

# Recent Changes in the Census Industry and Occupation Classification Systems

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*American Community Survey*

By Julia B. Beckhusen

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Technical Paper 78

## Acknowledgments

This American Community Survey Technical Paper (ACS TP78) is an updated version of TP65 released in 2003 (U.S. Census Bureau, 2003) and the industry and occupation technical documentation released for the 2010 ACS. This report provides the detailed technical documentation for the most recent updates to the U.S. Census Bureau's industry and occupation classification systems. Most importantly, it includes conversion rates that data users need to convert data classified with the 2012 industry and 2010 occupation classification systems to data classified with the 2017 industry and 2018 occupation classification systems. In addition, this report provides a historical background of the Census Bureau's collection and classification of the industry and occupation topics in their household surveys.

ACS TP78 was completed with the assistance of many individuals. These individuals assisted in the review of the text and tables for technical, procedural, and grammatical accuracy. In addition to those assisting with the review of this report, many additional individuals played important roles in the complex process of updating the Census Bureau's industry and occupation system. This process took place over nearly 8 years, starting with revising the Standard Occupation Classification (SOC) system. The 2018 SOC revision process was carried out by the Standard Occupational Classification Policy Committee, which included representatives of nine federal agencies, including the Census Bureau. Updates to the Census Bureau's industry and occupation classification system included revisions based on updates to the SOC, along with Census Bureau-specific revisions. Analysts at Census Bureau headquarters, along with the Industry and Occupation Coding staff at NPC, worked together to implement the revisions, test the system, and review the coded survey data.

Here, I have attempted to list all of the individuals who worked on this project.

Individuals who assisted in updating the Census Bureau's industry and occupation system were: **Augustus Anderson, Julia Beckhusen, Aileen Bennett, Cheridan Christnacht, Samantha Cole, Rochelle Cooper, Richard Downs, Asiah Gayfield, Clayton Gumber, Liana Christin Landivar, Lynda Laughlin, Traci Least, Julia Manzella, Anthony Martinez, Ana J. Montalvo**, and the Industry and Occupation Coding Unit at the National Processing Center, Jeffersonville, Indiana, led by **Kathryn Brewer** and **Amanda Burns**.

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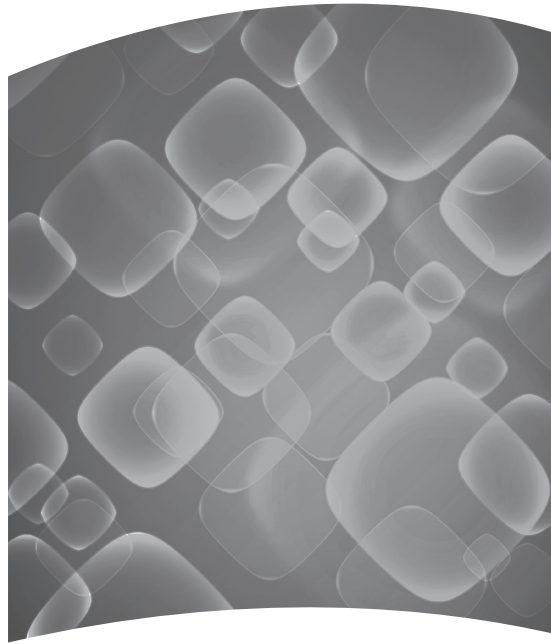
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## INTRODUCTION

The U.S. Census Bureau has collected and published data on industry and occupation for well over a century.<sup>1</sup> The industry and occupation classification system categorizes written responses into discrete numeric code lists of industries and occupations. All household Census Bureau surveys that include questions on industry and occupation use a similar methodology to assign a code.<sup>2</sup> The code lists are comprised of both a numeric code and a title or description.

The two most current classifications are the 2018 Census Occupation Code List, which includes 570 detailed occupation codes and titles, and the 2017 Census Industry Code List, which includes 271 detailed industry codes and descriptions. The Census Bureau began implementing the new lists in 2018.<sup>3</sup>

The Census Bureau code lists are based on even more comprehensive lists issued by the Office of Management and Budget (OMB). The 2017 Census Industry Code List is based on the 2017 North American Industry Classification System (NAICS).<sup>4</sup> Likewise, the 2018 Census Occupation Code List is based on the 2018 Standard Occupational Classification (SOC) system.<sup>5</sup> Both the industry and occupation classification systems created by the Census Bureau are aggregate versions of the NAICS and SOC. When either the NAICS or the SOC is updated, the Census Bureau updates their systems accordingly.

Because of the changes in 2018, some detailed industry categories and most major occupation groups and detailed categories are not directly comparable with categories in the previous

lists. In some cases, the updated classification may introduce a new industry or occupation. In other cases, a detailed industry or occupation that was included in the previous system may be aggregated with another in the updated classification. With each update to the classification system, the Census Bureau releases supporting documentation.

This report has two main objectives. First, this report describes the differences between the current and previous classification systems, specifically, the 2012 Census Industry Code List and the 2010 Census Occupation Code List. Second, the report provides a methodology for comparing industries and occupations between the current and previous classifications.

Census Bureau data on industry and occupation is typically disseminated in a tabular format on the Census Bureau Web site, where industry and occupation categories are displayed by their titles instead of their codes.<sup>6</sup> While many of the titles remain the same between classification systems, the underlying code, as well as the definition of the category, may have changed. For example, the job title “project management analysts” was categorized within the census occupation “managers, all other”—census code 0430—in 2010.<sup>7</sup> In 2018, it was assigned to its own census occupation title and code (project management specialists, 0705), while the occupation “managers, all other” kept the same title, but the underlying census code was changed to 0440. Consequently, the census occupation category seen on tables “managers, all other” is not comparable between 2010 and 2018. Likewise, aggregated occupation categories displayed in certain tables may not be comparable (e.g., using a table with aggregated occupation categories, the titles “management occupations” and “business and financial operations occupations” are not comparable between 2010 and 2018).

As a result, only tables that display data using the same classification system can be compared directly across time. For example, occupation tables with data from the American Community Survey (ACS) 1-year estimates should only be

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<sup>1</sup> The U.S. Census Bureau reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release. CBDRB-FY20-POP001-0066

<sup>2</sup> Examples of Census Bureau household surveys include the American Community Survey (ACS), the Current Population Survey, and the Survey of Income and Program Participation (SIPP).

<sup>3</sup> The census industry and occupation code lists are used in the coding of the write-in responses for industry and occupation of various household surveys collected by the Census Bureau. The implementation of the new code lists began with the 2018 ACS 1-year estimates.

<sup>4</sup> NAICS is maintained in partnership with U.S. Economic Classification Policy Committee (ECPC), Statistics Canada, and Mexico’s Instituto Nacional de Estadística y Geografía.

<sup>5</sup> The 2018 SOC revision process was carried out by the Standard Occupational Classification Policy Committee (SOCPC), which included representatives of 11 federal agencies, including the Census Bureau.

<sup>6</sup> Beginning in 2019, <<https://data.census.gov>> is the main dissemination platform for all Census Bureau data.

<sup>7</sup> Occupation titles and industry descriptions in the SOC and NAICS are capitalized, while census occupation titles and industry descriptions are not. In this report, we follow the practice of not capitalizing occupation titles or industry descriptions.

compared if the underlying data are from 2010 through 2017, since occupation data from those years were categorized using the 2010 Census Occupation Code List. The issue is similar with industry but applies to different years. Only tables showing industry data from 2013 through 2017 are completely comparable because they were categorized using the 2012 Census Industry Code List. However, there are typically fewer changes between one industry classification system and another, resulting in more categories being directly comparable over time across different systems.

In order to provide data users with the methodology and documentation necessary to compare data classified with the most recent industry and occupation system (2017 Census Industry Code List and 2018 Census Occupation Code List) to data from the previous classification systems (2012 Census Industry Code List and 2010 Census Occupation Code List), this report includes detailed crosswalks with conversion rates needed to transform the data. Conversion rates are the proportion of each code from the previous system that becomes part of a new code in the new system. There are multiple crosswalks for each system, industry, and occupation to capture differences by sex and educational attainment. This process is explained in detail in the section “Comparing Industry and Occupation Data Over Time.”

In addition, conversion rates were calculated separately for the full census code lists and for the Public Use Microdata Sample (PUMS) code lists. Many data users take advantage of the PUMS files to analyze ACS data.<sup>8</sup> In these files, the code lists for industry are a revised form of the census industry and occupation code lists described above. To follow data disclosure avoidance rules put forth by Census Bureau’s Disclosure Review Board, a number of categories are aggregated.<sup>9</sup> The previous PUMS code lists were released in 2012 for occupation and 2013 for industry. Both lists were updated in 2018 and separate documentation is provided in Appendix G of this report for comparing PUMS data between the two latest classification systems.

<sup>8</sup> For information on ACS PUMS files, visit <[www.census.gov/programs-surveys/acs/data/pums.html](http://www.census.gov/programs-surveys/acs/data/pums.html)>.

<sup>9</sup> There must be 10,000 weighted observations nationally in each industry code and occupation code; otherwise, the code is combined with another similar code.

The conversion rates were computed using 4 years of ACS data in which every record with particular 2010 occupation codes or 2012 industry codes was double-coded, or bridged, with new 2017 industry codes or 2018 occupation codes, respectively. The methodology presented in this report is similar to that used in previous reports that described previous updates to industry and occupation classification systems.<sup>10</sup>

## HISTORY OF CENSUS INDUSTRY AND OCCUPATION CLASSIFICATIONS

### 1820 to 1930

In 1820, the first question about occupation<sup>11</sup> appeared on the decennial census.<sup>12</sup> As shown in Figure 1, the enumerators, or census takers, were told to count those in the household who were “engaged in” agriculture, commerce, or manufacturing. The question was removed in 1830. In 1840, the question was added back and the categories were expanded to seven (mining; navigation of the oceans; navigation of the canals, lakes, and rivers; and learned professions and engineers were added). Beginning in 1850, the question was revised to be open-ended. Enumerators asked respondents for their “profession, occupation, or trade.”

To display the data, the responses were categorized into a list of 323 occupations and 16 aggregated groups (Edwards, 1943). While the question remained the same through 1900, the number of occupation categories varied, as well as the aggregated groups (Figure 2). The evolving nature of occupations was evident in these early years of collection. The Census Bureau released a report in 1904 that described the collection of occupation between 1820 and 1900, as well as how to compare these data across those years.<sup>13</sup>

<sup>10</sup> Previous technical papers include U.S. Census Bureau Technical Paper 65: The Relationship Between the 1990 Census and Census 2000 Industry and Occupation Classification Systems (issued October 2003); Technical Paper 59: The Relationship Between the 1970 and 1980 Industry and Occupation Classification Systems (issued February 1989); Technical Paper 26: 1970 Occupation and Industry Classification Systems in Terms of Their 1960 Occupation and Industry Elements (issued July 1972); and Technical Paper 18: Changes Between the 1950 and 1960 Occupation and Industry Classifications (issued 1968).

<sup>11</sup> Edwards (1943) described the question as occupation; however, the response categories could arguably be described as more akin to industry.

<sup>12</sup> For question text on each decennial census, see <[www.census.gov/history/www/through\\_the\\_decades/index\\_of\\_questions/](http://www.census.gov/history/www/through_the_decades/index_of_questions/)>.

<sup>13</sup> Occupations at the Twelfth Census (Hunt, 1904).

Figure 1.

## Timeline of Industry and Occupation Questions From 1820 to Present

INDUSTRY	YEAR	OCCUPATION
	<b>1820</b>	Number of persons (including slaves) engaged in agriculture, commerce, and manufactures
	<b>1830</b>	
	<b>1840</b>	The number of persons in each family employed in mining, agriculture, commerce, manufacture and trade, navigation of the ocean, navigation of canals, lakes and rivers, and learned professional engineers
	<b>1850–1880</b>	Profession, occupation, or trade
	<b>1890</b>	Profession, trade, or occupation
	<b>1900</b>	Occupation, trade, or profession
General nature of industry, business, or establishment in which the person works	<b>1910</b>	Trade or profession of, or particular kind of work done by this person
Industry, business, or establishment in which at work	<b>1920</b>	Trade or profession of, or particular kind of work done by this person
<b>1940: SIC introduced</b>	<b>1930–1940</b>	Trade, profession, or particular kind of work
What kind of business or industry was he working in?	<b>1950</b>	What kind of work was he doing?
For whom did he work?	<b>1960</b>	What kind of work was he doing?
What kind of business or industry was this?		
<b>1960: Industry and occupation questions moved to "long form."</b>		
Is this primarily...		
Manufacturing?		
Wholesale trade?		
Retail trade?		
Other (service, agriculture, government, construction, etc.)?		
For whom did he work?	<b>1970</b>	What kind of work was he doing?
What kind of business or industry was this?		What were his most important activities or duties?
Is this primarily...		What was his job title?
Manufacturing?		
Wholesale trade?		
Retail trade?		
Other (service, agriculture, government, construction, etc.)?		
For whom did he work?	<b>1980–2018</b>	What kind of work was this person doing?
What kind of business or industry was this?		What were this person's most important activities or duties?
Is this mainly...		
Manufacturing?		
Wholesale trade?		
Retail trade?		
Other (agriculture, construction, service, government, etc.)?		
<b>1997: NAICS introduced</b>		
		<b>1980: SOC introduced</b>

In 1910, a question on industry was added and enumerators asked about the “general nature of the industry, business, or establishment in which this person works.” Similar to occupation, the responses were categorized into a list of 131 industries. With this addition, enumerators were able to collect information on two distinct job characteristics: first, industry, which describes the kind of business of the respondent’s employer, and second, occupation, which describes the kind of work the respondent does at their job.

## DEFINITIONS

**Industry:** A description of the kind of business of the respondent’s employer.

**Occupation:** A description of the kind of work the respondent does at their job.

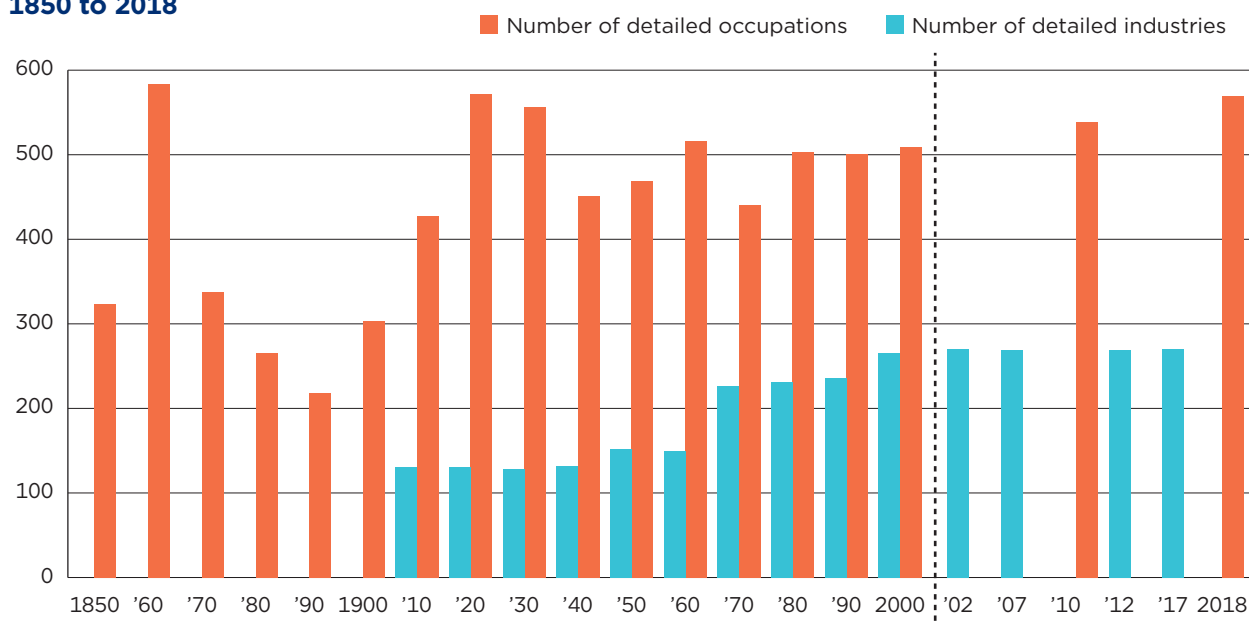
## 1940 to 1970

The next major change came with the 1940 industry classification system.<sup>14</sup> The Central Statistical Board established an interdepartmental

<sup>14</sup> The terms “classification system” and “code list” are used interchangeably. However, a classification system refers to both the code lists and the additional methods and tools used in coding (indexes of titles, coding procedures, etc.). All of these documents are explained in subsequent sections.

Figure 2.

### Number of Categories in the Industry and Occupation Census Classification Systems: 1850 to 2018



#### Notes:

Between 1850 and 1970, the U.S. Census Bureau created and maintained their own occupation classification system. Beginning with 1980, the Census Occupation Code List was based on the Standard Occupational Classification system.

Between 1910 and 1950, the Census Bureau created and maintained their own industry classification system. Beginning with 1960, the Census Industry Code List was based on the Standard Industrial Classification. In 2000, the North American Industry Classification System became the base.

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Committee on Industrial Classification in 1937 to create a more standard classification system for industry—the Standard Industrial Classification (SIC) system. The SIC categorized establishments by their “primary activity,” where an establishment was defined as “an economic unit, generally at a single physical location, where business is conducted or where services or industrial operations are performed” (OMB, 1987).

For the system to be used across the federal government, the committee worked to resolve the challenges involved with creating a system that would be useful to both agencies that performed household surveys and agencies that surveyed businesses.<sup>15</sup> In the end, the committee designed the classification system to have enough detail for business surveys but categorized so that household surveys could simply use a collapsed version of the list. The Census Bureau adopted the collapsed system as the new 1940 Census Industry Code List with 132 industries and 12 aggregate groups.

Also in the late 1930s, a separate group of federal agencies joined with organizations from the private sector to undertake a similar project for occupation classification. Their goal was less ambitious and encompassed reconciling the many occupation classification systems that existed at the time in lieu of creating a single standard system. The result was the publication “Convertibility List of Occupations with Conversion Tables and Industrial Classification for Reports from Individuals,” released with the 1940 Census of Population, which allowed data users to compare occupation statistics from the various agencies and organizations (Edwards, 1943; Palmer, 1939). While this report was not a classification system, it did serve as a primary source for the Census Bureau when updating their code list for the 1940 decennial census.

The 1940 Census Occupation Code List decreased from 557 categories in 1930 to 451 and instead of being divided into groups based on industry (e.g., agriculture, forestry and fishing, mining, manufacturing, etc.), the list was grouped by occupation type (e.g., professional and semiprofessional, farmers and farm managers, etc.). The occupation question remained the same between 1850 and

1950, with only minor variations to the wording “profession, occupation, or trade” (Figure 1). In 1950, the question was updated to “What kind of work does this person do?”

The next significant change to influence industry and occupation data came in 1960. Instead of the questions being asked of the entire population, they were moved to the decennial census “long form,” which only a sample of households received.<sup>16</sup> In addition, the questionnaire now included two more questions related to industry: “For whom did this person work?” and a “checkbox” for industry from which the respondent chose: manufacturing, wholesale trade, retail trade, or other. This three-question format for industry has been carried into the present. The purpose of these additions was to improve both the collection and coding of industry. Furthermore, ever since the introduction of the industry question in 1910, it had followed the occupation question; however, starting in 1960, the new industry questions were moved to precede the occupation question (U.S. Bureau of the Census, 1966).

Between 1950 and 1960, the Census Bureau also made minor updates to their industry code list, which mostly included movements of detailed categories from one major group to another following the 1957 SIC (U.S. Bureau of the Census, 1968). While the number of industry categories decreased from 152 to 150, the number of occupation categories in the census occupation code list expanded from 469 categories to 516. Additional occupation categories were added to nearly every major occupation group.

Alongside the changes to the classification systems, big improvements were made to the industry and occupation technical documentation released with each decennial census.<sup>17</sup> The Census Bureau began producing technical papers to describe the changes between the previous and new industry and occupation classification systems, as well as instructions on how to compare each between the two systems (Table 1).

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<sup>16</sup> The 1940 decennial census incorporated statistical sampling and 5 percent of respondents were asked 16 additional questions. In 1940 and 1950, questions on industry and occupation were included on the main questionnaire. In 1960, these questions were moved to the sample questionnaire (U.S. Bureau of the Census, 1966; Jenkins, 1983).

<sup>17</sup> Information on industry and occupation in each decennial census is also available in the procedural history reports released after each decennial census, available here: <[www.census.gov/history/www/through\\_the\\_decades/overview/](http://www.census.gov/history/www/through_the_decades/overview/)>.

Table 1.

### Historical Technical Papers Describing Changes Between the Previous and New Classification Systems

Technical paper #	Title	Year released
18	Changes Between the 1950 and 1960 Occupation and Industry Classifications—With Detailed Adjustments of 1950 Data to the 1960 Classifications	1968
26	1970 Occupation and Industry Classification Systems in Terms of Their 1960 Occupation and Industry Elements	1972
59	The Relationship Between the 1970 and 1980 Industry and Occupation Classification System	1989
65	The Relationship Between the 1990 Census and Census 2000 Industry and Occupation Classification Systems	2003

From 1960 forward, the Census Bureau would retabulate a sample of data from the previous decennial census using the new code list and the technical report would describe the work. Census Bureau analysts used these “double-coded” or “bridgecoded” data to calculate conversion rates that data users need to make intercensal comparisons. These conversion rates are described later in the section “Creation of the Conversion Rates.” For example, in 1968, Technical Paper 18 provided a list of changes between the new 1960 system from the old 1950 system (U.S. Bureau of the Census, 1968). It also included tables of data from the 1950 decennial census retabulated using the 1960 code lists allowing data users to make comparisons. The Census Bureau released similar reports after the 1970 and 2000 decennial censuses (Priebe, Heinkel, and Greene, 1972; U.S. Census Bureau, 2003).<sup>18</sup>

Following the improvements to the industry questions in 1960, the 1970 decennial census introduced two additional questions on occupation (Figure 1). The first new question asked for the “most important activities or duties,” while the second asked for the respondent’s job title. Similar to the additions in 1960, the main reason for the new questions was to obtain a greater level of detail and specificity in the respondents’ description of their occupations (U.S. Census Bureau, 1976).

For the 1970 decennial census, the industry code lists expanded to provide more detail, the industry list grew from 150 to 227, while the occupation list

decreased from 516 to 441. The Census Bureau implemented a second improvement related to data processing. Prior to 1970, both the industry and occupation code lists had a single category for “not reported”; however, in 1970, it was replaced with multiple “not reported” categories for each of the 12 major industry and occupation groups. Cases with missing industry or occupation responses were assigned to these new codes through allocation (U.S. Census Bureau, 1976).

In the mid-1970s, the Census Bureau joined with the Bureau of Labor Statistics, as well as other agencies to create the SOC system, published by OMB. The goal was to create a single system that could classify occupations for both household surveys and employer-based surveys (Levine, Salmon, and Weinberg, 1999). The SOC categorized any work for pay or for profit into detailed occupations based on the work performed (discussed in more detail in Recent Revisions to the Classification Systems) (U.S. Office of Federal Statistical Policy and Standards, 1980). The SOC included a description for each occupation, as well as a list of example job titles.<sup>19</sup> The SOC was released in 1980 and the Census Bureau revised their occupation code list to follow the new standard.

### 1980 to Present

The 1980 industry and occupation code lists increased the number of categories from 1970—231 detailed industries in 13 major groups and 503 detailed occupations in 13 major groups. In 1980, cases with missing industry or occupation data

<sup>18</sup> While no official reports were released after the 1990 decennial census or the 2010 ACS, technical documentation was provided to explain changes in the industry and occupation classification systems. This documentation can be found at <[www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html](http://www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html)>.

<sup>19</sup> The job titles used in the SOC came from the 1977 Dictionary of Occupational Titles (DOT), allowing the SOC to be crosswalked to other federal occupation systems that also used the DOT (OMB, 1995).

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were allocated into one of the detailed industry or occupation codes and the 12 separate “not reported” categories of the 1970 code lists were deleted. In addition to the updated code lists and processing of missing data, the “job title” question was dropped after a detailed study of occupation data from 1970 found the new question to be “less useful than expected” (U.S. Census Bureau, 1986).

Minor updates were made to the industry and occupation code lists for the 1990 decennial census. The 1980 and 1990 Census Occupation Code Lists were nearly identical—the 1980 SOC was the basis for both lists.<sup>20</sup> The 1990 Census Industry Code List was based on the 1987 SIC and experienced a small number of changes. The most notable difference for industry and occupation for the 1990 decennial census was the introduction of an automated coding system done using a computer.<sup>21</sup> Up to this point, clerical coders had solely coded industry and occupation (U.S. Census Bureau, 1990).

In 1992, OMB created the ECPC to review the SIC and create a new classification system from the ground up (ECPC, 1994). Ultimately, the ECPC joined with similar agencies from Mexico<sup>22</sup> and Canada<sup>23</sup> and together they developed the 1997 NAICS, which became the standard for industries in North America. While the SIC categorized establishments by their “primary activity,” the NAICS categorized establishments by the “similarity in the processes used to produce goods or services” (OMB, 2017). The Census Bureau revised the industry code list in 2000 to follow aggregated categories within the 1997 NAICS. The 2000 Census Industry Code List had 265 detailed industry categories in 20 sectors compared with the 1990 list, which had 236 detailed categories and 10 divisions, following the 1987 SIC revision (U.S. Census Bureau, 2003).

The SOC was revised again in 2000 after nearly a decade of research. The 1980 SOC organized occupations into divisions by required skill level, education, and credentials (U.S. Office of Federal Statistical Policy and Standards, 1980). However, in 2000, this methodology was abandoned and the focus was placed on structuring the SOC

by “job families,” so that people who worked together were classified in the same major groups (OMB, 2000). According to the report released to accompany the 2000 code lists, Technical Paper 65, none of the 22 divisions of 1990 were directly comparable with the new 23 major groups in 2000 (U.S. Census Bureau, 2003).

Once the major revisions to the 2000 code lists were complete, Census Bureau staff saw the need for greater flexibility when modifying the lists. Until that time, both lists used 3-digit codes ranging from 000 to 999. In 2002, a fourth digit was added to both lists by concatenating an additional zero to either the front or the back of the 2000 code. For example, 010 would become 0010 and 582 would become 5820. As a result, the Census Bureau published a set of 2000 code lists for industry and occupation, as well as a 2002 set of code lists. For occupation, the only difference in the two lists is the length of the codes. For industry, the 2002 code list included not only the increased code length but also some minor revisions corresponding to the new 2002 NAICS.

Prior to 2000, both the census industry and occupation systems were updated every 10 years to coincide with data releases from the decennial censuses. However, in the mid-1990s, the Census Bureau began testing the ACS as a potential replacement for the “long form.” Not only would the ACS include a detailed set of questions similar to the decennial long form, but it would be fielded monthly and data would be released annually. The full implementation of the ACS program began in 2005 with a sample of about 3 million addresses (U.S. Census Bureau, 2014). Industry and occupation questions on the ACS matched the 2000 decennial census, as shown in Figure 1.

With the introduction of the ACS, the code lists could potentially be updated more frequently than every 10 years. However, the Census Bureau decided to continue updating their classification system only following new versions of NAICS and SOC. New NAICS are released every 5 years, beginning with 1997, while the SOC manual is updated every 8 to 10 years, beginning with 1980. From 2003 to 2007, the Census Bureau classified industry and occupation data using the 2002 Census industry and occupation code lists,

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<sup>20</sup> OMB did not release an updated SOC until 2000.

<sup>21</sup> The new computer coding system was able to code 59 percent of the industry records and 38 percent of the occupation records (U.S. Census Bureau, 1990).

<sup>22</sup> Mexico's Instituto Nacional de Estadística y Geografía.

<sup>23</sup> Statistics Canada.

Table 2.

**Select Census Data Sets and Their Associated Industry and Occupation Code Lists**

	Census industry code list					Census occupation code list			
	2000	2002	2007	2012	2017	2000	2002	2010	2018
2000 Decennial Census	X					X			
ACS 2003		X					X		
ACS 2004		X					X		
ACS 2005		X					X		
ACS 2006		X					X		
ACS 2007		X					X		
ACS 2008			X				X		
ACS 2009			X				X		
ACS 2010			X					X	
ACS 2011			X					X	
ACS 2012			X					X	
ACS 2013				X				X	
ACS 2014				X				X	
ACS 2015				X				X	
ACS 2016				X				X	
ACS 2017				X				X	
ACS 2018					X				X
ACS 2019					X				X
SIPP 2001		X					X		
SIPP 2004		X					X		
SIPP 2008		X					X		
SIPP 2014				X				X	
SIPP 2018					X				X

## Notes:

Visit [www.census.gov/history/www/through\\_the\\_decades/overview/2000.html](http://www.census.gov/history/www/through_the_decades/overview/2000.html) to find additional information on the 2000 Decennial Census.

Detailed information on code lists used in the American Community Survey can be found at [www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html](http://www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html).

More information on the Survey of Income and Program Participation can be found at [www.census.gov/sipp/](http://www.census.gov/sipp/).

respectively (Downs, Tegler, and Weismantle, 2003).<sup>24</sup> Table 2 shows which code list was used in select Census Bureau data sets.

In 2007, the Census Bureau made minor updates to the industry code list, following the 2007 NAICS. The 2007 Census Industry Code List was implemented in the 2008 ACS.<sup>25</sup> In 2010, Census revised the occupation classification system according to the new 2010 SOC. The updates were minor, compared with those between 1990 and 2000. The 2010 Census Occupation Code List was implemented in the 2010 ACS. Thus, while updates

to occupation continued to be every 10 years, now the industry code lists were every 5 years. Luckily, the updates to NAICS typically involve only minor revisions and updates to the census industry code list have been few and straightforward.

In the mid-2010s, the SOCPC made the decision to release the next SOC sooner than the traditional 10 years. This decision was partly based on aligning the release of new occupation classification systems with that of industry (NAICS updates occur every 5 years, on years ending in “2” and “7”). Since NAICS is typically implemented in the year following the release, this meant that a new 2018 SOC would align with the 2017 NAICS in production.

Most recently, the Census Bureau released the 2018 ACS data in the fall. These data included industry and occupation coded to the 2017

<sup>24</sup> With the introduction of the ACS, the PUMS included its own set of industry and occupation code lists, which were a further aggregation of the census industry and occupation code lists. The aggregations are based on disclosure avoidance rules where each occupation must have 10,000 weighted observations. PUMS code lists are explained in Appendix G. ACS Public Use Microdata.

<sup>25</sup> Due to the timing of the NAICS release, the Census Bureau does not have enough time to implement the changes in the ACS until the subsequent year.

Census Industry Code List and the 2018 Census Occupation Code List, respectively. Currently, the Census Bureau classifies 271 industries in 20 sectors and 570 occupations in 23 major groups.<sup>26</sup>

## RECENT REVISIONS TO THE CLASSIFICATION SYSTEMS

In the early years of industry and occupation data collection, the Census Bureau created and maintained their own code lists. This changed in 1940 for industry and 1980 for occupation, when the Census Bureau joined with other agencies to create more uniform federal systems for each. Since those years, the Census Bureau has based their classification systems on the respective federal standard. The 2017 Census Industry Code List is based on the 2017 NAICS. Likewise, the 2018 census occupation system is based on the 2018 SOC system. Both the industry and occupation classification systems created by the Census Bureau are aggregate versions of the NAICS and SOC, respectively. The census lists maintain the same hierarchy of their base and every NAICS code and SOC code crosswalk to a single census industry or occupation code, respectively.

### Recent Industry Updates

The NAICS organizes industry by grouping establishments according to their process of production of goods and services. The system defines an establishment as a single structure where business is performed or services are rendered. This means that each establishment, within the same parent company, could potentially be classified as a

different industry. The first two principles used in developing and maintaining NAICS are:<sup>27</sup>

- NAICS will be erected on a production-oriented or supply-based conceptual framework. This means that producing units that use identical or similar production processes will be grouped together in NAICS.
- The system will give special attention to developing production-oriented classifications for (a) new and emerging industries, (b) service industries in general, and (c) industries engaged in the production of advanced technologies.

In 2017, there were 20 major industry categories, or sectors, as shown in Table 3, and 1,057 detailed industries (compared with 1,065 in 2012). NAICS uses a 2- through 6-digit hierarchical coding system, illustrated in Figure 3. The 2-digit codes refer to the most aggregated groups, or sectors, e.g., 44 retail trade. A 3-digit code refers to industry subsectors, e.g., 445 food and beverage stores. The fourth digit represents the industry group, e.g., 4452 specialty food stores. A 5-digit code reflects a NAICS industry; e.g., 44523 fruit and vegetable markets. Lastly, the sixth digit is used to represent a national industry. The sixth digit is used for country-specific codes. It will only be greater than zero when the industry is specific to the United States.

The NAICS manual also provides a description of each category along with illustrative examples of industry titles unique to that code.<sup>28</sup> Census industry codes correspond to NAICS at varying

<sup>26</sup> The 2017 Census Industry Code List includes seven military industries and one category for the unemployed. The 2018 Census Occupation Code List includes four military occupations and one category for the unemployed.

<sup>27</sup> There are a total of four principles in the 2017 NAICS.

<sup>28</sup> These illustrative examples are also contained in the NAICS Index File. The Census Bureau uses the NAICS Index File as an input to their coding system, explained in more detail in the section "Industry and Occupation Coding Process."

Figure 3.

### An Illustration of the NAICS 6-Digit Coding System

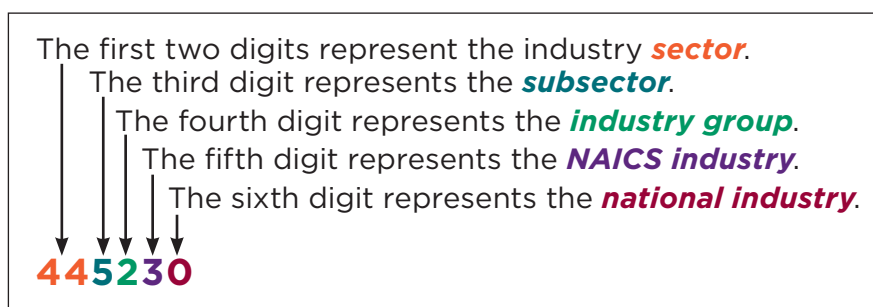


Table 3.

**The 20 Major Industry Categories: 2017**

Industry description	NAICS code	Census industry code
Agriculture, forestry, fishing and hunting	11	0170-0290
Mining, quarrying, and oil and gas extraction	21	0370-0490
Utilities	22	0570-0690
Construction	23	0770
Manufacturing	31-33	1070-3990
Wholesale trade	42	4070-4590
Retail trade	44-45	4670-5790
Transportation and warehousing	48-49	6070-6390
Information	51	6470-6780
Finance and insurance	52	6870-6992
Real estate and rental and leasing	53	7071-7190
Professional, scientific, and technical services	54	7270-7490
Management of companies and enterprises	55	7570
Administrative and support and waste management and remediation services	56	7580-7790
Educational services	61	7860-7890
Health care and social assistance	62	7970-8470
Arts, entertainment, and recreation	71	8561-8590
Accommodation and food services	72	8660-8690
Other services, except public administration	81	8770-9290
Public administration <sup>1</sup>	92	9370-9870

<sup>1</sup> The industry category “public administration” is limited to regular government functions such as legislative, judicial, administrative, and regulatory activities. Other government organizations, such as public schools, public hospitals, and bus lines, are classified by industry according to the activity in which they are engaged.

levels of aggregation—sometimes the full 6-digit code, but more frequently the 4-digit code. From the example in Figure 3, the 2017 census industry code 4980 (specialty food stores) crosswalks to the 2017 4-digit NAICS industry group 4452 (with the same title, specialty food stores). There are also instances where the census industry code crosswalks to multiple 4- or 5-digit NAICS codes within the industry subsector or industry group. For example, the census industry banking and related activities, 6870, corresponds to NAICS codes 521, 52211, and 52219.

The Census Bureau’s industry coding system uses a 4-digit code with codes from 0170 to 9920.<sup>29</sup> Unlike NAICS codes, the digits hold no significance.<sup>30</sup> Similar to NAICS, codes are updated when the industry experiences a significant change between classification systems. For example, if part of one census industry code moves to

another industry code, then both industry codes will receive new distinct codes in the new code list (e.g., the 2012 industry insurance carriers and related activities [6990] expanded into two new 2017 codes: insurance carriers [6991], and agencies, brokerages, and other insurance related activities [6992]).

In addition, if two industry codes are aggregated, the resulting industry will have a new distinct code. The next available code is used in order of sequence. For any new industry codes, they must not have been used in previous census industry code lists. Sometimes the industry code changes while the description remains the same.

In 2017, a number of changes to NAICS occurred within industries that are aggregated on the census code list resulting in no changes to census codes (e.g., oil and gas extraction, metal and ore mining, household appliance manufacturing, sound recording, scientific research and development services). The changes in NAICS that did affect the census industry code list stemmed either from the collapse of detailed industry codes, or from restructuring (in parentheses: NAICS code, census code):

<sup>29</sup> In both the census industry and occupation code lists, the code 9920 is a Census Bureau-specific code for unemployed. There are no counterparts in the NAICS or SOC for this code.

<sup>30</sup> Prior to the 1990 code list, in order to reduce coding errors, industry codes ended in digits 0, 1, or 2, while occupation codes ended in digits 3 through 9 so that no industry or occupation had the same code (U.S. Census Bureau, 1986). This coding scheme ended in 1990.

1. The 2017 NAICS aggregated the 2012 industries electronic shopping (545111, 5590), electronic auctions (545112, 5591), and mail-order houses (545113, 5592) into electronic shopping and mail-order houses (545110, 5593).
2. A part of the 2012 NAICS category discount department stores (452112, 5380) collapsed with warehouse clubs and supercenters (452910, 5390) to become the 2017 code (452311, 5391), warehouse clubs and supercenters. Any discount department store that sold “significant perishable groceries” switched to the industry, warehouse clubs and supercenters (452910, 5391).

In addition to the changes implemented due to changes in the NAICS, the Census Bureau also updated their code list in response to research using data collected from the ACS. Industries that declined significantly were collapsed with other similar industries, while growing industries with sufficient numbers were divided into multiple new industries to align with the more detailed NAICS industries. In addition to the two above, the Census Bureau made six notable changes between the 2012 and 2017 Industry Code Lists (census code in parentheses):

3. The Census Bureau expanded insurance carriers and related activities (6990) into insurance carriers (6991) and agencies, brokerages, and other insurance related activities (6992).
4. Census expanded real estate (7070) into lessors of real estate, and offices of real estate agents (7071) and brokers and agencies, brokerages, and other insurance related activities (7072) in 2017.
5. The Census Bureau aggregated video tape and disc rental (7170) with other consumer goods rental (7180) to the new industry other consumer goods rental (7181).
6. Census expanded hospitals (8190) into general medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals (8191) and psychiatric and substance abuse hospitals (8192).
7. The Census Bureau expanded performing arts, spectator sports, and related industries (8560) into performing arts companies (8561), spectator sports (8562), promoters of performing arts, sports, and similar events, agents and managers

for artists, athletes, entertainers, and other public figures (8563), and independent artists, writers, and performers (8564).

8. The Census Bureau aggregated personal and household goods repair and maintenance (8880) with footwear and leather goods repair (8890) to new industry personal and household goods repair and maintenance (8891).

Altogether, between 2012 and 2017, 18 industries were deleted and 19 were added, resulting in 271 industries in the 2017 Census Industry Code List (see Appendix A, Table A-1). Including changes due to the NAICS (first list) and those based on ACS research (second list), 91 percent of the census code list did not change between 2010 and 2018.

### Recent Occupation Updates

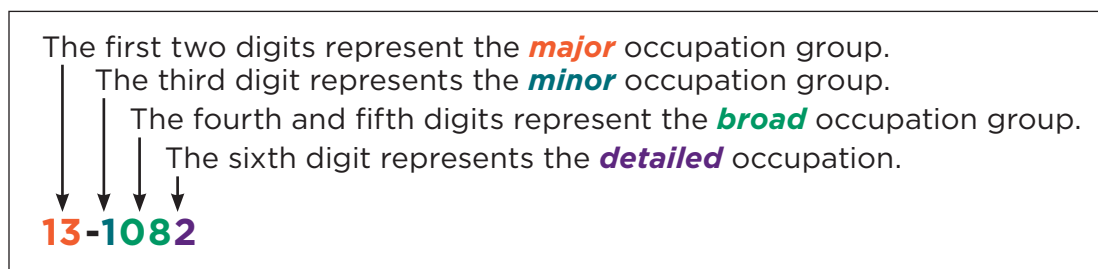
The SOC organizes all work performed for pay or profit into detailed occupations by the work performed or usual activities at the job. Education and training are only considered in certain cases. The first two principles<sup>31</sup> for maintaining the SOC are:

- The SOC covers all occupations in which work is performed for pay or profit, including work performed in family-operated enterprises by family members who are not directly compensated. It excludes occupations unique to volunteers. Each occupation is assigned to only one occupational category at the most detailed level of the classification.
- Occupations are classified based on work performed and, in some cases, on the skills, education, and/or training needed to perform the work.

The SOC uses a 6-digit coding system with a hyphen between the first two digits and the last four, as shown in Figure 4. The first two digits of the code represent the major group: for example, 13-0000 business and financial operations occupations. The following two digits represent the minor group: for example, 13-1000 business operations specialists. Broad occupations have a zero as the last digit: for example, 13-1080 logisticians and project management specialists. Detailed occupations end with a number greater than zero: for example, 13-1082 project management

<sup>31</sup> There are 10 principles in the 2018 SOC.

**Figure 4.**  
**An Illustration of the SOC 6-Digit Coding System**



specialists. Finally, codes ending in 90 represent residual broad groups, for example, 13-2090 miscellaneous financial specialists, and codes ending in 99 represent residual detailed groups, for example, 13-2099 financial specialists, all other. Accompanying each detailed SOC code is a list of illustrative examples or job titles that are unique to that occupation.<sup>32</sup>

Since education and skill level are secondary to work performed, trainees and apprentices are classified in the same detailed occupation as the trained workers. Workers who primarily supervise others in activities that they themselves often perform are categorized alongside the workers they supervise within the same minor group. The 2018 SOC classified 867 detailed occupations grouped into 459 broad categories, 98 minor groups, and 23 major groups, as shown in Table 4.

The Census Bureau occupation coding system follows the 23 major groups and consists of 4-digit codes ranging from 0010 to 9920.<sup>33</sup> Unlike SOC codes, the digits of census codes hold no significance. Similar to the SOC, census codes are updated when the occupation experiences a significant change from the previous code list. For example, if a job title moves from one detailed occupation to another, then both of those detailed occupation codes will receive new distinct codes in the new code list. In addition, occupation codes change if two detailed occupations are aggregated, or when occupation codes expand into multiple new codes. In each case, the new occupations get new, distinct codes.

<sup>32</sup> The SOCPC maintains the Direct Match Title File (DMTF) that also includes these job titles. The Census Bureau uses the DMTF as an input to their coding system, explained in more detail in the section “Industry and Occupation Coding Process.”

<sup>33</sup> In both the census industry and occupation code lists, the code 9920 is a Census Bureau-specific code for unemployed. There are no counterparts in the SOC or NAICS for this code.

The new occupation code assigned is in order of sequence and was not used in a previous occupation code list. Similar to changes in industry, it is possible for the detailed occupation to be assigned a new code but no change in title. For example, when the occupation managers, all other (0430) needed a new code for 2018, 0440 was assigned but the title “managers, all other,” remained the same.

Every census occupation code crosswalks to an SOC detailed occupation, a broad occupation group, or a minor occupation group. For example, census occupation code 2205, postsecondary teachers, crosswalks to the SOC minor group 25-1000, of the same title; code 2300, preschool and kindergarten teachers, crosswalks to the SOC broad group 25-2010, of the same title; and the census code 2350, tutors, crosswalks to the SOC detailed occupation 25-3041, of the same title.

Some census codes crosswalk to multiple detailed SOC codes, where the SOC codes are from different broad groups but do not include all detailed SOC codes in that broad group. For example, census code 2360, other teachers and instructors, crosswalks to the SOC code 25-30XX, which includes 25-3011, 25-3021, 25-3031, and 25-3099.<sup>34</sup> These detailed codes are from multiple broad groups. The Census Bureau aggregates them since they are not able to show them separately—the typical reason for aggregation is the number of workers in the detailed occupations is too small. In these instances, the Census Bureau uses the XX and YY designations as part of the SOC codes to indicate that the census code only corresponds to part of the SOC broad group.

<sup>34</sup> The SOC occupation titles for these codes are as follows: 25-3011 adult basic education, adult secondary education, and English as a second language instructors; 25-3021 self-enrichment teachers; 25-3031 substitute teachers, short-term, and 25-3099 teachers and instructors, all other.

Table 4.

**The 23 Major Occupation Categories: 2018**

Occupation title	Standard occupational classification code	Census occupation code
Management occupations	11-0000	0010-0440
Business and financial operations occupations	13-0000	0500-0960
Computer and mathematical occupations	15-0000	1005-1240
Architecture and engineering occupations	17-0000	1305-1560
Life, physical, and social science occupations	19-0000	1600-1980
Community and social service occupations	21-0000	2001-2060
Legal occupations	23-0000	2100-2180
Educational instruction and library occupations	25-0000	2205-2555
Arts, design, entertainment, sports, and media occupations	27-0000	2600-2970
Healthcare practitioners and technical occupations	29-0000	3000-3550
Healthcare support occupations	31-0000	3601-3655
Protective service occupations	33-0000	3700-3960
Food preparation and serving related occupations	35-0000	4000-4160
Building and grounds cleaning and maintenance occupations	37-0000	4200-4255
Personal care and service occupations	39-0000	4330-4655
Sales and related occupations	41-0000	4700-4965
Office and administrative support occupations	43-0000	5000-5940
Farming, fishing, and forestry occupations	45-0000	6005-6130
Construction and extraction occupations	47-0000	6200-6950
Installation, maintenance, and repair occupations	49-0000	7000-7640
Production occupations	51-0000	7700-8990
Transportation and material moving occupations	53-0000	9005-9760
Military specific occupations	55-0000	9800-9830

A number of census occupations do not cross-walk to the most detailed SOC. This can make implementing changes to the census code list complicated when a detailed SOC occupation moves from one broad, minor, or major group to another. In addition, when a detailed SOC occupation moves between major groups, it makes those major groups incomparable between the two systems. Even though the majority of published occupation tables show data by the major occupation groups, data users still must use caution when comparing tables that use different census occupation code lists. Data users can make comparisons if adjustments are made to older data. This process is explained below in “Comparing Industry and Occupation Data over Time.” Fortunately, only a small number of these types of moves occur due, in part, to the last SOC principle, “to maximize the comparability of data, time series-continuity is maintained to the extent possible.”

Between 2010 and 2018, 12 percent of the detailed occupations within the SOC changed significantly (OMB, 2018). The most significant changes to the

code list occurred in the minor group computer occupations (SOC code 15-1200) and the major groups healthcare practitioners and technical occupations (SOC code 29-0000) and healthcare support occupations (SOC code 31-0000). The most notable of these changes, which also affected the census code list, were as follows (in parentheses: SOC code, census code):

1. The 2010 SOC detailed occupation administrative services managers (11-3011, 0100) expanded into administrative services managers (11-3012, 0101) and facilities managers (11-3013, 0102).
2. The 2010 SOC broad group gaming managers (11-9070) was updated to include the new detailed occupation entertainment and recreation managers, except gambling (11-9072), and was renamed entertainment and recreation managers (11-9070). The 2010 census occupation gaming managers (0330) cross-walked to the detailed 2010 SOC occupation gaming managers (11-9071). Given the addition of entertainment and recreation managers,

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except gambling (11-9072), the 2010 census occupation gaming managers (0330, 11-9071) will be deleted and replaced by entertainment and recreation managers (0335, 11-9070), which crosswalks to the broad group. Workers in the new 2018 SOC occupation entertainment and recreation managers, except gambling, had been coded as managers, all other (11-9199, 0430) in 2010.

3. Personal service managers, all other (11-9179, 0426) was added as a new 2018 SOC occupation and census occupation. These workers had been coded as managers, all other (11-9199, 0430).
4. Project management specialists (13-1082, 0705) was added as a new 2018 SOC occupation and census occupation. These workers had been coded into one of three 2010 occupations: managers, all other (11-9199, 0430), business operations specialists, all other (13-1199, 0740), or computer occupations, all other (15-1199, 1107).
5. Two new computer occupations were added as a new 2018 SOC detailed occupations and census occupations: software quality assurance analysts and testers (15-1253, 1022) and Web and digital interface designers (15-1255, 1032). Software quality assurance analysts and testers (15-1253, 1022) had been coded as either software developers, applications and systems software (15-113X, 1020) or as computer workers, all other (15-1199, 1107) in the 2010 SOC. Web and digital interface designers (15-1255, 1032) had been coded into Web developers (15-1134, 1030) or computer workers, all other (15-1199, 1107) in the 2010 SOC.
6. Between 2010 and 2018, the detailed 2010 SOC occupation 25-1191 graduate teaching assistants moved to 25-9044 teaching assistants, postsecondary. Neither the 2010 nor the 2018 Census Occupation Code Lists shows these detailed codes. In the 2010 Census Occupation Code List, the SOC occupation graduate teaching assistants (25-1191) were coded as 2200 postsecondary teachers (25-1000) and the SOC occupation teacher assistants (25-9041) were coded as 2540 teacher assistants (25-9041). With the move of graduate teaching assistants to the broad group teaching assistants, postsecondary (25-9040), the 2018 Census Occupation Code List updated the occupations to 2205 postsecondary teachers (25-1000) and 2545 teaching assistants (25-9040).
7. Tutors (25-3041, 2350) was added as a new 2018 SOC occupation and census occupation. These workers had been classified as other teachers and instructors (25-3000, 2340) in 2010.
8. Disc jockeys, except radio (27-2091, 2755) was added as a new 2018 SOC occupation and census occupation. These workers had been classified in 2010 as entertainers and performers, sports and related workers, all other (27-2099, 2760).
9. Between 2010 and 2018, the SOC moved the occupation title lighting technicians from 27-4099 to 27-4015. In the 2010 Census Occupation Code List, lighting technicians (27-4099) were coded to 2960 media and communication equipment workers, all other (27-4099). In the 2018 Census Occupation Code List, lighting technicians (27-4015) were now coded to 2905 broadcast, sound, and lighting technicians (27-4010). With the move, 2960 media and communication equipment workers, all other (27-4099) was revised to 2970 media and communication equipment workers, all other (27-4099).
10. Acupuncturists (29-1291, 3261) was added as a new 2018 SOC occupation and census occupation. In 2010, these workers had been classified as health diagnosing and treating practitioners, all other (29-1199, 3260).
11. The 2010 SOC occupation emergency medical technicians and paramedics (29-2041, 3400) expanded into emergency medical technicians (29-2042, 3401) and paramedics (29-2043, 3402).
12. Occupational health and safety specialists and technicians (19-5010, 1980) was added as a new 2018 SOC occupation and census occupation. In 2010, these workers had been classified as other healthcare practitioners and technical occupations (29-9000, 3540).
13. First-line supervisors of security workers (33-1091, 3725) was added as a new 2018 SOC occupation and census occupation. In 2010,

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these workers had been classified as first-line supervisors of protective service workers, all other (33-1099, 3730).

14. School bus monitors (33-9094, 3946) was added as a new 2018 SOC occupation and census occupation. In 2010, these workers had been classified as lifeguards and other recreational, and all other protective service workers (33-909X, 3955).
15. The 2018 SOC aggregated the occupations combined food preparation and serving workers, including fast food (35-2021, 4050) and counter attendants, cafeteria, food, concession, and coffee shop (35-3022, 4060) to create the single occupation fast food and counter workers (35-3023, 4055).
16. Between 2010 and 2018, the SOC moved personal care aides (39-9021, 4610) to a different major group—31-0000 healthcare support occupations—and recoded to the SOC code 31-1122 and census code 3602.
17. Between 2010 and 2018, the SOC moved stockers and order fillers (43-5081, 5620) to a different major group—53-0000 transportation and material moving occupations—and recoded to the SOC code 53-7065 and census code 9645.
18. The 2010 SOC detailed occupation computer operators (43-9011, 5800) was deleted and replaced with an occupation title in the detailed occupation 2018 SOC occupation computer occupations, all other (15-1299, 1108).
19. Between 2010 and 2018, the SOC detailed occupation 27-4013 radio operators was deleted and replaced with an occupation title in 43-2099 communications equipment operators, all other. In the 2010 Census Occupation Code List, radio operators (27-4010) were coded to broadcast and sound engineering technicians and radio operators (27-4010, 2900). With the deletion and replacement of 27-4013 by 43-2099 in 2018, the census occupation code list updated the occupations to 2905 broadcast, sound, and lighting technicians (27-4010) and 5040 communications equipment operators, all other (43-2099).
20. The 2018 SOC aggregated the occupations fishers and related fishing workers (45-3011, 6100) and hunters and trappers (45-3021, 6110) into one 2018 code fishing and hunting workers (45-3031, 6115).
21. Between 2010 and 2018, the SOC moved 47-5061 roof bolters, mining to 47-5043. In the 2010 Census Occupation Code List, roof bolters, mining (47-5061) were coded to 6910 roof bolters, mining. In the 2018 Census Occupation Code List, roof bolters, mining (47-5043) were coded as 6850 underground mining machine operators (47-5040).
22. The 2010 SOC occupation taxi drivers and chauffeurs (53-3041, 9140) expanded into shuttle drivers and chauffeurs (53-3053, 9141) and taxi drivers (53-3054, 9142).
23. The SOC broad occupation group dredge, excavating, and loading machine operators (53-7030, 9520) was broken up. Two of the three detailed occupations in the broad group was moved to another major occupation group. First, excavating and loading machine and dragline operators (53-7032) moved to excavating and loading machine and dragline operators, surface mining (47-5022). Second, loading machine operators, underground mining (53-7033) moved to loading and moving machine operators, underground mining (47-5044). These moves left dredge operators (53-7031) as the only detailed occupation in the broad group of 53-7030. As a result, the 2010 census occupation dredge, excavating, and loading machine operators (9520) was deleted and 53-7030 dredge operators was combined with other occupations to the 2018 occupation conveyor, dredge, and hoist and winch operators (53-70XX, 9570).
24. Between 2010 and 2018, the SOC occupation mine shuttle car operators (53-7111, 9730) was deleted and replaced with the occupation title in loading and moving machine operators, underground mining (47-5044), which is included in the 2018 census occupation underground mining machine operators (47-5040, 6850).

The 2018 Census Occupation Code List includes changes based on the changes to the SOC, as

listed above, as well as changes based on research with ACS data. Census Bureau analysts studied trends in the counts of workers in census occupations to look for either growing or declining occupations. Additionally, analysts examined ACS write-in data for emerging, evolving, and growing occupations. The notable changes based on this research were as follows (SOC code, census code):

1. The Census Bureau expanded the 2010 occupation marketing and sales managers (11-2020, 0050) to the SOC detailed occupation level of marketing managers (11-2021, 0051) and sales managers (11-2021, 0052) for 2018.
2. The Census Bureau expanded the 2010 occupation architects, except naval (17-1010, 1300), to the SOC detailed occupation level of architects, except landscape and naval (17-1011, 1305) and landscape architects (17-1012, 1306) for 2018.
3. The Census Bureau expanded the 2010 occupation drafters (17-3010, 1540) to the SOC detailed occupation level of architectural and civil drafters (17-3011, 1541) and other drafters (17-301X, 1545) for 2018.
4. The Census Bureau expanded the 2010 occupation engineering technicians, except drafters (17-3020, 1550), to the SOC detailed occupation level of electrical and electronic engineering technologists and technicians (17-3023, 1551) and other engineering technologists and technicians, except drafters (17-302X, 1555) for 2018.
5. The Census Bureau expanded the 2010 occupation environmental scientists and geoscientists (19-2040, 1740) to the SOC detailed occupation level of environmental scientists and specialists including health (19-2041, 1745) and geoscientists and hydrologists, except geographers (19-204X, 1750) for 2018.
6. The Census Bureau expanded the 2010 occupation psychologists (19-3030, 1820) to the SOC detailed occupation level of clinical and counseling psychologists (19-3033, 1821), school psychologists (19-3034, 1822), and other psychologists (19-303X, 1825) for 2018.
7. The Census Bureau expanded the 2010 occupation counselors (21-1010, 2000) to the full SOC detailed occupation level of substance abuse and behavioral disorder counselors (21-1011, 2001), educational, guidance, and career counselors and advisors (21-1012, 2002), marriage and family therapists (21-1013, 2003), mental health counselors (21-1014, 2004), rehabilitation counselors (21-1015, 2005), and counselors, all other (21-1019, 2006) for 2018.
8. The Census Bureau expanded the 2010 occupation social workers (21-1020, 2010) to the full SOC detailed occupation level of child, family, and school social workers (21-1021, 2011), healthcare social workers (21-1022, 2012), mental health and substance abuse social workers (21-1023, 2013), and social workers, all other (21-1029, 2014) for 2018.
9. The Census Bureau expanded the 2010 occupation miscellaneous legal support workers (23-2090, 2160) to the full SOC detailed occupation level of title examiners, abstractors, and searchers (27-2093, 2170) and legal support workers, all other (23-2099, 2180) for 2018. In addition, a third detailed occupation that was included within 23-2090 in the 2010 SOC was moved to the major group 27-0000 arts, design, entertainment, sports, and media occupations: court reporters and simultaneous captioners (27-3092, 2862).
10. The Census Bureau expanded the 2010 occupation designers (27-1020, 2630) to the SOC detailed occupation level of commercial and industrial designers (27-1021, 2631), fashion designers (27-1022, 2632), floral designers (27-1023, 2633), graphic designers (27-1024, 2634), interior designers (27-1025, 2635), merchandise displayers and window trimmers (27-1026, 2636), and other designers (27-102X, 2640) for 2018.
11. The Census Bureau expanded the 2010 occupation athletes, coaches, umpires, and related workers (27-2020, 2720) to the full SOC detailed occupation level of athletes and sports competitors (27-2021, 2721), coaches and scouts (27-2022, 2722), and umpires, referees, and other sports officials (27-2023, 2723) for 2018.
12. The Census Bureau expanded the 2010 occupation musicians, singers, and related workers (27-2040, 2750) to the full SOC detailed occupation level of music directors and composers

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- (27-2041, 2751) and musicians and singers (27-2042, 2752) for 2018.
13. The Census Bureau expanded the 2010 occupation miscellaneous media and communication workers (27-3090, 2860) to the full SOC detailed occupation level of interpreters and translators (27-3091, 2861) and media and communication workers, all other (27-3099, 2865) for 2018. Also, court reporters and simultaneous captioners (27-3092, 2862) moved to this occupation group (see #9) above.
  14. The Census Bureau expanded the 2010 occupation physicians and surgeons (29-1060, 3060) to the SOC detailed occupation level of emergency medicine physicians (29-1214, 3065), radiologists (29-1224, 3070), other physicians (29-12XX, 3090), and surgeons (29-1240, 3100) for 2018.
  15. The Census Bureau expanded the 2010 occupation diagnostic related technologists and technicians (29-2030, 3320) to the SOC detailed occupation level of cardiovascular technologists and technicians (29-2031, 3321), diagnostic medical sonographers (29-2032, 3322), radiologic technologists and technicians (29-2034, 3323), magnetic resonance imaging technologists (29-2035, 3324), and nuclear medicine technologists and medical dosimetrists (29-203X, 3330) for 2018.
  16. The Census Bureau expanded the 2010 occupation health practitioner support technologists and technicians (29-2050, 3420) to the SOC detailed occupation level of pharmacy technicians (29-2052, 3421), psychiatric technicians (29-2053, 3422), surgical technologists (29-2055, 3423), veterinary technologists and technicians (29-2056, 3424), and dietetic technicians and ophthalmic medical technicians (29-205X, 3430) for 2018.
  17. The Census Bureau expanded the 2010 occupation nursing, psychiatric, and home health aides (31-1010, 3600) to the SOC detailed occupation level of home health aides (31-1121, 3601), nursing assistants (31-1131, 3603), and orderlies and psychiatric aides (31-113X, 3605) for 2018. In addition, personal care aides moved to this minor group (31-1122, 3602)—see #16.
  18. The Census Bureau expanded the 2010 occupation bailiffs, correctional officers, and jailers (33-3010, 3800) to the full SOC detailed occupation level of bailiffs (33-3011, 3801) and correctional officers and jailers (33-3012, 3802) for 2018.
  19. The 2010 Census occupations police and sheriff's patrol officers (33-3051, 3850) and transit and railroad police (33-3052, 3860) were aggregated to the SOC broad group level of police officers (33-3050, 3870) for 2018.
  20. The Census Bureau expanded the 2010 occupation grounds maintenance workers (37-3010, 4250) to the SOC detailed occupation level of landscaping and groundskeeping workers (37-3011, 4251), tree trimmers and pruners (37-3013, 4252), and other grounds maintenance workers (37-301X, 4255) for 2018.
  21. The 2010 Census occupations first-line supervisors of gaming workers (39-1010, 4300) and first-line supervisors of personal service workers (39-1021, 4320) were aggregated to the SOC minor group level of supervisors of personal care and service workers (39-1000, 4330) for 2018.
  22. The Census Bureau expanded the 2010 occupation miscellaneous personal appearance workers (39-5090, 4520) to the SOC detailed occupation level of manicurists and pedicurists (39-5092, 4521), skincare specialists (39-5094, 4522), and other personal appearance workers (39-509X, 4525) for 2018.
  23. The Census Bureau expanded the 2010 occupation recreation and fitness workers (39-9030, 4620) to the full SOC detailed occupation level of exercise trainers and group fitness instructors (39-9031, 4621) and recreation workers (39-9032, 4622) for 2018.
  24. The Census Bureau expanded the 2010 occupation dispatchers (43-5020, 5520) to the full SOC detailed occupation level of public safety telecommunicators (43-5031, 5521) and dispatchers, except police, fire, and ambulance (43-5032, 5522) for 2018.
  25. The Census Bureau expanded the 2010 occupation secretaries and administrative assistants (43-6010, 5700) to the full SOC detailed

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- occupation level of executive secretaries and executive administrative assistants (43-6011, 5710), legal secretaries and executive administrative assistants (43-6012, 5720), medical secretaries and executive administrative assistants (43-6013, 5730), and secretaries and executive administrative assistants, except legal, medical, and executive (43-6014, 5740) for 2018.
26. The 2010 Census occupations paving, surfacing, and tamping equipment operators (47-2071, 6300), pile-driver operators (47-2072, 6310), and operating engineers and other construction equipment operators (47-2073, 6320) were aggregated to the SOC broad group level of construction equipment operators (47-2070, 6305) for 2018.
27. The 2010 Census occupations painters, construction and maintenance (47-2141, 6420) and paperhangers (47-2142, 6430) were aggregated to the SOC broad group level of painters and paperhangers (47-2140, 6410) for 2018.
28. The Census Bureau expanded the 2010 occupation pipelayers, plumbers, pipefitters, and steamfitters (47-2150, 6440) to the full SOC detailed occupation level of pipelayers (47-2151, 6441) and plumbers, pipefitters, and steamfitters (47-2152, 6442) for 2018.
29. The 2010 Census occupations helpers—extraction workers (47-5081, 6930) and other extraction workers (47-50XX, 6940) were aggregated to other extraction workers (47-50XX, 6950) for 2018.
30. The 2010 Census occupations signal and track switch repairers (49-9097, 7600) and other installation, maintenance, and repair workers (49-909X, 7630) were aggregated to other installation, maintenance, and repair workers (49-909X, 7640) for 2018.
31. The 2010 Census occupations extruding and drawing machine setters, operators, and tenders, metal and plastic (51-4021, 7920), forging machine setters, operators, and tenders, metal and plastic (51-4022, 7930), and rolling machine setters, operators, and tenders, metal and plastic (51-4023, 7940) were aggregated to the SOC broad group level of forming machine setters, operators, and tenders, metal and plastic (51-4020, 7925) for 2018.
32. The 2010 Census occupations drilling and boring machine tool setters, operators, and tenders, metal and plastic (51-4032, 7960), lathe and turning machine tool setters, operators, and tenders, metal and plastic (51-4034, 8010), and milling and planing machine setters, operators, and tenders, metal and plastic (51-4035, 8020) were aggregated to other machine tool setters, operators, and tenders, metal and plastic (51-403X, 8025) for 2018.
33. The 2010 Census occupations multiple machine tool setters, operators, and tenders, metal and plastic (51-4081, 8120), heat treating equipment setters, operators, and tenders, metal and plastic (51-4191, 8150), layout workers, metal and plastic (51-4192, 8160), plating and coating machine setters, operators, and tenders, metal and plastic (51-4193, 8200), tool grinders, filers, and sharpeners (51-4194, 8210), and metal workers and plastic workers, all other (51-4199, 8220) were aggregated to other metal workers and plastic workers (51-4XXX, 8225) for 2018.
34. The 2010 Census occupations shoe and leather workers and repairers (51-6041, 8330) and shoe machine operators and tenders (51-6042, 8340) were aggregated to the SOC broad group level of shoe and leather workers (51-6040, 8335) for 2018.
35. The 2010 Census occupations textile bleaching and dyeing machine operators and tenders (51-6061, 8360), textile cutting machine setters, operators, and tenders (51-6062, 8400), textile knitting and weaving machine setters, operators, and tenders (51-6063, 8410) and textile winding, twisting, and drawing out machine setters, operators, and tenders (51-6064, 8420) were aggregated to the SOC broad group level of textile machine setters, operators, and tenders (51-6060, 8365) for 2018.
36. The 2010 Census occupations extruding and forming machine setters, operators, and tenders, synthetic and glass fibers (51-6091, 8430), fabric and apparel patternmakers (51-6092, 8440), and textile, apparel, and furnishings workers, all other (51-6099, 8460)
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were aggregated to other textile, apparel, and furnishings workers (51-609X, 8465) for 2018.

37. The 2010 Census occupations model makers and patternmakers, wood (51-7030, 8520) and woodworkers, all other (51-7099, 8550) were aggregated to other woodworkers (51-70XX, 8555) for 2018.
38. The 2010 Census occupations cleaning, washing, and metal pickling equipment operators and tenders (51-9121, 8860) and cooling and freezing equipment operators and tenders (51-9193, 8900) were aggregated to other production equipment operators and tenders (51-919X, 8865) for 2018.
39. The 2010 Census occupations semiconductor processors (51-9141, 8840) and production workers, all other (51-9199, 8965) were aggregated to other production workers (51-91XX, 8990) for 2018.
40. The Census Bureau expanded the 2010 occupation bus drivers (53-3020, 9120) to the full SOC detailed occupation level of bus drivers, school (53-3051, 9121) and bus drivers, transit and intercity (53-3052, 9122) for 2018.
41. The 2010 Census occupations railroad brake, signal, and switch operators (53-4021, 9230) and subway, streetcar, and other rail transportation workers (53-40XX, 9260) were aggregated to other rail transportation workers (53-40XX, 9265) for 2018.
42. The 2010 Census occupations bridge and lock tenders (53-6011, 9340) and other transportation workers (53-60XX, 9420) were aggregated to other transportation workers (53-60XX, 9430) for 2018.
43. The 2010 Census occupations conveyor operators and tenders (53-7011, 9500) and hoist and winch operators (53-4071, 9560) were aggregated to conveyor, dredge, and hoist and winch operators (53-70XX, 9570) for 2018. In addition, the 2010 SOC broad group dredge, excavating, and loading machine operators (53-7030, 9520) was broken up and dispersed (see #23 in the previous list detailing changes to the SOC) so that dredge operators (53-7071) was aggregated to the new 2018 occupation conveyor, dredge, and hoist and winch operators (53-70XX, 9570).

44. The 2010 census occupations tank car, truck, and ship loaders (53-7121, 9740) and material moving workers, all other (53-7199, 9750) were aggregated to other material moving workers (53-71XX, 9760) for 2018.

There were notable SOC title changes that also impacted the 2018 Census Occupation Code List (this is not a full list of title changes).<sup>35</sup>

1. Education administrators (11-9030, 0230) updated to education and childcare administrators (11-9030, 0230).
2. Funeral service managers (11-9071, 0330) updated to funeral home managers (11-9171, 0325).
3. Gaming managers (11-9071, 0330) updated to entertainment and recreation managers (11-9070, 0335).
4. Appraisers and assessors of real estate (13-2021, 0810) updated to property appraisers and assessors (13-2020, 0810).
5. Financial analysts (13-2051, 0840) updated to financial and investment analysts (13-2051, 0845).
6. Librarians (25-4021, 2430) updated to librarians and media collections specialists (25-4022, 2435).
7. Announcers (27-3010, 2800) updated to broadcast announcers and radio disc jockeys (27-3011, 2805).
8. News analysts, reporters, and correspondents (27-3020, 2810) updated to news analysts, reporters, and journalists (27-3023, 2810).
9. Television, video, and motion picture camera operators and editors (27-4030, 2920) updated to television, video, and film camera operators and editors (27-4030, 2920).
10. Shipping, receiving, and traffic clerks (43-5071, 5610) updated to shipping, receiving, and inventory clerks (43-5071, 5610).

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<sup>35</sup> There was one particular type of title change not included in this list. If the census occupation code crosswalks to multiple SOC codes where one SOC detailed occupation was a residual (ending in 90 or 99) and the other was not, then the title was updated to begin with "other." For example, the new 2018 census occupation other financial specialists (13-20XX, 0960) crosswalks to the SOC detailed codes financial risk specialists (13-2054) and financial specialists, all other (13-2099).

11. Computer control programmers and operators (51-4010, 7900) updated to computer numerically controlled tool operators and programmers (51-9160, 7905).
12. Automotive and watercraft service attendants (53-6031, 9360) updated to transportation service attendants (53-6030, 9365).
13. Transportation attendants, except flight attendants (53-6061, 9415) updated to passenger attendants (53-6061, 9415).

Altogether, between 2010 and 2018, 125 occupations were deleted and 155 were added, resulting in 570 occupations in the 2018 Census Occupation Code List (see Appendix A, Table A-2). Including changes due to the SOC (first list) and those based on ACS research (second list), 73 percent of the census code list did not change between 2010 and 2018. In comparison, 88 percent of the SOC experienced no substantive change (OMB, 2018).

### Industry and Occupation Coding Process

Since 1850, the Census Bureau has collected data on occupation (1910 for industry) using open-ended question(s) in which respondents provided subjective answers with guidance from field representatives and, at times, help text (see Figure 1 for the question texts). After the 2000 decennial census, the ACS has been the Census Bureau's main household survey for collecting the industry and occupation of U.S. workers.<sup>36</sup> The Census Bureau fields the ACS using an Internet form, a mailed-out paper form, and in-person interviews.<sup>37</sup>

To convert subjective responses into quantitative data, the Census Bureau has developed a complex coding process over nearly two centuries. The main components of this process are the Alphabetical Indexes of Industry and Occupation, the Census Military Index, the Employer Name List (ENL), a staff of clerical coders, and more recently, the ACS Industry and Occupation Autocoder ("the autocoder") and its accompanying dictionaries

## DEFINITIONS

### American Community Survey (ACS)

**Industry and Occupation Autocoder ("the autocoder"):** A set of logistic regression models, dictionaries, and consistency edits ("hardcodes") originally developed from around 2 million clerk-coded records from ACS 2010 data, including group quarters and Spanish records. U.S. Census Bureau staff designed the autocoder to replicate the results from clerical coding. The program assigns quality scores to each autocoded industry code and occupation code and those codes with scores below the cutoff go to clerical coding.

**Clerical coders:** A dedicated staff of Census Bureau employees working at the National Processing Center whose main job is assigning industry and occupation codes in household surveys using the Alphabetical Indexes of Industry and Occupation, the Census Military Index, and the Employer Name List. The coding process includes rigorous training, verification and double coding, and expert coding done by referralists who have the most experience. Samples of all coders' work go through a quality assurance process to ensure a high level of accuracy.

**Best code:** The most appropriate industry or occupation code that can be assigned given the write-in responses to each, as well as the respondent's class of work, geographic location, active duty military status, and demographic descriptive characteristics (e.g., age, sex, educational attainment).

and hardcodes.<sup>38</sup> During processing, the objective is to assign the "best codes" for industry and for occupation, given the write-in responses to each as well as the respondent's class of work, geographic location, active duty military status, and

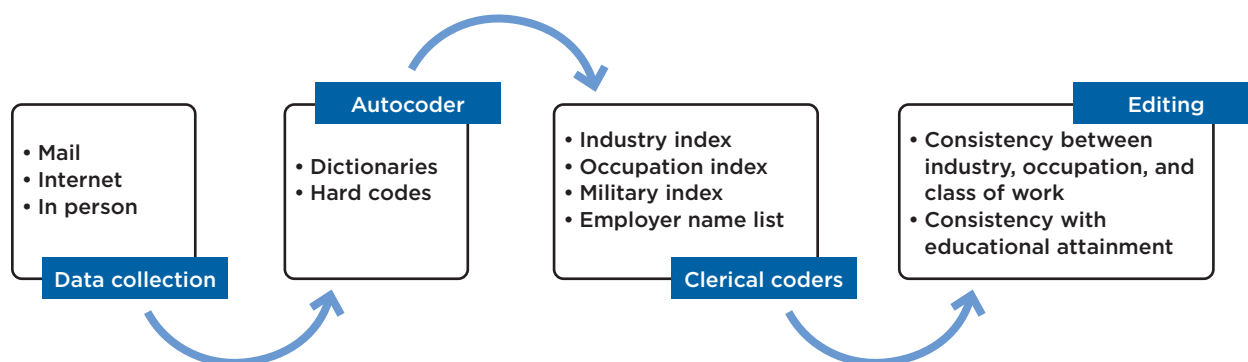
<sup>36</sup> The Census Bureau collects data on industry and occupation from other household surveys, such as the SIPP. While the coding processes for each survey are similar, this section discusses the process in the context of the ACS.

<sup>37</sup> For more information on ACS collection and processing methods, see <[www.census.gov/programs-surveys/acs/methodology.html](http://www.census.gov/programs-surveys/acs/methodology.html)>.

<sup>38</sup> The Census Bureau implemented the ACS Industry and Occupation Autocoder in 2012 to supplement clerical coding of industry and occupation in the ACS. The autocoder reduces the workload at the National Processing Center (NPC) and lowers the overall cost of coding Census' largest survey. Coding operations for the 1990 and 2000 Decennial Censuses also used an autocoder (Gillman & Appel, 1993).

Figure 5.

## A Basic Illustration of the Industry and Occupation Coding Process



demographic descriptive characteristics (e.g., age, sex, educational attainment).<sup>39</sup>

Figure 5 shows a simplified diagram of the coding process. First, the industry and occupation write-in data from each of the collection modes are combined. Next, the cases are processed through the autocoder. The autocoder is a set of logistic regression models, dictionaries, and consistency edits (“hardcodes”) (U.S. Census Bureau, 2014). It was originally developed from around 2 million clerk-coded records from ACS 2010 data, including group quarters and Spanish records.

Autocoder dictionaries are parameter files created from previously clerically coded data used to establish relationships between certain words that appear in the open-ended responses to the industry and occupation questions and specific industry and occupation codes. The probability that the code associated with each dictionary match would agree with the industry or occupation code should the record be manually coded is calculated. Once probabilities are calculated, the industry or occupation code with the highest probability is assigned to each incoming case. Hardcodes are used in the autocoding process to correct common and straightforward errors. Industry and then occupation are assigned along with a quality score for each assignment.

If the quality score is below a certain threshold, or if the autocoder fails to assign both an industry

code and an occupation code to a case, then the case is sent to the NPC in Jeffersonville, Indiana.<sup>40</sup>

At NPC, a dedicated staff of industry and occupation clerical coders assign the “best codes” to the remaining cases using the Alphabetical Indexes of Industry and Occupation, the Census Military Index, the ENL, and the Industry and Occupation (I&O) Coding Procedures.

The clerical coding staff includes production coders, dependent verifiers, and referralist coders—expert coders<sup>41</sup> with the most experience. Samples of all coders’ work undergo a quality assurance process to ensure a high level of accuracy. The final step in the coding process is editing. Once the cases are coded, they are returned to Census Bureau headquarters, combined with the fully autocoded cases and edited for consistency and missing values.

Staff at headquarters oversee the coding process, which includes maintaining the autocoder dictionaries and hardcodes and the industry, occupation, and military indexes used in clerical coding. Typically, staff at NPC initiates the majority of changes to these documents. Subsequently, staff in the Industry and Occupation Statistics Branch (IOSB) accept, modify, or reject the changes. With

<sup>39</sup> For more information on these topics, see <[www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html](http://www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html)>.

<sup>40</sup> Overall, the rate at which the autocoder assigned a valid code, or the autocoding rate, for 2018, in ACS, was around 52 percent for industry, 41 percent for occupation, and 28 percent for industry and occupation being jointly coded. These rates have remained steady since 2013. Given that over 200,000 cases need to be coded monthly, the autocoder reduces the burden on clerical coding substantially.

<sup>41</sup> Referralist coders also have access to additional resources such as Internet search engines, and job search Web sites (e.g., Glassdoor, <[www.glassdoor.com](http://www.glassdoor.com)>) and business search Web sites (e.g., Manta, <[www.manta.com](http://www.manta.com)>).

the new industry and occupation code lists implemented in 2018, IOSB updated all documentation related to coding to reflect the changes.

The Alphabetical Indexes of Industries and Occupations is a two-part document with over 50,000 industry and occupation titles.<sup>42</sup> The first part, the industry index, lists potential industry descriptions with their associated “best codes.” Certain industry assignments have occupation restrictions. The second part is the occupation index, which is a list of occupation titles and their equivalent “best codes.” The occupation index takes into account class of work, education, and industry restrictions. For example, there are two lines in the occupation index for the job title “accountant”: one for respondents with less than a bachelor’s degree (5120 bookkeeping, accounting, and auditing clerks) and another for respondent’s with a bachelor’s degree or higher (0800 accountants and auditors). In addition, the Census Military Index contains military job titles, armed forces branch, military grade, military job code, and the corresponding “best code” from the census occupation code list. This index is based on Defense Manpower Data Center’s Military Occupational Classification crosswalk, which crosswalks military job titles and job codes to SOC codes.

Currently, the indexes are maintained as spreadsheets in Microsoft Excel and uploaded to the I&O Coding System used by clerical coders in Microsoft Access.<sup>43</sup> Census Bureau analysts and clerical coders update the indexes regularly, revising entries based on codes that need to be deleted or modified and where new codes need to be added. They use detailed research and careful examination of write-in data, SOC occupation descriptions, and NAICS industry descriptions. Other important tools used to update the indexes are the NAICS Index File,<sup>44</sup> O\*NET,<sup>45</sup> and the Direct

Match Title File (DMTF).<sup>46</sup> The NAICS Index File is one of the components of NAICS and updates are released together. Likewise, the DMTF accompanies the SOC.

Lastly, clerical coders also have access to a tool called the ENL,<sup>47</sup> which is based on the Business Register<sup>48</sup> and crosswalks employer names to an industry code that could potentially be the “best code.” However, since industry codes are based on the specific establishment where the employee works, oftentimes the industry of their particular establishment is different from the industry of other more prominent establishments under the employer name. For example, a large department store could employ workers at one of the actual department stores, the distribution center, or the business office. Each of these establishments perform a different service and would have a different industry code. The ENL may list all three potential codes or may only list one. Consequently, clerical coders refer to the ENL as one of many resources when assigning an industry code.

Historically, the indexes are the primary tools used to turn write-in responses into numeric codes. Clerical coders compare the write-in responses to the indexes to find the most appropriate codes. When the Census Bureau first implemented the autocoder in the ACS in 2012, the dictionaries and hardcodes, used as the main inputs to the program, were first generated from write-ins from the 2010 ACS (Thompson, Kornbau, and Vesely, 2012).<sup>49</sup> Since their creation, they have been updated independently of the indexes. Similar to the indexes, the dictionaries and hardcodes receive regular updates. When the code lists are updated, these documents must undergo major revisions to ensure that only codes from the new code lists are assigned.

<sup>42</sup> The Census Bureau released the first version of the Alphabetical Index of Occupations in 1850. In 1920, the index was improved with taking into account occupational glossaries created by the federal Bureau of Labor Statistics.

<sup>43</sup> Recent versions of the indexes can be found online at <[www.census.gov/topics/employment/industry-occupation/guidance/indexes.html](http://www.census.gov/topics/employment/industry-occupation/guidance/indexes.html)>.

<sup>44</sup> The 2017 NAICS Index File can be found online at <[www.census.gov/eos/www/naics/downloadables/downloadables.html](http://www.census.gov/eos/www/naics/downloadables/downloadables.html)>.

<sup>45</sup> For more information on O\*NET, visit <[www.onetonline.org/](http://www.onetonline.org/)>.

<sup>46</sup> For more information on the DMTF, visit <[www.bls.gov/soc/](http://www.bls.gov/soc/)>.

<sup>47</sup> The ENL was implemented in ACS coding in August 2013. It matches employer names to census industry codes to improve accuracy and reliability in industry coding. The ENL is updated alongside the Business Register after each economic census.

<sup>48</sup> For more information on the Business Register, please visit <[www.census.gov/econ/overview/mu0600.html](http://www.census.gov/econ/overview/mu0600.html)>.

<sup>49</sup> Of the approximately 2.3 million industry and occupation responses from the 2010 ACS, 1.5 million were randomly selected to be used in creating the dictionaries and models required for automated coding, with the remaining records used to validate the performance of the I&O Autocoder.

## COMPARING INDUSTRY AND OCCUPATION DATA OVER TIME

Revisions to the industry and occupation code lists reflect the growth and decline of industries and occupations, changes in terminology, and the refinement of category composition. Every time the Census Bureau releases a new industry or occupation code list, data coded under the new list will not be directly comparable to data coded under the previous code lists. Table 2 shows the code list used in select census data sets. Simple comparisons between data sets can only be made if the code list remained the same. For example, for ACS 2013, data users can compare occupation data directly to 2012 ACS data, but conversions are needed for comparisons of Industry.

To make meaningful comparisons, data users need to apply conversions to published statistics and microdata that use the previous code lists to make it equivalent to those that use the new code lists. This is accomplished via two mechanisms: direct match and bridgecode. A direct match is applied when an old code moves in its entirety to a new code. All data with a particular code from the previous industry or occupation code list should be recoded to the new code.

A bridgecode is applied when the old code has split into multiple new codes. All data with a particular code from the previous industry or occupation code list should be recoded to one of multiple new codes, according to conversion rates, for the old data to be comparable to the new data. The Census Bureau supplies the conversion rates whenever data users need to apply bridgecoding.<sup>50</sup>

When making comparisons over time, if a bridgecode is not applied to data using the previous code list, then the resulting comparison would be biased. For example, the occupation title graduate teaching assistants moved from one occupation (postsecondary teachers) to another (teaching assistants). As a result, an occupation data table using the 2010 Census Occupation Code List would provide the number of postsecondary teachers including graduate teaching assistants, while an occupation data table using the 2018 Census Occupation Code List would give the

### DEFINITIONS

**Direct match:** A direct match occurs when all the data with an old code, from the previous code list, is assigned to a single new code from the most recent classification system. All data with a particular code from the previous industry or occupation code list should be recoded with the new code.

**Bridgecode:** The new code assigned from the most recent code list to data with an old code from the previous code list that split into multiple new codes between the two classification systems. When an old industry or occupation code splits into multiple new codes, all data with that particular code from the previous industry or occupation code list should be recoded to one of multiple new codes, or bridgecodes, according to conversion rates, for the old data to be comparable to the new data.

number of postsecondary teachers not including graduate teaching assistants. Making a comparison of postsecondary teachers between the two tables would be inappropriate. Did the number of postsecondary teachers actually change or is any difference simply due to the removal of graduate teaching assistants?

### Types of Changes

Whether data need to have a direct match or bridgecodes applied depends on the type of change the old code experienced between the previous code list and the new code list. Table 5 displays the six types of changes that can occur between code lists: replacement, aggregation, move between major groups, expansion, split, and industry title or job title move. The table provides a description and example of each type of change. Finally, it gives the type of conversion (direct match or bridgecode) that must be applied to compare data that used the previous code list with data that uses the new code list based on the type of change.

All data with old codes that experienced a change type of “replacement,” “aggregation,” or “move between major groups” should have the conversion type “direct match” applied to data from the

<sup>50</sup> Conversion rates are discussed in more detail in the section “Creation of the Conversion Rates.”

Table 5.

**The Six Types of Changes That Occur to Industry and Occupation Codes**

Type of code change	Description	Example	Type of conversion
Replacement	An industry (occupation) from the previous code list is replaced with another similar industry (occupation). All workers that were assigned to the old industry (occupation) will now be coded in the new industry (occupation), plus any additional workers that should now be assigned here. This can occur when the industry or occupation is declining or when an industry (job) title moved to this industry (occupation).	Industry: none occurred between 2012 and 2017.  Occupation: the 2010 Census occupation 2430 librarians was replaced with 2435 librarians and media collections specialists. Librarians were assigned this new code in addition to the job titles that moved here (e.g., audio-visual and multimedia collections specialists).	Direct match
Aggregation	An industry (occupation) from the previous code list will be aggregated with another industry (occupation). This typically occurs when the industry (occupation) is declining.	Industry: The 2012 Census industry 7170 video tape and disk rental was deleted and those establishments are now coded as 7181 other consumer goods rental.  Occupation: The 2010 Census occupation codes 8330 shoe and leather workers and repairers and 8340 shoe machine operators and tenders were aggregated to the 2018 code 8335 shoe and leather workers.	Direct match
Move between major groups	An industry (occupation) from the previous code list moves to a different industry sector (major occupation group). The industry description (occupation title) may change.	Industry: None occurred between 2012 and 2017.  Occupation: The 2010 Census occupation code 5620 stock clerks and order fillers (2010 SOC code 43-5091) was moved in 2018 to 9645 stockers and order fillers (2018 SOC code 53-7065).	Direct match
Expansion	An industry (occupation) from the previous code list splits into multiple new, more refined industries (occupations). This typically occurs when the industry (occupation) is growing.	Industry: The 2012 Census industry 8190 hospitals is being split into two new industries—8191 general medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals, and 8192 psychiatric and substance abuse hospitals.  Occupation: The 2010 Census occupation 1820 psychologists is being split into three new occupations in 2018—1821 clinical and counseling psychologists, 1822 school psychologists, and 1825 other psychologists.	Bridgecode
Split	An industry (occupation) from the previous code list splits into multiple new codes. This most often happens when a new industry (occupation) is added. The workers that were previously assigned the old code split off and are now coded to some new code. As industries and occupations emerge into the labor market, they can be collected and presented with survey data.	Industry: None occurred between 2012 and 2017.  Occupation: The 2010 code 0430 managers, all other split into 4 new codes in 2018, 0335 entertainment and recreation managers, 0426 personal service managers, all other, 0440 managers, all other, and 0705 project management specialists. Both personal service managers and project management specialists were added as new occupation codes in 2018.	Bridgecode

Table 5.

**The Six Types of Changes That Occur to Industry and Occupation Codes—Con.**

Type of code change	Description	Example	Type of conversion
Industry title or job title move	An industry description (occupation title) moves from one code in the previous code list to another code in the new code list. The most common occurrence of this is when a detailed SOC occupation moves from one broad group to another, but the census codes only crosswalk to the SOC broad groups.	<p>Industry: In 2012, any establishments with the industry description of discount department stores, significant perishable grocery sales (NAICS code pt. 452112) were coded as census code 5380 department stores. In 2017, NAICS moved this industry description to general merchandise stores, including warehouse clubs and supercenters, which crosswalks to 2017 census code 5391.</p> <p>Occupation: The job title graduate teaching assistants (2010 SOC code 25-1199) was coded as census code 2200 postsecondary teachers in 2010, but in 2018, the SOC moved them to 25-9044 teaching assistants, postsecondary which crosswalks to the 2018 census code 2545 teaching assistants (SOC broad group 25-9040).</p>	Bridgecode

old code to be comparable to the data with the new code. The old code directly matches a single new code and data with the old code should be recoded with the new code. For example, shoe and leather workers experienced an “aggregation” change between 2010 and 2018. To compare the number of shoe and leather workers between 2010 and 2018, data users would use the direct match method on the 2010 data with occupation codes 8330 (shoe and leather workers and repairers) and 8340 (shoe machine operators and tenders).

When using microdata, all records with the occupation codes 8330 and 8340 need to be recoded to 8335. The number of recoded records in 2010 can then be compared to the number of records in 2018 microdata with the occupation code 8335. If a data user is comparing occupation data from tables, then the rows for shoe and leather workers and repairers (8330) and shoe machine operators and tenders (8340) can be added together. That number can then be compared to the number of shoe and leather workers (8335) in a table with 2018 occupation codes.

Data with old codes that experienced the remaining types of change—expansion, split, and title move—need to have bridgecodes applied. While the methodology is the same for all three types of change, the descriptions look different between the three.

The simplest bridgecode approach occurs for codes that expanded between the previous list and the new list. For example, the 2012 industry code hospitals (8190) is being expanded into two new industries in 2017—general medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals (8191) and psychiatric and substance abuse hospitals (8192). To compare data on the distinct types of hospitals between 2012 and 2017, data users need to apply a conversion rate to all old data with the code 8190. Once applied, data users will be able to compare old data with converted codes to the new data.

The second type of change occurs when an industry or occupation from the previous code list splits into multiple new codes. This most often happens when a new industry or occupation is added in the new code list. As industries and occupations

emerge into the labor market, they can be categorized and presented with survey data. A split is different from an expansion in that the new industries and occupations do not solely expand from the previous industry or occupation, but from multiple industries or occupations.

For example, the 2010 occupation managers, all other (0430) split into four new codes in 2018: entertainment and recreation managers (0335), personal service managers, all other (0426), managers, all other (0440), and project management specialists (0705). Both personal service managers and project management specialists were

added as new occupation codes in 2018. Prior to 2018, only a percentage of entertainment and recreation managers, personal service managers, and project management specialists would have been coded as managers, all other (2010 occupation code 0430). For example, project management specialists would have been coded either as business operations specialists, all other (2010 occupation code 0740) or computer occupations, all other (2010 occupation code 1107).<sup>51</sup>

<sup>51</sup> Which occupation they were assigned to depended on the characteristics of the respondent. For example, a project manager who worked on developing computer software may have been coded to 1107 under the old code list.

Table 6.

**Summary of Code Changes Between the 2012 to 2017 Census Industry Code Lists—Con.**

2012 census industry code	2012 industry description	Type of change to 2012 code	Type of conversion	New 2017 census industry code	New 2017 industry description
1680	Cut and sew apparel manufacturing	Aggregation	Direct match	1691	Cut and sew, and apparel accessories and other apparel manufacturing
1690	Apparel accessories and other apparel manufacturing				
3190	Machinery manufacturing, n.e.c.	Aggregation	Direct match	3291	Machinery manufacturing, n.e.c. or not specified
3290	Not specified machinery manufacturing				
4970	Grocery stores	Expansion	Bridgecode	4971	Supermarkets and other grocery (except convenience) stores
				4972	Convenience stores
5380	Department stores and discount stores	Industry title move	Bridgecode	5381	Department stores
				5391	General merchandise stores, including warehouse clubs and supercenters
5390	Miscellaneous general merchandise stores	Deletion	Direct match	5391	General merchandise stores, including warehouse clubs and supercenters
5590	Electronic shopping	Aggregation	Direct match	5593	Electronic shopping and mail-order houses
5591	Electronic auctions				
5592	Mail-order houses				
6990	Insurance carriers and related activities	Expansion	Bridgecode	6991	Insurance carriers
				6992	Agencies, brokerages, and other insurance related activities
7070	Real estate	Expansion	Bridgecode	7071	Lessors of real estate, and offices of real estate agents and brokers
				7072	Real estate property managers, offices of real estate appraisers, and other activities related to real estate
7170	Video tape and disk rental	Aggregation	Direct match	7181	Other consumer goods rental
7180	Other consumer goods rental				

Table 6.

**Summary of Code Changes Between the 2012 to 2017 Census Industry Code Lists—Con.**

2012 census industry code	2012 industry description	Type of change to 2012 code	Type of conversion	New 2017 census industry code	New 2017 industry description
8190	Hospitals	Expansion	Bridgecode	8191	General medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals
				8192	Psychiatric and substance abuse hospitals
8560	Performing arts, spectator sports, and related industries	Expansion	Bridgecode	8561	Performing arts companies
				8562	Spectator sports
				8563	Promoters of performing arts, sports, and similar events, agents and managers for artists, athletes, entertainers, and other public figures
				8564	Independent artists, writers, and performers
8880	Personal and household goods repair and maintenance	Aggregation	Direct match	8891	Personal and household goods repair and maintenance
8890	Footwear and leather goods repair				

Table 7.

### Summary of Code Changes Between the 2010 to 2018 Census Occupation Code Lists

2010 census occupation code	2010 occupation title	Type of change to 2010 code	Type of conversion	New 2018 census occupation code	New 2018 occupation title
0050	Marketing and sales managers	Expansion	Bridgecode	0051	Marketing managers
				0052	Sales managers
0100	Administrative services managers	Expansion	Bridgecode	0101	Administrative services managers
				0102	Facilities managers
0330	Gaming managers	Replacement	Direct match	0335	Entertainment and recreation managers
0430	Managers, all other	Split, job title move	Bridgecode	0335	Entertainment and recreation managers
				0426	Personal service managers, all other
				0440	Managers, all other
				0705	Project management specialists
0740	Business operations specialists, all other	Split	Bridgecode	0705	Project management specialists
				0750	Business operations specialists, all other
0840	Financial analysts	Job title move	Bridgecode	0845	Financial and investment analysts
				0960	Other financial specialists
0950	Financial specialists, all other	Replacement	Direct match	0960	Other financial specialists
1020	Software developers, applications and systems software	Split	Bridgecode	1021	Software developers
				1022	Software quality assurance analysts and testers
1030	Web developers	Split	Bridgecode	1031	Web developers
				1032	Web and digital interface designers
1060	Database administrators	Replacement	Direct match	1065	Database administrators and architects
1107	Computer occupations, all other	Split, aggregation	Bridgecode	0705	Project management specialists
				1022	Software quality assurance analysts and testers
				1032	Web and digital interface designers
				1065	Database administrators and architects
				1108	Computer occupations, all other
1300	Architects, except naval	Expansion	Bridgecode	1305	Architects, except landscape and naval
				1306	Landscape architects
1540	Drafters	Expansion	Bridgecode	1541	Architectural and civil drafters
				1545	Other drafters
1550	Engineering technicians, except drafters	Expansion	Bridgecode	1551	Electrical and electronic engineering technologists and technicians
				1555	Other engineering technologists and technicians, except drafters

Table 7.

**Summary of Code Changes Between the 2010 to 2018 Census Occupation Code Lists—Con.**

2010 census occupation code	2010 occupation title	Type of change to 2010 code	Type of conversion	New 2018 census occupation code	New 2018 occupation title
1740	Environmental scientists and geoscientists	Expansion	Bridgecode	1745	Environmental scientists and specialists, including health
				1750	Geoscientists and hydrologists, except geographers
1820	Psychologists	Expansion	Bridgecode	1821	Clinical and counseling psychologists
				1822	School psychologists
				1825	Other psychologists
1930	Geological and petroleum technicians	Replacement	Direct match	1935	Environmental science and geoscience technicians
1965	Miscellaneous life, physical, and social science technicians	Job title move	Bridgecode	1935	Environmental science and geoscience technicians
				1970	Other life, physical, and social science technicians
2000	Counselors	Expansion	Bridgecode	2001	Substance abuse and behavioral disorder counselors
				2002	Educational, guidance, and career counselors and advisors
				2003	Marriage and family therapists
				2004	Mental health counselors
				2005	Rehabilitation counselors
				2006	Counselors, all other
2010	Social workers	Expansion	Bridgecode	2011	Child, family, and school social workers
				2012	Healthcare social workers
				2013	Mental health and substance abuse social workers
				2014	Social workers, all other
2160	Miscellaneous legal support workers	Expansion, split	Bridgecode	2170	Title examiners, abstractors, and searchers
				2180	Legal support workers, all other
				2862	Court reporters and simultaneous captioners
2200	Postsecondary teachers	Job title move	Bridgecode	2205	Postsecondary teachers
				2545	Teaching assistants
2340	Other teachers and instructors	Split	Bridgecode	2350	Tutors
				2360	Other teachers and instructors
2430	Librarians	Replacement	Direct match	2435	Librarians and media collections specialists
2540	Teacher assistants	Replacement	Direct match	2545	Teaching assistants
2550	Other education, training, and library workers	Job title move	Bridgecode	2435	Librarians and media collections specialists
				2555	Other educational instruction and library workers

Table 7.

**Summary of Code Changes Between the 2010 to 2018 Census Occupation Code Lists—Con.**

2010 census occupation code	2010 occupation title	Type of change to 2010 code	Type of conversion	New 2018 census occupation code	New 2018 occupation title
2630	Designers	Expansion	Bridgecode	2631	Commercial and industrial designers
				2632	Fashion designers
				2633	Floral designers
				2634	Graphic designers
				2635	Interior designers
				2636	Merchandise displayers and window trimmers
				2640	Other designers
2720	Athletes, coaches, umpires, and related workers	Expansion	Bridgecode	2721	Athletes and sports competitors
				2722	Coaches and scouts
				2723	Umpires, referees, and other sports officials
2750	Musicians, singers, and related workers	Expansion	Bridgecode	2751	Music directors and composers
				2752	Musicians and singers
2760	Entertainers and performers, sports and related workers, all other	Expansion	Bridgecode	2755	Disc jockeys, except radio
				2770	Entertainers and performers, sports and related workers, all other
2800	Announcers	Job title move	Bridgecode	2805	Broadcast announcers and radio disc jockeys
				2865	Media and communication workers, all other
2860	Miscellaneous media and communication workers	Expansion	Bridgecode	2861	Interpreters and translators
				2865	Media and communication workers, all other
2900	Broadcast and sound engineering technicians and radio operators	Job title move	Bridgecode	2905	Broadcast, sound, and lighting technicians
				5040	Communications equipment operators, all other
2960	Media and communication equipment workers, all other	Job title move	Bridgecode	2905	Broadcast, sound, and lighting technicians
				2970	Media and communication equipment workers, all other
3060	Physicians and surgeons	Expansion	Bridgecode	3065	Emergency medicine physicians
				3070	Radiologists
				3090	Other physicians
				3100	Surgeons
3260	Health diagnosing and treating practitioners, all other	Expansion	Bridgecode	3261	Acupuncturists
				3270	Healthcare diagnosing or treating practitioners, all other

Table 7.

**Summary of Code Changes Between the 2010 to 2018 Census Occupation Code Lists—Con.**

2010 census occupation code	2010 occupation title	Type of change to 2010 code	Type of conversion	New 2018 census occupation code	New 2018 occupation title
3320	Diagnostic related technologists and technicians	Expansion	Bridgecode	3321	Cardiovascular technologists and technicians
				3322	Diagnostic medical sonographers
				3323	Radiologic technologists and technicians
				3324	Magnetic resonance imaging technologists
				3330	Nuclear medicine technologists and medical dosimetrists
3400	Emergency medical technicians and paramedics	Expansion	Bridgecode	3401	Emergency medical technicians
				3402	Paramedics
3420	Health practitioner support technologists and technicians	Expansion, Job title move	Bridgecode	3421	Pharmacy technicians
				3422	Psychiatric technicians
				3423	Surgical technologists
				3424	Veterinary technologists and technicians
				3430	Dietetic technicians and ophthalmic medical technicians
3510	Medical records and health information technicians	Expansion	Bridgecode	3545	Miscellaneous health technologists and technicians
				3515	Medical records specialists
3535	Misc. health technologists and technicians	Replacement	Direct match	3550	Other healthcare practitioners and technical occupations
3540	Other healthcare practitioners and technical occupations	Expansion	Bridgecode	3545	Misc. Health technologists and technicians
				1980	Occupational health and safety specialists and technicians
3600	Nursing, psychiatric, and home health aides	Expansion	Bridgecode	3550	Other healthcare practitioners and technical occupations
				3601	Home health aides
				3603	Nursing assistants
3730	First-line supervisors of protective service workers, all other	Expansion	Bridgecode	3605	Orderlies and psychiatric aides
				3725	First-line supervisors of security workers
3800	Bailiffs, correctional officers, and jailers	Expansion	Bridgecode	3735	First-line supervisors of protective service workers, all other
				3801	Bailiffs
3850	Police and sheriff's patrol officers	Aggregation	Direct match	3802	Correctional officers and jailers
3860	Transit and railroad police			3870	Police officers

Table 7.

**Summary of Code Changes Between the 2010 to 2018 Census Occupation Code Lists—Con.**

2010 census occupation code	2010 occupation title	Type of change to 2010 code	Type of conversion	New 2018 census occupation code	New 2018 occupation title
3955	Lifeguards and other recreational, and all other protective service workers	Expansion	Bridgecode	3946	School bus monitors
				3960	Other protective service workers
4050	Combined food preparation and serving workers, including fast food	Aggregation	Direct match	4055	Fast food and counter workers
4060	Counter attendants, cafeteria, food concession, and coffee shop				
4250	Grounds maintenance workers	Expansion	Bridgecode	4251	Landscaping and grounds-keeping workers
				4252	Tree trimmers and pruners
				4255	Other grounds maintenance workers
4300	First-line supervisors of gaming workers	Replacement	Direct match	4330	Supervisors of personal care and service workers
4320	First-line supervisors of personal service workers	Job title move	Bridgecode	4330	Supervisors of personal care and service workers
				9005	Supervisors of transportation and material moving workers
4410	Motion picture projectionists	Aggregation	Direct match	4435	Other entertainment attendants and related workers
4430	Miscellaneous entertainment attendants and related workers				
4460	Embalmers and funeral attendants	Replacement	Direct match	4461	Embalmers, crematory operators and funeral attendants
4520	Miscellaneous personal appearance workers	Expansion	Bridgecode	4521	Manicurists and pedicurists
				4522	Skincare specialists
				4525	Other personal appearance workers
4610	Personal care aides	Move between major groups	Direct match	3602	Personal care aides
4620	Recreation and fitness workers	Expansion	Bridgecode	4621	Exercise trainers and group fitness instructors
				4622	Recreation workers
4650	Personal care and service workers, all other	Job title move	Bridgecode	4461	Embalmers, crematory operators and funeral attendants
				4655	Personal care and service workers, all other
5030	Communications equipment operators, all other	Replacement	Direct match	5040	Communications equipment operators, all other
5520	Dispatchers	Expansion	Bridgecode	5521	Public safety telecommunications
				5522	Dispatchers, except police, fire, and ambulance
5620	Stock clerks and order fillers	Move between major groups	Direct match	9645	Stockers and order fillers

Table 7.

### Summary of Code Changes Between the 2010 to 2018 Census Occupation Code Lists—Con.

2010 census occupation code	2010 occupation title	Type of change to 2010 code	Type of conversion	New 2018 census occupation code	New 2018 occupation title
5700	Secretaries and administrative assistants	Expansion	Bridgecode	5710	Executive secretaries and executive administrative assistants
				5720	Legal secretaries and administrative assistants
				5730	Medical secretaries and administrative assistants
				5740	Secretaries and administrative assistants, except legal, medical, and executive
5800	Computer operators	Aggregation	Direct match	1108	Computer occupations, all other
6100	Fishers and related fishing workers	Aggregation	Direct match	6115	Fishing and hunting workers
6110	Hunters and trappers				
6300	Paving, surfacing, and tamping equipment operators	Aggregation	Direct match	6305	Construction equipment operators
6310	Pile-driver operators				
6320	Operating engineers and other construction equipment operators				
6420	Painters, construction and maintenance	Aggregation	Direct match	6410	Painters and paperhangers
6430	Paperhangers				
6440	Pipelayers, plumbers, pipe fitters, and steamfitters	Expansion	Bridgecode	6441	Pipelayers
				6442	Plumbers, pipefitters, and steamfitters
6820	Earth drillers, except oil and gas	Job title move	Bridgecode	6825	Earth drillers, except oil and gas
				6835	Explosives workers, ordnance handling experts, and blasters
6830	Explosives workers, ordnance handling experts, and blasters	Replacement	Direct match	6835	Explosives workers, ordnance handling experts, and blasters
6840	Mining machine operators	Split	Bridgecode	6850	Underground mining machine operators
				6950	Other extraction workers
6910	Roof bolters, mining	Aggregation	Direct match	6850	Underground mining machine operators
6930	Helpers--extraction workers	Aggregation	Direct match	6950	Other extraction workers
6940	Other extraction workers				
7600	Signal and track switch repairers	Aggregation	Direct match	7640	Other installation, maintenance, and repair workers
7630	Other installation, maintenance, and repair workers				
7900	Computer control programmers and operators	Replacement	Direct match	7905	Computer numerically controlled tool programmers and operators

Table 7.

**Summary of Code Changes Between the 2010 to 2018 Census Occupation Code Lists—Con.**

2010 census occupation code	2010 occupation title	Type of change to 2010 code	Type of conversion	New 2018 census occupation code	New 2018 occupation title
7920	Extruding and drawing machine setters, operators, and tenders, metal and plastic	Aggregation	Direct match	7925	Forming machine setters, operators, and tenders, metal and plastic
7930	Forging machine setters, operators, and tenders, metal and plastic				
7940	Rolling machine setters, operators, and tenders, metal and plastic				
7960	Drilling and boring machine tool setters, operators, and tenders, metal and plastic	Aggregation	Direct match	8025	Other machine tool setters, operators, and tenders, metal and plastic
8010	Lathe and turning machine tool setters, operators, and tenders, metal and plastic				
8020	Milling and planing machine setters, operators, and tenders, metal and plastic				
8120	Multiple machine tool setters, operators, and tenders, metal and plastic	Aggregation	Direct match	8225	Other metal workers and plastic workers
8150	Heat treating equipment setters, operators, and tenders, metal and plastic				
8160	Layout workers, metal and plastic				
8200	Plating and coating machine setters, operators, and tenders, metal and plastic				
8210	Tool grinders, filers, and sharpeners				
8220	Metal workers and plastic workers, all other				
8330	Shoe and leather workers and repairers	Aggregation	Direct match	8335	Shoe and leather workers
8340	Shoe machine operators and tenders				
8360	Textile bleaching and dyeing machine operators and tenders	Aggregation	Direct match	8365	Textile machine setters, operators, and tenders
8400	Textile cutting machine setters, operators, and tenders				
8410	Textile knitting and weaving machine setters, operators, and tenders				
8420	Textile winding, twisting, and drawing out machine setters, operators, and tenders				

Table 7.

**Summary of Code Changes Between the 2010 to 2018 Census Occupation Code Lists—Con.**

2010 census occupation code	2010 occupation title	Type of change to 2010 code	Type of conversion	New 2018 census occupation code	New 2018 occupation title
8430	Extruding and forming machine setters, operators, and tenders, synthetic and glass fibers	Aggregation	Direct match	8465	Other textile, apparel, and furnishings workers
8440	Fabric and apparel pattern-makers				
8460	Textile, apparel, and furnishings workers, all other				
8520	Model makers and pattern-makers, wood	Aggregation	Direct match	8555	Other woodworkers
8550	Woodworkers, all other				
8860	Cleaning, washing, and metal pickling equipment operators and tenders	Aggregation	Direct match	8865	Other production equipment operators and tenders
8900	Cooling and freezing equipment operators and tenders				
8840	Semiconductor processors	Aggregation	Direct match	8990	Other production workers
8965	Production workers, all other	Job title move	Bridgecode	7905	Computer numerically controlled tool operators and programmers
				8990	Other production workers
9000	Supervisors of transportation and material moving workers	Replacement	Direct match	9005	Supervisors of transportation and material moving workers
9120	Bus drivers	Expansion	Bridgecode	9121	Bus drivers, school
				9122	Bus drivers, transit and intercity
				9141	Shuttle drivers and chauffeurs
9140	Taxi drivers and chauffeurs	Expansion	Bridgecode	9141	Shuttle drivers and chauffeurs
				9142	Taxi drivers
9200	Locomotive engineers and operators	Job title move	Bridgecode	9210	Locomotive engineers and operators
				9265	Other rail transportation workers
9230	Railroad brake, signal, and switch operators	Aggregation	Direct match	9265	Other rail transportation workers
9260	Subway, streetcar, and other rail transportation workers				
9340	Bridge and lock tenders	Aggregation	Direct match	9430	Other transportation workers
9360	Automotive and watercraft service attendants	Replacement	Direct match	9365	Transportation service attendants
9420	Other transportation workers	Job title move	Bridgecode	9365	Transportation service attendants
				9430	Other transportation workers
9500	Conveyor operators and tenders	Aggregation	Direct match	9570	Conveyor, dredge, and hoist and winch operators

Table 7.

### Summary of Code Changes Between the 2010 to 2018 Census Occupation Code Lists—Con.

2010 census occupation code	2010 occupation title	Type of change to 2010 code	Type of conversion	New 2018 census occupation code	New 2018 occupation title
9520	Dredge, excavating, and loading machine operators	Job title move, aggregation	Bridgecode	9570	Conveyor, dredge, and hoist and winch operators
				9760	Other material moving workers
				6850	Underground mining machine operators
				6821	Excavating and loading machine and dragline operators, surface mining
9560	Hoist and winch operators	Aggregation	Direct match	9570	Conveyor, dredge, and hoist and winch operators
9730	Mine shuttle car operators	Move between major groups	Direct match	6850	Underground mining machine operators
9740	Tank car, truck, and ship loaders	Aggregation	Direct match	9760	Other material moving workers
9750	Material moving workers, all other				
9820	Military enlisted tactical operations and air/weapons specialists and crew members	Job title move	Bridgecode	1555	Other engineering technologists and technicians, except drafters
				9825	Military enlisted tactical operations and air/weapons specialists and crew members

To compare data on managers, all other to prior years, data from the previous code list with code managers, all other (0430) has to be converted to the new codes using conversion rates. For comparing data on entertainment and recreation managers, personal service managers, and project management specialists, data users need to convert all previous occupations where these workers would have been coded and add the converted estimates together. An example is provided in the section “How to Use Conversion Rates.”

The last type of change is “industry description or job title move.” These occur when one industry description or one job title moves from one industry or occupation code to another.<sup>52</sup> For example, in 2010, the job title graduate teaching assistants (2010 SOC code 25-1199) was coded in the census occupation postsecondary teachers (2200). In 2018, the SOC moved graduate teaching assistants to teaching assistants, postsecond-

ary (2018 SOC code 25-9044), which crosswalks to the 2018 census occupation teaching assistants (2545, SOC broad group 25-9040). In order to make a comparison over time, data with the 2010 code 2200 need to be converted to either 2018 census occupation postsecondary teachers (2205) or teaching assistants (2545).

Table 6 provides a list of industry codes that changed between 2012 and 2017. Similarly, Table 7 shows the changes for occupation between 2010 and 2018. Historically, the industry list experienced fewer changes than the occupation list. This trend continues with the present revisions, where 18 2012 industry codes changed and 125 2010 occupation codes changed. While the number of changes may differ, both lists require direct match and bridgecode conversions before making comparisons over time. The next two sections describe the process by which conversion rates were created and how data users should apply conversion rates when making temporal comparisons of industry and occupation data.

<sup>52</sup> In some cases, the industry description or job title that is moving is a detailed NAICS or SOC code but the census code crosswalks to a less detailed NAICS or SOC code.

## Creation of Conversion Rates

Conversion rates allow data users to compare industry and occupation data from years that use the previous code list to data from years that use the latest code list.<sup>53</sup> These rates are created by taking cases that were coded under the previous code list and double-coding each case with a code from the new code list. Only data with codes that require the conversion type “bridgecode” are double-coded. Each case will have two codes: one from the previous list and one from the new

list. The conversion rate is the proportion of cases moving from an old code to a new code.

For example, the 2010 occupation psychologists (1820) split into three, more detailed codes. Data coded with 1820 were double-coded, given the original survey responses, with one of the three new codes 1821, 1822, or 1825.

Table 8 shows a simplified example of what bridgedcoded data look like. The example shows fictional occupation data from the ACS file and how the original survey responses were assigned bridgecodes from the 2018 Census Occupation Code List. Each case on the file will have two

<sup>53</sup> The Census Bureau has provided conversion rates alongside new code lists since 1960.

Table 8.

### Example of Mock Bridgedcoded Occupation Data From the 2014 ACS 1-Year Estimates

2014 ACS occupation question write-in	2010 occupation code assigned	2010 occupation title	2018 bridgecode assigned	2018 occupation title
School psychologist	1820	Psychologist	1822	School psychologists
Psychologist	1820	Psychologist	1825	Other psychologists
Clinical psychologist	1820	Psychologist	1821	Clinical and counseling psychologists
School psychologist	1820	Psychologist	1822	School psychologists

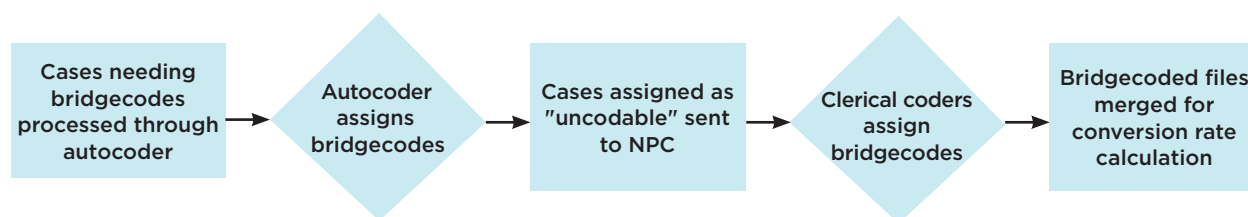
Table 9.

### Example of Mock Bridgedcoded Industry Data From the 2014 ACS 1-Year Estimates

2014 ACS industry question write-in	2012 industry code assigned	2012 industry description	2017 bridgecode assigned	2017 industry description
Hospital	8190	Hospitals	8191	General medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals
Psychiatric hospital	8190	Hospitals	8192	Psychiatric and substance abuse hospitals
Surgical hospital	8190	Hospitals	8191	General medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals
Medical hospital	8190	Hospitals	8191	General medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals

Figure 6.

### The Bridgecoding Process With the Addition of the Autocoder



codes: one from the 2010 code list and one from the 2018 code list. Once all the data from the previous data years with the 2010 codes are bridgecoded, a cross-tabulation of each of the 2010 codes by each of the new 2018 codes would generate the conversion rates for the occupation codes that need them. For example, a cross-tabulation of 1820 by 1821, 1822, and 1825 provided the conversion rates—the proportion of cases moving from the old code (1820) to each new code (1821, 1822, or 1825).

For cases with industry codes that need bridgecoding, each will have a code from the 2012 code list and the 2017 code list. Table 9 shows a simplified, fictional example of bridgecoded industry data from the 2014 ACS. Cases from 2014 with the 2012 industry code hospitals (8190) were bridgecoded with either general medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals (8191) or psychiatric and substance abuse hospitals (8192). Following the same methodology as for occupation, a cross-tabulation of each of the 2012 codes by each of the new 2017 codes would generate the conversion rates.

To create the 2017 industry and 2018 occupation conversion rates, the bridgecode procedure used data from 4 years of the ACS. Cases from the 2014 through 2017 1-year estimates files with a code that needed bridgecoding were double-coded

from a list of appropriate codes.<sup>54</sup> About 1.2 million cases were bridgecoded for industry and 2 million were bridgecoded for occupation (Table 10). In the past, clerical coders at the NPC and at Census Bureau headquarters bridgecoded data from a previous year (or years) with codes from the new code lists.<sup>55</sup> For the current bridgecoding process, the Census Bureau added the autocoder to the process. Figure 6 shows a flow chart of the bridgecoding process with the addition of the autocoder.

Cases needing a bridgecode were processed first through the autocoder.<sup>56</sup> Industry and then occupation were assigned,<sup>57</sup> along with a quality score for each assignment. If the quality score was below a certain threshold, then the case was left blank for industry and/or occupation. If the case was blank for either industry or occupation, or both, it was sent to clerical coders at NPC. At

<sup>54</sup> Only cases in which industry or occupation were “as reported” during the ACS data editing process were included. The ACS Design and Methodology Report explains the editing process in depth (U.S. Census Bureau, 2014).

<sup>55</sup> This process was completed last in 2012 for industry and in 2010 for occupation. For the industry and occupation code list changes between 1990 and 2000, a sample of the 1990 decennial census data were bridgecoded.

<sup>56</sup> The autocoder program process remained the same as in ACS production coding.

<sup>57</sup> Valid occupation codes included any code on the 2018 Census Occupation Code List while valid industry codes included any on the 2017 Census Industry Code List. The autocoder program could not be adjusted to include restrictions according to the bridgecode lists. If the autocoder assigned a code not on the bridgecoding list, then the case was not used in the calculation of conversion rates.

Table 10.

### Total Number of Bridgecoded Cases of Industry or Occupation

	Industry	Occupation
Total cases bridgecoded.....	1,245,000	2,038,000
Percentage of cases bridgecoded by clerical coders ..	69.1%	39.0%
Number of codes bridgecoded.....	6	56

NPC, clerical coders assigned bridge codes to these remaining cases.<sup>58</sup>

Since clerical coders only had to code the cases that the autocoder was unable to code, the autocoder significantly reduced the workload sent to NPC for the bridge coding operation. Between all 4 years, the autocoder assigned bridge codes to 69.1 percent of the industry cases and 39.0 percent of the occupation cases (Table 10).

Finally, the bridge coded files were merged for the calculation of the conversion rates.<sup>59</sup> Conversion rates were calculated for the total sample, and then by sex and education to provide more refined rates.<sup>60</sup> The rates by sex and education should be used whenever possible; however, in data sets where sex and educational attainment are not

available, the total rates should be used (e.g., non-ACS data). Table 11 and Table 12 offer an example of total conversion rates and more refined conversion rates for one 2010 occupation and one 2012 industry. The full list of conversion rates is provided in Appendixes C and E.

### How to Use Conversion Rates

When making comparisons over time, data users should apply the conversion rates to any data that use the 2010 Census Occupation Code List or the 2012 Census Industry Code List (see Table 2) in order to convert the data to the 2018 and 2017 lists, respectively. The conversion rates can be applied to tabulated data and to microdata. The most common application is in converting published tables in order to compare over time (e.g., occupation or industry tables on <<https://data.census.gov>>). Published tables typically include measures of statistical significance—standard deviations or margin of error (MOE)—which are needed to conduct statistical testing of the comparisons.<sup>61</sup> Converting microdata involves the use

<sup>58</sup> Clerical coders were restricted to only assigning codes from the bridge code lists.

<sup>59</sup> Only cases that were assigned a code from the bridge code lists (Table 6 and Table 7) were used in the calculation. For example, for a case with the 2010 occupation code 1820, if the autocoder assigned any code other than 1821, 1822, or 1825, the case was dropped from the file and not used to calculate conversion rates.

<sup>60</sup> The ACS 5-year estimates microdata file was created using the more refined sex and education conversion rates because they more accurately captured occupational demographic variation.

<sup>61</sup> See <[www.census.gov/programs-surveys/acs/guidance/statistical-testing-tool.html](https://www.census.gov/programs-surveys/acs/guidance/statistical-testing-tool.html)> for more information on statistical testing in the ACS.

Table 11.

#### Example of Conversion Rates for the 2012 Industry 8190 Hospitals

2012 industry codes and descriptions				Female			Male		
				High school or less	Some college or more	Ad- vanced degree	High school or less	Some college or more	Adv- anced Degree
2017 industry codes and descriptions			Total						
8190	Hospitals								
	8191	General medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals . . . . .	0.9878	0.9864	0.9908	0.986	0.9694	0.9825	0.9877
	8192	Psychiatric and substance abuse hospitals . . . . .	0.0122	0.0136	0.0092	0.014	0.0306	0.0175	0.0123

Table 12.

#### Example of Conversion Rates for the 2010 Occupation 1820 Psychologists

2010 occupation codes and titles			Total	Female			Male		
2018 occupation codes and titles				High school or less	Some college or more	Ad- vanced degree	High school or less	Some college or more	Ad- vanced degree
1820	Psychologists								
	1821	Clinical and counseling psychologists.....	0.1591	0	0.1438	0.1542	0	0.2056	0.1710
	1822	School psychologists.....	0.2049	0	0.1304	0.2354	0	0.0561	0.1396
	1825	Other psychologists.....	0.6360	1	0.7258	0.6104	1	0.7383	0.6894

of a statistical software program and only a small subset of data users need to use this method.<sup>62</sup>

When converting data from an industry or occupation table, the method used varies by the type of change. Codes that need a direct match applied are simply recoded to the new code (e.g., data with the 2010 industry video tape and disk rental [7170] should be recoded to other consumer goods rental [7181]). Codes that expanded will be converted differently than codes that experienced a split or lost a job title. In the case of an expansion, data with old codes are converted specifically to the new list of codes. In addition, no other old codes will need to be converted to one of these new codes. For example, occupation data from the 2010 code psychologists (1820) would all convert into one of the three new codes 1821, 1822, or 1825 according to the conversion rates. In addition, no other data from a different 2010 code are needed to create the converted data for 1821, 1822, and 1825. If a data user's goal is to compare data on psychologists between 2010 and 2018, they will only need to convert the 2010 code 1820.

Table 13 provides an example of how data users would apply the conversion rates to compare data on psychologists between 2010 and 2018. If a data user were to download 2010 ACS 1-year estimates data from <<https://data.census.gov>>, they would find that in 2010, there were 113,284 full-time,

year-round psychologists (TableID B24124). Downloading similar data from 2018, a data user would find counts for the three new detailed psychologist occupations: 15,902 clinical and counseling psychologists, 29,534 school psychologists, and 86,636 other psychologists. If the data user applies conversion rates to the 2010 estimate, then they can compare 2010 data to 2018, as shown in Table 13. For example, multiplying 113,284 by 0.1591 provides a converted estimate for the estimate of clinical and counseling psychologists in 2010: 18,023. Similarly, multiplying the MOE, 5,340, by the conversion rate 0.1591 provides a converted MOE for clinical and counseling psychologists.

If an old code experienced a split or a job title was moved, data with the old code will be converted into various other new codes according to the conversion rates. For example, data with the 2010 occupation code 0430 (managers, all other) should be split to multiple 2018 codes: 0335, 0426, 0440, and 0705. However, each of these new codes is made up of additional 2010 codes other than managers, all other (0430). For example, if a data user wants to compare data on project management analysts between 2010 and 2018, then they will need to convert data from the 2010 occupation codes 0430, 0750, and 1107. The sum of those converted data would provide a converted estimate of project management analysts to be used in comparing to 2018 data.

A working example of this conversion process is provided in Table 14. Project management analysts are a new 2018 occupation and, prior to 2018,

<sup>62</sup> The most commonly available ACS microdata are the PUMS files, which use modified versions of the code lists and a separate set of conversion rates. Information on how to apply the conversion rates to the PUMS are provided in Appendix G. ACS Public Use Microdata.

Table 13.

**Example 1 of Using Conversion Rates to Compare Occupation Data From the 2010 and 2018 Occupation Code Lists**

2010 occupation code	2010 occupation title	2010 ACS 1-year estimates		2018 occupation code	2018 occupation title	Conver- sion rate	2010 ACS 1 year estimates converted to 2018		2018 ACS 1-year estimates	
		Esti- mate	Margin of error (±)				Esti- mate	Margin of error (±)	Esti- mate	Margin of error (±)
1820	Psychologist	113,284	5,340	1821	Clinical and counseling psychologists . . .	0.159	18,023	850	15,902	2,168
				1822	School psychologists . . .	0.205	23,212	1,094	29,534	2,917
				1825	Other psychologist . . . .	0.636	72,049	3,396	86,636	5,171

Table 14.

### Example 2 of Using Conversion Rates to Compare Occupation Data From the 2010 and 2018 Occupation Code Lists

2010 Occupation Code List						
2010 occupation code	2010 occupation title	2015 ACS 1-year estimates		Conversion rate to 0705	2015 ACS 1-year estimates converted to 2018	
		Estimate	Margin of error (±)		Estimate	Margin of error (±)
0430	Managers, all other. . . . .	3,681,343	28,684	0.140	515,020	4,013
0740	Business operations specialists, all other. . .	240,307	7,786	0.071	16,990	550
1107	Computer workers, all other. . . . .	502,477	11,804	0.006	3,216	76

2018 Occupation Code List					
2018 occupation code	2018 occupation title	Estimate from 2015 conversion		Estimate from 2018 ACS 1-year estimates	
		Estimate	Margin of error (±)	Estimate	Margin of error (±)
0705	Project management specialists. . . . .	515,020 + 16,990 + 3,216 = 535,225	square root (4,013 <sup>2</sup> + 550 <sup>2</sup> + 76 <sup>2</sup> ) = 4,051	647,053	13,786

they were coded in one of three 2010 occupation codes. If a data user downloads a detailed occupation table from 2015, they will need data on 0430, 0740, and 1107 along with the conversion rates in Appendix E. Once the conversion rates are applied to the estimates, the converted estimates are summed to obtain the converted estimate of 0705. To convert the MOEs, data users should use the approximation formula as shown in the table.<sup>63</sup> According to the table, the converted estimate of project management specialists was 535,225 for 2015. Now, a comparison can be made with data from 2018 and converting the MOEs allows data users to test the statistical significance of those comparisons.

Comparisons of industry data require the same conversion process. The main difference between industry and occupation when making comparisons is the data years that can be compared with each given set of conversion rates. For industry, the conversion rates in this report apply to any

data sets that use the 2012 Census Industry Code List. However, for occupation, these conversion rates apply to any data sets that use the 2010 Census Occupation Code List. For comparisons of data sets using other code lists, data users should visit the Census Industry and Occupation Web page: <[www.census.gov/topics/employment/industry-occupation.html](http://www.census.gov/topics/employment/industry-occupation.html)>. Finally, a separate set of conversion rates is provided to compare the ACS PUMS (see Appendix G).

### Comparison Template

To assist data users in comparing occupation data over time, this section describes the available template for comparing data from one of the detailed occupation tables found on <<https://data.census.gov>>.<sup>64</sup> A screen shot of the comparison template is provided in Figure 7. The template should only be used with 1-, 3-, or 5-year ACS data from TableID B24124, years 2010 through 2017. Data created with the template can be used to

<sup>63</sup> For more information on the approximation formula for MOEs, see the Instructions for Statistical Testing at <[www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html](http://www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html)>.

<sup>64</sup> Technical paper 65 provides templates for comparing occupation data from the 1990 Census Occupation Code List to data from the 2000 Census Occupation Code List (U.S. Census Bureau, 2003).

Figure 7.

**Screen Shot of Table H-2 Microsoft Excel Template for Converting Data From Table B24124**

2010 Occupation Description	2010 Occupation Code	Estimate from Table	MOE from Table	2018 Occupation Description	2018 Occupation Code	Converted Estimate	Converted MOE	Note
Total:		109,307,428	136,407			109,307,349		
Chief executives	0010	1,098,048	17,047	Chief executives	0010	1,098,048	17,047	
General and operations managers	0020	885,352	15,606	General and operations managers	0020	885,352	15,606	
Legislators	0030	11,439	1,682	Legislators	0030	11,439	1,682	
Advertising and promotions managers	0040	41,608	3,857	Advertising and promotions managers	0040	41,608	3,857	
Marketing and sales managers	0050	863,652	17,206	Marketing managers	0051	441,931	8,804	
Public relations and fundraising managers	0060	53,176	3,856	Sales managers	0052	421,721	8,402	
Administrative services managers	0100	133,284	6,295	Public relations and fundraising managers	0060	53,176	3,856	
Computer and information systems managers	0110	561,466	12,442	Administrative services managers	0101	51,994	2,456	
Financial managers	0120	1,066,848	17,434	Facilities managers	0102	81,290	3,839	
Compensation and benefits managers	0135	16,470	2,196	Computer and information systems managers	0110	561,466	12,442	
Human resources managers	0136	377,342	10,007	Financial managers	0120	1,066,848	17,434	
Training and development managers	0137	53,382	3,923	Compensation and benefits managers	0135	16,470	2,196	
Industrial production managers	0140	233,451	8,011	Human resources managers	0136	377,342	10,007	
Purchasing managers	0150	185,381	6,341	Training and development managers	0137	53,382	3,923	
Transportation, storage, and distribution managers	0160	221,952	7,885	Industrial production managers	0140	233,451	8,011	
Farmers, ranchers, and other agricultural managers	0205	438,396	9,722	Purchasing managers	0150	185,381	6,341	
Construction managers	0220	709,029	17,489	Transportation, storage, and distribution managers	0160	221,952	7,885	
Education administrators	0230	781,769	15,249	Farmers, ranchers, and other agricultural managers	0205	438,396	9,722	
Architectural and engineering managers	0300	159,701	6,916	Construction managers	0220	709,029	17,489	

compare occupation data from the 2010 Census Occupation Code List to occupation data from the 2018 Census Occupation Code List.

Step 1: Obtain data from TableID B24124 from any year between 2010 and 2017, 1-, 3-, or 5-year data.

Step 2: Paste data into column C.

Step 3: Use converted data from column G to compare with ACS data from TableID B24124, years 2018 and on 1- or 5-year data.

Step 4: See list of notes for extra additions that need to be completed on current data to render them comparable.

The comparison template is provided alongside the electronic version of ACS TP78 as Appendix H. Table H-1 is the template and Table H-2 provides a working example of using the comparison template to compare 2017 ACS 1-year estimates to 2018 ACS 1-year estimates.

## ACCURACY AND RELIABILITY OF DATA

The ACS is a nationwide survey designed to provide communities with reliable and timely demographic, social, economic, and housing data for congressional districts, counties, places, and other localities every year. It has an annual sample size of about 3.5 million addresses across the United States and Puerto Rico and includes both housing units and group quarters (e.g., nursing homes and prisons). The ACS is conducted in every county

throughout the nation and every municipio in Puerto Rico, where it is called the Puerto Rico Community Survey (PRCS). For information on the ACS sample design and other topics, visit [www.census.gov/acs/www](http://www.census.gov/acs/www).

The data presented in this report are based on the ACS sampled households interviewed from January 2014 through December 2018. The estimates based on these samples describe the actual average value of characteristics for the household and group quarters populations over this period of collection. Sampling error is the difference between an estimate based on a sample and the corresponding value that would be obtained if the estimate were based on the entire population (as from a census). Measures of sampling error are provided in the form of MOEs for all estimates included in this report. All comparative statements in this report have undergone statistical testing, and comparisons are significant at the 90 percent level unless otherwise noted. In addition to sampling error, nonsampling error may be introduced during any of the operations used to collect and process survey data such as editing, reviewing, or keying data from questionnaires. For more information on sampling and estimation methods, confidentiality protection, and sampling and nonsampling errors, please see the ACS Accuracy of the Data document located at [www.census.gov/programs-surveys/acs/technical-documentation/pums/documentation.html](http://www.census.gov/programs-surveys/acs/technical-documentation/pums/documentation.html).

Table 15.

**Select List of Industry and Occupation Tables on Data.census.gov**

Table ID	Table Name
B24030	Sex by industry for the civilian employed population 16 years and over
B24040	Sex by industry for the full-time, year-round civilian employed population 16 years and over
C24030	Sex by industry for the civilian employed population 16 years and over
C24040	Sex by industry for the full-time, year-round civilian employed population 16 years and over
B24050	Industry by occupation for the civilian employed population 16 years and over
C24050	Industry by occupation for the civilian employed population 16 years and over
S2403	Industry by sex for the civilian employed population 16 years and over
S2404	Industry by sex for the full-time, year-round civilian employed population 16 years and over
S2405	Industry by occupation for the civilian employed population 16 years and over
B24010	Sex by occupation for the civilian employed population 16 years and over
B24020	Sex by occupation for the full-time, year-round civilian employed population 16 years and over
C24010	Sex by occupation for the civilian employed population 16 years and over
C24020	Sex by occupation for the full-time, year-round civilian employed population 16 years and over
B24114	Detailed occupation for the civilian employed population 16 years and over
B24115	Detailed occupation for the civilian employed male population 16 years and over
B24116	Detailed occupation for the civilian employed female population 16 years and over
B24124	Detailed occupation for the full-time, year-round civilian employed population 16 years and over
B24125	Detailed occupation for the full-time, year-round civilian employed male population 16 years and over
B24126	Detailed occupation for the full-time, year-round civilian employed female population 16 years and over
S2401	Occupation by sex for the civilian employed population 16 years and over
S2402	Occupation by sex for the full-time, year-round civilian employed population 16 years and over

**SOURCES OF INDUSTRY AND OCCUPATION DATA**

The main platform for obtaining Census Bureau data is data.census.gov. It contains data from the latest ACS data sets, as well as other Census Bureau surveys. Table 15 provides a list of TableIDs of tables with data on industry and occupation from the ACS. It should be noted that the most detailed tables will have limited geographies available. For example, TableID B24124 provides the most detailed list of occupations but is only available for the nation and TableID C24010 provides data for aggregate occupation groups but is available for smaller geographies.

Two additional sources of Census Bureau industry and occupation data are the SIPP and the Equal Employment Opportunity (EEO) Tabulation. SIPP data can be downloaded through an FTP site <[https://thedataweb.rm.census.gov/ftp/sipp\\_ftp.html](https://thedataweb.rm.census.gov/ftp/sipp_ftp.html)>, while EEO tabulation data can be downloaded via <[www.census.gov/topics/employment/equal-employment-opportunity-tabulation.html](http://www.census.gov/topics/employment/equal-employment-opportunity-tabulation.html)>.

**GLOSSARY OF TERMS**

**ACS Industry and Occupation Autocoder (“the autocoder”):** A set of logistic regression models, data dictionaries, and consistency edits (“hard-codes”) originally developed from around 2 million clerk-coded records from ACS 2010 data, including group quarters and Spanish records. Census Bureau staff designed the autocoder to replicate the results from clerical coding. The program assigns quality scores to each autocoded industry code and occupation code and those codes with scores below the cutoff go to clerical coding.

**Alphabetical Indexes of Industries and Occupations:** A two-part document with over 50,000 titles of industry and occupation. The first part, the industry index, lists potential industry titles with their associated “best codes.” Certain industry assignments have occupation restrictions. The second part is the occupation index, which is a list of occupation titles and their equivalent “best codes.” The occupation index takes into account class of work, education, and industry.

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**Autocoder dictionaries:** A set of parameter files created from previously clerically coded data used to establish relationships between certain words that appear in the open-ended responses to the industry and occupation questions and specific industry and occupation codes.

**Best code:** The most appropriate industry or occupation code that can be assigned given the written responses to each, as well as the respondent's class of work, geographic location, active duty military status, and demographic descriptive characteristics (e.g., age, sex, educational attainment).

**Bridgecode:** The new code assigned from the most recent code list to data with an old code, from the previous code list, that split into multiple new codes between the two classification systems. When an old industry or occupation code splits into multiple new codes, all data with that particular code from the previous industry or occupation code list should be recoded to one of multiple new codes, or bridgecodes, according to conversion rates, in order for the old data to be comparable to the new data.

**Bridgecoding/double-coding:** The assignment of a second set of codes from an alternative code list. This paper describes the double-coding, or bridgecoding, of cases with the 2012 Census Industry Code List (2010 Census Occupation Code List) with codes from the latest code list—the 2017 Census Industry Code List (2018 Census Occupation Code List). Each case will have two codes: one from the previous list and one from the new list. These bridgecoded cases are used to create the conversion rates.

**Clerical coders:** A dedicated staff of Census Bureau employees working at the NPC whose main job is assigning industry and occupation codes in household surveys using the Alphabetical Indexes of Industry and Occupation, the Census Military Index, and the ENL. The coding process includes rigorous training, verification and double coding, and expert coding done by referralists, who have the most experience. Samples of all coders' work go through a quality assurance process to ensure a high level of accuracy.

**Conversion rate:** The proportion of cases moving from an old code to a new code between the two most recent classification systems. Conversion rates allow data users to compare industry and

occupation data from years that use the previous code list to data from years that use the latest code list. Conversion rates are created using double-coded, or bridgecoded, data. In previous technical papers, the term conversion factor was used.

**Direct match:** A direct match occurs when all the data with an old code, from the previous code list, are assigned to a single new code from the most recent classification system. All data with a particular code from the previous industry or occupation code list should be recoded with the new code.

**Hardcodes:** During Autocoder processing, once the probabilities are calculated and industry and occupation codes assigned, hardcodes correct common and straightforward errors through a series of direct assignments. Hardcodes significantly improve the quality of the codes assigned by the autocoder.

**Industry:** A description of the kind of business of the respondent's employer.

**Occupation:** A description of the kind of work the respondent does at their job.

**NAICS:** The North American Industry Classification System, developed in the late 1990s, organizes industry by grouping establishments according to their process of production of goods and services. The system defines an establishment as a single structure where business is performed or services are rendered. It has been used as the basis for the 2000, 2002, 2007, 2012, and 2017 Census Industry Code Lists.

**SOC:** The Standard Occupational Classification system, developed in the late 1970s, organizes all work performed for pay or profit into detailed occupations by the work performed or usual activities at the job. Education and training are only considered in certain cases. It has been used as the basis for the 1980, 1990, 2000, 2010, and 2018 Census Occupation Code Lists.

## REFERENCES

Downs, B., M. Tegler, and M. Weismantle, "Comparison of ACS-CPS Data on Industry, Occupation, and Class of Worker: 2003," Housing and Household Economic Statistics Division Working Paper, 2003.

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Economic Classification Policy Committee (ECPC), "Economic Concepts Incorporated in the Standard Industrial Classification Industries of the United States," Bureau of Economic Analysis, Washington, DC, 1994. Retrieved from <[www.census.gov/eos/www/naics/history/history.html](http://www.census.gov/eos/www/naics/history/history.html)>.

Edwards, A. M., "Comparative Occupation Statistics for the United States, 1870-1940," United States Government Printing Office, Washington, DC, 1943.

Gillman, D. W. and M. V. Appel, "Analysis of the Census Bureau's Automated Industry and Occupation Coding System Algorithm," Proceedings of the American Statistical Association, 1993.

Hunt, W. C., "Occupations at the Twelfth Census," Government Printing Office, Washington, DC, 1904.

Jenkins, R., "Procedural History of the 1940 Census of Population and Housing," The Center of Demography and Ecology, University of Wisconsin, Madison, WI, 1983.

Levine, C., L. Salmon, and D. H. Weinberg, "Revising the Standard Occupational Classification System," Monthly Labor Review, 1999, Vol. 122(5), pp. 36-45.

Office of Management and Budget (OMB), "Standard Industrial Classification (SIC) Manual," National Technical Information Service (NTIS), Springfield, VA, 1987.

Palmer, G. L., "The Convertibility List of Occupations and the Problems of Developing It," Journal of the American Statistical Association, 1939, Vol. 34(208), pp. 693-708.

Priebe, J. A., J. Heinkel, and S. Greene, "1970 Occupation and Industry Classification Systems in Terms of Their 1960 Occupation and Industry Elements," Technical Paper No. 26, U.S. Bureau of the Census, U.S. Government Printing Office, Washington, DC, 1972.

Thompson, M., M. E. Kornbau, and J. Vesely, "Creating an Automated Industry and Occupation Coding Process for the American Community Survey," U.S. Census Bureau, Washington, DC, 2012.

U.S. Bureau of the Census, "1960 Censuses of Population and Housing. Procedural History," U.S. Government Printing Office, Washington, DC, 1966.

U.S. Bureau of the Census, "Changes Between the 1950 and 1960 Occupation and Industry Classifications--With Detailed Adjustments of 1950 Data to the 1960 Classifications," Technical Paper No. 18, U.S. Government Printing Office, Washington, DC, 1968.

U.S. Census Bureau, "U.S. Census of Population and Housing: 1970 Procedural History," U.S. Government Printing Office, Washington, DC, 1976.

U.S. Census Bureau, "Procedural History: 1980 Census of Population and Housing," U.S. Government Printing Office, Washington, DC, 1986.

U.S. Census Bureau, "1990 Census of Population and Housing--History," U.S. Office of Management and Budget, Washington, DC, 1990.

U.S. Census Bureau, "The relationship between the 1990 Census and Census 2000 industry and occupation classification systems: Technical Paper #65," U.S. Government Printing Office, Washington, DC, 2003.

U.S. Census Bureau, "American Community Survey Design and Methodology," U.S. Government Printing Office, Washington, DC, 2014.

U.S. Office of Federal Statistical Policy and Standards, "Standard Occupational Classification Manual, 1980," U.S. Government Printing Office, Washington, DC, 1980.

U.S. Office of Management and Budget, "Standard Occupational Classification Revision Policy Committee Proposal to Revise the SOC, 60(39)," Federal Register Notice, Washington, DC, February 28, 1995.

U.S. Office of Management and Budget, "Standard Occupational Classification Manual, 2000," Bernan Associates, Lanham, MD, 2000.

U.S. Office of Management and Budget, "North American Industrial Classification System, 2017," U.S. Government Printing Office, Washington, DC, 2017.

U.S. Office of Management and Budget, "2018 Standard Occupational Classification Manual," U.S. Government Printing Office, Washington, DC, 2018.

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**APPENDIX A.**  
**2017 CENSUS INDUSTRY CODE LIST AND**  
**2018 CENSUS OCCUPATION LIST**

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Appendix Table A-1.

**2017 Census Industry Code List**

2017 census description	2017 census code	2017 NAICS code
<b>Agriculture, Forestry, Fishing and Hunting, and Mining</b>	<b>0170-0490</b>	<b>11-21</b>
<b><i>Agriculture, Forestry, Fishing and Hunting</i></b>	<b><i>0170-0290</i></b>	<b><i>11</i></b>
Crop production	0170	111
Animal production and aquaculture	0180	112
Forestry except logging	0190	1131, 1132
Logging	0270	1133
Fishing, hunting and trapping	0280	114
Support activities for agriculture and forestry	0290	115
<b><i>Mining, Quarrying, and Oil and Gas Extraction</i></b>	<b><i>0370-0490</i></b>	<b><i>21</i></b>
Oil and gas extraction	0370	211
Coal mining	0380	2121
Metal ore mining	0390	2122
Nonmetallic mineral mining and quarrying	0470	2123
Not specified type of mining	0480	Part of 21
Support activities for mining	0490	213
<b>Construction</b>	<b>0770</b>	<b>23</b>
Construction (the cleaning of buildings and dwellings is incidental during construction and immediately after construction)	0770	23
<b>Manufacturing</b>	<b>1070-3990</b>	<b>31-33</b>
Animal food, grain and oilseed milling	1070	3111, 3112
Sugar and confectionery products	1080	3113
Fruit and vegetable preserving and specialty food manufacturing	1090	3114
Dairy product manufacturing	1170	3115
Animal slaughtering and processing	1180	3116
Retail bakeries	1190	311811
Bakeries and tortilla manufacturing, except retail bakeries	1270	3118 exc. 311811
Seafood and other miscellaneous foods, n.e.c.	1280	3117, 3119
Not specified food industries	1290	Part of 311
Beverage manufacturing	1370	3121
Tobacco manufacturing	1390	3122
Fiber, yarn, and thread mills	1470	3131
Fabric mills, except knitting mills	1480	3132 exc. 31324
Textile and fabric finishing and fabric coating mills	1490	3133
Carpet and rug mills	1570	31411
Textile product mills, except carpet and rug	1590	314 exc. 31411
Knitting fabric mills, and apparel knitting mills	1670	31324, 3151
Cut and sew, and apparel accessories and other apparel manufacturing	1691	3152, 3159
Footwear manufacturing	1770	3162
Leather and hide tanning and finishing, and other leather and allied product manufacturing	1790	3161, 3169
Pulp, paper, and paperboard mills	1870	3221
Paperboard container manufacturing	1880	32221

Appendix Table A-1.

**2017 Census Industry Code List—Con.**

2017 census description	2017 census code	2017 NAICS code
Miscellaneous paper and pulp products	1890	32222, 32223, 32229
Printing and related support activities	1990	3231
Petroleum refining	2070	32411
Miscellaneous petroleum and coal products	2090	32412, 32419
Resin, synthetic rubber, and fibers and filaments manufacturing	2170	3252
Agricultural chemical manufacturing	2180	3253
Pharmaceutical and medicine manufacturing	2190	3254
Paint, coating, and adhesive manufacturing	2270	3255
Soap, cleaning compound, and cosmetics manufacturing	2280	3256
Industrial and miscellaneous chemicals	2290	3251, 3259
Plastics product manufacturing	2370	3261
Tire manufacturing	2380	32621
Rubber products, except tires, manufacturing	2390	32622, 32629
Pottery, ceramics, and plumbing fixture manufacturing	2470	32711
Clay building material and refractories manufacturing	2480	327120
Glass and glass product manufacturing	2490	3272
Cement, concrete, lime, and gypsum product manufacturing	2570	3273, 3274
Miscellaneous nonmetallic mineral product manufacturing	2590	3279
Iron and steel mills and steel product manufacturing	2670	3311, 3312
Aluminum production and processing	2680	3313
Nonferrous metal (except aluminum) production and processing	2690	3314
Foundries	2770	3315
Metal forgings and stampings	2780	3321
Cutlery and hand tool manufacturing	2790	3322
Structural metals, and boiler, tank, and shipping container manufacturing	2870	3323, 3324
Machine shops; turned product; screw, nut, and bolt manufacturing	2880	3327
Coating, engraving, heat treating, and allied activities	2890	3328
Ordnance	2970	332992, 332993, 332994, 332996
Miscellaneous fabricated metal products manufacturing	2980	3325, 3326, 3329 exc. 332992, 332993, 332994, 332996
Not specified metal industries	2990	Part of 331 and 332
Agricultural implement manufacturing	3070	33311
Construction, and mining and oil and gas field machinery manufacturing	3080	33312, 33313
Commercial and service industry machinery manufacturing	3095	3333
Metalworking machinery manufacturing	3170	3335
Engine, turbine, and power transmission equipment manufacturing	3180	3336
<b>Machinery manufacturing, n.e.c. or not specified</b>	<b>3291</b>	<b>3332, 3334, 3339, Part of 333</b>
Computer and peripheral equipment manufacturing	3365	3341
Communications, audio, and video equipment manufacturing	3370	3342, 3343

Appendix Table A-1.

**2017 Census Industry Code List—Con.**

2017 census description	2017 census code	2017 NAICS code
Navigational, measuring, electromedical, and control instruments manufacturing	3380	3345
Electronic component and product manufacturing, n.e.c.	3390	3344, 3346
Household appliance manufacturing	3470	3352
Electric lighting and electrical equipment manufacturing, and other electrical component manufacturing, n.e.c.	3490	3351, 3353, 3359
Motor vehicles and motor vehicle equipment manufacturing	3570	3361, 3362, 3363
Aircraft and parts manufacturing	3580	336411, 336412, 336413
Aerospace products and parts manufacturing	3590	336414, 336415, 336419
Railroad rolling stock manufacturing	3670	3365
Ship and boat building	3680	3366
Other transportation equipment manufacturing	3690	3369
Sawmills and wood preservation	3770	3211
Veneer, plywood, and engineered wood products	3780	3212
Prefabricated wood buildings and mobile homes manufacturing	3790	321991, 321992
Miscellaneous wood products	3875	3219 exc. 321991, 321992
Furniture and related product manufacturing	3895	337
Medical equipment and supplies manufacturing	3960	3391
Sporting and athletic goods, and doll, toy and game manufacturing	3970	33992, 33993
Miscellaneous manufacturing, n.e.c.	3980	3399 exc. 33992, 33993
Not specified manufacturing industries	3990	Part of 31, 32, 33
<b>Wholesale Trade</b>	<b>4070-4590</b>	<b>42</b>
Motor vehicle and motor vehicle parts and supplies merchant wholesalers	4070	4231
Furniture and home furnishing merchant wholesalers	4080	4232
Lumber and other construction materials merchant wholesalers	4090	4233
Professional and commercial equipment and supplies merchant wholesalers	4170	4234
Metals and minerals, except petroleum, merchant wholesalers	4180	4235
Household appliances and electrical and electronic goods merchant wholesalers	4195	4236
Hardware, and plumbing and heating equipment, and supplies merchant wholesalers	4265	4237
Machinery, equipment, and supplies merchant wholesalers	4270	4238
Recyclable material merchant wholesalers	4280	42393
Miscellaneous durable goods merchant wholesalers	4290	4239 exc. 42393
Paper and paper products merchant wholesalers	4370	4241
Drugs, sundries, and chemical and allied products merchant wholesalers	4380	4242, 4246
Apparel, piece goods, and notions merchant wholesalers	4390	4243
Grocery and related product merchant wholesalers	4470	4244
Farm product raw material merchant wholesalers	4480	4245
Petroleum and petroleum products merchant wholesalers	4490	4247

Appendix Table A-1.

**2017 Census Industry Code List—Con.**

2017 census description	2017 census code	2017 NAICS code
Alcoholic beverages merchant wholesalers	4560	4248
Farm supplies merchant wholesalers	4570	42491
Miscellaneous nondurable goods merchant wholesalers	4580	4249 exc. 42491
Wholesale electronic markets and agents and brokers	4585	4251
Not specified wholesale trade	4590	Part of 42
<b>Retail Trade</b>	<b>4670–5790</b>	<b>44–45</b>
Automobile dealers	4670	4411
Other motor vehicle dealers	4680	4412
Automotive parts, accessories, and tire stores	4690	4413
Furniture and home furnishings stores	4770	442
Household appliance stores	4780	443141
Electronics Stores	4795	443142
Building material and supplies dealers	4870	4441 exc. 44413
Hardware stores	4880	44413
Lawn and garden equipment and supplies stores	4890	4442
Supermarkets and other grocery (except convenience) stores	4971	44511
Convenience stores	4972	44512
Specialty food stores	4980	4452
Beer, wine, and liquor stores	4990	4453
Pharmacies and drug stores	5070	44611
Health and personal care, except drug, stores	5080	446 exc. 44611
Gasoline stations	5090	447
Clothing stores	5170	4481
Shoe stores	5180	44821
Jewelry, luggage, and leather goods stores	5190	4483
Sporting goods, and hobby and toy stores	5275	45111, 45112
Sewing, needlework, and piece goods stores	5280	45113
Musical instrument and supplies stores	5295	45114
Book stores and news dealers	5370	45121
Department stores	5381	45221
General merchandise stores, including warehouse clubs and supercenters	5391	4523
Florists	5470	4531
Office supplies and stationery stores	5480	45321
Used merchandise stores	5490	4533
Gift, novelty, and souvenir shops	5570	45322
Miscellaneous retail stores	5580	4539
Electronic shopping and mail-order houses	5593	454110
Vending machine operators	5670	4542
Fuel dealers	5680	454310
Other direct selling establishments	5690	45439
Not specified retail trade	5790	Part of 44, 45

Appendix Table A-1.

**2017 Census Industry Code List—Con.**

2017 census description	2017 census code	2017 NAICS code
<b>Transportation and Warehousing, and Utilities</b>	<b>6070–6390, 0570–0690</b>	<b>48–49, 22</b>
<b><i>Transportation and Warehousing</i></b>	<b>6070–6390</b>	<b>48–49</b>
Air transportation	6070	481
Rail transportation	6080	482
Water transportation	6090	483
Truck transportation	6170	484
Bus service and urban transit	6180	4851, 4852, 4854, 4855, 4859
Taxi and limousine service	6190	4853
Pipeline transportation	6270	486
Scenic and sightseeing transportation	6280	487
Services incidental to transportation	6290	488
Postal Service	6370	491
Couriers and messengers	6380	492
Warehousing and storage	6390	493
<b><i>Utilities</i></b>	<b>0570–0690</b>	<b>22</b>
Electric power generation, transmission and distribution	0570	2211
Natural gas distribution	0580	2212
Electric and gas, and other combinations	0590	Pts. 2211, 2212
Water, steam, air-conditioning, and irrigation systems	0670	22131, 22133
Sewage treatment facilities	0680	22132
Not specified utilities	0690	Part of 22
<b>Information</b>	<b>6470–6780</b>	<b>51</b>
Newspaper publishers	6470	51111
Periodical, book, and directory publishers	6480	5111 exc. 51111
Software publishers	6490	5112
Motion pictures and video industries	6570	5121
Sound recording industries	6590	5122
Broadcasting (except internet)	6670	515
Internet publishing and broadcasting and web search portals	6672	51913
Wired telecommunications carriers	6680	517311
Telecommunications, except wired telecommunications carriers	6690	517 exc. 517311
Data processing, hosting, and related services	6695	5182
Libraries and archives	6770	51912
Other information services, except libraries and archives, and internet publishing and broadcasting and web search portals	6780	5191 exc. 51912, 51913
<b>Finance and Insurance, and Real Estate and Rental and Leasing</b>	<b>6870–7190</b>	<b>52–53</b>
<b><i>Finance and Insurance</i></b>	<b>6870–6992</b>	<b>52</b>
Banking and related activities	6870	521, 52211, 52219
Savings institutions, including credit unions	6880	52212, 52213
Nondepository credit and related activities	6890	5222, 5223
Securities, commodities, funds, trusts, and other financial investments	6970	523, 525

Appendix Table A-1.

**2017 Census Industry Code List—Con.**

2017 census description	2017 census code	2017 NAICS code
Insurance carriers	6991	5241
Agencies, brokerages, and other insurance related activities	6992	5242
<b>Real Estate and Rental and Leasing</b>	7071-7190	53
Lessors of real estate, and offices of real estate agents and brokers	7071	5311, 5312
Real estate property managers, offices of real estate appraisers, and other activities related to real estate	7072	5313
Automotive equipment rental and leasing	7080	5321
Other consumer goods rental	7181	53221, 532281, 532282, 532283, 532284, 532289, 5323
Commercial, industrial, and other intangible assets rental and leasing	7190	5324, 533
<b>Professional, Scientific, and Management, and Administrative and Waste Management Services</b>	7270-7790	54-56
<b>Professional, Scientific, and Technical Services</b>	7270-7490	54
Legal services	7270	5411
Accounting, tax preparation, bookkeeping, and payroll services	7280	5412
Architectural, engineering, and related services	7290	5413
Specialized design services	7370	5414
Computer systems design and related services	7380	5415
Management, scientific, and technical consulting services	7390	5416
Scientific research and development services	7460	5417
Advertising, public relations, and related services	7470	5418
Veterinary services	7480	54194
Other professional, scientific, and technical services	7490	5419 exc. 54194
<b>Management of companies and enterprises</b>	7570	55
Management of companies and enterprises	7570	55
<b>Administrative and support and waste management services</b>	7580-7790	56
Employment services	7580	5613
Business support services	7590	5614
Travel arrangements and reservation services	7670	5615
Investigation and security services	7680	5616
Services to buildings and dwellings (except cleaning during construction and immediately after construction)	7690	5617 exc. 56173
Landscaping services	7770	56173
Other administrative and other support services	7780	5611, 5612, 5619
Waste management and remediation services	7790	562
<b>Educational Services, and Health Care and Social Assistance</b>	7860-8470	61-62
<b>Educational Services</b>	7860-7890	61
Elementary and secondary schools	7860	6111
Colleges, universities, and professional schools, including junior colleges	7870	6112, 6113
Business, technical, and trade schools and training	7880	6114, 6115
Other schools and instruction, and educational support services	7890	6116, 6117

Appendix Table A-1.

**2017 Census Industry Code List—Con.**

2017 census description	2017 census code	2017 NAICS code
<b>Health Care and Social Assistance</b>	<b>7970–8470</b>	<b>62</b>
Offices of physicians	7970	6211
Offices of dentists	7980	6212
Offices of chiropractors	7990	62131
Offices of optometrists	8070	62132
Offices of other health practitioners	8080	6213 exc. 62131, 62132
Outpatient care centers	8090	6214
Home health care services	8170	6216
Other health care services	8180	6215, 6219
General medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals	8191	6221, 6223
Psychiatric and substance abuse hospitals	8192	6222
Nursing care facilities (skilled nursing facilities)	8270	6231
Residential care facilities, except skilled nursing facilities	8290	6232, 6233, 6239
Individual and family services	8370	6241
Community food and housing, and emergency services	8380	6242
Vocational rehabilitation services	8390	6243
Child day care services	8470	6244
<b>Arts, Entertainment, and Recreation, and Accommodation and Food Services</b>	<b>8560–8690</b>	<b>71–72</b>
<b>Arts, Entertainment, and Recreation</b>	<b>8560–8590</b>	<b>71</b>
Performing arts companies	8561	7111
Spectator sports	8562	7112
Promoters of performing arts, sports, and similar events, agents and managers for artists, athletes, entertainers, and other public figures	8563	7113, 7114
Independent artists, writers, and performers	8564	7115
Museums, art galleries, historical sites, and similar institutions	8570	712
Bowling centers	8580	71395
Other amusement, gambling, and recreation industries	8590	713 exc. 71395
<b>Accommodation and Food Services</b>	<b>8660–8690</b>	<b>72</b>
Traveler accommodation	8660	7211
Recreational vehicle parks and camps, and rooming and boarding houses, dormitories, and workers' camps	8670	7212, 7213
Restaurants and other food services	8680	722 exc. 7224
Drinking places, alcoholic beverages	8690	7224
<b>Other Services, Except Public Administration</b>	<b>8770–9290</b>	<b>81</b>
Automotive repair and maintenance	8770	8111 exc. 811192
Car washes	8780	811192
Electronic and precision equipment repair and maintenance	8790	8112
Commercial and industrial machinery and equipment repair and maintenance	8870	8113
Personal and household goods repair and maintenance	8891	8114
Barber shops	8970	812111
Beauty salons	8980	812112

Appendix Table A-1.

**2017 Census Industry Code List—Con.**

2017 census description	2017 census code	2017 NAICS code
Nail salons and other personal care services	8990	812113, 81219
Drycleaning and laundry services	9070	8123
Funeral homes, and cemeteries and crematories	9080	8122
Other personal services	9090	8129
Religious organizations	9160	8131
Civic, social, advocacy organizations, and grantmaking and giving services	9170	8132, 8133, 8134
Labor unions	9180	81393
Business, professional, political, and similar organizations	9190	8139 exc. 81393
Private households	9290	814
<b>Public Administration</b>	<b>9370-9590</b>	<b>92</b>
Executive offices and legislative bodies	9370	92111, 92112, 92114, pt. 92115
Public finance activities	9380	92113
Other general government and support	9390	92119
Justice, public order, and safety activities	9470	922, pt. 92115
Administration of human resource programs	9480	923
Administration of environmental quality and housing programs	9490	924, 925
Administration of economic programs and space research	9570	926, 927
National security and international affairs	9590	928
<b>Military</b>	<b>9670-9870</b>	<b>928110</b>
U.S. Army	9670	928110
U.S. Air Force	9680	928110
U.S. Navy	9690	928110
U.S. Marines	9770	928110
U.S. Coast Guard	9780	928110
Armed Forces, Branch not specified	9790	928110
Military Reserves or National Guard	9870	928110
Unemployed, last worked 5 years ago or earlier or never worked	9920	
Note: The 2017 census industry classification list has 270 codes including 7 military codes. The 2017 Census Industry Code List can be found at < <a href="http://www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html">www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html</a> >.		
Light blue fill—No change in census code, but change in NAICS code		
Red font—Code change		
Yellow fill—Title change		

Appendix Table A-2.

**2018 Census Occupation Code List**

2018 census title	2018 census code	2018 SOC code
<b>Management, Business, Science, and Arts Occupations</b>	<b>0010-3550</b>	<b>11-0000-29-0000</b>
<b><i>Management, Business, and Financial Occupations</i></b>	<b><i>0010-0960</i></b>	<b><i>11-0000-13-0000</i></b>
<b>Management Occupations</b>	<b>0010-0440</b>	<b>11-0000</b>
Chief executives	0010	11-1011
General and operations managers	0020	11-1021
Legislators	0030	11-1031
Advertising and promotions managers	0040	11-2011
Marketing managers	0051	11-2021
Sales managers	0052	11-2022
Public relations and fundraising managers	0060	11-2030
Administrative services managers	0101	11-3012
Facilities managers	0102	11-3013
Computer and information systems managers	0110	11-3021
Financial managers	0120	11-3031
Compensation and benefits managers	0135	11-3111
Human resources managers	0136	11-3121
Training and development managers	0137	11-3131
Industrial production managers	0140	11-3051
Purchasing managers	0150	11-3061
Transportation, storage, and distribution managers	0160	11-3071
Farmers, ranchers, and other agricultural managers	0205	11-9013
Construction managers	0220	11-9021
Education and childcare administrators	0230	11-9030
Architectural and engineering managers	0300	11-9041
Food service managers	0310	11-9051
Funeral home managers	0325	11-9171
Entertainment and recreation managers	0335	11-9070
Lodging managers	0340	11-9081
Medical and health services managers	0350	11-9111
Natural sciences managers	0360	11-9121
Postmasters and mail superintendents	0400	11-9131
Property, real estate, and community association managers	0410	11-9141
Social and community service managers	0420	11-9151
Emergency management directors	0425	11-9161
Personal service managers, all other	0426	11-9179
Managers, all other	0440	11-9199
<b>Business and Financial Operations Occupations</b>	<b>0500-0960</b>	<b>13-0000</b>
Agents and business managers of artists, performers, and athletes	0500	13-1011
Buyers and purchasing agents, farm products	0510	13-1021
Wholesale and retail buyers, except farm products	0520	13-1022
Purchasing agents, except wholesale, retail, and farm products	0530	13-1023
Claims adjusters, appraisers, examiners, and investigators	0540	13-1030
Compliance officers	0565	13-1041
Cost estimators	0600	13-1051

Appendix Table A-2.

**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
Human resources workers	0630	13-1070
Compensation, benefits, and job analysis specialists	0640	13-1141
Training and development specialists	0650	13-1151
Logisticians	0700	13-1081
<b>Project management specialists</b>	<b>0705</b>	<b>13-1082</b>
Management analysts	0710	13-1111
Meeting, convention, and event planners	0725	13-1121
Fundraisers	0726	13-1131
Market research analysts and marketing specialists	0735	13-1161
<b>Business operations specialists, all other</b>	<b>0750</b>	<b>13-1199</b>
Accountants and auditors	0800	13-2011
<b>Property appraisers and assessors</b>	<b>0810</b>	<b>13-2020</b>
Budget analysts	0820	13-2031
Credit analysts	0830	13-2041
<b>Financial and investment analysts</b>	<b>0845</b>	<b>13-2051</b>
Personal financial advisors	0850	13-2052
Insurance underwriters	0860	13-2053
Financial examiners	0900	13-2061
Credit counselors and loan officers	0910	13-2070
Tax examiners and collectors, and revenue agents	0930	13-2081
Tax preparers	0940	13-2082
<b>Other financial specialists</b>	<b>0960</b>	<b>13-20XX</b>
<b>Computer, Engineering, and Science Occupations</b>	<b>1005-1980</b>	<b>15-0000-19-0000</b>
<b>Computer and Mathematical Occupations</b>	<b>1005-1240</b>	<b>15-0000</b>
<b>Computer and information research scientists</b>	<b>1005</b>	<b>15-1221</b>
<b>Computer systems analysts</b>	<b>1006</b>	<b>15-1211</b>
<b>Information security analysts</b>	<b>1007</b>	<b>15-1212</b>
<b>Computer programmers</b>	<b>1010</b>	<b>15-1251</b>
<b>Software developers</b>	<b>1021</b>	<b>15-1252</b>
Software quality assurance analysts and testers	1022	15-1253
<b>Web developers</b>	<b>1031</b>	<b>15-1254</b>
Web and digital interface designers	1032	15-1255
<b>Computer support specialists</b>	<b>1050</b>	<b>15-1230</b>
<b>Database administrators and architects</b>	<b>1065</b>	<b>15-124X</b>
<b>Network and computer systems administrators</b>	<b>1105</b>	<b>15-1244</b>
<b>Computer network architects</b>	<b>1106</b>	<b>15-1241</b>
<b>Computer occupations, all other</b>	<b>1108</b>	<b>15-1299</b>
Actuaries	1200	15-2011
Mathematicians	1210	15-2021
Operations research analysts	1220	15-2031
Statisticians	1230	15-2041
<b>Other mathematical science occupations</b>	<b>1240</b>	<b>15-20XX</b>

Appendix Table A-2.

**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
<b>Architecture and Engineering Occupations</b>	<b>1305-1560</b>	<b>17-0000</b>
Architects, except landscape and naval	1305	17-1011
Landscape architects	1306	17-1012
Surveyors, cartographers, and photogrammetrists	1310	17-1020
Aerospace engineers	1320	17-2011
Agricultural engineers	1330	17-2021
Bioengineers and biomedical engineers	1340	17-2031
Chemical engineers	1350	17-2041
Civil engineers	1360	17-2051
Computer hardware engineers	1400	17-2061
Electrical and electronics engineers	1410	17-2070
Environmental engineers	1420	17-2081
Industrial engineers, including health and safety	1430	17-2110
Marine engineers and naval architects	1440	17-2121
Materials engineers	1450	17-2131
Mechanical engineers	1460	17-2141
Mining and geological engineers, including mining safety engineers	1500	17-2151
Nuclear engineers	1510	17-2161
Petroleum engineers	1520	17-2171
Engineers, all other	1530	17-2199
Architectural and civil drafters	1541	17-3011
Other drafters	1545	17-301X
Electrical and electronic engineering technologists and technicians	1551	17-3023
Other engineering technologists and technicians, except drafters	1555	17-302X
Surveying and mapping technicians	1560	17-3031
<b>Life, Physical, and Social Science Occupations</b>	<b>1600-1980</b>	<b>19-0000</b>
Agricultural and food scientists	1600	19-1010
Biological scientists	1610	19-1020
Conservation scientists and foresters	1640	19-1030
Medical scientists	1650	19-1040
Life scientists, all other	1660	19-1099
Astronomers and physicists	1700	19-2010
Atmospheric and space scientists	1710	19-2021
Chemists and materials scientists	1720	19-2030
Environmental scientists and specialists, including health	1745	19-2041
Geoscientists and hydrologists, except geographers	1750	19-204X
Physical scientists, all other	1760	19-2099
Economists	1800	19-3011
Survey researchers	1815	19-3022
Clinical and counseling psychologists	1821	19-3033
School psychologists	1822	19-3034
Other psychologists	1825	19-303X
Sociologists	1830	19-3041
Urban and regional planners	1840	19-3051

Appendix Table A-2.

**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
Miscellaneous social scientists and related workers	1860	19-3090
Agricultural and food science technicians	1900	19-4010
Biological technicians	1910	19-4021
Chemical technicians	1920	19-4031
Environmental science and geoscience technicians	1935	19-4040
Nuclear technicians	1940	19-4051
Social science research assistants	1950	19-4061
Other life, physical, and social science technicians	1970	19-40XX
Occupational health and safety specialists and technicians	1980	19-5010
<b>Education, Legal, Community Service, Arts, and Media Occupations</b>	<b>2001-2970</b>	<b>21-0000-27-0000</b>
<b>Community and Social Service Occupations</b>	<b>2001-2060</b>	<b>21-0000</b>
Substance abuse and behavioral disorder counselors	2001	21-1011
Educational, guidance, and career counselors and advisors	2002	21-1012
Marriage and family therapists	2003	21-1013
Mental health counselors	2004	21-1014
Rehabilitation counselors	2005	21-1015
Counselors, all other	2006	21-1019
Child, family, and school social workers	2011	21-1021
Healthcare social workers	2012	21-1022
Mental health and substance abuse social workers	2013	21-1023
Social workers, all other	2014	21-1029
Probation officers and correctional treatment specialists	2015	21-1092
Social and human service assistants	2016	21-1093
Other community and social service specialists	2025	21-109X
Clergy	2040	21-2011
Directors, religious activities and education	2050	21-2021
Religious workers, all other	2060	21-2099
<b>Legal Occupations</b>	<b>2100-2180</b>	<b>23-0000</b>
Lawyers	2100	23-1011
Judicial law clerks	2105	23-1012
Judges, magistrates, and other judicial workers	2110	23-1020
Paralegals and legal assistants	2145	23-2011
Title examiners, abstractors, and searchers	2170	23-2093
Legal support workers, all other	2180	23-2099
<b>Educational Instruction, and Library Occupations</b>	<b>2205-2555</b>	<b>25-0000</b>
Postsecondary teachers	2205	25-1000
Preschool and kindergarten teachers	2300	25-2010
Elementary and middle school teachers	2310	25-2020
Secondary school teachers	2320	25-2030
Special education teachers	2330	25-2050
Tutors	2350	25-3041
Other teachers and instructors	2360	25-30XX
Archivists, curators, and museum technicians	2400	25-4010

Appendix Table A-2.

**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
Librarians and media collections specialists	2435	25-4022
Library technicians	2440	25-4031
Teaching assistants	2545	25-9040
Other educational instruction and library workers	2555	25-90XX
<b>Arts, Design, Entertainment, Sports, and Media Occupations</b>	<b>2600-2970</b>	<b>27-0000</b>
Artists and related workers	2600	27-1010
Commercial and industrial designers	2631	27-1021
Fashion designers	2632	27-1022
Floral designers	2633	27-1023
Graphic designers	2634	27-1024
Interior designers	2635	27-1025
Merchandise displayers and window trimmers	2636	27-1026
Other designers	2640	27-102X
Actors	2700	27-2011
Producers and directors	2710	27-2012
Athletes and sports competitors	2721	27-2021
Coaches and scouts	2722	27-2022
Umpires, referees, and other sports officials	2723	27-2023
Dancers and choreographers	2740	27-2030
Music directors and composers	2751	27-2041
Musicians and singers	2752	27-2042
Disc jockeys, except radio	2755	27-2091
Entertainers and performers, sports and related workers, all other	2770	27-2099
Broadcast announcers and radio	2805	27-3011
News analysts, reporters, and journalists	2810	27-3023
Public relations specialists	2825	27-3031
Editors	2830	27-3041
Technical writers	2840	27-3042
Writers and authors	2850	27-3043
Interpreters and translators	2861	27-3091
Court reporters and simultaneous captioners	2862	27-3092
Media and communication workers, all other	2865	27-3099
Broadcast, sound, and lighting technicians	2905	27-4010
Photographers	2910	27-4021
Television, video, and film camera operators and editors	2920	27-4030
Media and communication equipment workers, all other	2970	27-4099
<b>Healthcare Practitioners and Technical Occupations</b>	<b>3000-3550</b>	<b>29-0000</b>
Chiropractors	3000	29-1011
Dentists	3010	29-1020
Dietitians and nutritionists	3030	29-1031
Optometrists	3040	29-1041
Pharmacists	3050	29-1051
Emergency medicine physicians	3065	29-1214

Appendix Table A-2.

**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
Radiologists	3070	29-1224
Other physicians	3090	29-12XX
Surgeons	3100	29-1240
Physician assistants	3110	29-1071
Podiatrists	3120	29-1081
Audiologists	3140	29-1181
Occupational therapists	3150	29-1122
Physical therapists	3160	29-1123
Radiation therapists	3200	29-1124
Recreational therapists	3210	29-1125
Respiratory therapists	3220	29-1126
Speech-language pathologists	3230	29-1127
Exercise physiologists	3235	29-1128
Therapists, all other	3245	29-1129
Veterinarians	3250	29-1131
Registered nurses	3255	29-1141
Nurse anesthetists	3256	29-1151
Nurse midwives	3257	29-1161
Nurse practitioners	3258	29-1171
Acupuncturists	3261	29-1291
Healthcare diagnosing or treating practitioners, all other	3270	29-1299
Clinical laboratory technologists and technicians	3300	29-2010
Dental hygienists	3310	29-1292
Cardiovascular technologists and technicians	3321	29-2031
Diagnostic medical sonographers	3322	29-2032
Radiologic technologists and technicians	3323	29-2034
Magnetic resonance imaging technologists	3324	29-2035
Nuclear medicine technologists and medical dosimetrists	3330	29-203X
Emergency medical technicians	3401	29-2042
Paramedics	3402	29-2043
Pharmacy technicians	3421	29-2052
Psychiatric technicians	3422	29-2053
Surgical technologists	3423	29-2055
Veterinary technologists and technicians	3424	29-2056
Dietetic technicians and ophthalmic medical technicians	3430	29-205X
Licensed practical and licensed vocational nurses	3500	29-2061
Medical records specialists	3515	29-2072
Opticians, dispensing	3520	29-2081
Miscellaneous health technologists and technicians	3545	29-2090
Other healthcare practitioners and technical occupations	3550	29-9000
<b>Service Occupations</b>	<b>3601-4655</b>	<b>31-0000-39-0000</b>
<b>Healthcare Support Occupations</b>	<b>3601-3655</b>	<b>31-0000</b>
Home health aides	3601	31-1121

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**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
Personal care aides	3602	31-1122
Nursing assistants	3603	31-1131
Orderlies and psychiatric aides	3605	31-113X
Occupational therapy assistants and aides	3610	31-2010
Physical therapist assistants and aides	3620	31-2020
Massage therapists	3630	31-9011
Dental assistants	3640	31-9091
Medical assistants	3645	31-9092
Medical transcriptionists	3646	31-9094
Pharmacy aides	3647	31-9095
Veterinary assistants and laboratory animal caretakers	3648	31-9096
Phlebotomists	3649	31-9097
Other healthcare support workers	3655	31-909X
<b>Protective Service Occupations</b>	<b>3700-3960</b>	<b>33-0000</b>
First-line supervisors of correctional officers	3700	33-1011
First-line supervisors of police and detectives	3710	33-1012
First-line supervisors of firefighting and prevention workers	3720	33-1021
First-line supervisors of security workers	3725	33-1091
First-line supervisors of protective service workers, all other	3735	33-1099
Firefighters	3740	33-2011
Fire inspectors	3750	33-2020
Bailiffs	3801	33-3011
Correctional officers and jailers	3802	33-3012
Detectives and criminal investigators	3820	33-3021
Fish and game wardens	3830	33-3031
Parking enforcement workers	3840	33-3041
Police officers	3870	33-3050
Animal control workers	3900	33-9011
Private detectives and investigators	3910	33-9021
Security guards and gambling surveillance officers	3930	33-9030
Crossing guards and flaggers	3940	33-9091
Transportation security screeners	3945	33-9093
School bus monitors	3946	33-9094
Other protective service workers	3960	33-909X
<b>Food Preparation and Serving Related Occupations</b>	<b>4000-4160</b>	<b>35-0000</b>
Chefs and head cooks	4000	35-1011
First-line supervisors of food preparation and serving workers	4010	35-1012
Cooks	4020	35-2010
Food preparation workers	4030	35-2021
Bartenders	4040	35-3011
Fast food and counter workers	4055	35-3023
Waiters and waitresses	4110	35-3031
Food servers, nonrestaurant	4120	35-3041
Dining room and cafeteria attendants and bartender helpers	4130	35-9011

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**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
Dishwashers	4140	35-9021
Hosts and hostesses, restaurant, lounge, and coffee shop	4150	35-9031
Food preparation and serving related workers, all other	4160	35-9099
<b>Building and Grounds Cleaning and Maintenance Occupations</b>	<b>4200-4255</b>	<b>37-0000</b>
First-line supervisors of housekeeping and janitorial workers	4200	37-1011
First-line supervisors of landscaping, lawn service, and groundskeeping workers	4210	37-1012
Janitors and building cleaners	4220	37-201X
Maids and housekeeping cleaners	4230	37-2012
Pest control workers	4240	37-2021
Landscaping and groundskeeping workers	4251	37-3011
Tree trimmers and pruners	4252	37-3013
Other grounds maintenance workers	4255	37-301X
<b>Personal Care and Service Occupations</b>	<b>4330-4655</b>	<b>39-0000</b>
Supervisors of personal care and service workers	4330	39-1000
Animal trainers	4340	39-2011
Animal caretakers	4350	39-2021
Gambling services workers	4400	39-3010
Ushers, lobby attendants, and ticket takers	4420	39-3031
Other entertainment attendants and related workers	4435	39-30XX
Embalmers, crematory operators and funeral attendants	4461	39-40XX
Morticians, undertakers, and funeral arrangers	4465	39-4031
Barbers	4500	39-5011
Hairdressers, hairstylists, and cosmetologists	4510	39-5012
Manicurists and pedicurists	4521	39-5092
Skincare specialists	4522	39-5094
Other personal appearance workers	4525	39-509X
Baggage porters, bellhops, and concierges	4530	39-6010
Tour and travel guides	4540	39-7010
Childcare workers	4600	39-9011
Exercise trainers and group fitness instructors	4621	39-9031
Recreation workers	4622	39-9032
Residential advisors	4640	39-9041
Personal care and service workers, all other	4655	39-9099
<b>Sales and Office Occupations</b>	<b>4700-5940</b>	<b>41-0000-43-0000</b>
<b>Sales and Related Occupations</b>	<b>4700-4965</b>	<b>41-0000</b>
First-Line supervisors of retail sales workers	4700	41-1011
First-Line supervisors of non-retail sales workers	4710	41-1012
Cashiers	4720	41-2010
Counter and rental clerks	4740	41-2021
Parts salespersons	4750	41-2022
Retail salespersons	4760	41-2031
Advertising sales agents	4800	41-3011

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**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
Insurance sales agents	4810	41-3021
Securities, commodities, and financial services sales agents	4820	41-3031
Travel agents	4830	41-3041
Sales representatives of services, except advertising, insurance, financial services, and travel	4840	41-3091
Sales representatives, wholesale and manufacturing	4850	41-4010
Models, demonstrators, and product promoters	4900	41-9010
Real estate brokers and sales agents	4920	41-9020
Sales engineers	4930	41-9031
Telemarketers	4940	41-9041
Door-to-door sales workers, news and street vendors, and related workers	4950	41-9091
Sales and related workers, all other	4965	41-9099
<b>Office and Administrative Support Occupations</b>	<b>5000-5940</b>	<b>43-0000</b>
First-Line supervisors of office and administrative support workers	5000	43-1011
Switchboard operators, including answering service	5010	43-2011
Telephone operators	5020	43-2021
Communications equipment operators, all other	5040	43-2099
Bill and account collectors	5100	43-3011
Billing and posting clerks	5110	43-3021
Bookkeeping, accounting, and auditing clerks	5120	43-3031
Gambling cage workers	5130	43-3041
Payroll and timekeeping clerks	5140	43-3051
Procurement clerks	5150	43-3061
Tellers	5160	43-3071
Financial clerks, all other	5165	43-3099
Brokerage clerks	5200	43-4011
Correspondence clerks	5210	43-4021
Court, municipal, and license clerks	5220	43-4031
Credit authorizers, checkers, and clerks	5230	43-4041
Customer service representatives	5240	43-4051
Eligibility interviewers, government programs	5250	43-4061
File clerks	5260	43-4071
Hotel, motel, and resort desk clerks	5300	43-4081
Interviewers, except eligibility and loan	5310	43-4111
Library assistants, clerical	5320	43-4121
Loan interviewers and clerks	5330	43-4131
New accounts clerks	5340	43-4141
Order clerks	5350	43-4151
Human resources assistants, except payroll and timekeeping	5360	43-4161
Receptionists and information clerks	5400	43-4171
Reservation and transportation ticket agents and travel clerks	5410	43-4181
Information and record clerks, all other	5420	43-4199
Cargo and freight agents	5500	43-5011

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**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
Couriers and messengers	5510	43-5021
Public safety telecommunicators	5521	43-5031
Dispatchers, except police, fire, and ambulance	5522	43-5032
Meter readers, utilities	5530	43-5041
Postal service clerks	5540	43-5051
Postal service mail carriers	5550	43-5052
Postal service mail sorters, processors, and processing machine operators	5560	43-5053
Production, planning, and expediting clerks	5600	43-5061
Shipping, receiving, and inventory clerks	5610	43-5071
Weighers, measurers, checkers, and samplers, recordkeeping	5630	43-5111
Executive secretaries and executive administrative assistants	5710	43-6011
Legal secretaries and administrative assistants	5720	43-6012
Medical secretaries and administrative assistants	5730	43-6013
Secretaries and administrative assistants, except legal, medical, and executive	5740	43-6014
Data entry keyers	5810	43-9021
Word processors and typists	5820	43-9022
Desktop publishers	5830	43-9031
Insurance claims and policy processing clerks	5840	43-9041
Mail clerks and mail machine operators, except postal service	5850	43-9051
Office clerks, general	5860	43-9061
Office machine operators, except computer	5900	43-9071
Proofreaders and copy markers	5910	43-9081
Statistical assistants	5920	43-9111
Office and administrative support workers, all other	5940	43-9199
<b>Natural Resources, Construction, and Maintenance Occupations</b>	<b>6005-7640</b>	<b>45-0000-49-0000</b>
<b><i>Farming, Fishing, and Forestry Occupations</i></b>	<b>6005-6130</b>	<b>45-0000</b>
First-line supervisors of farming, fishing, and forestry workers	6005	45-1011
Agricultural inspectors	6010	45-2011
Animal breeders	6020	45-2021
Graders and sorters, agricultural products	6040	45-2041
Miscellaneous agricultural workers	6050	45-2090
Fishing and hunting workers	6115	45-3031
Forest and conservation workers	6120	45-4011
Logging workers	6130	45-4020
<b><i>Construction and Extraction Occupations</i></b>	<b>6200-6950</b>	<b>47-0000</b>
First-line supervisors of construction trades and extraction workers	6200	47-1011
Boilermakers	6210	47-2011
Brickmasons, blockmasons, and stonemasons	6220	47-2020
Carpenters	6230	47-2031
Carpet, floor, and tile installers and finishers	6240	47-2040
Cement masons, concrete finishers, and terrazzo workers	6250	47-2050
Construction laborers	6260	47-2061

Appendix Table A-2.

**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
<b>Construction equipment operators</b>	<b>6305</b>	<b>47-2070</b>
Drywall installers, ceiling tile installers, and tapers	6330	47-2080
Electricians	6355	47-2111
Glaziers	6360	47-2121
Insulation workers	6400	47-2130
<b>Painters and paperhangers</b>	<b>6410</b>	<b>47-2140</b>
<b>Pipelayers</b>	<b>6441</b>	<b>47-2151</b>
<b>Plumbers, pipefitters, and steamfitters</b>	<b>6442</b>	<b>47-2152</b>
Plasterers and stucco masons	6460	47-2161
Reinforcing iron and rebar workers	6500	47-2171
Roofers	6515	47-2181
Sheet metal workers	6520	47-2211
Structural iron and steel workers	6530	47-2221
Solar photovoltaic installers	6540	47-2231
Helpers, construction trades	6600	47-3010
Construction and building inspectors	6660	47-4011
Elevator and escalator installers and repairers	6700	47-4021
Fence erectors	6710	47-4031
Hazardous materials removal workers	6720	47-4041
Highway maintenance workers	6730	47-4051
Rail-track laying and maintenance equipment operators	6740	47-4061
Septic tank servicers and sewer pipe cleaners	6750	47-4071
Miscellaneous construction and related workers	6765	47-4090
Derrick, rotary drill, and service unit operators, oil and gas	6800	47-5010
<b>Excavating and loading machine and dragline operators, surface mining</b>	<b>6821</b>	<b>47-5022</b>
<b>Earth drillers, except oil and gas</b>	<b>6825</b>	<b>47-5023</b>
<b>Explosives workers, ordnance handling experts, and blasters</b>	<b>6835</b>	<b>47-5032</b>
<b>Underground mining machine operators</b>	<b>6850</b>	<b>47-5040</b>
Roustabouts, oil and gas	6920	47-5071
<b>Other extraction workers</b>	<b>6950</b>	<b>47-50XX</b>
<b><i>Installation, Maintenance, and Repair Occupations</i></b>	<b><i>7000-7640</i></b>	<b><i>49-0000</i></b>
First-line supervisors of mechanics, installers, and repairers	7000	49-1011
Computer, automated teller, and office machine repairers	7010	49-2011
Radio and telecommunications equipment installers and repairers	7020	49-2020
Avionics technicians	7030	49-2091
Electric motor, power tool, and related repairers	7040	49-2092
Electrical and electronics installers and repairers, transportation equipment	7050	49-2093
Electrical and electronics repairers, industrial and utility	7100	49-209X
Electronic equipment installers and repairers, motor vehicles	7110	49-2096
Audiovisual equipment installers and repairers	7120	49-2097
Security and fire alarm systems installers	7130	49-2098
Aircraft mechanics and service technicians	7140	49-3011

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**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
Automotive body and related repairers	7150	49-3021
Automotive glass installers and repairers	7160	49-3022
Automotive service technicians and mechanics	7200	49-3023
Bus and truck mechanics and diesel engine specialists	7210	49-3031
Heavy vehicle and mobile equipment service technicians and mechanics	7220	49-3040
Small engine mechanics	7240	49-3050
Miscellaneous vehicle and mobile equipment mechanics, installers, and repairers	7260	49-3090
Control and valve installers and repairers	7300	49-9010
Heating, air conditioning, and refrigeration mechanics and installers	7315	49-9021
Home appliance repairers	7320	49-9031
Industrial and refractory machinery mechanics	7330	49-904X
Maintenance and repair workers, general	7340	49-9071
Maintenance workers, machinery	7350	49-9043
Millwrights	7360	49-9044
Electrical power-line installers and repairers	7410	49-9051
Telecommunications line installers and repairers	7420	49-9052
Precision instrument and equipment repairers	7430	49-9060
Wind turbine service technicians	7440	49-9081
Coin, vending, and amusement machine servicers and repairers	7510	49-9091
Commercial divers	7520	49-9092
Locksmiths and safe repairers	7540	49-9094
Manufactured building and mobile home installers	7550	49-9095
Riggers	7560	49-9096
Helpers—installation, maintenance, and repair workers	7610	49-9098
Other installation, maintenance, and repair workers	7640	49-909X
<b>Production, Transportation, and Material Moving Occupations</b>	<b>7700-9760</b>	<b>51-0000-53-0000</b>
<b><i>Production Occupations</i></b>	<b><i>7700-8990</i></b>	<b><i>51-0000</i></b>
First-line supervisors of production and operating workers	7700	51-1011
Aircraft structure, surfaces, rigging, and systems assemblers	7710	51-2011
Electrical, electronics, and electromechanical assemblers	7720	51-2020
Engine and other machine assemblers	7730	51-2031
Structural metal fabricators and fitters	7740	51-2041
Other assemblers and fabricators	7750	51-20XX
Bakers	7800	51-3011
Butchers and other meat, poultry, and fish processing workers	7810	51-3020
Food and tobacco roasting, baking, and drying machine operators and tenders	7830	51-3091
Food batchmakers	7840	51-3092
Food cooking machine operators and tenders	7850	51-3093
Food processing workers, all other	7855	51-3099
Computer numerically controlled tool operators and programmers	7905	51-9160

Appendix Table A-2.

**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
<b>Forming machine setters, operators, and tenders, metal and plastic</b>	<b>7925</b>	<b>51-4020</b>
Cutting, punching, and press machine setters, operators, and tenders, metal and plastic	7950	51-4031
Grinding, lapping, polishing, and buffing machine tool setters, operators, and tenders, metal and plastic	8000	51-4033
<b>Other machine tool setters, operators, and tenders, metal and plastic</b>	<b>8025</b>	<b>51-403X</b>
Machinists	8030	51-4041
Metal furnace operators, tenders, pourers, and casters	8040	51-4050
Model makers and patternmakers, metal and plastic	8060	51-4060
Molders and molding machine setters, operators, and tenders, metal and plastic	8100	51-4070
Tool and die makers	8130	51-4111
Welding, soldering, and brazing workers	8140	51-4120
<b>Other metal workers and plastic workers</b>	<b>8225</b>	<b>51-4XXX</b>
Prepress technicians and workers	8250	51-5111
Printing press operators	8255	51-5112
Print binding and finishing workers	8256	51-5113
Laundry and dry-cleaning workers	8300	51-6011
Pressers, textile, garment, and related materials	8310	51-6021
Sewing machine operators	8320	51-6031
<b>Shoe and leather workers</b>	<b>8335</b>	<b>51-6040</b>
Tailors, dressmakers, and sewers	8350	51-6050
<b>Textile machine setters, operators, and tenders</b>	<b>8365</b>	<b>51-6060</b>
Upholsterers	8450	51-6093
<b>Other textile, apparel, and furnishings workers</b>	<b>8465</b>	<b>51-609X</b>
Cabinetmakers and bench carpenters	8500	51-7011
Furniture finishers	8510	51-7021
Sawing machine setters, operators, and tenders, wood	8530	51-7041
Woodworking machine setters, operators, and tenders, except sawing	8540	51-7042
<b>Other woodworkers</b>	<b>8555</b>	<b>51-70XX</b>
Power plant operators, distributors, and dispatchers	8600	51-8010
Stationary engineers and boiler operators	8610	51-8021
Water and wastewater treatment plant and system operators	8620	51-8031
Miscellaneous plant and system operators	8630	51-8090
Chemical processing machine setters, operators, and tenders	8640	51-9010
Crushing, grinding, polishing, mixing, and blending workers	8650	51-9020
Cutting workers	8710	51-9030
Extruding, forming, pressing, and compacting machine setters, operators, and tenders	8720	51-9041
Furnace, kiln, oven, drier, and kettle operators and tenders	8730	51-9051
Inspectors, testers, sorters, samplers, and weighers	8740	51-9061
Jewelers and precious stone and metal workers	8750	51-9071
Dental and ophthalmic laboratory technicians and medical appliance technicians	8760	51-9080

Appendix Table A-2.

**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
Packaging and filling machine operators and tenders	8800	51-9111
Painting workers	8810	51-9120
Photographic process workers and processing machine operators	8830	51-9151
Adhesive bonding machine operators and tenders	8850	51-9191
Etchers and engravers	8910	51-9194
Molders, shapers, and casters, except metal and plastic	8920	51-9195
Paper goods machine setters, operators, and tenders	8930	51-9196
Tire builders	8940	51-9197
Helpers—production workers	8950	51-9198
Other production equipment operators and tenders	8865	51-919X
Other production workers	8990	51-91XX
<b>Transportation and Material Moving Occupations</b>	<b>9005-9760</b>	<b>53-0000</b>
<b>Transportation Occupations</b>	<b>9005-9430</b>	<b>53-1000-53-6000</b>
Supervisors of transportation and material moving workers	9005	53-1000
Aircraft pilots and flight engineers	9030	53-2010
Air traffic controllers and airfield operations specialists	9040	53-2020
Flight attendants	9050	53-2031
Ambulance drivers and attendants, except emergency medical technicians	9110	53-3011
Bus drivers, school	9121	53-3051
Bus drivers, transit and intercity	9122	53-3052
Driver/sales workers and truck drivers	9130	53-3030
Shuttle drivers and chauffeurs	9141	53-3053
Taxi drivers	9142	53-3054
Motor vehicle operators, all other	9150	53-3099
Locomotive engineers and operators	9210	53-4010
Railroad conductors and yardmasters	9240	53-4031
Other rail transportation workers	9265	53-40XX
Sailors and marine oilers	9300	53-5011
Ship and boat captains and operators	9310	53-5020
Ship engineers	9330	53-5031
Parking attendants	9350	53-6021
Transportation service attendants	9365	53-6030
Transportation inspectors	9410	53-6051
Passenger attendants	9415	53-6061
Other transportation workers	9430	53-60XX
<b>Material Moving Occupations</b>	<b>9510-9760</b>	<b>53-7000</b>
Crane and tower operators	9510	53-7021
Conveyor, dredge, and hoist and winch operators	9570	53-70XX
Industrial truck and tractor operators	9600	53-7051
Cleaners of vehicles and equipment	9610	53-7061
Laborers and freight, stock, and material movers, hand	9620	53-7062
Machine feeders and offbearers	9630	53-7063
Packers and packagers, hand	9640	53-7064

Appendix Table A-2.

**2018 Census Occupation Code List—Con.**

2018 census title	2018 census code	2018 SOC code
Stockers and order fillers	9645	53-7065
Pumping station operators	9650	53-7070
Refuse and recyclable material collectors	9720	53-7081
Other material moving workers	9760	53-71XX
<b>Military Specific Occupations</b>	<b>9800-9830</b>	<b>55-0000</b>
Military officer special and tactical operations leaders	9800	55-1010
First-line enlisted military supervisors	9810	55-2010
Military enlisted tactical operations and air/weapons specialists and crew members	9825	55-3010
Military, rank not Specified	9830	none
Unemployed, with no work experience in the last 5 years or earlier or never worked	9920	none
Note: The 2018 census occupation classification list has 570 codes including 4 military codes. The 2018 Census Occupation Code List can be found at < <a href="http://www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html">www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html</a> >.		
Blue fill—Change to code title		
Red font—Change to census code and/or SOC code (but not a new occupation)		
Yellow fill—New occupation, code, and title		

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**APPENDIX B.**  
**2012 CENSUS INDUSTRY CODE LIST AND**  
**2010 CENSUS OCCUPATION CODE LIST**

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Appendix Table B-1.

**2012 Census Industry Code List**

2012 census description	2012 census code	2012 NAICS code
<b>Agriculture, Forestry, Fishing and Hunting, and Mining</b>	<b>0170-0490</b>	<b>11-21</b>
<b><i>Agriculture, Forestry, Fishing, and Hunting</i></b>	<b><i>0170-0290</i></b>	<b><i>11</i></b>
Crop production	0170	111
Animal production and aquaculture	0180	112
Forestry except logging	0190	1131, 1132
Logging	0270	1133
Fishing, hunting and trapping	0280	114
Support activities for agriculture and forestry	0290	115
<b><i>Mining, Quarrying, and Oil and Gas Extraction</i></b>	<b><i>0370-0490</i></b>	<b><i>21</i></b>
Oil and gas extraction	0370	211
Coal mining	0380	2121
Metal ore mining	0390	2122
Nonmetallic mineral mining and quarrying	0470	2123
Not specified type of mining	0480	Part of 21
Support activities for mining	0490	213
<b>Construction</b>	<b>0770</b>	<b>23</b>
Construction (the cleaning of buildings and dwellings is incidental during construction and immediately after construction)	0770	23
<b>Manufacturing</b>	<b>1070-3990</b>	<b>31-33</b>
Animal food, grain and oilseed milling	1070	3111, 3112
Sugar and confectionery products	1080	3113
Fruit and vegetable preserving and specialty food manufacturing	1090	3114
Dairy product manufacturing	1170	3115
Animal slaughtering and processing	1180	3116
Retail bakeries	1190	311811
Bakeries and tortilla manufacturing, except retail bakeries	1270	3118 exc. 311811
Seafood and other miscellaneous foods, n.e.c.	1280	3117, 3119
Not specified food industries	1290	Part of 311
Beverage manufacturing	1370	3121
Tobacco manufacturing	1390	3122
Fiber, yarn, and thread mills	1470	3131
Fabric mills, except knitting mills	1480	3132 exc. 31324
Textile and fabric finishing and fabric coating mills	1490	3133
Carpet and rug mills	1570	31411
Textile product mills, except carpet and rug	1590	314 exc. 31411
Knitting fabric mills, and apparel knitting mills	1670	31324, 3151
Cut and sew apparel manufacturing	1680	3152
Apparel accessories and other apparel manufacturing	1690	3159
Footwear manufacturing	1770	3162
Leather tanning and finishing and other allied products manufacturing	1790	3161, 3169
Pulp, paper, and paperboard mills	1870	3221
Paperboard container manufacturing	1880	32221

Appendix Table B-1.

**2012 Census Industry Code List—Con.**

2012 census description	2012 census code	2012 NAICS code
Miscellaneous paper and pulp products	1890	32222, 32223, 32229
Printing and related support activities	1990	3231
Petroleum refining	2070	32411
Miscellaneous petroleum and coal products	2090	32412, 32419
Resin, synthetic rubber, and fibers and filaments manufacturing	2170	3252
Agricultural chemical manufacturing	2180	3253
Pharmaceutical and medicine manufacturing	2190	3254
Paint, coating, and adhesive manufacturing	2270	3255
Soap, cleaning compound, and cosmetics manufacturing	2280	3256
Industrial and miscellaneous chemicals	2290	3251, 3259
Plastics product manufacturing	2370	3261
Tire manufacturing	2380	32621
Rubber products, except tires, manufacturing	2390	32622, 32629
Pottery, ceramics, and plumbing fixture manufacturing	2470	32711
Clay building material and refractories manufacturing	2480	327120
Glass and glass product manufacturing	2490	3272
Cement, concrete, lime, and gypsum product manufacturing	2570	3273, 3274
Miscellaneous nonmetallic mineral product manufacturing	2590	3279
Iron and steel mills and steel product manufacturing	2670	3311, 3312
Aluminum production and processing	2680	3313
Nonferrous metal (except aluminum) production and processing	2690	3314
Foundries	2770	3315
Metal forgings and stampings	2780	3321
Cutlery and hand tool manufacturing	2790	3322
Structural metals, and boiler, tank, and shipping container manufacturing	2870	3323, 3324
Machine shops; turned product; screw, nut, and bolt manufacturing	2880	3327
Coating, engraving, heat treating, and allied activities	2890	3328
Ordnance	2970	332992, 332993, 332994
Miscellaneous fabricated metal products manufacturing	2980	3325, 3326, 3329 exc. 332992, 332993, 332994
Not specified metal industries	2990	Part of 331 and 332
Agricultural implement manufacturing	3070	33311
Construction, and mining and oil and gas field machinery manufacturing	3080	33312, 33313
Commercial and service industry machinery manufacturing	3095	3333
Metalworking machinery manufacturing	3170	3335
Engine, turbine, and power transmission equipment manufacturing	3180	3336
Machinery manufacturing, n.e.c.	3190	3332, 3334, 3339
Not specified machinery manufacturing	3290	Part of 333
Computer and peripheral equipment manufacturing	3365	3341
Communications, audio, and video equipment manufacturing	3370	3342, 3343

Appendix Table B-1.

**2012 Census Industry Code List—Con.**

2012 census description	2012 census code	2012 NAICS code
Navigational, measuring, electromedical, and control instruments manufacturing	3380	3345
Electronic component and product manufacturing, n.e.c.	3390	3344, 3346
Household appliance manufacturing	3470	3352
Electric lighting and electrical equipment manufacturing, and other electrical component manufacturing, n.e.c.	3490	3351, 3353, 3359
Motor vehicles and motor vehicle equipment manufacturing	3570	3361, 3362, 3363
Aircraft and parts manufacturing	3580	336411, 336412, 336413
Aerospace products and parts manufacturing	3590	336414, 336415, 336419
Railroad rolling stock manufacturing	3670	3365
Ship and boat building	3680	3366
Other transportation equipment manufacturing	3690	3369
Sawmills and wood preservation	3770	3211
Veneer, plywood, and engineered wood products	3780	3212
Prefabricated wood buildings and mobile homes	3790	321991, 321992
Miscellaneous wood products	3875	3219 exc. 321991, 321992
Furniture and related product manufacturing	3895	337
Medical equipment and supplies manufacturing	3960	3391
Sporting and athletic goods, and doll, toy and game manufacturing	3970	33992, 33993
Miscellaneous manufacturing, n.e.c.	3980	3399 exc. 33992, 33993
Not specified manufacturing industries	3990	Part of 31, 32, 33
<b>Wholesale Trade</b>	<b>4070-4590</b>	<b>42</b>
Motor vehicle and motor vehicle parts and supplies merchant wholesalers	4070	4231
Furniture and home furnishing merchant wholesalers	4080	4232
Lumber and other construction materials merchant wholesalers	4090	4233
Professional and commercial equipment and supplies merchant wholesalers	4170	4234
Metals and minerals, except petroleum, merchant wholesalers	4180	4235
Household appliances and electrical and electronic goods merchant wholesalers	4195	4236
Hardware, plumbing and heating equipment, and supplies merchant wholesalers	4265	4237
Machinery, equipment, and supplies merchant wholesalers	4270	4238
Recyclable material merchant wholesalers	4280	42393
Miscellaneous durable goods merchant wholesalers	4290	4239 exc. 42393
Paper and paper products merchant wholesalers	4370	4241
Drugs, sundries, and chemical and allied products merchant wholesalers	4380	4242, 4246
Apparel, piece goods, and notions merchant wholesalers	4390	4243
Grocery and related product merchant wholesalers	4470	4244
Farm product raw material merchant wholesalers	4480	4245
Petroleum and petroleum products merchant wholesalers	4490	4247

Appendix Table B-1.

**2012 Census Industry Code List—Con.**

2012 census description	2012 census code	2012 NAICS code
Alcoholic beverages merchant wholesalers	4560	4248
Farm supplies merchant wholesalers	4570	42491
Miscellaneous nondurable goods merchant wholesalers	4580	4249 exc. 42491
Wholesale electronic markets and agents and brokers	4585	4251
Not specified wholesale trade	4590	Part of 42
<b>Retail Trade</b>	<b>4670–5790</b>	<b>44–45</b>
Automobile dealers	4670	4411
Other motor vehicle dealers	4680	4412
Automotive parts, accessories, and tire stores	4690	4413
Furniture and home furnishings stores	4770	442
Household appliance stores	4780	443141
Electronics Stores	4795	443142
Building material and supplies dealers	4870	4441 exc. 44413
Hardware stores	4880	44413
Lawn and garden equipment and supplies stores	4890	4442
Grocery stores	4970	4451
Specialty food stores	4980	4452
Beer, wine, and liquor stores	4990	4453
Pharmacies and drug stores	5070	44611
Health and personal care, except drug, stores	5080	446 exc. 44611
Gasoline stations	5090	447
Clothing stores	5170	4481
Shoe stores	5180	44821
Jewelry, luggage, and leather goods stores	5190	4483
Sporting goods, and hobby and toy stores	5275	45111, 45112
Sewing, needlework, and piece goods stores	5280	45113
Musical instrument and supplies stores	5295	45114
Book stores and news dealers	5370	45121
Department stores and discount stores	5380	45211
Miscellaneous general merchandise stores	5390	4529
Retail florists	5470	4531
Office supplies and stationery stores	5480	45321
Used merchandise stores	5490	4533
Gift, novelty, and souvenir shops	5570	45322
Miscellaneous retail stores	5580	4539
Electronic shopping	5590	454111
Electronic auctions	5591	454112
Mail-order houses	5592	454113
Vending machine operators	5670	4542
Fuel dealers	5680	454310
Other direct selling establishments	5690	45439
Not specified retail trade	5790	Part of 44, 45

Appendix Table B-1.

**2012 Census Industry Code List—Con.**

2012 census description	2012 census code	2012 NAICS code
<b>Transportation and Warehousing and Utilities</b>	<b>6070-6390, 0570-0690</b>	<b>48-49, 22</b>
<b><i>Transportation and Warehousing</i></b>	<b>6070-6390</b>	<b>48-49</b>
Air transportation	6070	481
Rail transportation	6080	482
Water transportation	6090	483
Truck transportation	6170	484
Bus service and urban transit	6180	4851, 4852, 4854, 4855, 4859
Taxi and limousine service	6190	4853
Pipeline transportation	6270	486
Scenic and sightseeing transportation	6280	487
Services incidental to transportation	6290	488
Postal Service	6370	491
Couriers and messengers	6380	492
Warehousing and storage	6390	493
<b><i>Utilities</i></b>	<b>0570-0690</b>	<b>22</b>
Electric power generation, transmission and distribution	0570	2211
Natural gas distribution	0580	2212
Electric and gas, and other combinations	0590	Pts. 2211, 2212
Water, steam, air-conditioning, and irrigation systems	0670	22131, 22133
Sewage treatment facilities	0680	22132
Not specified utilities	0690	Part of 22
<b>Information</b>	<b>6470-6780</b>	<b>51</b>
Newspaper publishers	6470	51111
Periodical, book, and directory publishers	6480	5111 exc. 51111
Software publishers	6490	5112
Motion pictures and video industries	6570	5121
Sound recording industries	6590	5122
Broadcasting (except internet)	6670	515
Internet publishing and broadcasting and web search portals	6672	51913
Wired telecommunications carriers	6680	5171
Telecommunications, except wired telecommunications carriers	6690	517 exc. 5171
Data processing, hosting, and related services	6695	5182
Libraries and archives	6770	51912
Other information services, except libraries and archives, and internet publishing and broadcasting and web search portals	6780	5191 exc. 51912, 51913
<b>Finance and Insurance, and Real Estate and Rental and Leasing</b>	<b>6870-7190</b>	<b>52-53</b>
<b><i>Finance and Insurance</i></b>	<b>6870-6990</b>	<b>52</b>
Banking and related activities	6870	521, 52211, 52219
Savings institutions, including credit unions	6880	52212, 52213
Nondepository credit and related activities	6890	5222, 5223
Securities, commodities, funds, trusts, and other financial investments	6970	523, 525
Insurance carriers and related activities	6990	524

Appendix Table B-1.

**2012 Census Industry Code List—Con.**

2012 census description	2012 census code	2012 NAICS code
<b><i>Real Estate and Rental and Leasing</i></b>	<b>7070-7190</b>	<b>53</b>
Real estate	7070	531
Automotive equipment rental and leasing	7080	5321
Video tape and disk rental	7170	53223
Other consumer goods rental	7180	53221, 53222, 53229, 5323
Commercial, industrial, and other intangible assets rental and leasing	7190	5324, 533
<b>Professional, Scientific, and Management, and Administrative and Waste Management Services</b>	<b>7270-7790</b>	<b>54-56</b>
<b><i>Professional, Scientific, and Technical Services</i></b>	<b>7270-7490</b>	<b>54</b>
Legal services	7270	5411
Accounting, tax preparation, bookkeeping, and payroll services	7280	5412
Architectural, engineering, and related services	7290	5413
Specialized design services	7370	5414
Computer systems design and related services	7380	5415
Management, scientific, and technical consulting services	7390	5416
Scientific research and development services	7460	5417
Advertising, public relations, and related services	7470	5418
Veterinary services	7480	54194
Other professional, scientific, and technical services	7490	5419 exc. 54194
<b><i>Management of companies and enterprises</i></b>	<b>7570</b>	<b>55</b>
Management of companies and enterprises	7570	55
<b><i>Administrative and support and waste management services</i></b>	<b>7580-7790</b>	<b>56</b>
Employment services	7580	5613
Business support services	7590	5614
Travel arrangements and reservation services	7670	5615
Investigation and security services	7680	5616
Services to buildings and dwellings (except cleaning during construction and immediately after construction)	7690	5617 exc. 56173
Landscaping services	7770	56173
Other administrative and other support services	7780	5611, 5612, 5619
Waste management and remediation services	7790	562
<b>Educational Services, and Health Care and Social Assistance</b>	<b>7860-8470</b>	<b>61-62</b>
<b><i>Educational Services</i></b>	<b>7860-7890</b>	<b>61</b>
Elementary and secondary schools	7860	6111
Colleges, universities, and professional schools, including junior colleges	7870	6112, 6113
Business, technical, and trade schools and training	7880	6114, 6115
Other schools and instruction, and educational support services	7890	6116, 6117
<b><i>Health Care and Social Assistance</i></b>	<b>7970-8470</b>	<b>62</b>
Offices of physicians	7970	6211
Offices of dentists	7980	6212
Offices of chiropractors	7990	62131
Offices of optometrists	8070	62132

Appendix Table B-1.

**2012 Census Industry Code List—Con.**

2012 census description	2012 census code	2012 NAICS code
Offices of other health practitioners	8080	6213 exc. 62131, 62132
Outpatient care centers	8090	6214
Home health care services	8170	6216
Other health care services	8180	6215, 6219
Hospitals	8190	622
Nursing care facilities (skilled nursing facilities)	8270	6231
Residential care facilities, except skilled nursing facilities	8290	6232, 6233, 6239
Individual and family services	8370	6241
Community food and housing, and emergency services	8380	6242
Vocational rehabilitation services	8390	6243
Child day care services	8470	6244
<b>Arts, Entertainment, and Recreation, and Accommodation and Food Services</b>	<b>8560-8690</b>	<b>71-72</b>
<b>Arts, Entertainment, and Recreation</b>	<b>8560-8590</b>	<b>71</b>
Performing arts, spectator sports, and related industries	8560	711
Museums, art galleries, historical sites, and similar institutions	8570	712
Bowling centers	8580	71395
Other amusement, gambling, and recreation industries	8590	713 exc. 71395
<b>Accommodation and Food Services</b>	<b>8660-8690</b>	<b>72</b>
Traveler accommodation	8660	7211
Recreational vehicle parks and camps, and rooming and boarding houses	8670	7212, 7213
Restaurants and other food services	8680	722 exc. 7224
Drinking places, alcoholic beverages	8690	7224
<b>Other Services, Except Public Administration</b>	<b>8770-9290</b>	<b>81</b>
Automotive repair and maintenance	8770	8111 exc. 811192
Car washes	8780	811192
Electronic and precision equipment repair and maintenance	8790	8112
Commercial and industrial machinery and equipment repair and maintenance	8870	8113
Personal and household goods repair and maintenance	8880	8114 exc. 81143
Footwear and leather goods repair	8890	81143
Barber shops	8970	812111
Beauty salons	8980	812112
Nail salons and other personal care services	8990	812113, 81219
Drycleaning and laundry services	9070	8123
Funeral homes, and cemeteries and crematories	9080	8122
Other personal services	9090	8129
Religious organizations	9160	8131
Civic, social, advocacy organizations, and grantmaking and giving services	9170	8132, 8133, 8134
Labor unions	9180	81393
Business, professional, political, and similar organizations	9190	8139 exc. 81393
Private households	9290	814

Appendix Table B-1.

**2012 Census Industry Code List—Con.**

2012 census description	2012 census code	2012 NAICS code
<b>Public Administration</b>	<b>9370–9590</b>	<b>92</b>
Executive offices and legislative bodies	9370	92111, 92112, 92114, pt. 92115
Public finance activities	9380	92113
Other general government and support	9390	92119
Justice, public order, and safety activities	9470	922, pt. 92115
Administration of human resource programs	9480	923
Administration of environmental quality and housing programs	9490	924, 925
Administration of economic programs and space research	9570	926, 927
National security and international affairs	9590	928
<b>Military</b>	<b>9670–9870</b>	<b>928110</b>
U. S. Army	9670	928110
U. S. Air Force	9680	928110
U. S. Navy	9690	928110
U. S. Marines	9770	928110
U. S. Coast Guard	9780	928110
Armed Forces, Branch not specified	9790	928110
Military Reserves or National Guard	9870	928110
Note: The 2012 Census Industry Code List can be found at < <a href="http://www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html">www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html</a> >.		

Appendix Table B-2.

**2010 Census Occupation Code List**

2010 census description	2010 census code	2010 SOC code
<b>Management, Business, Science, and Arts Occupations:</b>	<b>0010-3540</b>	<b>11-0000-29-0000</b>
<b><i>Management, Business, and Financial Occupations:</i></b>	<b><i>0010-0950</i></b>	<b><i>11-0000-13-0000</i></b>
<b>Management Occupations:</b>	<b>0010-0430</b>	<b>11-0000</b>
Chief executives	0010	11-1011
General and operations managers	0020	11-1021
Legislators	0030	11-1031
Advertising and promotions managers	0040	11-2011
Marketing and sales managers	0050	11-2020
Public relations and fundraising managers	0060	11-2031
Administrative services managers	0100	11-3011
Computer and information systems managers	0110	11-3021
Financial managers	0120	11-3031
Compensation and benefits managers	0135	11-3111
Human resources managers	0136	11-3121
Training and development managers	0137	11-3131
Industrial production managers	0140	11-3051
Purchasing managers	0150	11-3061
Transportation, storage, and distribution managers	0160	11-3071
Farmers, ranchers, and other agricultural managers	0205	11-9013
Construction managers	0220	11-9021
Education administrators	0230	11-9030
Architectural and engineering managers	0300	11-9041
Food service managers	0310	11-9051
Funeral service managers	0325	11-9061
Gaming managers	0330	11-9071
Lodging managers	0340	11-9081
Medical and health services managers	0350	11-9111
Natural sciences managers	0360	11-9121
Postmasters and mail superintendents	0400	11-9131
Property, real estate, and community association managers	0410	11-9141
Social and community service managers	0420	11-9151
Emergency management directors	0425	11-9161
Managers, all other	0430	11-9199
<b>Business and Financial Operations Occupations:</b>	<b>0500-0950</b>	<b>13-0000</b>
Agents and business managers of artists, performers, and athletes	0500	13-1011
Buyers and purchasing agents, farm products	0510	13-1021
Wholesale and retail buyers, except farm products	0520	13-1022
Purchasing agents, except wholesale, retail, and farm products	0530	13-1023
Claims adjusters, appraisers, examiners, and investigators	0540	13-1030
Compliance officers	0565	13-1041
Cost estimators	0600	13-1051
Human resources workers	0630	13-1070
Compensation, benefits, and job analysis specialists	0640	13-1141
Training and development specialists	0650	13-1151
Logisticians	0700	13-1081

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
Management analysts	0710	13-1111
Meeting, convention, and event planners	0725	13-1121
Fundraisers	0726	13-1131
Market research analysts and marketing specialists	0735	13-1161
Business operations specialists, all other	0740	13-1199
Accountants and auditors	0800	13-2011
Appraisers and assessors of real estate	0810	13-2021
Budget analysts	0820	13-2031
Credit analysts	0830	13-2041
Financial analysts	0840	13-2051
Personal financial advisors	0850	13-2052
Insurance underwriters	0860	13-2053
Financial examiners	0900	13-2061
Credit counselors and loan officers	0910	13-2070
Tax examiners and collectors, and revenue agents	0930	13-2081
Tax preparers	0940	13-2082
Financial specialists, all other	0950	13-2099
<b>Computer, Engineering, and Science Occupations:</b>	<b>1000-1965</b>	<b>15-0000-19-0000</b>
<b>Computer and mathematical occupations:</b>	<b>1000-1240</b>	<b>15-0000</b>
Computer and information research scientists	1005	15-1111
Computer systems analysts	1006	15-1121
Information security analysts	1007	15-1122
Computer programmers	1010	15-1131
Software developers, applications and systems software	1020	15-113X
Web developers	1030	15-1134
Computer support specialists	1050	15-1150
Database administrators	1060	15-1141
Network and computer systems administrators	1105	15-1142
Computer network architects	1106	15-1143
Computer occupations, all other	1107	15-1199
Actuaries	1200	15-2011
Mathematicians	1210	15-2021
Operations research analysts	1220	15-2031
Statisticians	1230	15-2041
Miscellaneous mathematical science occupations	1240	15-2090
<b>Architecture and Engineering Occupations:</b>	<b>1300-1560</b>	<b>17-0000</b>
Architects, except naval	1300	17-1010
Surveyors, cartographers, and photogrammetrists	1310	17-1020
Aerospace engineers	1320	17-2011
Agricultural engineers	1330	17-2021
Biomedical engineers	1340	17-2031
Chemical engineers	1350	17-2041
Civil engineers	1360	17-2051
Computer hardware engineers	1400	17-2061

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
Electrical and electronics engineers	1410	17-2070
Environmental engineers	1420	17-2081
Industrial engineers, including health and safety	1430	17-2110
Marine engineers and naval architects	1440	17-2121
Materials engineers	1450	17-2131
Mechanical engineers	1460	17-2141
Mining and geological engineers, including mining safety engineers	1500	17-2151
Nuclear engineers	1510	17-2161
Petroleum engineers	1520	17-2171
Engineers, all other	1530	17-2199
Drafters	1540	17-3010
Engineering technicians, except drafters	1550	17-3020
Surveying and mapping technicians	1560	17-3031
<b>Life, Physical, and Social Science Occupations:</b>	<b>1600-1965</b>	<b>19-0000</b>
Agricultural and food scientists	1600	19-1010
Biological scientists	1610	19-1020
Conservation scientists and foresters	1640	19-1030
Medical scientists	1650	19-1040
Life scientists, all other	1660	19-1099
Astronomers and physicists	1700	19-2010
Atmospheric and space scientists	1710	19-2021
Chemists and materials scientists	1720	19-2030
Environmental scientists and geoscientists	1740	19-2040
Physical scientists, all other	1760	19-2099
Economists	1800	19-3011
Survey researchers	1815	19-3022
Psychologists	1820	19-3030
Sociologists	1830	19-3041
Urban and regional planners	1840	19-3051
Miscellaneous social scientists and related workers	1860	19-3090
Agricultural and food science technicians	1900	19-4011
Biological technicians	1910	19-4021
Chemical technicians	1920	19-4031
Geological and petroleum technicians	1930	19-4041
Nuclear technicians	1940	19-4051
Social science research assistants	1950	19-4061
Miscellaneous life, physical, and social science technicians	1965	19-4090
<b>Education, Legal, Community Service, Arts, and Media Occupations:</b>	<b>2000-2960</b>	<b>21-0000-27-0000</b>
<b>Community and Social Service Occupations:</b>	<b>2000-2060</b>	<b>21-0000</b>
Counselors	2000	21-1010
Social workers	2010	21-1020
Probation officers and correctional treatment specialists	2015	21-1092
Social and human service assistants	2016	21-1093

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
Miscellaneous community and social service specialists, including health educators and community health workers	2025	21-109X
Clergy	2040	21-2011
Directors, religious activities and education	2050	21-2021
Religious workers, all other	2060	21-2099
<b>Legal Occupations:</b>	<b>2100-2160</b>	<b>23-0000</b>
Lawyers	2100	23-1011
Judicial law clerks	2105	23-1012
Judges, magistrates, and other judicial workers	2110	23-1020
Paralegals and legal assistants	2145	23-2011
Miscellaneous legal support workers	2160	23-2090
<b>Education, Training, and Library Occupations:</b>	<b>2200-2550</b>	<b>25-0000</b>
Postsecondary teachers	2200	25-1000
Preschool and kindergarten teachers	2300	25-2010
Elementary and middle school teachers	2310	25-2020
Secondary school teachers	2320	25-2030
Special education teachers	2330	25-2050
Other teachers and instructors	2340	25-3000
Archivists, curators, and museum technicians	2400	25-4010
Librarians	2430	25-4021
Library technicians	2440	25-4031
Teacher assistants	2540	25-9041
Other education, training, and library workers	2550	25-90XX
<b>Arts, Design, Entertainment, Sports, and Media Occupations:</b>	<b>2600-2960</b>	<b>27-0000</b>
Artists and related workers	2600	27-1010
Designers	2630	27-1020
Actors	2700	27-2011
Producers and directors	2710	27-2012
Athletes, coaches, umpires, and related workers	2720	27-2020
Dancers and choreographers	2740	27-2030
Musicians, singers, and related workers	2750	27-2040
Entertainers and performers, sports and related workers, all other	2760	27-2099
Announcers	2800	27-3010
News analysts, reporters and correspondents	2810	27-3020
Public relations specialists	2825	27-3031
Editors	2830	27-3041
Technical writers	2840	27-3042
Writers and authors	2850	27-3043
Miscellaneous media and communication workers	2860	27-3090
Broadcast and sound engineering technicians and radio operators	2900	27-4010
Photographers	2910	27-4021
Television, video, and motion picture camera operators and editors	2920	27-4030
Media and communication equipment workers, all other	2960	27-4099

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
<b>Healthcare Practitioners and Technical Occupations:</b>	<b>3000–3540</b>	<b>29-0000</b>
Chiropractors	3000	29-1011
Dentists	3010	29-1020
Dietitians and nutritionists	3030	29-1031
Optometrists	3040	29-1041
Pharmacists	3050	29-1051
Physicians and surgeons	3060	29-1060
Physician assistants	3110	29-1071
Podiatrists	3120	29-1081
Audiologists	3140	29-1181
Occupational therapists	3150	29-1122
Physical therapists	3160	29-1123
Radiation therapists	3200	29-1124
Recreational therapists	3210	29-1125
Respiratory therapists	3220	29-1126
Speech-language pathologists	3230	29-1127
Exercise physiologists	3235	29-1128
Therapists, all other	3245	29-1129
Veterinarians	3250	29-1131
Registered nurses	3255	29-1141
Nurse anesthetists	3256	29-1151
Nurse midwives	3257	29-1161
Nurse practitioners	3258	29-1171
Health diagnosing and treating practitioners, all other	3260	29-1199
Clinical laboratory technologists and technicians	3300	29-2010
Dental hygienists	3310	29-2021
Diagnostic related technologists and technicians	3320	29-2030
Emergency medical technicians and paramedics	3400	29-2041
Health practitioner support technologists and technicians	3420	29-2050
Licensed practical and licensed vocational nurses	3500	29-2061
Medical records and health information technicians	3510	29-2071
Opticians, dispensing	3520	29-2081
Miscellaneous health technologists and technicians	3535	29-2090
Other healthcare practitioners and technical occupations	3540	29-9000
<b>Service Occupations:</b>	<b>3600–4650</b>	<b>31-0000–39-0000</b>
<b>Healthcare Support Occupations:</b>	<b>3600–3655</b>	<b>31-0000</b>
Nursing, psychiatric, and home health aides	3600	31-1010
Occupational therapy assistants and aides	3610	31-2010
Physical therapist assistants and aides	3620	31-2020
Massage therapists	3630	31-9011
Dental assistants	3640	31-9091
Medical assistants	3645	31-9092
Medical transcriptionists	3646	31-9094

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
Pharmacy aides	3647	31-9095
Veterinary assistants and laboratory animal caretakers	3648	31-9096
Phlebotomists	3649	31-9097
Healthcare support workers, all other, including medical equipment preparers	3655	31-909X
<b>Protective Service Occupations:</b>	<b>3700–3955</b>	<b>33-0000</b>
First-line supervisors of correctional officers	3700	33-1011
First-line supervisors of police and detectives	3710	33-1012
First-line supervisors of fire fighting and prevention workers	3720	33-1021
First-line supervisors of protective service workers, all other	3730	33-1099
Firefighters	3740	33-2011
Fire inspectors	3750	33-2020
Bailiffs, correctional officers, and jailers	3800	33-3010
Detectives and criminal investigators	3820	33-3021
Fish and game wardens	3830	33-3031
Parking enforcement workers	3840	33-3041
Police and sheriff's patrol officers	3850	33-3051
Transit and railroad police	3860	33-3052
Animal control workers	3900	33-9011
Private detectives and investigators	3910	33-9021
Security guards and gaming surveillance officers	3930	33-9030
Crossing guards	3940	33-9091
Transportation security screeners	3945	33-9093
Lifeguards and other recreational, and all other protective service workers	3955	33-909X
<b>Food Preparation and Serving Related Occupations:</b>	<b>4000–4160</b>	<b>35-0000</b>
Chefs and head cooks	4000	35-1011
First-line supervisors of food preparation and serving workers	4010	35-1012
Cooks	4020	35-2010
Food preparation workers	4030	35-2021
Bartenders	4040	35-3011
Combined food preparation and serving workers, including fast food	4050	35-3021
Counter attendants, cafeteria, food concession, and coffee shop	4060	35-3022
Waiters and waitresses	4110	35-3031
Food servers, nonrestaurant	4120	35-3041
Dining room and cafeteria attendants and bartender helpers	4130	35-9011
Dishwashers	4140	35-9021
Hosts and hostesses, restaurant, lounge, and coffee shop	4150	35-9031
Food preparation and serving related workers, all other	4160	35-9099
<b>Building and Grounds Cleaning and Maintenance Occupations:</b>	<b>4200–4250</b>	<b>37-0000</b>
First-line supervisors of housekeeping and janitorial workers	4200	37-1011
First-line supervisors of landscaping, lawn service, and groundskeeping workers	4210	37-1012
Janitors and building cleaners	4220	37-201X
Maids and housekeeping cleaners	4230	37-2012

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
Pest control workers	4240	37-2021
Grounds maintenance workers	4250	37-3010
<b>Personal Care and Service Occupations:</b>	<b>4300-4650</b>	<b>39-0000</b>
First-line supervisors of gaming workers	4300	39-1010
First-line supervisors of personal service workers	4320	39-1021
Animal trainers	4340	39-2011
Nonfarm animal caretakers	4350	39-2021
Gaming services workers	4400	39-3010
Motion picture projectionists	4410	39-3021
Ushers, lobby attendants, and ticket takers	4420	39-3031
Miscellaneous entertainment attendants and related workers	4430	39-3090
Embalmers and funeral attendants	4460	39-40XX
Morticians, undertakers, and funeral directors	4465	39-4031
Barbers	4500	39-5011
Hairdressers, hairstylists, and cosmetologists	4510	39-5012
Miscellaneous personal appearance workers	4520	39-5090
Baggage porters, bellhops, and concierges	4530	39-6010
Tour and travel guides	4540	39-7010
Childcare workers	4600	39-9011
Personal care aides	4610	39-9021
Recreation and fitness workers	4620	39-9030
Residential advisors	4640	39-9041
Personal care and service workers, all other	4650	39-9099
<b>Sales and Office Occupations:</b>	<b>4700-5940</b>	<b>41-0000-43-0000</b>
<b>Sales and Related Occupations:</b>	<b>4700-4965</b>	<b>41-0000</b>
First-line supervisors of retail sales workers	4700	41-1011
First-line supervisors of non-retail sales workers	4710	41-1012
Cashiers	4720	41-2010
Counter and rental clerks	4740	41-2021
Parts salespersons	4750	41-2022
Retail salespersons	4760	41-2031
Advertising sales agents	4800	41-3011
Insurance sales agents	4810	41-3021
Securities, commodities, and financial services sales agents	4820	41-3031
Travel agents	4830	41-3041
Sales representatives, services, all other	4840	41-3099
Sales representatives, wholesale and manufacturing	4850	41-4010
Models, demonstrators, and product promoters	4900	41-9010
Real estate brokers and sales agents	4920	41-9020
Sales engineers	4930	41-9031
Telemarketers	4940	41-9041
Door-to-door sales workers, news and street vendors, and related workers	4950	41-9091
Sales and related workers, all other	4965	41-9099

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**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
<b>Office and Administrative Support Occupations:</b>	<b>5000-5940</b>	<b>43-0000</b>
First-line supervisors of office and administrative support workers	5000	43-1011
Switchboard operators, including answering service	5010	43-2011
Telephone operators	5020	43-2021
Communications equipment operators, all other	5030	43-2099
Bill and account collectors	5100	43-3011
Billing and posting clerks	5110	43-3021
Bookkeeping, accounting, and auditing clerks	5120	43-3031
Gaming cage workers	5130	43-3041
Payroll and timekeeping clerks	5140	43-3051
Procurement clerks	5150	43-3061
Tellers	5160	43-3071
Financial clerks, all other	5165	43-3099
Brokerage clerks	5200	43-4011
Correspondence clerks	5210	43-4021
Court, municipal, and license clerks	5220	43-4031
Credit authorizers, checkers, and clerks	5230	43-4041
Customer service representatives	5240	43-4051
Eligibility interviewers, government programs	5250	43-4061
File clerks	5260	43-4071
Hotel, motel, and resort desk clerks	5300	43-4081
Interviewers, except eligibility and loan	5310	43-4111
Library assistants, clerical	5320	43-4121
Loan interviewers and clerks	5330	43-4131
New accounts clerks	5340	43-4141
Order clerks	5350	43-4151
Human resources assistants, except payroll and timekeeping	5360	43-4161
Receptionists and information clerks	5400	43-4171
Reservation and transportation ticket agents and travel clerks	5410	43-4181
Information and record clerks, all other	5420	43-4199
Cargo and freight agents	5500	43-5011
Couriers and messengers	5510	43-5021
Dispatchers	5520	43-5030
Meter readers, utilities	5530	43-5041
Postal service clerks	5540	43-5051
Postal service mail carriers	5550	43-5052
Postal service mail sorters, processors, and processing machine operators	5560	43-5053
Production, planning, and expediting clerks	5600	43-5061
Shipping, receiving, and traffic clerks	5610	43-5071
Stock clerks and order fillers	5620	43-5081
Weighers, measurers, checkers, and samplers, recordkeeping	5630	43-5111
Secretaries and administrative assistants	5700	43-6010
Computer operators	5800	43-9011
Data entry keyers	5810	43-9021

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
Word processors and typists	5820	43-9022
Desktop publishers	5830	43-9031
Insurance claims and policy processing clerks	5840	43-9041
Mail clerks and mail machine operators, except postal service	5850	43-9051
Office clerks, general	5860	43-9061
Office machine operators, except computer	5900	43-9071
Proofreaders and copy markers	5910	43-9081
Statistical assistants	5920	43-9111
Office and administrative support workers, all other	5940	43-9199
<b>Natural Resources, Construction, and Maintenance Occupations:</b>	<b>6005-7630</b>	<b>45-0000-49-0000</b>
<b><i>Farming, Fishing, and Forestry Occupations:</i></b>	<b><i>6005-6130</i></b>	<b><i>45-0000</i></b>
First-line supervisors of farming, fishing, and forestry workers	6005	45-1011
Agricultural inspectors	6010	45-2011
Animal breeders	6020	45-2021
Graders and sorters, agricultural products	6040	45-2041
Miscellaneous agricultural workers	6050	45-2090
Fishers and related fishing workers	6100	45-3011
Hunters and trappers	6110	45-3021
Forest and conservation workers	6120	45-4011
Logging workers	6130	45-4020
<b><i>Construction and Extraction Occupations:</i></b>	<b><i>6200-6940</i></b>	<b><i>47-0000</i></b>
First-line supervisors of construction trades and extraction workers	6200	47-1011
Boilermakers	6210	47-2011
Brickmasons, blockmasons, and stonemasons	6220	47-2020
Carpenters	6230	47-2031
Carpet, floor, and tile installers and finishers	6240	47-2040
Cement masons, concrete finishers, and terrazzo workers	6250	47-2050
Construction laborers	6260	47-2061
Paving, surfacing, and tamping equipment operators	6300	47-2071
Pile-driver operators	6310	47-2072
Operating engineers and other construction equipment operators	6320	47-2073
Drywall installers, ceiling tile installers, and tapers	6330	47-2080
Electricians	6355	47-2111
Glaziers	6360	47-2121
Insulation workers	6400	47-2130
Painters, construction and maintenance	6420	47-2141
Paperhangers	6430	47-2142
Pipelayers, plumbers, pipefitters, and steamfitters	6440	47-2150
Plasterers and stucco masons	6460	47-2161
Reinforcing iron and rebar workers	6500	47-2171
Roofers	6515	47-2181
Sheet metal workers	6520	47-2211
Structural iron and steel workers	6530	47-2221

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
Solar photovoltaic installers	6540	47-2231
Helpers, construction trades	6600	47-3010
Construction and building inspectors	6660	47-4011
Elevator installers and repairers	6700	47-4021
Fence erectors	6710	47-4031
Hazardous materials removal workers	6720	47-4041
Highway maintenance workers	6730	47-4051
Rail-track laying and maintenance equipment operators	6740	47-4061
Septic tank servicers and sewer pipe cleaners	6750	47-4071
Miscellaneous construction and related workers	6765	47-4090
Derrick, rotary drill, and service unit operators, oil, gas, and mining	6800	47-5010
Earth drillers, except oil and gas	6820	47-5021
Explosives workers, ordnance handling experts, and blasters	6830	47-5031
Mining machine operators	6840	47-5040
Roof bolters, mining	6910	47-5061
Roustabouts, oil and gas	6920	47-5071
Helpers—extraction workers	6930	47-5081
Other extraction workers	6940	47-50XX
<b><i>Installation, Maintenance, and Repair Occupations:</i></b>	<b><i>7000-7630</i></b>	<b><i>49-0000</i></b>
First-line supervisors of mechanics, installers, and repairers	7000	49-1011
Computer, automated teller, and office machine repairers	7010	49-2011
Radio and telecommunications equipment installers and repairers	7020	49-2020
Avionics technicians	7030	49-2091
Electric motor, power tool, and related repairers	7040	49-2092
Electrical and electronics installers and repairers, transportation equipment	7050	49-2093
Electrical and electronics repairers, industrial and utility	7100	49-209X
Electronic equipment installers and repairers, motor vehicles	7110	49-2096
Electronic home entertainment equipment installers and repairers	7120	49-2097
Security and fire alarm systems installers	7130	49-2098
Aircraft mechanics and service technicians	7140	49-3011
Automotive body and related repairers	7150	49-3021
Automotive glass installers and repairers	7160	49-3022
Automotive service technicians and mechanics	7200	49-3023
Bus and truck mechanics and diesel engine specialists	7210	49-3031
Heavy vehicle and mobile equipment service technicians and mechanics	7220	49-3040
Small engine mechanics	7240	49-3050
Miscellaneous vehicle and mobile equipment mechanics, installers, and repairers	7260	49-3090
Control and valve installers and repairers	7300	49-9010
Heating, air conditioning, and refrigeration mechanics and installers	7315	49-9021
Home appliance repairers	7320	49-9031
Industrial and refractory machinery mechanics	7330	49-904X
Maintenance and repair workers, general	7340	49-9071

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
Maintenance workers, machinery	7350	49-9043
Millwrights	7360	49-9044
Electrical power-line installers and repairers	7410	49-9051
Telecommunications line installers and repairers	7420	49-9052
Precision instrument and equipment repairers	7430	49-9060
Wind turbine service technicians	7440	49-9081
Coin, vending, and amusement machine servicers and repairers	7510	49-9091
Commercial divers	7520	49-9092
Locksmiths and safe repairers	7540	49-9094
Manufactured building and mobile home installers	7550	49-9095
Riggers	7560	49-9096
Signal and track switch repairers	7600	49-9097
Helpers—installation, maintenance, and repair workers	7610	49-9098
Other installation, maintenance, and repair workers	7630	49-909X
<b>Production, Transportation, and Material Moving Occupations:</b>	<b>7700-9750</b>	<b>51-0000-53-0000</b>
<b><i>Production Occupations:</i></b>	<b><i>7700-8965</i></b>	<b><i>51-0000</i></b>
First-line supervisors of production and operating workers	7700	51-1011
Aircraft structure, surfaces, rigging, and systems assemblers	7710	51-2011
Electrical, electronics, and electromechanical assemblers	7720	51-2020
Engine and other machine assemblers	7730	51-2031
Structural metal fabricators and fitters	7740	51-2041
Miscellaneous assemblers and fabricators	7750	51-2090
Bakers	7800	51-3011
Butchers and other meat, poultry, and fish processing workers	7810	51-3020
Food and tobacco roasting, baking, and drying machine operators and tenders	7830	51-3091
Food batchmakers	7840	51-3092
Food cooking machine operators and tenders	7850	51-3093
Food processing workers, all other	7855	51-3099
Computer control programmers and operators	7900	51-4010
Extruding and drawing machine setters, operators, and tenders, metal and plastic	7920	51-4021
Forging machine setters, operators, and tenders, metal and plastic	7930	51-4022
Rolling machine setters, operators, and tenders, metal and plastic	7940	51-4023
Cutting, punching, and press machine setters, operators, and tenders, metal and plastic	7950	51-4031
Drilling and boring machine tool setters, operators, and tenders, metal and plastic	7960	51-4032
Grinding, lapping, polishing, and buffing machine tool setters, operators, and tenders, metal and plastic	8000	51-4033
Lathe and turning machine tool setters, operators, and tenders, metal and plastic	8010	51-4034
Milling and planing machine setters, operators, and tenders, metal and plastic	8020	51-4035
Machinists	8030	51-4041
Metal furnace operators, tenders, pourers, and casters	8040	51-4050

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
Model makers and patternmakers, metal and plastic	8060	51-4060
Molders and molding machine setters, operators, and tenders, metal and plastic	8100	51-4070
Multiple machine tool setters, operators, and tenders, metal and plastic	8120	51-4081
Tool and die makers	8130	51-4111
Welding, soldering, and brazing workers	8140	51-4120
Heat treating equipment setters, operators, and tenders, metal and plastic	8150	51-4191
Layout workers, metal and plastic	8160	51-4192
Plating and coating machine setters, operators, and tenders, metal and plastic	8200	51-4193
Tool grinders, filers, and sharpeners	8210	51-4194
Metal workers and plastic workers, all other	8220	51-4199
Prepress technicians and workers	8250	51-5111
Printing press operators	8255	51-5112
Print binding and finishing workers	8256	51-5113
Laundry and dry-cleaning workers	8300	51-6011
Pressers, textile, garment, and related materials	8310	51-6021
Sewing machine operators	8320	51-6031
Shoe and leather workers and repairers	8330	51-6041
Shoe machine operators and tenders	8340	51-6042
Tailors, dressmakers, and sewers	8350	51-6050
Textile bleaching and dyeing machine operators and tenders	8360	51-6061
Textile cutting machine setters, operators, and tenders	8400	51-6062
Textile knitting and weaving machine setters, operators, and tenders	8410	51-6063
Textile winding, twisting, and drawing out machine setters, operators, and tenders	8420	51-6064
Extruding and forming machine setters, operators, and tenders, synthetic and glass fibers	8430	51-6091
Fabric and apparel patternmakers	8440	51-6092
Upholsterers	8450	51-6093
Textile, apparel, and furnishings workers, all other	8460	51-6099
Cabinetmakers and bench carpenters	8500	51-7011
Furniture finishers	8510	51-7021
Model makers and patternmakers, wood	8520	51-7030
Sawing machine setters, operators, and tenders, wood	8530	51-7041
Woodworking machine setters, operators, and tenders, except sawing	8540	51-7042
Woodworkers, all other	8550	51-7099
Power plant operators, distributors, and dispatchers	8600	51-8010
Stationary engineers and boiler operators	8610	51-8021
Water and wastewater treatment plant and system operators	8620	51-8031
Miscellaneous plant and system operators	8630	51-8090
Chemical processing machine setters, operators, and tenders	8640	51-9010
Crushing, grinding, polishing, mixing, and blending workers	8650	51-9020

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
Cutting workers	8710	51-9030
Extruding, forming, pressing, and compacting machine setters, operators, and tenders	8720	51-9041
Furnace, kiln, oven, drier, and kettle operators and tenders	8730	51-9051
Inspectors, testers, sorters, samplers, and weighers	8740	51-9061
Jewelers and precious stone and metal workers	8750	51-9071
Medical, dental, and ophthalmic laboratory technicians	8760	51-9080
Packaging and filling machine operators and tenders	8800	51-9111
Painting workers	8810	51-9120
Photographic process workers and processing machine operators	8830	51-9151
Semiconductor processors	8840	51-9141
Adhesive bonding machine operators and tenders	8850	51-9191
Cleaning, washing, and metal pickling equipment operators and tenders	8860	51-9192
Cooling and freezing equipment operators and tenders	8900	51-9193
Etchers and engravers	8910	51-9194
Molders, shapers, and casters, except metal and plastic	8920	51-9195
Paper goods machine setters, operators, and tenders	8930	51-9196
Tire builders	8940	51-9197
Helpers—production workers	8950	51-9198
Production workers, all other	8965	51-9199
<b><i>Transportation and Material Moving Occupations:</i></b>	<b><i>9000-9750</i></b>	<b><i>53-0000</i></b>
<b>Transportation Occupations:</b>	<b>9000-9420</b>	<b>53-1000-53-6000</b>
Supervisors of transportation and material moving workers	9000	53-1000
Aircraft pilots and flight engineers	9030	53-2010
Air traffic controllers and airfield operations specialists	9040	53-2020
Flight attendants	9050	53-2031
Ambulance drivers and attendants, except emergency medical technicians	9110	53-3011
Bus drivers	9120	53-3020
Driver/sales workers and truck drivers	9130	53-3030
Taxi drivers and chauffeurs	9140	53-3041
Motor vehicle operators, all other	9150	53-3099
Locomotive engineers and operators	9200	53-4010
Railroad brake, signal, and switch operators	9230	53-4021
Railroad conductors and yardmasters	9240	53-4031
Subway, streetcar, and other rail transportation workers	9260	53-40XX
Sailors and marine oilers	9300	53-5011
Ship and boat captains and operators	9310	53-5020
Ship engineers	9330	53-5031
Bridge and lock tenders	9340	53-6011
Parking lot attendants	9350	53-6021
Automotive and watercraft service attendants	9360	53-6031
Transportation inspectors	9410	53-6051

Appendix Table B-2.

**2010 Census Occupation Code List—Con.**

2010 census description	2010 census code	2010 SOC code
Transportation attendants, except flight attendants	9415	53-6061
Other transportation workers	9420	53-60XX
<b>Material Moving Occupations:</b>	<b>9500-9750</b>	<b>53-7000</b>
Conveyor operators and tenders	9500	53-7011
Crane and tower operators	9510	53-7021
Dredge, excavating, and loading machine operators	9520	53-7030
Hoist and winch operators	9560	53-7041
Industrial truck and tractor operators	9600	53-7051
Cleaners of vehicles and equipment	9610	53-7061
Laborers and freight, stock, and material movers, hand	9620	53-7062
Machine feeders and offbearers	9630	53-7063
Packers and packagers, hand	9640	53-7064
Pumping station operators	9650	53-7070
Refuse and recyclable material collectors	9720	53-7081
Mine shuttle car operators	9730	53-7111
Tank car, truck, and ship loaders	9740	53-7121
Material moving workers, all other	9750	53-7199
<b>Military Specific Occupations:</b>	<b>9800-9830</b>	<b>55-0000</b>
Military officer special and tactical operations leaders	9800	55-1010
First-line enlisted military supervisors	9810	55-2010
Military enlisted tactical operations and air/weapons specialists and crew members	9820	55-3010
Military, rank not specified	9830	none
Unemployed, with no work experience in the last 5 years or earlier or never worked	9920	none
Note: The 2010 census occupation classification list has 539 codes including four military codes. The 2010 Census Occupation Code List can be found at < <a href="http://www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html">www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html</a> >.		

**APPENDIX C.**  
**2012 TO 2017 INDUSTRY CONVERSION RATES**

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Appendix Table C-1.

**2012 to 2017 Census Industry Code List Total Conversion Rates**

2012 code	2012 industry description	2017 code	2017 industry description	Conversion rate
4970	Grocery stores	4971	Supermarkets and other grocery (except convenience) stores	0.8777
		4972	Convenience stores	0.1223
5380	Department stores and discount stores	5381	Department stores	0.3139
		5391	General merchandise stores, including warehouse clubs and supercenters	0.6861
6990	Insurance carriers and related activities	6991	Insurance carriers	0.8182
		6992	Agencies, brokerages, and other insurance related activities	0.1818
7070	Real estate	7071	Lessors of real estate, and offices of real estate agents and brokers	0.7864
		7072	Real estate property managers, offices of real estate appraisers, and other activities related to real estate	0.2136
8190	Hospitals	8191	General medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals	0.9878
		8192	Psychiatric and substance abuse hospitals	0.0122
8560	Performing arts, spectator sports, and related industries	8561	Performing arts companies	0.2000
		8562	Spectator sports	0.1790
		8563	Promoters of performing arts, sports, and similar events, agents and managers for artists, athletes, entertainers, and other public figures	0.1790
		8564	Independent artists, writers, and performers	0.4419

Appendix Table C-2.

**2012 to 2017 Census Industry Code List Conversion Rates for Women by Educational Attainment**

2012 code	2012 industry description	2017 code	2017 industry description	Conversion rates		
				High school or less	At least some college	Advanced degree
4970	Grocery stores	4971	Supermarkets and other grocery (except convenience) stores . . . . .	0.842	0.863	0.905
		4972	Convenience stores . . . . .	0.159	0.137	0.095
5380	Department stores and discount stores	5381	Department stores . . . . .	0.297	0.423	0.527
		5391	General merchandise stores, including warehouse clubs and supercenters . . . . .	0.703	0.577	0.473
6990	Insurance carriers and related activities	6991	Insurance carriers . . . . .	0.806	0.834	0.892
		6992	Agencies, brokerages, and other insurance related activities . . . . .	0.194	0.166	0.108
7070	Real estate	7071	Lessors of real estate, and offices of real estate agents and brokers . . . . .	0.791	0.795	0.836
		7072	Real estate property managers, offices of real estate appraisers, and other activities related to real estate . . . . .	0.209	0.205	0.164
8190	Hospitals	8191	General medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals	0.986	0.991	0.986
		8192	Psychiatric and substance abuse hospitals . . . . .	0.014	0.009	0.014
8560	Performing arts, spectator sports, and related industries	8561	Performing arts companies . .	0.191	0.201	0.220
		8562	Spectator sports . . . . .	0.253	0.118	0.047
		8563	Promoters of performing arts, sports, and similar events, agents and managers for artists, athletes, entertainers, and other public figures . . . . .	0.264	0.191	0.107
		8564	Independent artists, writers, and performers . . . . .	0.292	0.491	0.627

Appendix Table C-3.

**2012 to 2017 Census Industry Code List Conversion Rates for Men by Educational Attainment**

2012 code	2012 industry description	2017 code	2017 industry description	Conversion rates		
				High school or less	At least some college	Advanced degree
4970	Grocery stores	4971	Supermarkets and other grocery (except convenience) stores.....	0.914	0.901	0.850
		4972	Convenience stores .....	0.086	0.099	0.150
5380	Department stores and discount stores	5381	Department stores .....	0.182	0.274	0.330
		5391	General merchandise stores, including warehouse clubs and supercenters .....	0.818	0.726	0.670
6990	Insurance carriers and related activities	6991	Insurance carriers.....	0.759	0.788	0.839
		6992	Agencies, brokerages, and other insurance related activities .....	0.241	0.212	0.161
7070	Real estate	7071	Lessors of real estate, and offices of real estate agents and brokers .....	0.756	0.774	0.818
		7072	Real estate property managers, offices of real estate appraisers, and other activities related to real estate.....	0.244	0.226	0.182
8190	Hospitals	8191	General medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals	0.969	0.983	0.988
		8192	Psychiatric and substance abuse hospitals .....	0.031	0.018	0.012
8560	Performing arts, spectator sports, and related industries	8561	Performing arts companies ..	0.180	0.203	0.207
		8562	Spectator sports.....	0.301	0.207	0.147
		8563	Promoters of performing arts, sports, and similar events, agents and managers for artists, athletes, entertainers, and other public figures.....	0.203	0.173	0.118
		8564	Independent artists, writers, and performers.....	0.315	0.418	0.529

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**APPENDIX D.**  
**2012 TO 2017 DIRECT MATCH INDUSTRY CODES**

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Appendix Table D-1.

**Summary of 2012 to 2017 Census Industry Code Direct Match Changes**

2012 code	2012 industry description	2017 code	2017 industry description
1680	Cut and sew apparel manufacturing	1691	Cut and sew, and apparel accessories and other apparel manufacturing
1690	Apparel accessories and other apparel manufacturing		
3190	Machinery manufacturing, n.e.c.	3291	Machinery manufacturing, n.e.c. or not specified
3290	Not specified machinery manufacturing		
5390	Miscellaneous general merchandise stores	5391	General merchandise stores, including warehouse clubs and supercenters
5590	Electronic shopping	5593	Electronic shopping and mail-order houses
5591	Electronic auctions		
5592	Mail-order houses		
7170	Video tape and disk rental	7181	Other consumer goods rental
7180	Other consumer goods rental		
8880	Personal and household goods repair and maintenance	8891	Personal and household goods repair and maintenance
8890	Footwear and leather goods repair		

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**APPENDIX E.**  
**2010 TO 2018 OCCUPATION CONVERSION RATES**

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Appendix Table E-1.

**2010 To 2018 Census Occupation Code List Total Conversion Rates**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rate
0050	Marketing and sales managers	0051	Marketing managers	0.5117
		0052	Sales managers	0.4883
0100	Administrative services managers	0101	Administrative services managers	0.3901
		0102	Facilities managers	0.6099
0430	Managers, all other	0335	Entertainment and recreation managers	0.0128
		0426	Personal service managers, all other	0.0060
		0440	Managers, all other	0.8413
		0705	Project management specialists	0.1399
0740	Business operations specialists, all other	0705	Project management specialists	0.0707
		0750	Business operations specialists, all other	0.9293
0840	Financial analysts	0845	Financial and investment analysts	0.9823
		0960	Financial risk specialists	0.0177
1020	Software developers, applications and systems software	1021	Software developers	0.8988
		1022	Software quality assurance analysts and testers	0.1012
1030	Web developers	1031	Web developers	0.6767
		1032	Web or digital interface designers	0.3233
1107	Computer occupations, all other	0705	Project management specialists	0.0064
		1022	Software quality assurance analysts and testers	0.0164
		1032	Web and digital interface designers	0.0055
		1065	Database administrators and architects	0.0130
		1108	Computer occupations, all other	0.9587
1300	Architects, except naval	1305	Architects, except landscape and naval	0.8467
		1306	Landscape architects	0.1533
1540	Drafters	1541	Architectural and civil drafters	0.3382
		1545	Other drafters	0.6618
1550	Engineering technicians, except drafters	1551	Electrical and electronic engineering technologists and technicians	0.2932
		1555	Other engineering technologists and technicians, except drafters	0.7068
1740	Environmental scientists and geoscientists	1745	Environmental scientists and specialists, including health	0.4004
		1750	Geoscientists and hydrologists, except geographers	0.5996
1820	Psychologists	1821	Clinical and counseling psychologists	0.1591
		1822	School psychologists	0.2049
		1825	Other psychologists	0.6360
1965	Miscellaneous life, physical, and social science technicians	1935	Environmental science and geoscience technicians	0.1319
		1970	Other life, physical, and social science technicians	0.8681

Appendix Table E-1.

**2010 To 2018 Census Occupation Code List Total Conversion Rates—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rate
2000	Counselors	2001	Substance abuse and behavioral disorder counselors	0.0860
		2002	Educational, guidance, and career counselors and advisors	0.4445
		2003	Marriage and family therapists	0.0462
		2004	Mental health counselors	0.1219
		2005	Rehabilitation counselors	0.0416
		2006	Counselors, all other	0.2598
2010	Social workers	2011	Child, family, and school social workers	0.1534
		2012	Healthcare social workers	0.1291
		2013	Mental health and substance abuse social workers	0.0468
		2014	Social workers, all other	0.6707
2160	Miscellaneous legal support workers	2170	Title examiners, abstractors, and searchers	0.5342
		2180	Legal support workers, all other	0.2641
		2862	Court reporters and simultaneous captioners	0.2017
2200	Postsecondary teachers	2205	Postsecondary teachers	0.9423
		2545	Teaching assistants	0.0577
2340	Other teachers and instructors	2350	Tutors	0.2670
		2360	Other teachers and instructors	0.7330
2550	Other education, training, and library workers	2435	Librarians and media collections specialists	0.0261
		2555	Other educational instruction and library workers	0.9739
2630	Designers	2631	Commercial and industrial designers	0.0250
		2632	Fashion designers	0.0319
		2633	Floral designers	0.0882
		2634	Graphic designers	0.3441
		2635	Interior designers	0.1077
		2636	Merchandise displayers and window trimmers	0.0158
		2640	Other designers	0.3874
2720	Athletes, coaches, umpires, and related workers	2721	Athletes and sports competitors	0.0970
		2722	Coaches and scouts	0.7353
		2723	Umpires, referees, and other sports officials	0.1677
2750	Musicians, singers, and related workers	2751	Music directors and composers	0.2304
		2752	Musicians and singers	0.7696
2760	Entertainers and performers, sports and related workers, all other	2755	Disc jockeys, except radio	0.0036
		2770	Entertainers and performers, sports and related workers, all other	0.9964
2800	Announcers	2805	Broadcast announcers and radio disc jockeys	0.8945
		2865	Media and communication workers, all other	0.1055

Appendix Table E-1.

**2010 To 2018 Census Occupation Code List Total Conversion Rates—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rate
2860	Miscellaneous media and communication workers	2861	Interpreters and translators	0.9051
		2865	Media and communication workers, all other	0.0949
2900	Broadcast and sound engineering technicians and radio operators	2905	Broadcast, sound, and lighting technicians	0.7888
		5040	Communications equipment operators, all other	0.2112
2960	Media and communication equipment workers, all other	2905	Broadcast, sound, and lighting technicians	0.2118
		2970	Media and communication equipment workers, all other	0.7882
3060	Physicians and surgeons	3065	Emergency medicine physicians	0.0191
		3070	Radiologists	0.0246
		3090	Other physicians	0.9046
		3100	Surgeons	0.0517
3260	Health diagnosing and treating practitioners, all other	3261	Acupuncturists	0.6750
		3270	Healthcare diagnosing or treating practitioners, all other	0.3250
3320	Diagnostic related technologists and technicians	3321	Cardiovascular technologists and technicians	0.0837
		3322	Diagnostic medical sonographers	0.2038
		3323	Radiologic technologists and technicians	0.5749
		3324	Magnetic resonance imaging technologists	0.0900
		3330	Nuclear medicine technologists and medical dosimetrists	0.0477
3400	Emergency medical technicians and paramedics	3401	Emergency medical technicians	0.5406
		3402	Paramedics	0.4594
3420	Health practitioner support technologists and technicians	3421	Pharmacy technicians	0.5720
		3422	Psychiatric technicians	0.0561
		3423	Surgical technologists	0.1468
		3424	Veterinary technologists and technicians	0.1831
		3430	Dietetic technicians and ophthalmic medical technicians	0.0236
		3545	Miscellaneous health technologists and technicians	0.0183
3510	Medical records and health information technicians	3515	Medical records specialists	0.9420
		3550	Other healthcare practitioners and technical occupations	0.0580
3540	Other healthcare practitioners and technical occupations	1980	Occupational health and safety specialists and technicians	0.4636
		3550	Other healthcare practitioners and technical occupations	0.5364
3600	Nursing, psychiatric, and home health aides	3601	Home health aides	0.2155
		3603	Nursing assistants	0.7551
		3605	Orderlies and psychiatric aides	0.0294

Appendix Table E-1.

**2010 To 2018 Census Occupation Code List Total Conversion Rates—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rate
3730	First-line supervisors of protective service workers, all other	3725	First-line supervisors of security workers	0.7751
		3735	First-line supervisors of protective service workers, all other	0.2249
3800	Bailiffs, correctional officers, and jailers	3801	Bailiffs	0.0787
		3802	Correctional officers and jailers	0.9213
3955	Lifeguards and other recreational, and all other protective service workers	3946	School bus monitors	0.0245
		3960	Other protective service workers	0.9755
4250	Grounds maintenance workers	4251	Landscaping and groundskeeping workers	0.8756
		4252	Tree trimmers and pruners	0.0668
		4255	Other grounds maintenance workers	0.0575
4320	First-line supervisors of personal service workers	4330	Supervisors of personal care and service workers	0.9794
		9005	Supervisors of transportation and material moving workers	0.0206
4520	Miscellaneous personal appearance workers	4521	Manicurists and pedicurists	0.7214
		4522	Skincare specialists	0.1942
		4525	Makeup artists and shampooers	0.0843
4620	Recreation and fitness workers	4621	Exercise trainers and group fitness instructors	0.4245
		4622	Recreation workers	0.5755
4650	Personal care and service workers, all other	4461	Embalmers, crematory operators and funeral attendants	0.0145
		4655	Personal care and service workers, all other	0.9855
5520	Dispatchers	5521	Public safety telecommunicators	0.3331
		5522	Dispatchers, except police, fire, and ambulance	0.6669
5700	Secretaries and administrative assistants	5710	Executive secretaries and executive administrative assistants	0.0642
		5720	Legal secretaries and administrative assistants	0.0277
		5730	Medical secretaries and administrative assistants	0.0327
		5740	Secretaries and administrative assistants, except legal, medical, and executive	0.8754
6440	Pipelayers, plumbers, pipefitters, and steamfitters	6441	Pipelayers	0.0953
		6442	Plumbers, pipefitters, and steamfitters	0.9047
6820	Earth drillers, except oil and gas	6825	Earth drillers, except oil and gas	0.9753
		6835	Explosives workers, ordnance handling experts, and blasters	0.0247
6840	Mining machine operators	6850	Underground mining machine operators	0.7356
		6950	Other extraction workers	0.2644
8965	Production workers, all other	7905	Computer numerically controlled tool programmers and operators	0.0623
		8990	Other production workers	0.9377

Appendix Table E-1.

**2010 To 2018 Census Occupation Code List Total Conversion Rates—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rate
9120	Bus drivers	9121	Bus drivers, school	0.5824
		9122	Bus drivers, transit and intercity	0.4009
		9141	Shuttle drivers and chauffeurs	0.0166
9140	Taxi drivers and chauffeurs	9141	Shuttle drivers and chauffeurs	0.4411
		9142	Taxi drivers	0.5589
9200	Locomotive engineers and operators	9210	Locomotive engineers and operators	0.9441
		9265	Other rail transportation workers	0.0559
9420	Other transportation workers	9365	Transportation service attendants	0.4031
		9430	Other transportation workers	0.5969
9520	Dredge, excavating, and loading machine operators	6821	Excavating and loading machine and dragline operators, surface mining	0.4174
		6850	Underground mining machine operators	0.0268
		9570	Conveyor, dredge, and hoist and winch operators	0.1415
		9760	Other material moving workers	0.4143
9820	Military enlisted tactical operations and air/weapons specialists and crew members	1555	Other engineering technologists and technicians, except drafters	0.0194
		9825	Military enlisted tactical operations and air/weapons specialists and crew members	0.9806

Appendix Table E-2.

**2010 to 2018 Census Occupation Code List Conversion Rates For Women by Educational Attainment**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
0050	Marketing and sales managers	0051	Marketing managers	0.4086	0.6562	0.7932
		0052	Sales managers	0.5914	0.3438	0.2068
0100	Administrative services managers	0101	Administrative services managers	0.6538	0.6748	0.7325
		0102	Facilities managers	0.3462	0.3252	0.2675
0430	Managers, all other	0335	Entertainment and recreation managers	0.0230	0.0175	0.0079
		0426	Personal service managers, all other	0.0105	0.0086	0.0070
		0440	Managers, all other	0.9125	0.8049	0.7866
		0705	Project management specialists	0.0540	0.1690	0.1985
0740	Business operations specialists, all other	0705	Project management specialists	0.0521	0.0772	0.0759
		0750	Business operations specialists, all other	0.9479	0.9228	0.9241
0840	Financial analysts	0845	Financial and investment analysts	0.9779	0.9819	0.9857
		0960	Financial risk specialists	0.0221	0.0181	0.0143
1020	Software developers, applications and systems software	1021	Software developers	0.6856	0.7853	0.8663
		1022	Software quality assurance analysts and testers	0.3144	0.2147	0.1337
1030	Web developers	1031	Web developers	0.6308	0.6003	0.6512
		1032	Web or digital interface designers	0.3692	0.3997	0.3488
1107	Computer occupations, all other	0705	Project management specialists	0.0042	0.0083	0.0179
		1022	Software quality assurance analysts and testers	0.0189	0.0227	0.0358
		1032	Web and digital interface designers	0.0094	0.0077	0.0073
		1065	Database administrators and architects	0.0126	0.0146	0.0206
		1108	Computer occupations, all other	0.9549	0.9467	0.9184
1300	Architects, except naval	1305	Architects, except landscape and naval	0.5814	0.7390	0.8436
		1306	Landscape architects	0.4186	0.2610	0.1564
1540	Drafters	1541	Architectural and civil drafters	0.3942	0.3968	0.4438
		1545	Other drafters	0.6058	0.6032	0.5562

Appendix Table E-2.

**2010 to 2018 Census Occupation Code List Conversion Rates For Women by Educational Attainment—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
1550	Engineering technicians, except drafters	1551	Electrical and electronic engineering technologists and technicians	0.1604	0.1644	0.1347
		1555	Other engineering technologists and technicians, except drafters	0.8396	0.8356	0.8653
1740	Environmental scientists and geoscientists	1745	Environmental scientists and specialists, including health	0.0000	0.5813	0.4911
		1750	Geoscientists and hydrologists, except geographers	1.0000	0.4187	0.5089
1820	Psychologists	1821	Clinical and counseling psychologists	0.0000	0.1438	0.1542
		1822	School psychologists	0.0000	0.1304	0.2354
		1825	Other psychologists	1.0000	0.7258	0.6104
1965	Miscellaneous life, physical, and social science technicians	1935	Environmental science and geoscience technicians	0.1252	0.1077	0.1223
		1970	Other life, physical, and social science technicians	0.8748	0.8923	0.8777
2000	Counselors	2001	Substance abuse and behavioral disorder counselors	0.0661	0.1279	0.0562
		2002	Educational, guidance, and career counselors and advisors	0.3689	0.3863	0.5104
		2003	Marriage and family therapists	0.0390	0.0374	0.0527
		2004	Mental health counselors	0.0553	0.0891	0.1520
		2005	Rehabilitation counselors	0.0482	0.0497	0.0348
		2006	Counselors, all other	0.4225	0.3096	0.1939
2010	Social workers	2011	Child, family, and school social workers	0.1412	0.1573	0.1598
		2012	Healthcare social workers	0.2121	0.1071	0.1454
		2013	Mental health and substance abuse social workers	0.0319	0.0316	0.0615
		2014	Social workers, all other	0.6148	0.7040	0.6333
2160	Miscellaneous legal support workers	2170	Title examiners, abstractors, and searchers	0.7098	0.4808	0.4078
		2180	Legal support workers, all other	0.1360	0.2310	0.5093
		2862	Court reporters and simultaneous captioners	0.1542	0.2883	0.0829
2200	Postsecondary teachers	2205	Postsecondary teachers	0.8318	0.8680	0.9666
		2545	Teaching assistants	0.1682	0.1320	0.0334
2340	Other teachers and instructors	2350	Tutors	0.2726	0.2993	0.2421
		2360	Other teachers and instructors	0.7274	0.7007	0.7579

Appendix Table E-2.

**2010 to 2018 Census Occupation Code List Conversion Rates For Women by Educational Attainment—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
2550	Other education, training, and library workers	2435	Librarians and media collections specialists	0.0424	0.0232	0.0232
		2555	Other educational instruction and library workers	0.9576	0.9768	0.9768
2630	Designers	2631	Commercial and industrial designers	0.0082	0.0140	0.0276
		2632	Fashion designers	0.0311	0.0460	0.0474
		2633	Floral designers	0.4750	0.0920	0.0399
		2634	Graphic designers	0.1549	0.3720	0.2427
		2635	Interior designers	0.0819	0.1717	0.1619
		2636	Merchandise displayers and window trimmers	0.0355	0.0128	0.0110
		2640	Other designers	0.2133	0.2914	0.4695
2720	Athletes, coaches, umpires, and related workers	2721	Athletes and sports competitors	0.0284	0.0564	0.0443
		2722	Coaches and scouts	0.8186	0.8805	0.9068
		2723	Umpires, referees, and other sports officials	0.1530	0.0630	0.0490
2750	Musicians, singers, and related workers	2751	Music directors and composers	0.1366	0.2508	0.2785
		2752	Musicians and singers	0.8634	0.7492	0.7215
2760	Entertainers and performers, sports and related workers, all other	2755	Disc jockeys, except radio	0.0032	0.0026	0.0240
		2770	Entertainers and performers, sports and related workers, all other	0.9968	0.9974	0.9760
2800	Announcers	2805	Broadcast announcers and radio disc jockeys	0.8750	0.8819	0.7018
		2865	Media and communication workers, all other	0.1250	0.1181	0.2982
2860	Miscellaneous media and communication workers	2861	Interpreters and translators	0.9472	0.9382	0.9592
		2865	Media and communication workers, all other	0.0528	0.0618	0.0408
2900	Broadcast and sound engineering technicians and radio operators	2905	Broadcast, sound, and lighting technicians	0.7500	0.7792	0.8293
		5040	Communications equipment operators, all other	0.2500	0.2208	0.1707
2960	Media and communication equipment workers, all other	2905	Broadcast, sound, and lighting technicians	0.5000	0.0769	0.0001
		2970	Media and communication equipment workers, all other	0.5000	0.9231	0.9999
3060	Physicians and surgeons	3065	Emergency medicine physicians	0.0000	0.0000	0.0143
		3070	Radiologists	0.0000	0.0000	0.0149
		3090	Other physicians	1.0000	1.0000	0.9492
		3100	Surgeons	0.0000	0.0000	0.0217

Appendix Table E-2.

**2010 to 2018 Census Occupation Code List Conversion Rates For Women by Educational Attainment—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
3260	Health diagnosing and treating practitioners, all other	3261	Acupuncturists	0.0667	0.2881	0.7864
		3270	Healthcare diagnosing or treating practitioners, all other	0.9333	0.7119	0.2136
3320	Diagnostic related technologists and technicians	3321	Cardiovascular technologists and technicians	0.2191	0.0680	0.1089
		3322	Diagnostic medical sonographers	0.1541	0.2303	0.4161
		3323	Radiologic technologists and technicians	0.5534	0.5843	0.3312
		3324	Magnetic resonance imaging technologists	0.0529	0.0785	0.0654
		3330	Nuclear medicine technologists and medical dosimetrists	0.0204	0.0389	0.0784
3400	Emergency medical technicians and paramedics	3401	Emergency medical technicians	0.8011	0.5960	0.6667
		3402	Paramedics	0.1989	0.4040	0.3333
3420	Health practitioner support technologists and technicians	3421	Pharmacy technicians	0.7185	0.5318	0.5186
		3422	Psychiatric technicians	0.0355	0.0447	0.1389
		3423	Surgical technologists	0.0779	0.1609	0.0413
		3424	Veterinary technologists and technicians	0.1280	0.2224	0.2077
		3430	Dietetic technicians and ophthalmic medical technicians	0.0260	0.0241	0.0426
		3545	Miscellaneous health technologists and technicians	0.0141	0.0161	0.0509
3510	Medical records and health information technicians	3515	Medical records specialists	0.9563	0.9455	0.8909
		3550	Other healthcare practitioners and technical occupations	0.0437	0.0545	0.1091
3540	Other healthcare practitioners and technical occupations	1980	Occupational health and safety specialists and technicians	0.5345	0.3707	0.2393
		3550	Other healthcare practitioners and technical occupations	0.4655	0.6293	0.7607
3600	Nursing, psychiatric, and home health aides	3601	Home health aides	0.2602	0.1788	0.3235
		3603	Nursing assistants	0.7254	0.8029	0.6339
		3605	Orderlies and psychiatric aides	0.0145	0.0183	0.0426
3730	First-line supervisors of protective service workers, all other	3725	First-line supervisors of security workers	0.7908	0.7244	0.7193
		3735	First-line supervisors of protective service workers, all other	0.2092	0.2756	0.2807

Appendix Table E-2.

**2010 to 2018 Census Occupation Code List Conversion Rates For Women by Educational Attainment—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
3800	Bailiffs, correctional officers, and jailers	3801	Bailiffs	0.0712	0.0777	0.2189
		3802	Correctional officers and jailers	0.9288	0.9223	0.7811
3955	Lifeguards and other recreational, and all other protective service workers	3946	School bus monitors	0.0471	0.0332	0.0000
		3960	Other protective service workers	0.9529	0.9668	1.0000
4250	Grounds maintenance workers	4251	Landscaping and grounds-keeping workers	0.8845	0.8894	0.8930
		4252	Tree trimmers and pruners	0.0356	0.0240	0.0093
		4255	Other grounds maintenance workers	0.0798	0.0866	0.0977
4320	First-line supervisors of personal service workers	4330	Supervisors of personal care and service workers	0.9959	0.9860	0.9999
		9005	Supervisors of transportation and material moving workers	0.0041	0.0140	0.0001
4520	Miscellaneous personal appearance workers	4521	Manicurists and pedicurists	0.8350	0.5284	0.4203
		4522	Skincare specialists	0.1071	0.3470	0.4493
		4525	Makeup artists and shampooers	0.0579	0.1246	0.1304
4620	Recreation and fitness workers	4621	Exercise trainers and group fitness instructors	0.1914	0.4946	0.7534
		4622	Recreation workers	0.8086	0.5054	0.2466
4650	Personal care and service workers, all other	4461	Embalmers, crematory operators and funeral attendants	0.0092	0.0080	0.0038
		4655	Personal care and service workers, all other	0.9908	0.9920	0.9962
5520	Dispatchers	5521	Public safety telecommunications	0.3210	0.4514	0.4313
		5522	Dispatchers, except police, fire, and ambulance	0.6790	0.5486	0.5688
5700	Secretaries and administrative assistants	5710	Executive secretaries and executive administrative assistants	0.0436	0.0708	0.1001
		5720	Legal secretaries and administrative assistants	0.0248	0.0293	0.0260
		5730	Medical secretaries and administrative assistants	0.0306	0.0337	0.0330
		5740	Secretaries and administrative assistants, except legal, medical, and executive	0.9010	0.8662	0.8409
6440	Pipelayers, plumbers, pipefitters, and steamfitters	6441	Pipelayers	0.1169	0.1115	0.0001
		6442	Plumbers, pipefitters, and steamfitters	0.8831	0.8885	0.9999

Appendix Table E-2.

**2010 to 2018 Census Occupation Code List Conversion Rates For Women by Educational Attainment—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
6820	Earth drillers, except oil and gas	6825	Earth drillers, except oil and gas	0.9999	0.9999	1.0000
		6835	Explosives workers, ordnance handling experts, and blasters	0.0001	0.0001	0.0000
6840	Mining machine operators	6850	Underground mining machine operators	0.6739	0.6792	1.0000
		6950	Other extraction workers	0.3261	0.3208	0.0000
8965	Production workers, all other	7905	Computer numerically controlled tool programmers and operators	0.0520	0.0471	0.0225
		8990	Other production workers	0.9480	0.9529	0.9775
9120	Bus drivers	9121	Bus drivers, school	0.6896	0.6587	0.6043
		9122	Bus drivers, transit and intercity	0.3010	0.3313	0.3741
		9141	Shuttle drivers and chauffeurs	0.0094	0.0099	0.0216
9140	Taxi drivers and chauffeurs	9141	Shuttle drivers and chauffeurs	0.6057	0.5278	0.5189
		9142	Taxi drivers	0.3943	0.4722	0.4811
9200	Locomotive engineers and operators	9210	Locomotive engineers and operators	0.8571	0.8615	0.9999
		9265	Other rail transportation workers	0.1429	0.1385	0.0001
9420	Other transportation workers	9365	Transportation service attendants	0.1667	0.3125	0.0001
		9430	Other transportation workers	0.8333	0.6875	0.9999
9520	Dredge, excavating, and loading machine operators	6821	Excavating and loading machine and dragline operators, surface mining	0.2105	0.5000	0.0000
		6850	Underground mining machine operators	0.1053	0.0625	0.0000
		9570	Conveyor, dredge, and hoist and winch operators	0.1579	0.1250	0.0000
		9760	Other material moving workers	0.5263	0.3125	1.0000
9820	Military enlisted tactical operations and air/weapons specialists and crew members	1555	Other engineering technologists and technicians, except drafters	0.0195	0.0201	0.0278
		9825	Military enlisted tactical operations and air/weapons specialists and crew members	0.9805	0.9799	0.9722

Appendix Table E-3.

**2010 To 2018 Census Occupation Code List Conversion Rates for Men by Educational Attainment**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
0050	Marketing and sales managers	0051	Marketing managers	0.2515	0.3570	0.5438
		0052	Sales managers	0.7485	0.6430	0.4562
0100	Administrative services managers	0101	Administrative services managers	0.1565	0.2047	0.4150
		0102	Facilities managers	0.8435	0.7953	0.5850
0430	Managers, all other	0335	Entertainment and recreation managers	0.0107	0.0130	0.0055
		0426	Personal service managers, all other	0.0050	0.0046	0.0044
		0440	Managers, all other	0.9339	0.8441	0.8268
		0705	Project management specialists	0.0504	0.1383	0.1632
0740	Business operations specialists, all other	0705	Project management specialists	0.0626	0.0649	0.0746
		0750	Business operations specialists, all other	0.9374	0.9351	0.9254
0840	Financial analysts	0845	Financial and investment analysts	0.9604	0.9835	0.9804
		0960	Financial risk specialists	0.0396	0.0165	0.0196
1020	Software developers, applications and systems software	1021	Software developers	0.8784	0.9124	0.9438
		1022	Software quality assurance analysts and testers	0.1216	0.0876	0.0562
1030	Web developers	1031	Web developers	0.6504	0.7179	0.7444
		1032	Web or digital interface designers	0.3496	0.2821	0.2556
1107	Computer occupations, all other	0705	Project management specialists	0.0004	0.0047	0.0124
		1022	Software quality assurance analysts and testers	0.0084	0.0138	0.0167
		1032	Web and digital interface designers	0.0029	0.0045	0.0070
		1065	Database administrators and architects	0.0055	0.0115	0.0205
		1108	Computer occupations, all other	0.9827	0.9655	0.9433
1300	Architects, except naval	1305	Architects, except landscape and naval	0.6174	0.8444	0.9107
		1306	Landscape architects	0.3826	0.1556	0.0893
1540	Drafters	1541	Architectural and civil drafters	0.3234	0.3208	0.3613
		1545	Other drafters	0.6766	0.6792	0.6387

Appendix Table E-3.

**2010 To 2018 Census Occupation Code List Conversion Rates for Men by Educational Attainment—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
1550	Engineering technicians, except drafters	1551	Electrical and electronic engineering technologists and technicians	0.2755	0.3416	0.2749
		1555	Other engineering technologists and technicians, except drafters	0.7245	0.6584	0.7251
1740	Environmental scientists and geoscientists	1745	Environmental scientists and specialists, including health	0.0000	0.3910	0.2918
		1750	Geoscientists and hydrologists, except geographers	1.0000	0.6090	0.7082
1820	Psychologists	1821	Clinical and counseling psychologists	0.0000	0.2056	0.1710
		1822	School psychologists	0.0000	0.0561	0.1396
		1825	Other psychologists	1.0000	0.7383	0.6894
1965	Miscellaneous life, physical, and social science technicians	1935	Environmental science and geoscience technicians	0.1594	0.1453	0.1706
		1970	Other life, physical, and social science technicians	0.8406	0.8547	0.8294
2000	Counselors	2001	Substance abuse and behavioral disorder counselors	0.0932	0.1402	0.0675
		2002	Educational, guidance, and career counselors and advisors	0.3355	0.3458	0.4497
		2003	Marriage and family therapists	0.0402	0.0371	0.0510
		2004	Mental health counselors	0.0430	0.0791	0.1482
		2005	Rehabilitation counselors	0.0402	0.0483	0.0426
		2006	Counselors, all other	0.4479	0.3495	0.2410
2010	Social workers	2011	Child, family, and school social workers	0.1145	0.1391	0.1311
		2012	Healthcare social workers	0.3215	0.1114	0.1396
		2013	Mental health and substance abuse social workers	0.0421	0.0464	0.0898
		2014	Social workers, all other	0.5219	0.7032	0.6395
2160	Miscellaneous legal support workers	2170	Title examiners, abstractors, and searchers	0.6311	0.5453	0.5863
		2180	Legal support workers, all other	0.2533	0.3534	0.3909
		2862	Court reporters and simultaneous captioners	0.1156	0.1013	0.0228
2200	Postsecondary teachers	2205	Postsecondary teachers	0.8804	0.8618	0.9646
		2545	Teaching assistants	0.1196	0.1382	0.0354
2340	Other teachers and instructors	2350	Tutors	0.2202	0.2630	0.1853
		2360	Other teachers and instructors	0.7798	0.7370	0.8147

Appendix Table E-3.

**2010 To 2018 Census Occupation Code List Conversion Rates for Men by Educational Attainment—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
2550	Other education, training, and library workers	2435	Librarians and media collections specialists	0.0091	0.0458	0.0215
		2555	Other educational instruction and library workers	0.9909	0.9542	0.9785
2630	Designers	2631	Commercial and industrial designers	0.0346	0.0376	0.0583
		2632	Fashion designers	0.0230	0.0140	0.0137
		2633	Floral designers	0.0929	0.0150	0.0071
		2634	Graphic designers	0.2662	0.3951	0.1837
		2635	Interior designers	0.0480	0.0362	0.0346
		2636	Merchandise displayers and window trimmers	0.0439	0.0128	0.0125
		2640	Other designers	0.4914	0.4893	0.6901
2720	Athletes, coaches, umpires, and related workers	2721	Athletes and sports competitors	0.0882	0.1685	0.0486
		2722	Coaches and scouts	0.4870	0.6693	0.8513
		2723	Umpires, referees, and other sports officials	0.4248	0.1621	0.1001
2750	Musicians, singers, and related workers	2751	Music directors and composers	0.1110	0.2218	0.3247
		2752	Musicians and singers	0.8890	0.7782	0.6753
2760	Entertainers and performers, sports and related workers, all other	2755	Disc jockeys, except radio	0.0001	0.0024	0.0079
		2770	Entertainers and performers, sports and related workers, all other	0.9999	0.9976	0.9921
2800	Announcers	2805	Broadcast announcers and radio disc jockeys	0.9046	0.9072	0.8507
		2865	Media and communication workers, all other	0.0954	0.0928	0.1493
2860	Miscellaneous media and communication workers	2861	Interpreters and translators	0.7914	0.7812	0.9241
		2865	Media and communication workers, all other	0.2086	0.2188	0.0759
2900	Broadcast and sound engineering technicians and radio operators	2905	Broadcast, sound, and lighting technicians	0.6988	0.8120	0.8416
		5040	Communications equipment operators, all other	0.3012	0.1880	0.1584
2960	Media and communication equipment workers, all other	2905	Broadcast, sound, and lighting technicians	0.1111	0.2632	0.0001
		2970	Media and communication equipment workers, all other	0.8889	0.7368	0.9999
3060	Physicians and surgeons	3065	Emergency medicine physicians	0.0000	0.0000	0.0216
		3070	Radiologists	0.0000	0.0000	0.0298
		3090	Other physicians	1.0000	0.9999	0.8809
		3100	Surgeons	0.0000	0.0001	0.0677

Appendix Table E-3.

**2010 To 2018 Census Occupation Code List Conversion Rates for Men by Educational Attainment—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
3260	Health diagnosing and treating practitioners, all other	3261	Acupuncturists	0.1538	0.5109	0.8400
		3270	Healthcare diagnosing or treating practitioners, all other	0.8462	0.4891	0.1600
3320	Diagnostic related technologists and technicians	3321	Cardiovascular technologists and technicians	0.1600	0.0905	0.1242
		3322	Diagnostic medical sonographers	0.1229	0.1191	0.2636
		3323	Radiologic technologists and technicians	0.6343	0.5829	0.3758
		3324	Magnetic resonance imaging technologists	0.0571	0.1351	0.1061
		3330	Nuclear medicine technologists and medical dosimetrists	0.0257	0.0725	0.1303
3400	Emergency medical technicians and paramedics	3401	Emergency medical technicians	0.6483	0.4717	0.4892
		3402	Paramedics	0.3517	0.5283	0.5108
3420	Health practitioner support technologists and technicians	3421	Pharmacy technicians	0.5227	0.5702	0.5739
		3422	Psychiatric technicians	0.1007	0.1053	0.1392
		3423	Surgical technologists	0.1720	0.1880	0.1051
		3424	Veterinary technologists and technicians	0.1535	0.0946	0.1307
		3430	Dietetic technicians and ophthalmic medical technicians	0.0235	0.0174	0.0028
		3545	Miscellaneous health technologists and technicians	0.0277	0.0246	0.0483
3510	Medical records and health information technicians	3515	Medical records specialists	0.9712	0.8947	0.7938
		3550	Other healthcare practitioners and technical occupations	0.0288	0.1053	0.2062
3540	Other healthcare practitioners and technical occupations	1980	Occupational health and safety specialists and technicians	0.7435	0.6333	0.3831
		3550	Other healthcare practitioners and technical occupations	0.2565	0.3667	0.6169
3600	Nursing, psychiatric, and home health aides	3601	Home health aides	0.2167	0.1459	0.1888
		3603	Nursing assistants	0.6437	0.7201	0.7313
		3605	Orderlies and psychiatric aides	0.1396	0.1340	0.0799
3730	First-line supervisors of protective service workers, all other	3725	First-line supervisors of security workers	0.7900	0.7893	0.7642
		3735	First-line supervisors of protective service workers, all other	0.2100	0.2107	0.2358

Appendix Table E-3.

**2010 To 2018 Census Occupation Code List Conversion Rates for Men by Educational Attainment—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
3800	Bailiffs, correctional officers, and jailers	3801	Bailiffs	0.0531	0.0903	0.1828
		3802	Correctional officers and jailers	0.9469	0.9097	0.8172
3955	Lifeguards and other recreational, and all other protective service workers	3946	School bus monitors	0.0086	0.0082	0.0137
		3960	Other protective service workers	0.9914	0.9918	0.9863
4250	Grounds maintenance workers	4251	Landscaping and grounds-keeping workers	0.8757	0.8724	0.8722
		4252	Tree trimmers and pruners	0.0748	0.0600	0.0559
		4255	Other grounds maintenance workers	0.0495	0.0676	0.0720
4320	First-line supervisors of personal service workers	4330	Supervisors of personal care and service workers	0.9420	0.9613	0.9783
		9005	Supervisors of transportation and material moving workers	0.0580	0.0387	0.0217
4520	Miscellaneous personal appearance workers	4521	Manicurists and pedicurists	0.9524	0.8718	0.7143
		4522	Skincare specialists	0.0141	0.0360	0.2381
		4525	Makeup artists and shampooers	0.0335	0.0921	0.0476
4620	Recreation and fitness workers	4621	Exercise trainers and group fitness instructors	0.1948	0.4638	0.6044
		4622	Recreation workers	0.8052	0.5362	0.3956
4650	Personal care and service workers, all other	4461	Embalmers, crematory operators and funeral attendants	0.0231	0.0223	0.0246
		4655	Personal care and service workers, all other	0.9769	0.9777	0.9754
5520	Dispatchers	5521	Public safety telecommunications	0.1752	0.2734	0.2345
		5522	Dispatchers, except police, fire, and ambulance	0.8248	0.7266	0.7655
5700	Secretaries and administrative assistants	5710	Executive secretaries and executive administrative assistants	0.0515	0.0814	0.1338
		5720	Legal secretaries and administrative assistants	0.0180	0.0262	0.0337
		5730	Medical secretaries and administrative assistants	0.0236	0.0348	0.0337
		5740	Secretaries and administrative assistants, except legal, medical, and executive	0.9068	0.8576	0.7988
6440	Pipelayers, plumbers, pipefitters, and steamfitters	6441	Pipelayers	0.1065	0.0774	0.0480
		6442	Plumbers, pipefitters, and steamfitters	0.8935	0.9226	0.9520

Appendix Table E-3.

**2010 To 2018 Census Occupation Code List Conversion Rates for Men by Educational Attainment—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title	Conversion rates		
				High school or less	Some college or more	Advanced degree
6820	Earth drillers, except oil and gas	6825	Earth drillers, except oil and gas	0.9752	0.9748	0.9999
		6835	Explosives workers, ordnance handling experts, and blasters	0.0248	0.0252	0.0001
6840	Mining machine operators	6850	Underground mining machine operators	0.7389	0.7342	0.6667
		6950	Other extraction workers	0.2611	0.2658	0.3333
8965	Production workers, all other	7905	Computer numerically controlled tool programmers and operators	0.0701	0.0627	0.0489
		8990	Other production workers	0.9299	0.9373	0.9511
9120	Bus drivers	9121	Bus drivers, school	0.4951	0.5104	0.5678
		9122	Bus drivers, transit and intercity	0.4823	0.4674	0.4094
		9141	Shuttle drivers and chauffeurs	0.0225	0.0222	0.0228
9140	Taxi drivers and chauffeurs	9141	Shuttle drivers and chauffeurs	0.4054	0.4287	0.3968
		9142	Taxi drivers	0.5946	0.5713	0.6032
9200	Locomotive engineers and operators	9210	Locomotive engineers and operators	0.9394	0.9538	0.8667
		9265	Other rail transportation workers	0.0606	0.0462	0.1333
9420	Other transportation workers	9365	Transportation service attendants	0.4004	0.4435	0.3810
		9430	Other transportation workers	0.5996	0.5565	0.6190
9520	Dredge, excavating, and loading machine operators	6821	Excavating and loading machine and dragline operators, surface mining	0.4084	0.4425	0.0000
		6850	Underground mining machine operators	0.0263	0.0254	0.7778
		9570	Conveyor, dredge, and hoist and winch operators	0.1425	0.1390	0.1111
		9760	Other material moving workers	0.4228	0.3931	0.1111
9820	Military enlisted tactical operations and air/weapons specialists and crew members	1555	Other engineering technologists and technicians, except drafters	0.0123	0.0240	0.0286
		9825	Military enlisted tactical operations and air/weapons specialists and crew members	0.9877	0.9760	0.9714

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**APPENDIX F.**  
**2010 TO 2018 DIRECT MATCH OCCUPATION CODES**

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Appendix Table F-1.

**Summary of 2010 to 2018 Census Occupation Code Direct Match Changes**

2010 code	2010 occupation title	2018 code	2018 occupation title
0330	Gaming managers	0335	Entertainment and recreation managers
0950	Financial specialists, all other	0960	Other financial specialists
1060	Database administrators	1065	Database administrators and architects
1930	Geological and petroleum technicians	1935	Environmental science and geoscience technicians
2430	Librarians	2435	Librarians and media collections specialists
2540	Teaching assistants	2545	Teaching assistants
3535	Miscellaneous health technologists and technicians	3545	Misc. Health technologists and technicians
3850	Police and sheriff's patrol officers	3870	Police officers
3860	Transit and railroad police		
4050	Combined food preparation and serving workers, including fast food	4055	Fast food and counter workers
4060	Counter attendants, cafeteria, food concession, and coffee shop		
4300	First-line supervisors of gaming workers	4330	Supervisors of personal care and service workers
4410	Motion picture projectionists	4435	Other entertainment attendants and related workers
4430	Miscellaneous entertainment attendants and related workers		
4460	Embalmers and funeral attendants	4461	Embalmers, crematory operators and funeral attendants
4610	Personal care aides	3602	Personal care aides
5030	Communications equipment operators, all other	5040	Communications equipment operators, all other
5620	Stock clerks and order fillers	9645	Stockers and order fillers
5800	Computer operators	1108	Computer occupations, all other
6100	Fishers and related fishing workers	6115	Fishing and hunting workers
6110	Hunters and trappers		
6300	Paving, surfacing, and tamping equipment operators	6305	Construction equipment operators
6310	Pile-driver operators		
6320	Operating engineers and other construction equipment operators		
6420	Painters, construction and maintenance	6410	Painters and paperhangers
6430	Paperhangers		
6830	Explosives workers, ordnance handling experts, and blasters	6835	Explosives workers, ordnance handling experts, and blasters
6910	Roof bolters, mining	6850	Underground mining machine operators
6930	Helpers--extraction workers	6950	Other extraction workers
6940	Other extraction workers		
7600	Signal and track switch repairers	7640	Other installation, maintenance, and repair workers
7630	Other installation, maintenance, and repair workers		
7900	Computer control programmers and operators	7905	Computer numerically controlled tool programmers and operators

Appendix Table F-1.

**Summary of 2010 to 2018 Census Occupation Code Direct Match Changes—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title
7920	Extruding and drawing machine setters, operators, and tenders, metal and plastic	7925	Forming machine setters, operators, and tenders, metal and plastic
7930	Forging machine setters, operators, and tenders, metal and plastic		
7940	Rolling machine setters, operators, and tenders, metal and plastic		
7960	Drilling and boring machine tool setters, operators, and tenders, metal and plastic	8025	Other machine tool setters, operators, and tenders, metal and plastic
8010	Lathe and turning machine tool setters, operators, and tenders, metal and plastic		
8020	Milling and planning machine setters, operators, and tenders, metal and plastic		
8120	Multiple machine tool setters, operators, and tenders, metal and plastic	8225	Other metal workers and plastic workers
8150	Heat treating equipment setters, operators, and tenders, metal and plastic		
8160	Layout workers, metal and plastic		
8200	Plating and coating machine setters, operators, and tenders, metal and plastic		
8210	Tool grinders, filers, and sharpeners		
8220	Metal workers and plastic workers, all other		
8330	Shoe and leather workers and repairers	8335	Shoe and leather workers
8340	Shoe machine operators and tenders		
8360	Textile bleaching and dyeing machine operators and tenders	8365	Textile machine setters, operators, and tenders
8400	Textile cutting machine setters, operators, and tenders		
8410	Textile knitting and weaving machine setters, operators, and tenders		
8420	Textile winding, twisting, and drawing out machine setters, operators, and tenders		
8430	Extruding and forming machine setters, operators, and tenders, synthetic and glass fibers	8465	Other textile, apparel, and furnishings workers
8440	Fabric and apparel patternmakers		
8460	Textile, apparel, and furnishings workers, all other		
8520	Model makers and patternmakers, wood	8555	Other woodworkers
8550	Woodworkers, all other		
8860	Cleaning, washing, and metal pickling equipment operators and tenders	8865	Other production equipment operators and tenders
8900	Cooling and freezing equipment operators and tenders		
8840	Semiconductor processors	8990	Other production workers
9000	Supervisors of transportation and material moving workers	9005	Supervisors of transportation and material moving workers
9230	Railroad brake, signal, and switch operators	9265	Other rail transportation workers
9260	Subway, streetcar, and other rail transportation workers		
9340	Bridge and lock tenders	9430	Other transportation workers

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Appendix Table F-1.

**Summary of 2010 to 2018 Census Occupation Code Direct Match Changes—Con.**

2010 code	2010 occupation title	2018 code	2018 occupation title
9360	Automotive and watercraft service attendants	9365	Transportation service attendants
9500	Conveyor operators and tenders	9570	Conveyor, dredge, and hoist and winch operators
9560	Hoist and winch operators		
9730	Mine shuttle car operators	6850	Underground mining machine operators
9740	Tank car, truck, and ship loaders	9760	Other material moving workers
9750	Material moving workers, all other		

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**APPENDIX G.**  
**AMERICAN COMMUNITY SURVEY (ACS)**  
**PUBLIC USE MICRODATA (PUMS)**

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## ABOUT AMERICAN COMMUNITY SURVEY (ACS) PUBLIC USE MICRODATA (PUMS) INDUSTRY AND OCCUPATION

Many data users take advantage of the PUMS files to analyze ACS data. In terms of industry and occupation, these publicly available microdata differ in two ways from the internal ACS microdata files. First, industry and occupation are collapsed using a revised form of the Census Industry and Occupation Code Lists. To follow data disclosure rules, put forth by the U.S. Census Bureau's Disclosure Review Board, a number of categories are aggregated for the PUMS list. For occupation, 72 occupations were combined with similar occupations for 531 total PUMS occupation codes, compared with 570 codes in the 2018 Census Occupation Code List. For industry, however, no detailed industries had to be aggregated. As a result, the 2017 Census Industry Code List and the 2017 ACS PUMS Industry Code List are identical.

Second, the PUMS files include two sets of variables for both industry and occupation. In addition to variables with the census industry code and census occupation code, there are also variables for the corresponding 2017 North American Industry Classification System code (NAICSP) and the 2018 Standard Occupational Classification code (SOCP). NAICSP and SOCP simply provide the NAICS code and SOC code that the PUMS industry code or PUMS occupation code cross-walks to as shown in the respective code lists.

Due to the difference in lists and the existence of the extra variables, the PUMS occupation and industry lists have their own set of conversion rates and list of direct match codes. Conversion rates are available for not only industry and occupation, but for NAICSP and SOCP also. NAICSP and SOCP have their own set of direct match codes.

The previous PUMS code lists were implemented in 2012 for occupation and 2013 for industry. Both lists have been updated for implementation in 2018. Because the PUMS code lists are different than the code lists used in internal Census Bureau data, separate documentation is provided for comparing industry and occupation data in the PUMS files. This appendix explains how to compare PUMS data between the two latest classification systems—the 2013 ACS PUMS Industry

Code List to the 2017 ACS PUMS Industry Code List; and the 2012 ACS PUMS Occupation Code List to the 2018 ACS PUMS Occupation Code List. These PUMS codes lists and accompanying PUMS conversion rates are located online with the PUMS technical documentation at [www.census.gov/programs-surveys/acs/technical-documentation/pums/documentation.html](http://www.census.gov/programs-surveys/acs/technical-documentation/pums/documentation.html).

Every time the Census Bureau releases a new industry or occupation PUMS code list, data coded under the new list will not be directly comparable to data coded under the previous code lists. Appendix Table G-1 shows which ACS PUMS code lists were used in select Census Bureau data sets. Simple comparisons between data sets can only be made if the code list remained the same. For example, for ACS PUMS 2013 1-year estimates, data users can compare occupation data directly to ACS PUMS 2012 1-year estimates data but conversions are needed for comparisons of industry data.

## USING THE PUMS CONVERSION RATES

The PUMS conversion rates should be used when comparing data from published tables created with ACS PUMS data or when analyzing the PUMS microdata files. The method for the first was described in the main part of the paper. The method for the second is explained here since the majority of data users only have access to microdata via the PUMS files and not the internal ACS data. Microdata files provide records for every respondent in the sample. Instead of applying the conversion rates to rows of data in a table, the rates are instead applied to each record with a code that needs to be bridged. The recommended method for applying the conversion rates is through a four-step process.

First, create cutoff intervals from the table of conversion rates. To create the cutoffs, start at "0," then cumulatively add the conversion rates within a code on the older classification; the last interval should always end with "1." These cutoffs create intervals with sizes, or proportions, reflecting the conversion rates. That is, the intervals are mutually exclusive and cover the proportion of the numbers between zero and one with the same proportions as the conversion rates. Appendix Table G-2 provides an example for the 2012 PUMS occupation code 1820 psychologists. In the example, the areas

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for the three intervals are, respectively, 0.1562, 0.2013, and 0.6425, thus reflecting the conversion rates for that code. The intervals are also mutually exclusive and together cover all possible random numbers between zero and one. Note that the conversion rates shown are rounded, so the proportions derived from the cutoffs may not exactly match the proportions shown in the conversion rates.

Second, generate a random number for each record using a uniform distribution between zero and one. This means that all such numbers generated will be evenly distributed between zero and one. Third, compare a record's random number,  $x$ , to the appropriate conversion rate cutoffs. Fourth, the new classification code should be selected if  $x$  falls between the corresponding cutoffs.

Appendix Table G-3 provides an example using a subset of imitation ACS PUMS microdata for four records with 2012 occupation code 1820. For every record, assign a random number using a random number generator (in this example, the function RAND was used in Microsoft Excel). Then, compare the random number to the cutoff intervals from Appendix Table G-2. Finally, assign the 2018 code that corresponds to each interval.

Any 2012 occupation code that needs a direct match conversion needs to be recoded to, or assigned, a new 2018 occupation code from the direct match list. Once the new 2018 PUMS occupation codes are assigned for every code that changed, data users can then compare the microdata to other datasets that use the 2018 PUMS Occupation Code Lists. This method can also be applied to industry data.

Appendix Table G-1.

**Select ACS Census Datasets and Their Associated Industry and Occupation Code Lists**

	ACS PUMS Industry Code List					ACS PUMS Occupation Code List				
	2000	2002	2007	2012	2017	2000	2002	2010	2012	2018
ACS PUMS 2000	X					X				
ACS PUMS 2001	X					X				
ACS PUMS 2002	X					X				
ACS PUMS 2003		X					X			
ACS PUMS 2004		X					X			
ACS PUMS 2005		X					X			
ACS PUMS 2006		X					X			
ACS PUMS 2007		X					X			
ACS PUMS 2008			X				X			
ACS PUMS 2009			X				X			
ACS PUMS 2010			X					X		
ACS PUMS 2011			X					X		
ACS PUMS 2012			X						X	
ACS PUMS 2013				X					X	
ACS PUMS 2014				X					X	
ACS PUMS 2015				X					X	
ACS PUMS 2016				X					X	
ACS PUMS 2017				X					X	
ACS PUMS 2018					X					X
ACS PUMS 2019					X					X

Appendix Table G-2.

**Example of Cutoff Intervals for Applying Conversion Rates to Microdata**

2012 occupation code	2018 occupation code	Conversion rate	Corresponding cutoff interval
1820	1821	0.1562	$0 < x \leq 0.1562$
1820	1822	0.2013	$0.1562 < x \leq 0.3575$
1820	1825	0.6425	$0.3575 < x < 1$

Appendix Table G-3.

**Example of Mock PUMS Microdata Subset by 2012 Occupation Code 1820**

2012 occupation code	Random number	Corresponding cutoff interval	New 2018 occupation code
1820	0.03772	$0 < x \leq 0.1562$	1822
1820	0.81913	$0.3575 < x < 1$	1825
1820	0.29913	$0.1562 < x \leq 0.3575$	1821
1820	0.62693	$0.3575 < x < 1$	1821

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