SDLC Strengthening Data Literacy across the Curriculum

Investigating Immigration to the U.S.

Module Overview and Sample Lessons

The *Investigating Immigration to the U.S.* module focuses on describing, comparing, and making sense of categorical variables. Students investigate questions such as: Are there more immigrants in the U.S. today than in previous years? Where have most immigrants been coming from? Are immigrants as likely as the U.S. born to be participating in the labor force?

This module was developed for 12th grade non-AP mathematics and statistics courses and contains seven lessons and one final team data investigation. The module is designed for two to three weeks of instruction.

This sample document contains 1) an overview of the module lessons and learning objectives; 2) the teacher guide for Lesson 4, titled *Are there more immigrants in the U.S. today than in previous years?*; 3) the teacher guide for Lesson 5, titled *Where have most immigrants been coming from?*; and 3) the team data investigation.

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Investigating Immigration to the U.S.

Lesson Overview and Learning Objectives

SDLC Strengthening Data Literacy across the Curriculum

Immigration Module*

Lesson Overview and Learning Objectives

1. **Who are immigrants in the U.S.?**
   The goal of this lesson is to introduce the overarching theme of this module: Who has been immigrating to the U.S, and how have immigrants shaped U.S. society over time? The lesson also introduces some claims about immigrants, which students will evaluate using data in subsequent lessons. Students will pose research questions that may help them explore the claims and decide which questions can be answered with data. They will learn about the American Community Survey and the decennial censuses as data sources that can help explore questions about immigration to the U.S.

   Learning Objectives
   Students will build the following skills and concepts:
   - Identify questions about U.S. immigrants that can and cannot be answered with data.
   - Summarize key information about immigrants and U.S.-born individuals that is collected by the U.S. Census Bureau through the American Community Survey (ACS).

2. **What can we learn about immigration from the American Community Survey?**
   The activities in this lesson are designed to engage students in exploration of the data source of the module: The U.S. Census Bureau's American Community Survey (ACS). Students will learn about how the data collected by the ACS are coded and organized, and will learn about ACS variables (attributes) and categories of information. Students will use a data analysis tool called CODAP to explore how data can be assembled and represented in tables and graphs.

   Learning Objectives
   Students will build the following skills and concepts:
   - Describe what kind of information is collected by the ACS.
   - Describe how the variables (attributes) in a dataset relate to the ACS questionnaire.
   - Use the CODAP data portal to create a dataset.
   - Describe how data in a table relates to data in a graph.

3. **What percentage of the U.S. population are immigrants?**
   In this lesson, students begin to examine the following claim: *Immigrants are taking* over. They do so by examining data from the ACS to determine the percentage of the U.S. population who were immigrants in 2017. In the next lesson they will compare their findings to other points in time in U.S. history. The lesson discusses the concepts of sample proportions and percentages; how these concepts are involved in analyzing categorical variables; and the approximate margin of error around sample estimates.

   Learning Objectives
   Students will build the following skills and concepts:
   - Use a proportion or percentage of a *sample* to estimate the proportion or percentage of a *population*.
   - Explain why sample proportions will vary from sample to sample.
   - Explain what *margin of error* means and why it is important to include this calculation when reporting findings.
   - Use data to comment on whether or not the immigration claim can be substantiated by data.

   Focus Immigration Claim: In this lesson students will examine data to address one of the claims that we explored in Lesson 1: *Immigrants are taking over.*

*Modified for remote and hybrid implementation.

Focus CODAP Skills
Students will build the following skills:

- Take screenshots and create links to share your graphs.
- Create a categorical attribute from a quantitative attribute (extension activity).

4. Are there more immigrants in the U.S. today than in previous years?

This lesson continues to use data to explore the following claim: *Immigrants are taking over.* Students will investigate how levels of immigration to the U.S. have changed over time by examining the percentage of immigrants in the U.S. population in 1920, 1970, and 2017.

Learning Objectives
Students will build the following skills and concepts:

- Describe the distribution of a categorical attribute using percentages and proportions.
- Compare two different percentages and write a conclusion about whether or not the difference is larger than the approximate margin of error.
- Interpret a timeplot using background information.

Focus CODAP Skills
Students will build the following skills:

- Create a data sample with given attributes.
- Determine sample percentages and proportions.

5. Where have most immigrants been coming from?

The goal of this lesson is to have students examine the changing world origins of immigrants over time, and to reflect on causes behind these changes. In this investigation, students will gain experience generating and comparing percentages of categorical data from different years.

Learning Objectives
Students will build the following skills and concepts:

- Create a graph and calculate numbers to compare percentages across groups.
- Use this information to analyze the association between two categorical variables.

Focus Immigration Claim: In this lesson you will examine data to address the claim: *Most immigrants are Mexican***.**

Focus CODAP Skills
Students will build the following skills:

- Compute row percentages and column percentages.

6. Where have immigrants settled in the U.S.?

The goal of this lesson is to have students examine variation in immigrants' geographic settlement patterns. Through this investigation, students will gain further experience generating and comparing percentages of categorical data.

Learning Objectives
Students will build the following skills and concepts:

- Read and interpret percentages from bar graphs.
- Attend to what is the "part" and what is the "whole" when calculating and interpreting a percentage.

Focus CODAP Skills
Students will build the following skills:

- Use graphs and appropriate row or column percentages to describe the association between two categorical attributes.

7. Are immigrants as likely as the U.S. born to be in the labor force?

In this lesson, students investigate one of the myths from Lesson 1: *Immigrants don't work.* People who work in jobs contribute to the economy rather than being a drain on it. This lesson explores ACS data to study differences in labor force participation rates between U.S.-born individuals and immigrants. The lesson also aims to develop students' understanding that the association between two variables may change after "controlling" for a third attribute. Specifically, what happens to the difference in labor force participation rates between U.S.-born individuals and immigrants when we control for education level? In this investigation, students will gain experience generating and comparing percentages for categorical data with more than two possible categories. They will also gain experience with data cleaning and subsetting.

Learning Objectives

Students will build the following skills and concepts:

- Determine percentages based on what is the "part" and what is the "whole."
- Read and interpret percentages from bar graphs.
- Describe what may happen to the association between two attributes when controlling for a third attribute.

Focus Immigration Claim: In this lesson you will examine data to address the following claim: *Immigrants don't work.*

Focus CODAP Skills

Students will build the following skills:

- Identify attributes of individual cases in a graph by selecting and finding the cases in the data table.
- Create multiple graphs (such as in a side-by-side layout) to examine the association between two attributes when adjusting (or controlling) for a third attribute.

8. Final Data Investigation

Students will choose and investigate a new question related to immigrants in the U.S. They will apply their understanding of the 4-step Data Investigation Cycle as well as statistical concepts to address their chosen question. Specifically, they will identify a question to answer, assemble a data set using ACS and/or decennial census data, use graphs and tables to analyze the data, and justify conclusions based on the data. After investigating patterns between two attributes, students will examine how the relationship between two attributes may change when adjusting for a third attribute.

Questions for further investigation of immigrants in the U.S.:

1) What types of occupations are immigrants most likely to hold compared to U.S.-born individuals?
2) How does the typical wage of immigrants compare to the typical wage of U.S.-born individuals?
3) Are immigrants in 2017 less likely than immigrants in 1980 to speak English well?
    - *Note that this question addresses one of the claims discussed in Lesson 1*.

Possible third attributes:

- Sex, race/ethnicity, education, age, marital status, U.S. region, birthplace (an option for question 3 only).

Investigating Immigration to the U.S.

Lesson 4 Teacher Guide

Investigating Immigration to the U.S.
Lesson 4 Teacher Guide

Are there more immigrants in the U.S. today than in previous years?

Lesson Overview
This lesson continues to use data to explore the following claim: *Immigrants are taking over.* Students will investigate how levels of immigration to the U.S. have changed over time by examining the percentage of immigrants in the U.S. population in 1920, 1970, and 2017.

Learning Objectives
Students will build the following skills and concepts:

- Describe the distribution of a categorical attribute using percentages and proportions.
- Compare two different percentages and write a conclusion about whether or not the difference is larger than the approximate margin of error.
- Interpret a timeplot using background information.

Focus CODAP Skills
Students will build the following skills:

- Creating a data sample with given attributes.
- Determining sample percentages and proportions.

Lesson Introduction and Opening Discussion

Use **slide** to share the focus claim and the topics the lesson explores.
Remind students that the investigation in the previous lesson used ACS data to examine the percentage of the U.S. population who were immigrants in 2017. This was a first step in exploring the myth from Lesson 1: *Immigrants are taking over.* Now that we have a sense of 2017, we are going to look at two earlier years in our U.S. history to explore how the percentages may have changed over time. You might ask students what data we will be using to assess their recollection of ACS data from prior lessons.

Student Activity

Step 1: Make Predictions about the Session Question

Use **slide** to remind students that the first step in the investigation cycle is to pose a question. In this lesson, the questions have already been framed for students:

- What percentage of the U.S. population who were immigrants in 1970? How about in 1920?
- How has the percentage of immigrants in the U.S. changed over time? (1920, 1970 and 2017)

In this step, students will make some guesses about the answer. This is a good way to dig into the exploration. If you are meeting with students remotely, display **slide** showing Question 1 and have students type their choice (A, B, or C) in the chat. Then invite students with different responses to explain their thinking. Or after collecting their results, provide a rough summary (e.g., A lot of you think…. A few chose….). Repeat, using **slide** to display the second question. We have tried to be consistent on use of "percentage" vs. "proportion" and encourage you to always clarify which one you want them using/which one the question is asking about.

Step 1: Make Predictions About the Session Question

Make some predictions about how the percentage of immigrants in the U.S. in recent years compares to years in the past. Your teacher will share a google form or invite you to participate in a poll during class. Here are the questions:

1. Make a prediction about how the percentage of the U.S. population who were immigrants **in 1920** compares to the percentage **in 2017**. Highlight or underline your choice from the statements below.

   *A. I think the percentage of the U.S. population who were immigrants **in 1920 was lower than in 2017**.*
   *B. I think the percentage of the U.S. population who were immigrants **in 1920 was higher than in 2017**.*
   *C. I think the percentages of the U.S. population who were immigrants **in 1920 and 2017 were about the same**.*

2. Make a prediction about how the percentage of the U.S. population who were immigrants **in 1970** compares to the percentage in 2017. Highlight or underline your choice from the statements below.

   *A. I think the percentage of the U.S. population who were immigrants **in 1970 was lower than in 2017**.*
   *B. I think the percentage of the U.S. population who were immigrants **in 1970 was higher than in 2017**.*
   *C. I think the percentages of the U.S. population who were immigrants **in 1970 and 2017 were about the same**.*

Stop here for instructions from your teacher.

Step 2: Assemble Data Using CODAP and Step 3: Analyze the Data

Use **slides** to summarize this step of the investigation and to outline expectations for team work to investigate the myth: *Immigrants are taking over*. Students will work independently but assign half of your students Question A and half of the teams Question B.

Question A: What percentage of the U.S. population were immigrants in 1920?
Question B: What percentage of the U.S. population were immigrants in 1970?

Students will be responsible for completing Steps 2 and 3 and for recording their findings on a class chart. These data will be used in a whole-group discussion after the investigation. Students will learn about data from the other year during this discussion.

Note: You may need to check in with students during this step to provide help. Students may also use the link to the CODAP Reference Guide for more detailed instructions on how to create their data sample.

Step 2: Use CODAP to Assemble Data

Question 3. Your teacher will assign you one question, A or B. Highlight your assigned question.

- Question A: What percentage of the U.S. population were immigrants in 1920?
- Question B: What percentage of the U.S. population were immigrants in 1970?

Use the Data Portal to get a random sample of 1000 people for your assigned year.

Use the *years* tab to select your assigned year, 1920 or 1970. Unselect 2017, so you don't get data for that year.

Check that the default attributes (**age, sex,** and **all states**) are selected.

Select **Immigrate-year.**

Make sure 1000 is entered next to the question "How many people?"

Click on "get people."

Your data table will soon appear.

Note: For more guidance in creating your random sample, refer to the **CODAP Reference Guide.**

In Step 3, students will need to choose between the two methods they used in Lesson 3 to determine the percentage of their sample who were immigrants. Have them use the sentence frame to practice properly interpreting their calculation. You may want to remind them to "follow the of."

CODAP note: Hiding cases in a graph window does so only in that graph. A new graph window will show all 1,000 cases. As students complete their analysis, have them add their data to the dotplot for their year. Or, have them submit the data and create the dot plots to display.

Step 3: Analyze the Data

Now you will analyze your data set.

Recall that in Lesson 3, there were two different methods to determine the percentage of your random sample who were immigrants:

Method 1: Using hand calculations, after generating group and total counts
Method 2: Using a formula in CODAP to create a new attribute with two categories, and displaying the percentages using the ruler

Question 4. Using one of the two methods, determine the percentage of individuals in your sample who are immigrants. Write your response in the following format and fill in the blanks.

>> For year _____, in our sample of _____ people, _____ % are immigrants.

If you chose Method 1, show your calculations below.
>>

If you chose Method 2, insert screenshots and links to CODAP to show your results.
>>

Write your sample percentage estimate on a post-it note and put it on the Jamboard class dotplot or Google Slide for the year you were assigned. [Your teacher will provide the link below.]

Lesson 4 Class Sticky Note Plot 1970 OR **Lesson 4 Class Sticky Note Plot 1920**

_____

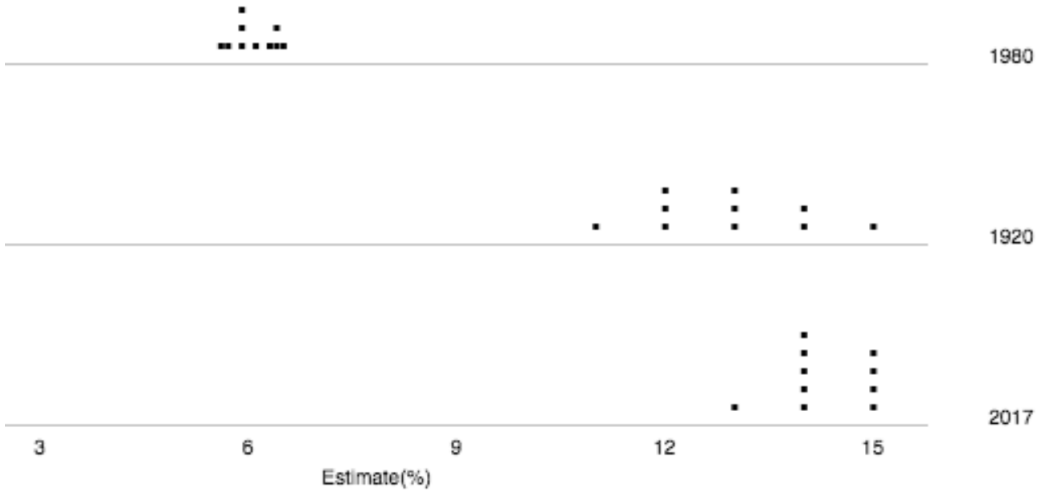
Class Dot Plot and Discussion

Provide the class dot plots to students and have them examine them and respond to Question 5. Display **Slide** to orient students to the task. Some notes about preparing the dot plots are provided below.

Question 5. Consider the dotplots for the three years (1920, 1970, and 2017). What do you notice? (For example, how do the centers compare? How do the spreads compare? Think about the approximate margin of error, which we discussed in the last lesson.) Jot down some ideas in preparation for a discussion.
>>

Pause here and return to class discussion.

Before beginning the discussion, be sure each team has displayed their findings in the class dotplot with a post-it note to represent their sample percentage estimate. Shown below, is a group of dotplots with possible estimates that the students could get for the different years. It is provided as an example of what the distribution of post-it notes might look like.



You'll want to make sure that the dotplots from the three years are "stacked" one above another, and the scale or ticks on the x-axis or horizontal axis are the same for all three years.

For remote instruction, use Jamboard or the google slides to have students create the dotplot. Alternatively, you could have students submit their data and create a post-it dotplot on chart paper that you can photograph and post. Or you can create a digital version using one of the digital tool options.

Note about 2017 estimates: Use the class dotplot that students created in Lesson 3. In case that graph or the estimates were not saved or are not easily retrievable, here are some possible estimates based on the same procedures used in Lesson 2. (% estimates of immigrants in the 2017 U.S. population: 13%, 14%, 14%, 14%, 14%, 14%, 15%, 15%, 15%, 15%)

If you have a small group of students, and so your dotplot for any year ends up with too few dots to see any discernible pattern, here are a few estimates that we obtained for the other two years using the same technique as was used in Lesson 2 for the year 2017. Add these values to post it notes so you have more dots on the dotplot.

1970: 5.6%, 5.7%, 5.9%, 5.9%, 5.9%, 6.1%, 6.3%, 6.4%, 6.4%, 6.5%

1920: 11%, 12%, 12%, 12%, 13%, 13%, 13%, 14%, 14%, 15%

Use **slide** to display discussion questions. Below are some questions to include in the discussion.

- Why did teams working with data from the same year come up with different percentages?

  Students should bring up sampling variability ideas discussed in Lesson 3. Remind students that these percentages will likely vary from sample to sample by random chance, and samples of 1000 people will give estimates that should be within 0.03 of the population proportion, or within 3 percentage points of the population percentage.

- What do you notice about the dotplots? What do you notice about the differences in the percentages of the U.S. population who were immigrants in 1920, 1970, and 2017?

  Note: Immigrants were approx. 13% of the population in 1920, 5% in 1970, and 14% in 2017.

- Do you see a lot of overlap in the distributions? Do the results from one of the years appear to be distinctly different from the others? Help students notice that even after we have accounted for the sample-to-sample variability in the estimates for each year, there is a lot of "overlap" in the estimates (dots) for years 1920 and 2017. This overlap indicates that there is plausibly no genuine difference in the percentage of immigrants in 2017 and 1920. In contrast, there isn't any "overlap" at all between the estimates on the dotplots of 1970 and 2017! Because the estimates for 1970 look so different and "far away" from those for 2017, we have reason to believe that there was a genuine difference between the population percentages of immigrants in 1970 and the population percentage of immigrants in 2017.

- Students should also notice that in all three years, the range of the percentages from their samples should be about 6 percentage points (or even less), coinciding with the margin of error of 3 percentage points from the last lesson. They can also discuss how the differences in the percentages for 1970 and the other years is more than six percentage points. This supports the argument that it reflects a genuine difference in the population percentages.

Step 4: Summarize Conclusions, Part I

Teacher-guided activity

Part 1: Questions 6-7;

First, ask students to look back at their predictions. Ask them to share ideas on how their predictions compared to their findings. Then, together complete questions 6-8.
Direct students to Step 4 in their Google document. The class will discuss these questions and then students will record their responses.

On these questions, remind students about the Lesson 3 discussion on margin of error, and how it tells us how much variability to reasonably expect in an estimate from a sample. Percentage estimates from a sample size of 1000 tend to have a margin of error that is 3 percentage points. So, we might not consider a difference in two percentages meaningful (i.e., likely to represent a genuine difference in the population percentages) unless the difference is more than 6 percentage points.

Step 4: Summarize Conclusions

Part I: Drawing Conclusions from the Dotplots

Question 6. Consider the dotplots of the sample percentages of the U.S. population who were immigrants **in 1920 and in 2017.**

Do you think the population percentages in each year are genuinely different from each other? Justify your answer using ideas that you have learned about margin of error.
>>

Question 7. Consider the dot plot of estimates of the percentage of the U.S. population who were immigrants **in 1970 and in 2017.**

Do you think the population percentages in each year are genuinely different from each other? Justify your answer using ideas that you have learned about margin of error.
>>

Question 8. Consider the dot plot of estimates of the percentage of the U.S. population who were immigrants **in 1970 and in 1920.**

Do you think the population percentages in each year are genuinely different from each other? Justify your answer using ideas that you have learned about margin of error.
>>

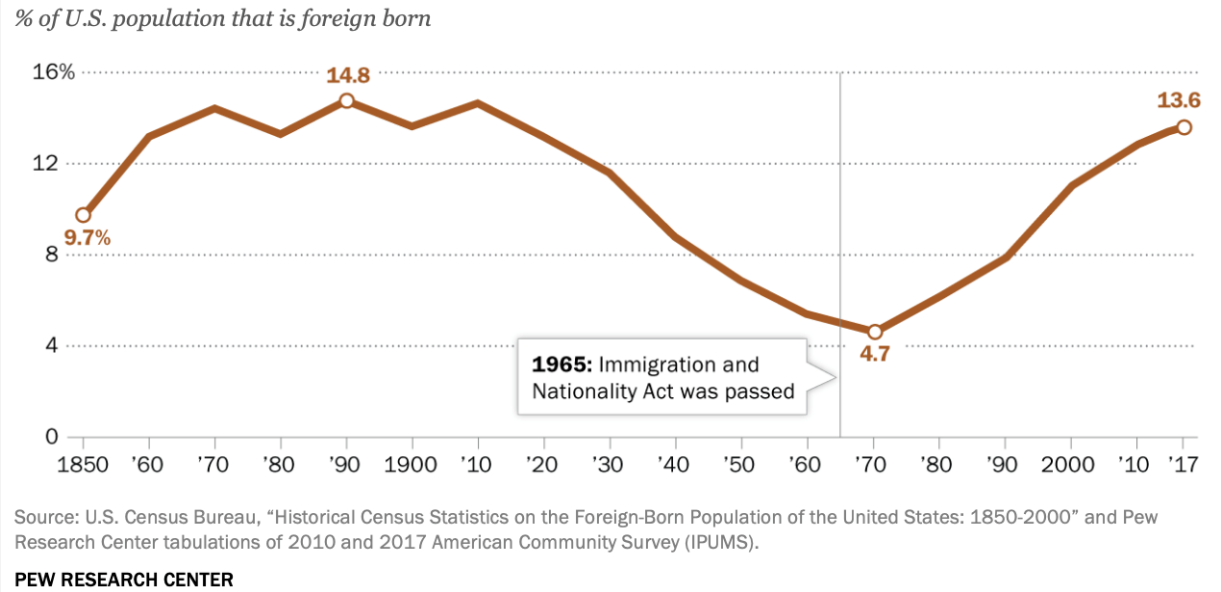
Step 4: Summarize Conclusions, Part II

Slide 8. In the next part of the lesson, students interpret a graph of immigration levels over time and do some reading about the historical and political landscape over time and consider how these events might help to explain trends in immigration.

First, have students examine the graph provided and think about how the data shown compares with the data they just investigated. Have them record their response to Question 9.

Part II: Reading about Immigration History and Policy
The graph below is called a **time plot**. It shows how the percentage of the U.S. population that is foreign born (or immigrants) has changed from 1850 to 2017. The percentage that are immigrants is on the vertical axis (or y-axis) and year is on the horizontal axis (or x-axis).

Percentages are based on Census data and the full 2017 ACS data, rather than random samples of 1000. Percentages that are calculated from Census data represent exact population values rather than sample estimates like we gathered in the last part of the lesson. Percentages that are calculated from the ACS data represent sample estimates, but because the ACS samples are so large, the percentages have very small margins of error.



Question 9. Based on the data in the graph above, what was the percentage of the total U.S. population who were immigrants in each of the following years?

1920: >>
1970: >>
2017: >>

Readings:
Assign students one or more of the readings at the links below. You could have all students complete the same reading or assign different students different readings.

- Chapter 1: The Nation's Immigration Laws, 1920 to Today (Pew Research Center) https://www.pewresearch.org/hispanic/2015/09/28/chapter-1-the-nations-immigration-laws-1920-to-today/
- U.S Immigration Timeline (history.com) https://www.history.com/topics/immigration/immigration-united-states-timeline
- U.S. Immigration Policy, Past and Present (Brown University)

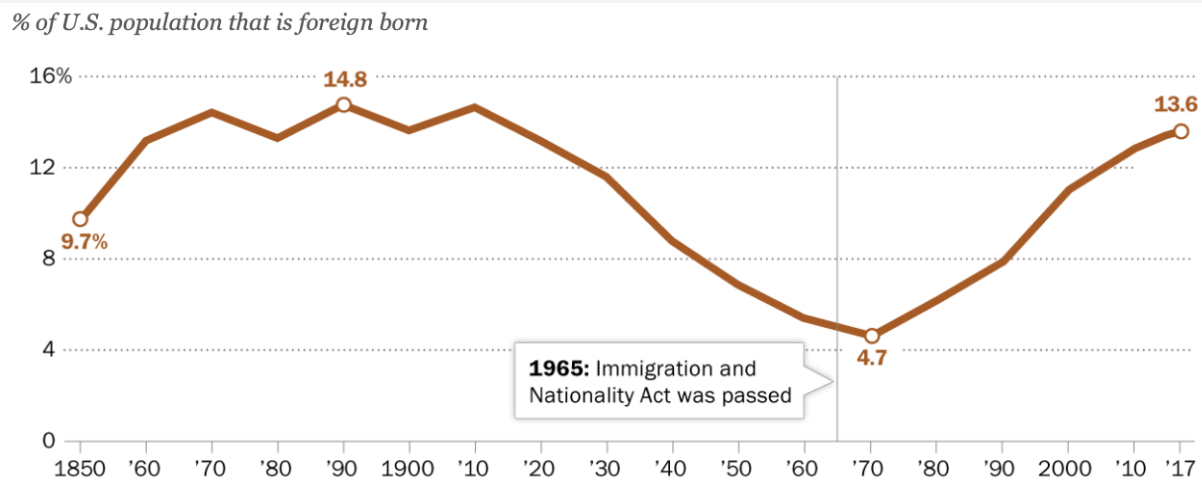
https://cdn.knightlab.com/libs/timeline3/latest/embed/index.html?source=1vQpiaHh30KH9Bakpu7pBP7y0uYlR0BUNJOiVPSymrmk&font=Default&lang=en&initial_zoom=2&height=650

How can we learn about the changes represented in this graph? What immigration policies might have influenced these percentages? Your assignment is to do some reading to try to explain this graph.

Question 10. Complete the assigned readings at the links below and record some notes about historical events and policy changes during each period of years that might have influenced rates of immigration to the U.S.

1790-1879 >>
1880-1929 >>
1930-1964 >>
1965-1999 >>
2000-2020 >>

Use your notes from the reading along with your own knowledge of immigration to the U.S. to explain trends in the graph.



Source: U.S. Census Bureau, "Historical Census Statistics on the Foreign-Born Population of the United States: 1850-2000" and Pew Research Center tabulations of 2010 and 2017 American Community Survey (IPUMS).

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Use your notes from the reading along with your own knowledge of immigration to the U.S. to answer the questions below.

Question 11. What does the graph illustrate about U.S immigration during the period 1925 to around 1970? What did you read in the article that might help to explain this trend?
>>

Question 12. What trend does the graph illustrate about 1965 to 2017? How did U.S. policy during this period influence immigration to the U.S.?
>>

Stop here and rejoin class for discussion.

Lesson Wrap-Up

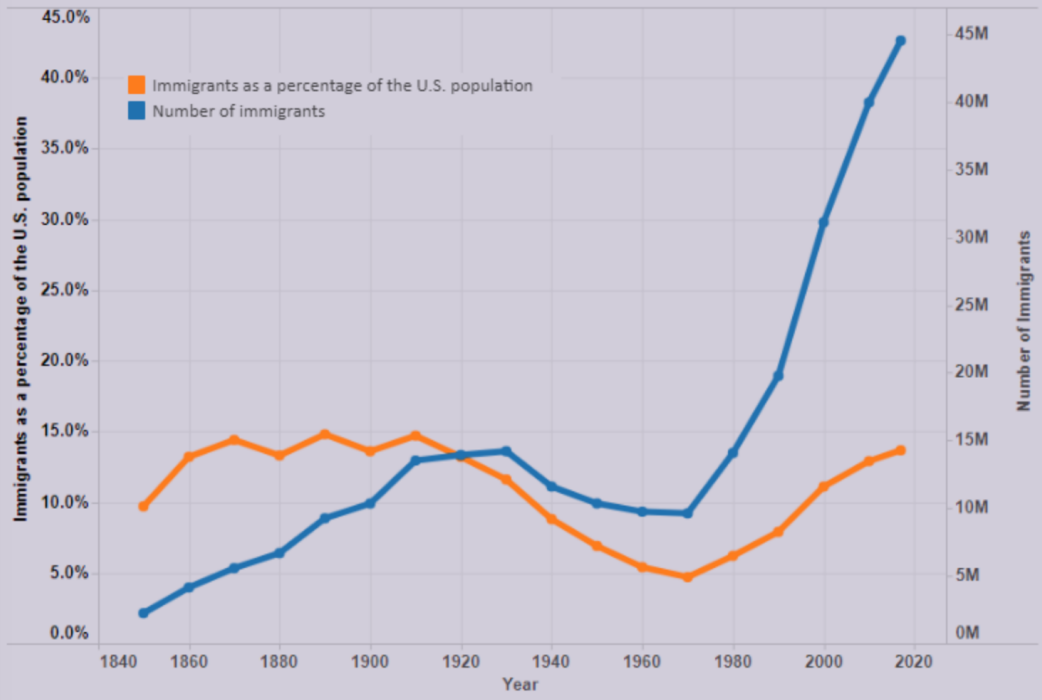
Use **slides** to display the timeplot and invite students to share their responses to questions 10-12. Then, use **slides** to revisit the investigation cycle and the myth: *Immigrants are taking over* and to hear their ideas. Now they will summarize their conclusion about how the percentage of immigrants has changed over time. Before giving students the exit task, summarize key learning by revisiting the lesson learning objectives with students. **Slide** summarizes the topics and skills from this lesson. Focus on a couple of the "can you" questions and invite students to share their ideas and examples of what they've learned that shows progress toward the objective and to honing their CODAP skills.

Final Activity: Lesson 4 Google Form

Slide. To end the lesson, have students Reflect on their experiences and learning in the lesson. Provide students with the link to complete the Lesson 4 Wrap Up Google Form. In this form, they will need to copy and paste their responses to questions 11 and 12 and answer two additional questions about the following graph.

The graph below shows how the number of immigrants (blue line) in the U.S. and the percentage of the U.S. population that are immigrants (orange line) have changed from 1850 to 2017.

Figure 1. Size and Share of the Foreign-Born Population in the United States, 1850-2017



Source: Migration Policy Institute (MPI) tabulation of data from U.S. Census Bureau, 2010-17 American Community Surveys (ACS), and 1970, 1990, and 2000 Decennial Census. All other data are from Campbell J. Gibson and Emily Lennon, "Historical Census Statistics on the Foreign-Born Population of the United States: 1850 to 1990" (Working Paper no. 29., U.S. Census Bureau, Washington, DC, 1999).

The graph above shows how the number of immigrants (blue line) in the U.S. and the percentage of the U.S. population that are immigrants (orange line) have changed from 1850 to 2017. Consider both the counts and percentages represented in the graph and evaluate the claim: "Immigrants are taking over."

Wrap Up Question 3. Does the data support this claim or not? Use specific numbers to explain your reasoning.

Wrap Up Question 4. Which graph (orange or blue) is more helpful for evaluating immigration trends over time? Explain your choice.

Investigating Immigration to the U.S.

Lesson 5 Teacher Guide

Investigating Immigration to the U.S.
Lesson 5 Teacher Guide

Where have most immigrants been coming from?

Lesson Overview
The goal of this lesson is to have students examine the changing world origins of immigrants over time, and to reflect on causes behind these changes. In this investigation, students will gain experience generating and comparing percentages of categorical data from different years.

Learning Objectives
Students will build the following skills and concepts:
- Create a graph and calculate numbers to compare percentages across groups.
- Use this information to analyze the association between two categorical variables.

Focus Immigration Claim: In this lesson you will examine data to address the claim: *Most immigrants are Mexican*.

Focus CODAP Skills
Students will build the following skills:
- Compute row percentages and column percentages.

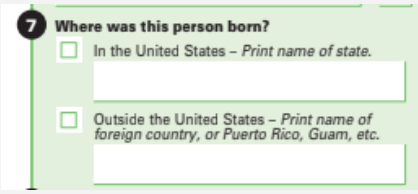
Lesson Introduction and Opening Discussion
Use **slides** to share the lesson overview and objectives. Remind students that the investigation in the previous lesson used ACS data to examine the percentage of the population who were immigrants over time. Today we are going to look at where immigrants have come from now and in the past.

Step 1: Ask Questions (and Make Predictions)
Slide. The first step in the investigation cycle is to pose a question. In this lesson, the question has already been framed for students. Here is the question for today's investigation:
- **What were the percentages of U.S. immigrants from different world regions in 2017? How about in 1920?**

In this step, students will make some guesses about the answer. This is a good way to dig into the exploration. Remind students that in this lesson they will continue to use data from the ACS and recall that Question 7 asks "Where is this person from?"

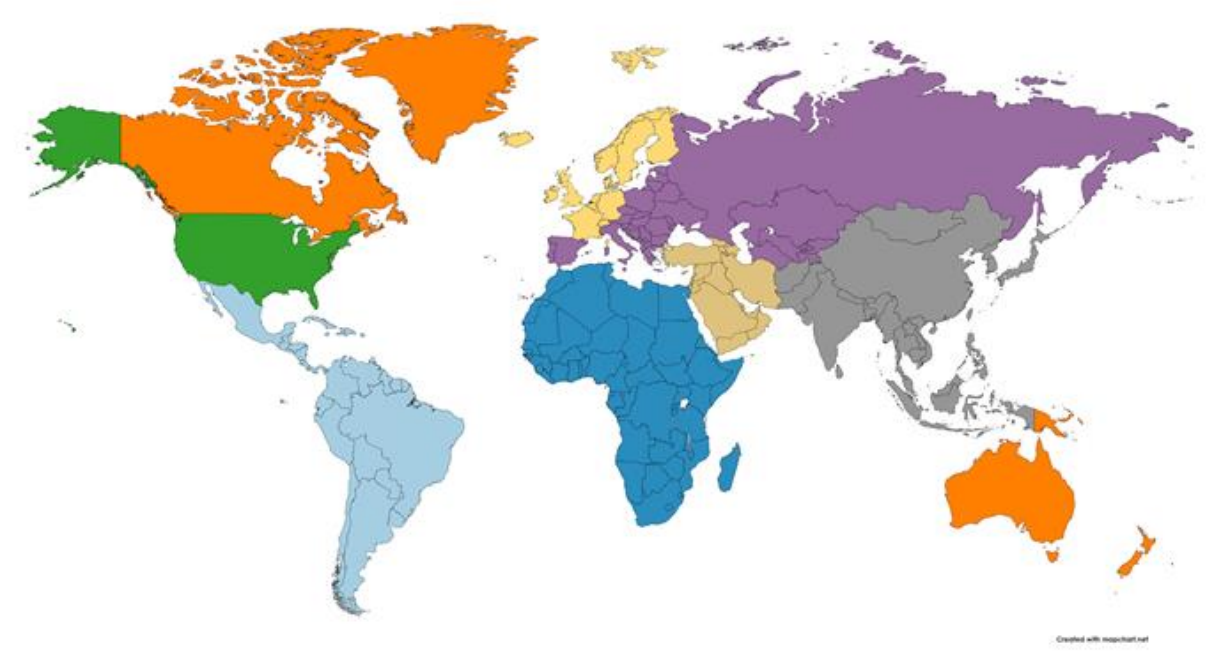
Step 1: Make a prediction

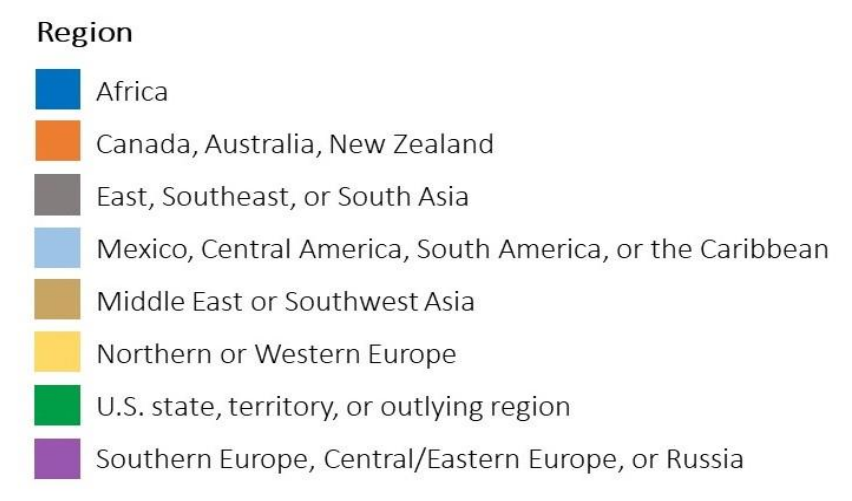
Recall that the ACS asks where an individual was born.



The responses to "Outside of the United States" are categorized into (188!) different world regions. We have broken this down into 9 world regions in the data portal.

- U.S. state, territory, or outlying region
- Canada, Australia, New Zealand, or Pacific Islands
- Mexico, Central America, South America, or the Caribbean
- Northern or Western Europe
- Southern Europe, Central/Eastern Europe, or Russia
- East, Southeast, or South Asia
- Middle East or Southwest Asia
- Africa
- Unknown





In this lesson, we will consider anyone born outside of the United States as an immigrant.

Question 1. When this question was asked in 2017, which world region do you think most immigrants living in the U.S. had come from?
>>

Question 2. Do you think the responses were much different when this question was asked 100 years ago?
>>

Reflect on these questions and prepare to share your answers in the chat or using a Google Form as your teacher instructs you.

Stop here for instructions from your teacher.

When students have completed their guesses, take each question at a time and invite students to share their responses in the chat or in discussion. One important idea to help students understand the question: We are not asking where did most people who came in 2017 come from. We are asking, if you think of all of the immigrants who are here in the U.S. in 2017 which regions will have the most immigrant representation?

CODAP Activity

Slide. In this lesson, students are provided a dataset of randomly selected immigrants who responded to questionnaires from the U.S. Census Bureau. (They will not create their own dataset from the Data Portal as they did in previous lessons. Make sure students understand that by using the same dataset, everyone in the class will be analyzing the same sample of people.) The dataset includes several attributes. Check in on understanding of "attributes" by briefly hearing from students what attributes they might expect to be included in the dataset. Hopefully, they will mention an attribute that tells where the person immigrated from. Ask students to look for such an attribute when they examine the dataset with their team. Don't take a lot of time in discussion here

because it's best to talk about this after they've looked at the dataset. Have students complete through Question 4 and then confirm their responses to questions 3 and 4.

Step 2: Assemble Data Using CODAP and Step 3: Analyze the Data

Step 2: Assemble Data Using CODAP

For this lesson, we will all use a random sample of immigrants who responded to the ACS survey in 2017 and the decennial census in 1920. Open the data file in CODAP: Link

Describe your sample:

Question 3. How many immigrants are in this sample?
>> **1092**

In this data file, we have immigrants who responded in 2017 and 1920.

- Determine the number of immigrants that were surveyed in 1920 or in 2017 by creating a graph and dragging the Year attribute to the horizontal axis.
- User the Ruler to show Count.

If you get stuck and need guidance, see the CODAP Reference Guide for more instructions.

Question 4. Examine who is in your sample.

A. How many people in this sample were surveyed in 1920? >> **505**
B. How many people in this sample were surveyed in 2017? >> **587**

Stop here and be prepared to share your responses.

Step 3: Analyze the Data, Questions

Slides. In this step students will analyze the data. Show slide and orient students to the purple box: *Make sense of the data by **creating and analyzing graphs**. What story is the data telling? Give your graphs titles.*

Have students continue to Step 3, Questions 5 and 6. You can have students work independently and share answers or complete this together as a class and have students give input. Then, guide them through Questions 7-9 and provide support to make sense of percentages.

Step 3: Analyze Data

To evaluate the claim that most immigrants are Mexican, we can compare the percentage of immigrants who were born in "Mexico, Central America, South America, or the Caribbean" to the percentage of immigrants from other world regions. We can also see whether this percentage was much different between 1920 and 2017.

- Drag the Birthplace_recode attribute to the y axis.

First examine the distribution of responses in 2017.

Question 5. In 2017, how many immigrants in the sample were born in Mexico, Central America, South America, or the Caribbean? >> **294**

Was this the most common birth place in 2017? >> **There were more people with this birth place in 2017 than any other region. (*It's important to note, though, that this region includes several other countries than just Mexico. We don't have a breakdown of this data by country, so it's not clear how many are from Mexico and how that compares to other countries in this region and other regions in the world. Since 50% of all immigrants are from this region that includes several countries, it's safe to assume that most (more than half) immigrants are <u>not</u> from Mexico.)***

Now consider the distribution of responses in 1920.

Question 6. Was Mexico/Central America/South America/Caribbean still the most common region? >> **No**
If not, what was the most common region? >> **Southern Europe, Central/Easter Europe, or Russia**

Because we do not have the same number of immigrants in this sample each year, it is helpful to convert the "number of immigrants" to percentages in order to compare the distributions for the two years. Let's see what CODAP does when we ask for percentages.

Use the **Ruler** to check the **Percent** box. Note that the "Row" button is selected.

Question 7. What percentages are reported for the Mexico, Central America, South America, Caribbean category in each year?

	2017	1920
Mexico, Central America, South America, Caribbean	>> **92%**	>> **8.1%**

What do these percentages mean? To interpret proportions and percentages it is important to identify the numbers that form the "part" and the "whole." For these "row percentages" (which, apart from rounding, sum to 100%), the "whole" is the total number of individuals who said they were born in Mexico, Central America, South America, or the Caribbean. This total number becomes our denominator.

Question 8. What is the total number of responses for this region, combining the two years together?
>> **320**

The "part" is how many responded from each year. This number becomes the numerator. In this sample,
294 / (294+26) x 100% = 92%
part whole

So 92% of those born in Mexico, Central America, South America, or the Caribbean responded to the survey in 2017 and 8% responded in 1920.

Question 9. Now consider the Southern, Central, or Eastern Europe row. Determine the percentages that responded in each year (show your work) and complete the sentence.
>>
__**12**__% of immigrants born in Southern, Central, or Eastern Europe responded in _**2017**___ and ____**88**_____% responded in _____**1920**_____.

Next, help students understand the terminology "association." Association between attributes corresponds to differences between groups. Both analyses (row and column percentages) are summarizing the same association, but the interpretation is probably easier for students if we condition on "year" rather than on "region." In this next section, they will also explore column percentages to condition on region.

Because these percentages (92%/8% vs. 12%/88%) are so different, we say there is an association between birth place and year. But it might be more clear to describe the association another way.

Use CODAP to change the row percentages to "column percentages."

- Use the Ruler to select the Column percent rather than the Row percent.

Question 10. What two percentages are reported for the Mexico, Central America, South America, Caribbean category?

	2017	1920
Mexico, Central America, South America, Caribbean	>>**50%**	>>**5.1%**

Question 11. Explore these values to see how to interpret them:

Do these values sum to 100%? >> **No**

What is the "whole" (denominator) for the values in 2017? (Hint: What numbers do sum to 100%?) >> **The whole is all of the individuals in the sample who responded in 2017. Or all of the individuals who responded in 1920. Each of the years is the whole.**

Show how the percentage for 2017 was calculated: __**294**__/ _**587**__x 100%

Question 12. Complete the sentences below to interpret these values.

Of the _**587**_ immigrants in the 2017 sample, _**50**__ % were born in Mexico, Central America, South America, or the Caribbean.
Of the _**505**__ immigrants in the 1920 sample, _**5.1**___ % were born in Mexico, Central America, South America, or the Caribbean.

Question 13. Would you say these two percentages from Question 12 are similar to each other or quite different?
>>**These are quite different. The 2017 percentage is ½ of the sample. In 1920, the individuals from this region were much fewer -- less than 10%.**

Next, have students work on their own to explore the data and birthplace regions further by completing Question 14. Hear their ideas before moving to the lesson Wrap-Up.

Question 14. Identify another region where the percentage of immigrants born in that region changed substantially between 1920 and 2017. Record the region and the percentages below.

	Percentage of U.S. immigrants from the region	
Region	2017	1920
>>	>>	>>

Definition: Because the distributions of birthplaces are so different between 1920 and 2017, we say there is an association between birthplace and year. In other words, we have evidence that the pattern of birth places of immigrants has changed between 1920 and 2017.

Class Discussion

Slides. When students have finished Question 14, facilitate a whole-class discussion. Possible questions are listed below. You can record results in the slide or on board.

Which world regions were most U.S. immigrants from in **2017**? What were the percentages of immigrants that year who were born in these world regions?
Note that immigrants may move among multiple countries before coming to the U.S. In this analysis, we considered immigrants' reported birthplace as where they are from.

Which world regions were most U.S. immigrants from in **1920**? What were the percentages of immigrants that year who were born in these world regions?
Consider recording students' responses to both questions above for the class to examine together.

What changes do you notice in immigrants' world origins or birthplaces between 1920 and 2017?
Have students compare the percentage of immigrants from a specific world region in 1920 and 2017. Consider having students calculate the percentage point change vs. the percent change.

What are you wondering about after analyzing these data?
How could you learn more to explore these questions?

Lesson Wrap-Up

Step 4: Summarize Conclusions

Slide Ask students to complete Step 4 of the Data Investigation Cycle. Summarize key learning by revisiting the lesson learning objectives with students. Let students know that in the Lesson Wrap Up they will summarize their conclusion to the claim the class has been investigating: *Most Immigrants are Mexican.*

Lesson Wrap-Up
Step 4: Summarize Your Conclusions

Use the link that your teacher provides to complete the Lesson 5 Google Form that contains the 3 questions below. If you prefer, you can type your answers here and then copy and paste them into the Google Form.

Wrap-Up Question 1. Recall the claim that Most immigrants are Mexican. How would you respond to this claim? Use data to support your argument and discuss if there is any additional data you would like to have to further explore the claim.

Wrap-Up Question 2. How has the distribution of birth places changed between 1920 and 2017? (Hint: Focus on describing which regions have had bigger changes.)

Wrap-Up Question 3. Reflect or re-read sections of the Immigration Timeline article you read in the last lesson. Cite at least one reason that might help to explain the difference in the distribution of birth places between 1920 and 2017 from this article.

Make sure that you have submitted your responses in your Lesson 5 Google Form at this link.

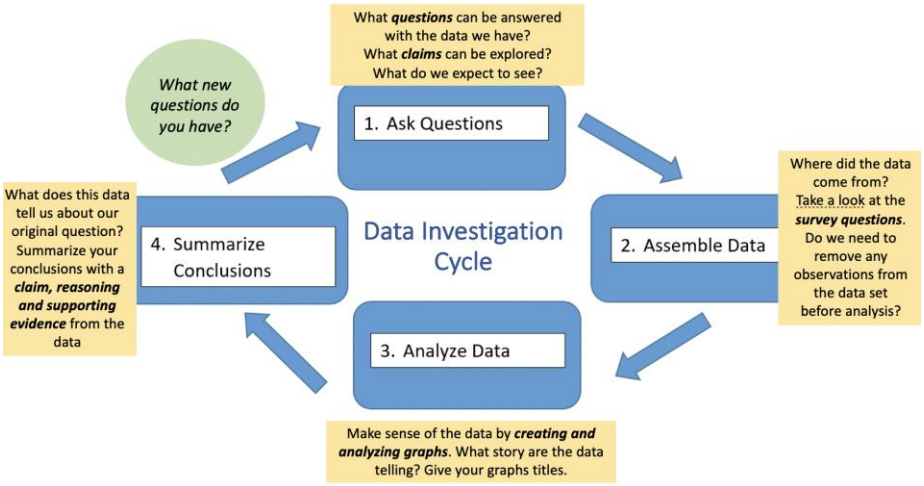
Investigating Immigration to the U.S.

Team Data Investigation

Team Data Investigation: Investigating Immigration to the U.S.

Overview

Work as part of a team to apply your understanding of the Data Investigation Cycle and statistical concepts by completing the cycle for a new question using ACS and decennial census data. You will identify a question, assemble a data set, analyze the data, and draw conclusions. You will share your work and findings with your peers.



Step 1: Ask a Question

Review the suggested list of questions below. Choose a question from Part A that interests you. Then choose a third attribute from Part B to add to your analysis.

Part A. ***Choose one*** *of the bolded questions below to investigate:*

Question 1. What types of occupations are immigrants most likely to hold compared to U.S.-born individuals?

Question 2. How does the typical income of immigrants compare to the typical income of U.S.-born individuals?

Question 3. Are immigrants in 2017 less likely than immigrants in 1980 to speak English well?

Part B. ***Choose a third attribute*** *to extend your analysis. In particular, you will explore how your findings change when you adjust (or control) for this third attribute.*

- Sex
- Race/ethnicity
- Education
- Age
- Marital status
- U.S. region
- Birthplace (Option for Question 3 only)

1. List your question below.

2. List the third attribute you will investigate.

3. Make some **predictions about** what you expect to see in the data.

4. How do you expect the results will differ when you consider the third attribute?

Step 2: Assemble Data

If you chose **Question 1 or 2** in Part A above, you will use this dataset.
If you chose **Question 3** in Part A above, you will use this dataset.

5. What is the sample size?

6. List the attributes (variables) included in the dataset

7. List the attributes you plan to use in your analysis. Reference the data code book and include a description of the attribute.

8. Will you clean the data at all? Record notes here on what you do so that you can describe your actions in your conclusion summary.

9. Which attributes might you want to recode? Why? Record notes here on what you do so that you can describe your actions in your conclusion summary.

Step 3: Analyze Data

10. Make graphs to address your first data investigation question (Part A).
    - Display appropriate counts and percentages on the graph or create a table to display the counts and/or percentages.
    - Give each of your graphs a title.
    - Describe any data-cleaning (setting aside or hiding) that you did and why.

11. Insert screenshots of your graphs and paste a link to CODAP below.

12. What story do you think is told by the data? What patterns do you see?

Next, you will create and analyze graph(s) that incorporate the third variable you have selected.

Step 1: Ask a Question

13. Pose your question(s) involving the third variable here:

14. What do you expect to see? Make some predictions about how the graphs will look or what relationship you expect you might find?

Step 2: Assemble Data

15. Will you recode the third variable? If so, how?

Step 3: Analyze Data

- Create new graphs to investigate your question with the third attribute. Make sure you keep your prior graphs and update your CODAP link to keep all of your graphs.
- Display appropriate counts and percentages on the graphs or create a table to display the counts and/or percentages.
- Give your graphs titles.
- Read *Guidance for the Third Attribute* to get more information on how to work with your third attribute.

16. Describe your new graphs and insert screenshots of them. Update your CODAP link.

Step 4: Summarize Conclusions

17. What story do you think is told by the graphs? What could help explain the relationships you see among variables or other patterns in the data?

18. Pose at least one new question for future investigation.