

Make Data Speak

Topic(s):

Displaying data, geography, funding, decennial census

Grade Level:

9-12

Approx. Time Required:

40 minutes

Learning Objectives:

Students will be able to:

- Research and interpret data.
- Build English vocabulary and develop language concerning the census.
- Display categorical data in a visually creative way.
- Understand the impact of Census Bureau data on their city, state, and country.

Introduction

The 2020 Census Statistics in Schools (SIS) program is designed to educate students about the decennial census and to teach them educational concepts and skills, such as data literacy, through use of census data in the classroom. Responding to the census helps your community get its fair share of funding. Census data guides how more than \$675 billion in federal funding is distributed to states and communities each year. These funds support vital community programs that help children, such as schools, hospitals, housing, and food assistance. By educating students about the 2020 Census, you can help encourage a complete count.

The 2020 Census SIS program can be used with educational standards across the United States. You can use the topics and learning objectives above to determine which subject and unit plan or theme this activity will best fit into.

About the 2020 Census

In addition to the information that is built into instructions for this activity, the following points provide an easy, grade-appropriate way to explain the decennial census to your students.

- The decennial census is a count of every person living in the United States that occurs every 10 years.
- It is important that every person be counted so that the government can properly distribute \$675 billion to communities.
- The population of every state as counted in the census also determines how many representatives each state is given in the U.S. House of Representatives.
- You can do your part by making sure an adult in your home counts you—and every person living in your home—in the 2020 Census.





About the Modifications

- **This activity is a modified version of the 2020 SIS activity: Make Data Speak for high school classrooms. It has been modified to accommodate high school English language learners (ELLs).**
- **Sections have been added to this teaching guide that call out modifications made specifically for ELLs.**

Materials Required

- **Printed ELL student worksheets**
- Computers or tablets with internet access for each group of four students
 - If student technology is not available, follow the instructions for accessing QuickFacts and print out the data for up to 10 locations for your students to view during the activity, including data for the U.S., your state, your ZIP code, and additional cities for students to choose from.
- A projector or smartboard to display infographics
 - **Baseball** (<https://www.census.gov/content/dam/Census/library/visualizations/2019/comm/opening-day-2019.jpg>)
 - **Women at Work** (<https://www.census.gov/content/dam/Census/library/visualizations/2019/comm/womens-earnings-by-occupation.jpg>)
 - **Irish Ancestry** (<https://www.census.gov/content/dam/Census/library/visualizations/2019/comm/irish-american.pdf>)

Worksheet Description

Students will learn how to make visual representations of data—to give meaning to numbers. Using a census infographic as a model, students will create their own infographics about their communities. Students may draw the infographic by hand, create a collage, or use a computer, depending on the class and the student’s skill level.

Before the Activity—5 Minutes

For ELLs: Before the lesson, when you hand out student worksheets and activity items to all students, hand out the Word Bank and Vocabulary to English language learners as well. Introduce vocabulary to your students. Use your discretion in choosing which concepts are already understood and which require previewing. Direct students to the word bank and vocabulary to follow along and view images. Ask students to make connections between cognates in their first language and English.



Key Vocabulary for ELLs:

- **Infographic:** A way to display data visually
- **Ancestry:** Where a person's family came from
- **Population:** The number of people living in a certain area
- **Living arrangements:** Where and how people live, like in an apartment or house, with family members or alone
- **Poverty:** Severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education, and information
- **Statistics:** Collection and analysis of numerical data in large quantities
- **Proficiency:** A high degree of skill

For ELLs: During discussions, encourage students to use the word bank in their worksheet to find words to support them in their oral answers. Provide sentence starters on the board for students, as needed, to help them answer questions.

1. Ask students, "What are different ways to creatively display data, and when do we use them?" Encourage students to think about ways they already know how to display data, such as different types of graphs, charts, and plots.

For ELLs: Use the following sentence starters:

- "One way to creatively display data is _____."
 - "We use data to _____."
2. Explain that sometimes you can have the coolest data, but in today's world, if you want that data to be digested easily and passed along quickly, it should also be creatively displayed. Note that today the class will explore displaying data through infographics. Explain to students that an infographic is a collection of graphic elements and text that provides an easy-to-understand overview of a topic. Have them reference **Activity Item 2: Sample U.S. Census Bureau Infographics**. Show students the following infographics from the U.S. Census Bureau: [*Baseball*](#), [*Women at Work*](#), and [*Irish Ancestry*](#).



- The baseball infographic shows the population of cities with baseball teams and their location across the United States.
- The women at work infographic compares median earnings for various occupations for female workers.
- The Irish ancestry infographic displays a map showing the percentage of U.S. Irish ancestry by county.

For ELLs: Ask students, “Why are these infographics effective?” Based on their responses, generate a list of what to include in an infographic to guide students as they create their own infographics later in the lesson.

3. Tell students that all of these infographics came from the Census Bureau, which is in charge of counting all the people in the United States in the decennial census every 10 years. The data that the Census Bureau collects affects how many seats each state has in the House of Representatives, as well as how \$675 billion a year is spent on federal programs. Let students know that the Census Bureau collects really powerful data and that today they will display that data in an impactful way.

During the Activity—20 Minutes

For ELLs: Depending on the language proficiencies in your class, you may want to provide sentence starters to encourage language development. Below are some sample sentence starters that may be helpful to your English language learners as your class moves through this activity.

- **To guide their completion of the worksheet:**
 - “My group is going to research _____.”
 - “We will use the data from _____ to _____.”
 - “I think we should display the data by _____.”
- **To guide their presentation or discussion:**
 - “Our statistic is _____ and it is important because _____.”
 - “Businesses can use information about _____ to make decisions about _____.”
 - “One way we could improve this statistic at the _____ level is _____.”
 - “The regions or states that most need assistance to improve this statistic are _____.”

For ELLs: Also, consider creating a model infographic prior to class. If students are struggling, you can guide them by displaying your own infographic and explaining how you made it to creatively and accurately represent your data.





1. Hand out the student worksheets and divide students into groups of four. In this activity, each group will develop a compelling infographic, then present it at the end of class.
2. Have each group choose a statistic of interest from the Census Bureau's [QuickFacts](https://www.census.gov/quickfacts/fact/table/US/PST045218) data tool (<https://www.census.gov/quickfacts/fact/table/US/PST045218>). Encourage students to choose a statistic that varies from state to state. Students can refer to the list of data at the top of their student worksheet.

Note for students that although the decennial census is best known for tracking population data, the U.S. Census Bureau tracks all kinds of data, from age, sex, and race to types of housing or average household size. This varied information helps the federal government better understand and make decisions for the people. Today we will look at census data from the American Community Survey.

3. Each group will collect data points for its statistic for the United States, their state, their county or city, and two other cities of their choice.
4. Each group will then make its own infographic based on the data collected. Students will pick the theme of their infographic, but the theme should be related to the data collected. Students must use data for all five locations.

After the Activity—15 Minutes

1. As a group, students will present their infographics to the class, highlighting the data they found and what could be done at the city, state, and national level to improve that statistic. (Note that “improving” a statistic would mean *increasing* a positive statistic, for example, high school graduation rates, or *decreasing* a negative one, such as people who do not have health insurance.)
2. Ask the students to think about which regions or states would need the most assistance in improving their statistic. Students should also share why these data points are important and how businesses can use the data when making decisions.

Home Extension

Teachers, please read the instructions for the students' homework assignment out loud to the class:

Take your student worksheet home and share it with an adult in your home. Share with them the data you collected and how you think your statistic could improve within your city, state, or country. Remind them that the 2020 Census is coming soon and ask who will be completing the form for your household.





Activity Item 1: Data Available From the Census Bureau

Fact	United States
PEOPLE	
Population	
Population estimates, July 1, 2018, (V2018)	327,167,434
Population estimates base, April 1, 2010, (V2018)	308,758,105
Population, percent change - April 1, 2010 (estimates base) to July 1, 2018, (V2018)	6.0%
Population, Census, April 1, 2010	308,745,538
Age and Sex	
Persons under 5 years, percent	6.1%
Persons under 18 years, percent	22.4%
Persons 65 years and over, percent	16.0%
Female persons, percent	50.8%
Race and Hispanic Origin	
White alone, percent	76.5%
Black or African American alone, percent	13.4%
American Indian and Alaska Native alone, percent	1.3%
Asian alone, percent	5.9%
Native Hawaiian and Other Pacific Islander alone, percent	0.2%
Two or More Races, percent	2.7%
Hispanic or Latino, percent	18.3%
White alone, not Hispanic or Latino, percent	60.4%
Population Characteristics	
Veterans, 2013-2017	18,939,219
Foreign born persons, percent, 2013-2017	13.4%
Housing	
Housing units, July 1, 2018, (V2018)	138,537,078
Owner-occupied housing unit rate, 2013-2017	63.8%
Median value of owner-occupied housing units, 2013-2017	\$193,500
Median selected monthly owner costs -with a mortgage, 2013-2017	\$1,515
Median selected monthly owner costs -without a mortgage, 2013-2017	\$474
Median gross rent, 2013-2017	\$982
Building permits, 2018	1,328,827



Activity Item 1: Data Available From the Census Bureau (Cont.)

Families & Living Arrangements	
Households, 2013-2017	118,825,921
Persons per household, 2013-2017	2.63
Living in same house 1 year ago, percent of persons age 1 year+, 2013-2017	85.4%
Language other than English spoken at home, percent of persons age 5 years+, 2013-2017	21.3%
Computer and Internet Use	
Households with a computer, percent, 2013-2017	87.2%
Households with a broadband Internet subscription, percent, 2013-2017	78.1%
Education	
High school graduate or higher, percent of persons age 25 years+, 2013-2017	87.3%
Bachelor's degree or higher, percent of persons age 25 years+, 2013-2017	30.9%
Health	
With a disability, under age 65 years, percent, 2013-2017	8.7%
Persons without health insurance, under age 65 years, percent	10.2%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2013-2017	63.0%
In civilian labor force, female, percent of population age 16 years+, 2013-2017	58.2%
Total accommodation and food services sales, 2012 (\$1,000)	708,138,598
Total health care and social assistance receipts/revenue, 2012 (\$1,000)	2,040,441,203
Total manufacturers shipments, 2012 (\$1,000)	5,696,729,632
Total merchant wholesaler sales, 2012 (\$1,000)	5,208,023,478
Total retail sales, 2012 (\$1,000)	4,219,821,871
Total retail sales per capita, 2012	\$13,443
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2013-2017	26.4
Income & Poverty	
Median household income (in 2017 dollars), 2013-2017	\$57,652
Per capita income in past 12 months (in 2017 dollars), 2013-2017	\$31,177
Persons in poverty, percent	12.3%



Activity Item 1: Data Available From the Census Bureau (Cont.)

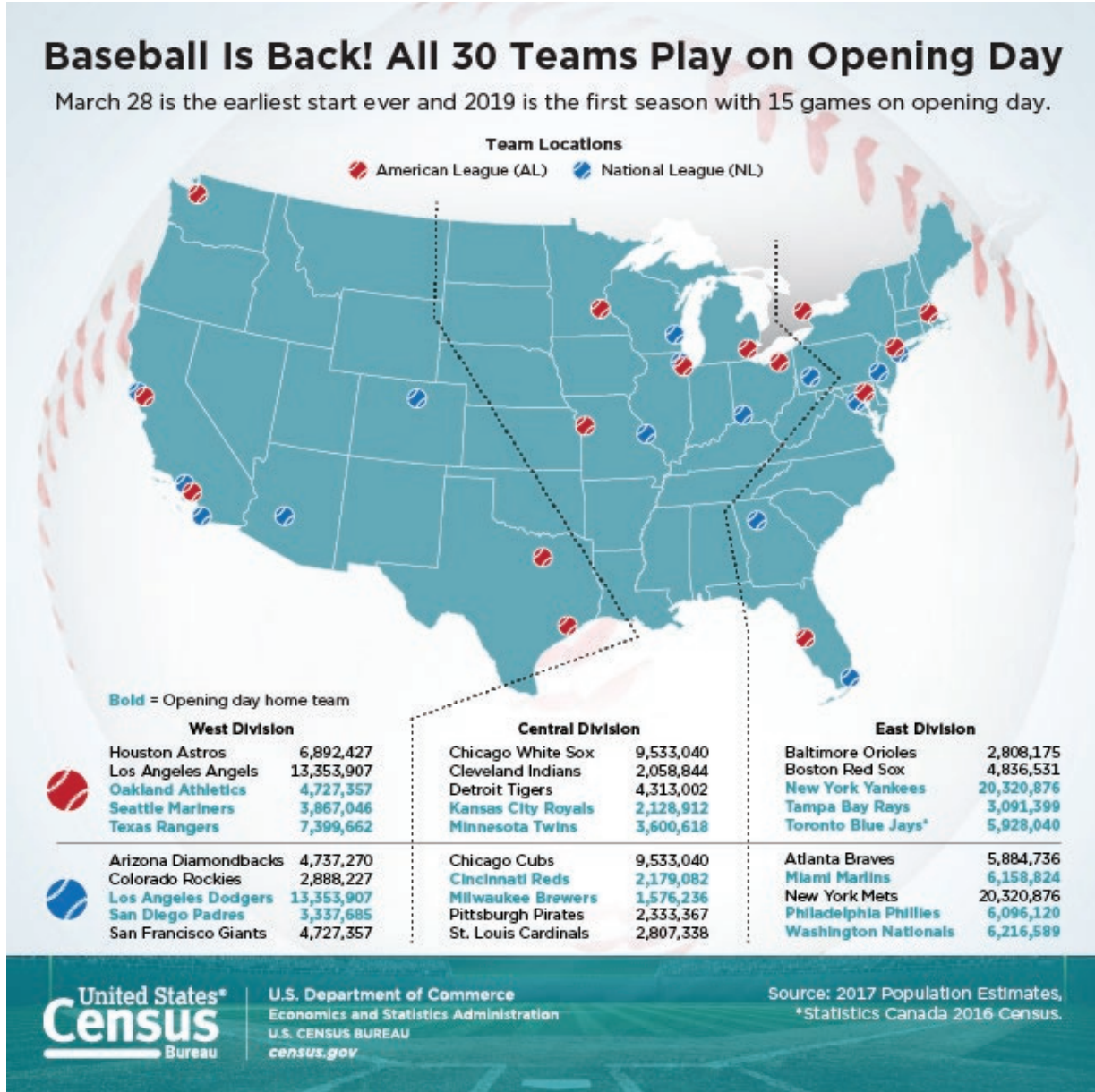
BUSINESSES	
Total employer establishments, 2016	7,757,807
Total employment, 2016	126,752,238
Total annual payroll, 2016 (\$1,000)	6,435,142,055
Total employment, percent change, 2015-2016	2.1%
Total nonemployer establishments, 2017	25,701,671
All firms, 2012	27,626,360
Men-owned firms, 2012	14,844,597
Women-owned firms, 2012	9,878,397
Minority-owned firms, 2012	7,952,386
Nonminority-owned firms, 2012	18,987,918
Veteran-owned firms, 2012	2,521,682
Nonveteran-owned firms, 2012	24,070,685
GEOGRAPHY	
Population per square mile, 2010	87.4
Land area in square miles, 2010	3,531,905.43

Source: *U.S. Census Bureau, QuickFacts*

<https://www.census.gov/quickfacts/fact/table/US/PST045218>



Activity Item 2: Sample U.S. Census Bureau Infographics

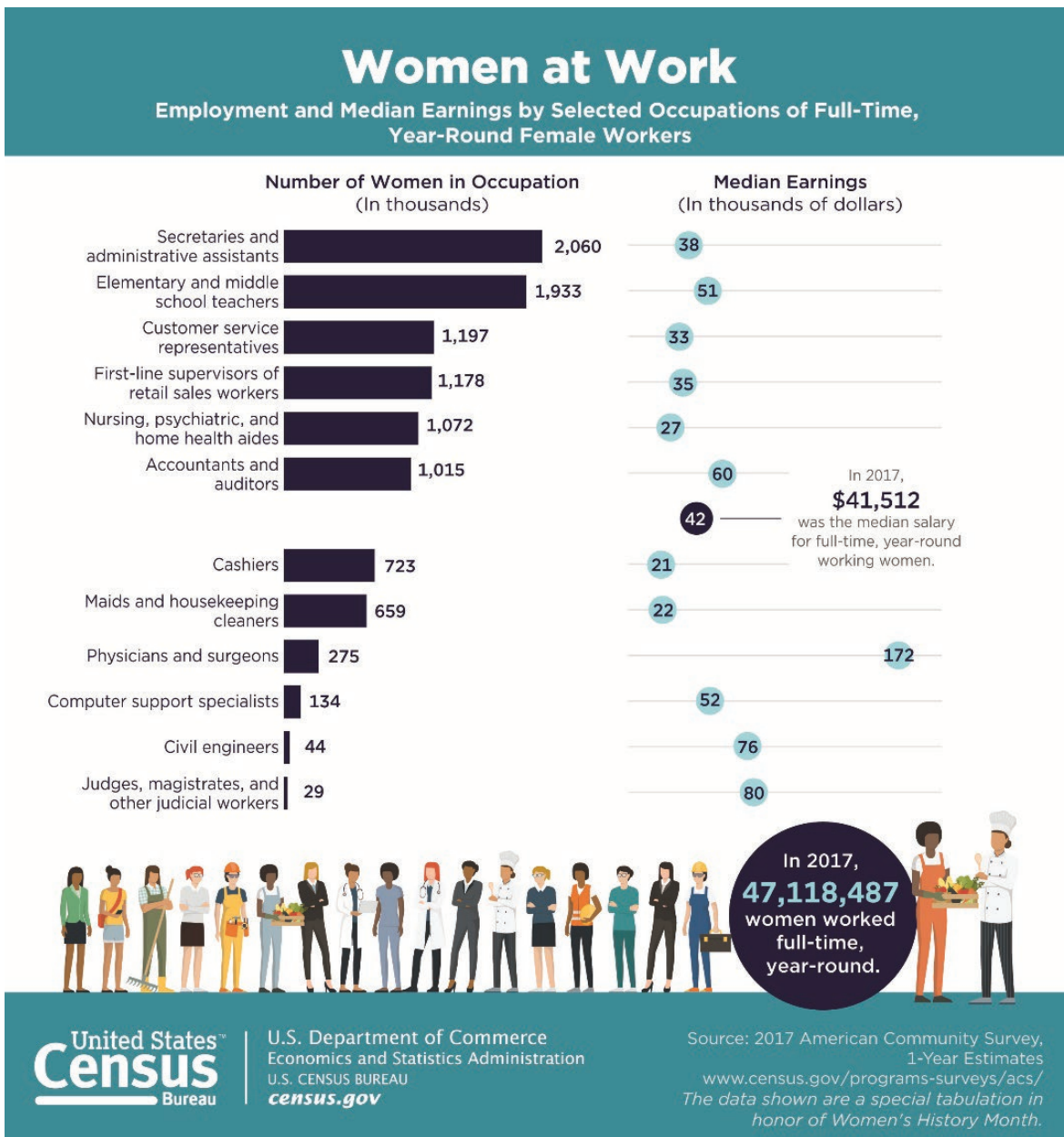


Source: U.S. Census Bureau, 2017 Population Estimates

<https://www.census.gov/content/dam/Census/library/visualizations/2019/comm/opening-day-2019.jpg>



Activity Item 2: Sample U.S. Census Bureau Infographics (Cont.)

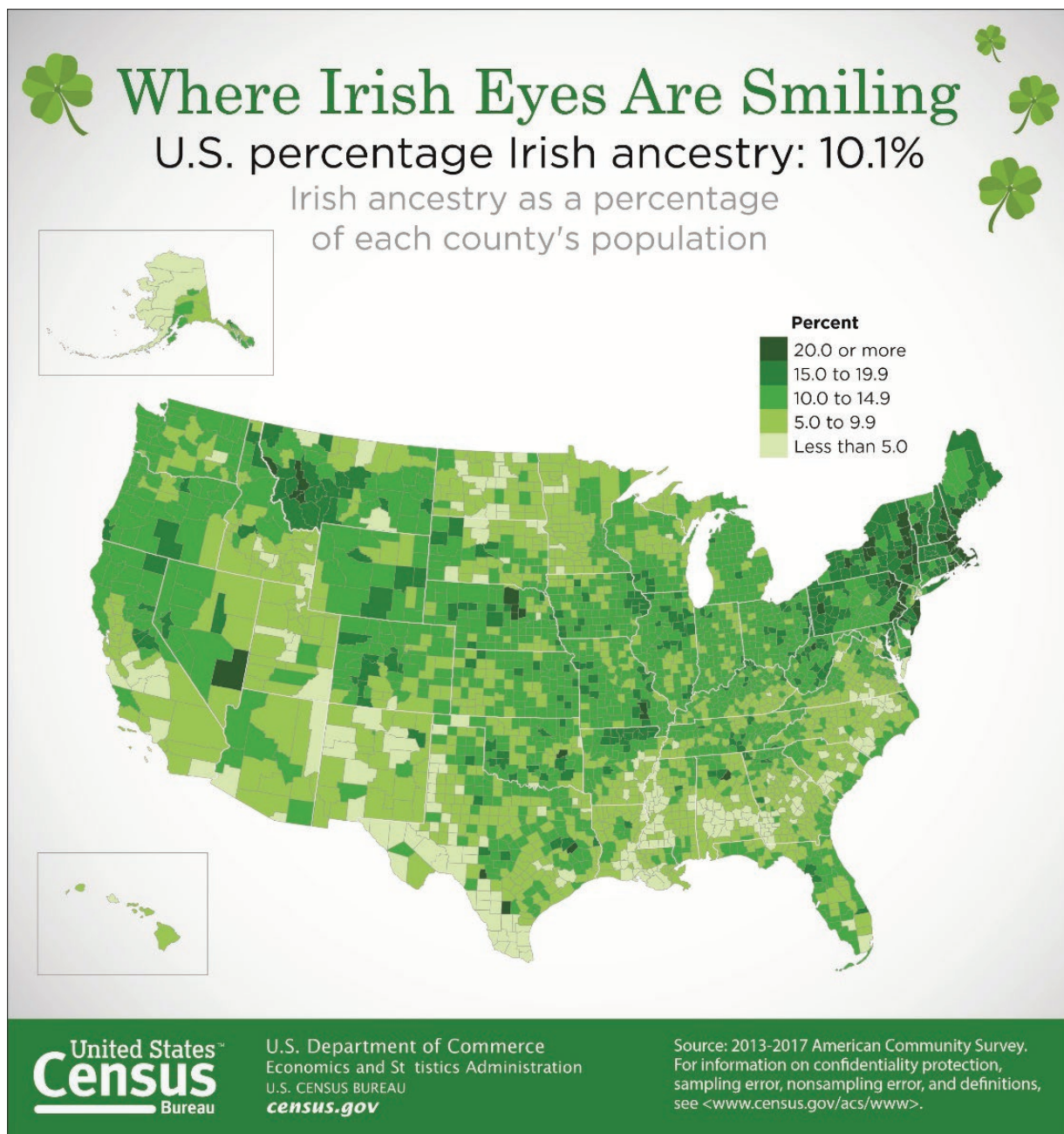


Source: U.S. Census Bureau, 2017 American Community Survey, 1-Year Estimates

<https://www.census.gov/content/dam/Census/library/visualizations/2019/comm/womens-earnings-by-occupation.jpg>



Activity Item 2: Sample U.S. Census Bureau Infographics (Cont.)



Source: *U.S. Census Bureau, 2013-2017 American Community Survey*

<https://www.census.gov/content/dam/Census/library/visualizations/2019/comm/irish-american.pdf>