulative time spent performing a physical demand or exposure to an environmental condition. Both the interval (daily, weekly, quarterly) and work schedule contribute to duration.

Duration Formula

Percent of Time = [#repetitions per time period x time to perform each repetition per time period]

Duration Scale

A scale measuring the duration of an activity being performed used in the collection of Lifting/Carrying and as a fallback for all other data elements. Scale: Seldom (up to 2%), Occasionally (2% up to 1/3 of the time), Frequently (1/3 up to 2/3 of the time), and Constantly (2/3 or more).

Educational Certificate

A credential awarded by a training provider or educational institution based on completion of all requirements for a program of study, including coursework and tests or other performance evaluations. Educational certificates are typically awarded for life (like a degree).

Exertion

The physical effort that a worker uses to complete a task.

Experience

Measures the amount of prior relevant work activity.

Extreme Cold

40 degrees or below when exposed constantly (greater than or equal to 2/3 of the day) and 32 degrees or below when exposed frequently or less (less than 2/3 of the day). Indoor and job-related exposure only.

Extreme Heat

Above 85 degrees with humidity and above 90 degrees in a dry atmosphere. Indoor and job-related exposure only.

Far Visual Acuity

Clarity of vision at 20 feet or more. Not just the ability to see a person but to be able to recognize their features.

Fine Manipulation

Picking, pinching, or otherwise working primarily with fingers rather than the whole hand or arm as in Gross Manipulation.

Force

An interaction that changes the motion of an object.

Foot/Leg Controls

The use of one or both feet or legs to move controls on machinery or equipment. Controls include, but are not limited to, pedals, buttons, levers, and cranks.

Frequent

From 1/3 up to 2/3 of the time.

Gross Manipulation

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.

Hazardous Contaminants

Exposure that negatively affects the respiratory system, eyes, skin, or other living tissue via inhalation, ingestion or contact.

Hearing Requirements

Hearing requirements are the ability to hear, understand, and distinguish speech in person or by telephone and/or other sounds (e.g., machinery alarms, medical codes/alarms).

Heavy Vibration

Exposure to a shaking object(s) or surface(s) that causes a strain on the body or extremities

High, Exposed Places

Exposure to possible bodily injury from falling.

High School Vocational Education

Only count half of the time spent in high school vocational education towards SVP. A high school student spending six months at vo-tech would count for three months of SVP.

Humidity

Exposure to air that contains a high amount of water or water vapor in which the atmosphere is oppressive. Include only non-weather, job related exposure.

Interaction

The ability to cooperate with others, handle conflict, and respond to social cues, requests, and criticism.

Job

A group of workers in an establishment that have the same position. The term job refers to a single position in a single company, whereas occupation refers to a profession or trade. Example: “waiters at Smith’s Restaurant” is a job, whereas “waiters” is an occupation.

Keyboarding

Entering text or data into a computer or other machine by means of a keyboard, using a repetitive motion requiring the use of the whole hand.

Kneeling

Bending legs at knees to come to rest on knee(s).

License

A credential awarded by a government agency that constitutes legal authority to do a specific job. Licenses are based on some combination of degree or certificate attainment, certifications, assessments, or work experience; are time-limited; and must be renewed periodically.

Lifting

Raising or lowering an object from one level to another. This includes upward pulling.

Minimum Education

Measures the minimum level of formal coursework required of an occupation, excluding general education

Mitigation

When the employer installs devices, or requires the use of personal protective equipment that fully or partially eliminates potentially hazardous conditions or exposures.

Near Visual Acuity

Clarity of vision at approximately 20 inches or less, including use of computers.

Negligible Weight

So small an amount that measurement is not meaningful (e.g., a pen, a few sheets of paper).

Noise Intensity Level

The amount of noise that a worker experiences while working.

Occasional
From 2% up to 1/3 of the time.

Occupation
A generalized job or family of jobs common to many industries and areas, such as an economist or carpenter.

Outdoors
Exposure to weather-related atmospheric conditions such as heat, cold, rain, snow, or wind.

Overhead Reaching
Extending the arms with the hand goes higher than the head and, either the person bends the elbows with the shoulders at an angle of 90 degrees or more, or the person keeps the elbow extended, and the angle at the shoulder is 120 degrees or more.

Pace
The physical and cognitive speed needed to perform work tasks.

Pace of Work
The rate at which a worker must process new or incoming information or take physical action based on new information.

Passenger Vehicle
A motorized automobile, van, or bus.

Peripheral Vision
Observing an area that can be seen up and down or to the right or left while eyes are fixed on a given point.

Personal Protective Equipment (PPE)
Equipment used or worn to minimize exposure to serious workplace injuries and illnesses.

Post-employment Training
Measures the amount of training time occurring after an employee has been hired.

Pre-employment Training
The amount of time needed to complete training required as a condition for hiring.

Professional Degree
A credential that recognizes completion of academic requirements that emphasize skills and practical analysis over theory. Most, but not all, professional degrees are in professions that require licensing through recognized accrediting agencies in order to practice in the field.

Production Rate
Constant repetition of pushing/pulling requiring considerable strength or exertion at any weight.

Proximity to Moving Mechanical Parts
Operation of or proximity to materials, mechanical parts, settings, or any moving objects (most commonly moving machinery or equipment) that could cause bodily harm.

Pulling
Exerting force upon an object so that the object moves toward the force.

Pushing
Exerting force upon an object so that the object moves away from the force.

Reaching
Extending the hand(s) and arm(s) in any direction.

Reaching At/Below Shoulder
Reaching that is present but does not meet the threshold for Overhead Reaching.

Regular Contacts
Those people with whom a worker has an established working relationship.

Revised Handbook for Analyzing Jobs (RHAJ)
A guiding document for writing occupational descriptions created by the U.S. Department of Labor's ETA used in developing the 1991 revision of the Dictionary of Occupational Titles.

Seldom
Up to 2% of the time.

Sitting vs. Standing/Walking at Will
A worker has the flexibility to choose between sitting and standing throughout the day, there is no assigned time during the day to sit or stand, and no external factors determine whether an employee must sit or stand.

Skill Level
Work classification that divides occupations into unskilled, semi-skilled, or skilled work.

Semi-skilled Work
Work that requires some skill but does not require complex duties. Generally SVP of 3 or 4.

Sitting
A worker is either active or inactive in a seated position or prone. Active sitting involves pushing or pulling with feet/legs. A worker that is not standing, must be sitting.

Skilled Work
Work requiring high levels of judgment and adaptability; setting of realistic goals or independent planning; understanding, carrying out, and remembering of complex instructions; and often encompasses abstract ideas and problem solving. Generally SVP of 5 or greater.

Specific Vocational Preparation (SVP)
The amount of preparation 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. (See *Revised Handbook for Analyzing Jobs* 8-1).

Standing
Remaining on one's feet in an upright position without moving about; a worker walks about; or a worker is not sitting or prone.

Stooping

Bending the body forward and down, bending the spine at the waist and leaning down towards an object or the ground. Stooping can occur in a seated position, although it occurs most often while standing.

Strength

The capacity for exertion or endurance.

Task

A distinct activity assigned to or performed by workers in an occupation that results in a meaningful outcome.

Task List

A list of the typical tasks that are performed in an occupation. It is similar to job duties used in NCS leveling and the information used to select SOCs for occupations.

Threshold

A magnitude or intensity that must be met or exceeded for a certain condition to occur.

Touchscreen Keyboard

A touch sensitive keyboard display on a computer or other electronic device that uses repetitive finger or thumb motion, using the whole hand, for data entry.

Unskilled Work

Work that requires little or no judgment for simple duties that can be learned on the job in a short time period. Generally SVP of 1 or 2.

Vocational Associate's Degree

Count all two years for SVP as all time is usually vocational. This contrasts with a regular associate's degree where usually only one of the two years of time is vocational education so only one year counts towards SVP. Completion of a two-year technical or vocational program often results in an Associates of Applied Science degree.

Walking

Moving about on foot.

Wetness

Any contact with water or other liquids and/or working in a wet area.

Work as Generally Performed

Refers to the way in which most workers normally complete the duties, tasks, and responsibilities as assigned. Collection should include occupational information representative of the typical duties performed.

Work-Related Personal Interactions

The requirement of the worker in an occupation to cooperate with others, handle conflict, and respond to social cues, requests, and criticisms.

Work Review

Measures the frequency at which a machine, supervisor, or lead worker checks an individual's work to ensure performance standards are being met.

Work Location

The physical site where a worker performs the typical duties of the occupation.

Work Schedule

The regular recurring work hours and days for the occupation set by the employer.

Work Task

The regular duties of an occupation.