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Statistics in Schools
Moving the Benchmark on Statistical Learning
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Welcome to Statistics in Schools
Statistics in Schools is a statistics education site that can give lesson content to teachers, and help students with their grades. It focuses on statistics using real world data that's also useful for teaching and learning social science. SIS is run by the Census, but is a separate site from Census.gov.
Teachers
Did you know that the SIS teaching and learning tools map to standards and adapt to your classroom?
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What's New
Statistics in Schools
New type of activity available
Census staff teach math at local HS
Federal Statistical Agencies
300 new maps uploaded by BEA
New aviation safety dataset available from FedStats
Featured Activity
Answer 5 Questions about the Normal Curve
Answer these 5 questions about the Normal Curve to prove you have what it takes to make it out of the 6th grade!
Covers Statistics, Grade 6, Variability, 6.SP.1
See this activity in Teach
Start it now in Learn!
Featured Research
US Populations Map 1912
Compiled from early 20th century Census results, this 4-color map shows the US before the large migrations out of the 1930s dust bowl.
Covers History, Era 7, 1890-1920
See this map in Research
Featured Data Access Tool
QuickFacts
QuickFacts can give you all sorts of data. Find demographics and business information about your community.
This tool takes results from the 2010 Census.
See this tool in Research or Use it now!
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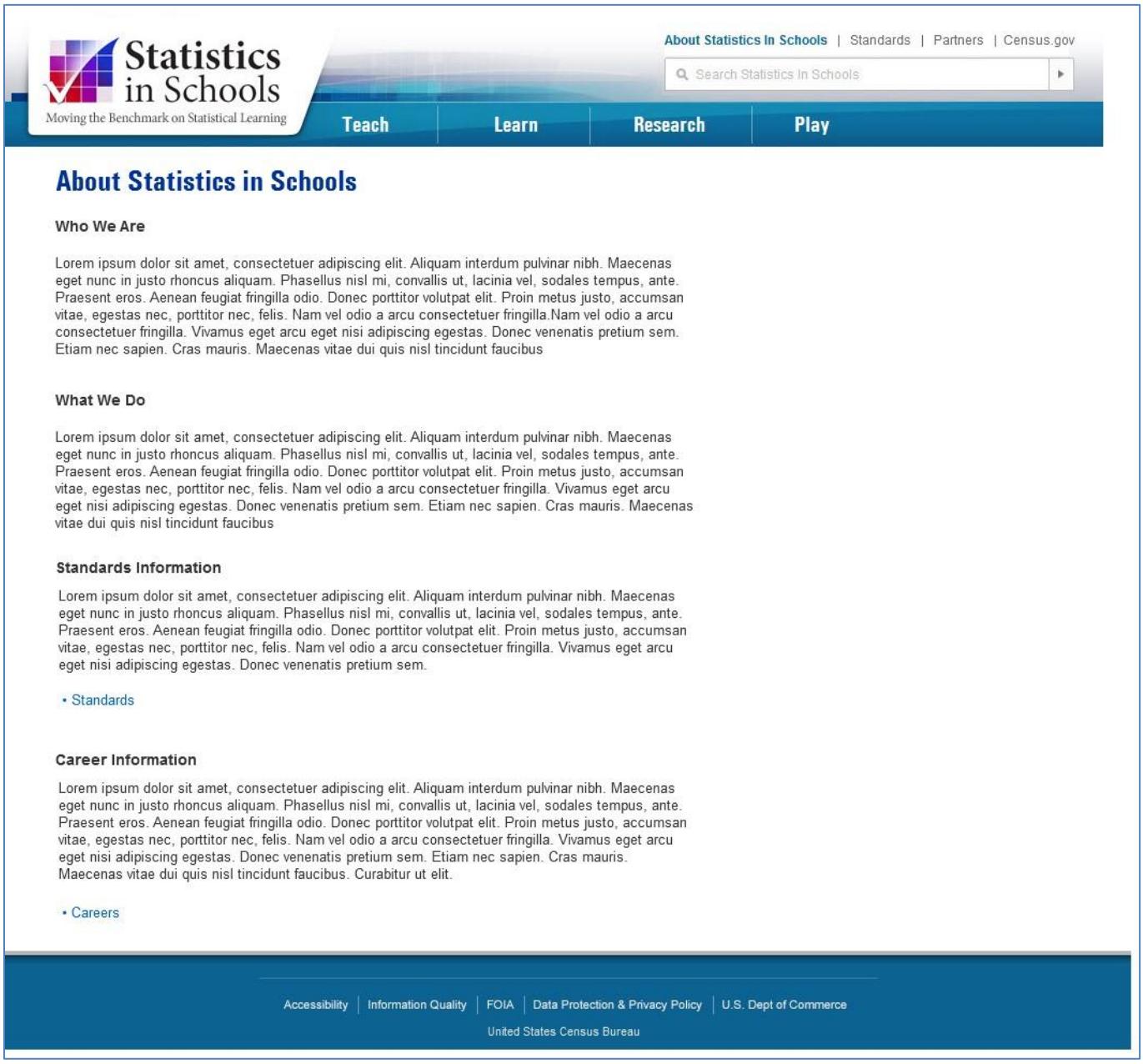
United States Census Bureau

About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Who We Are
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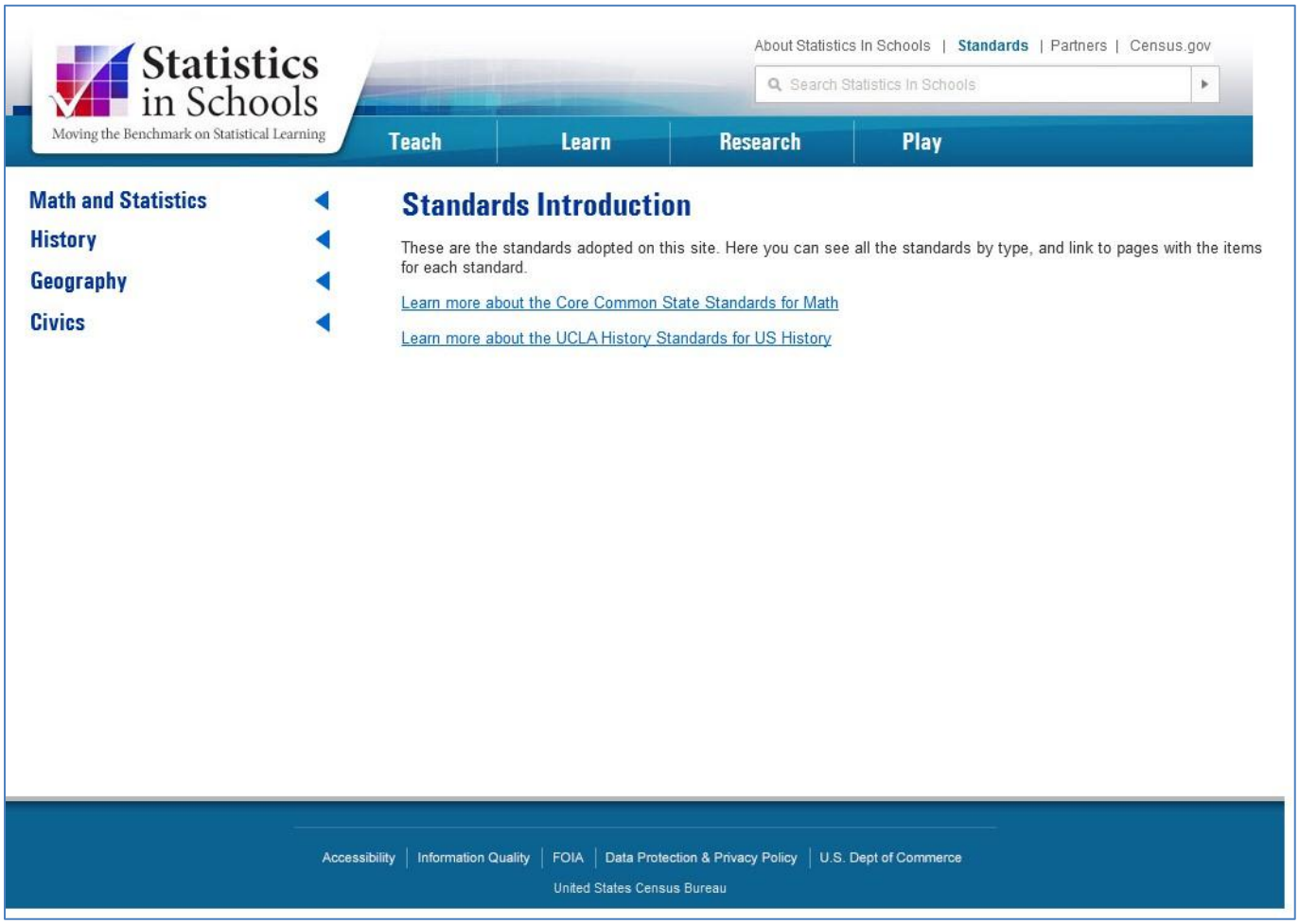
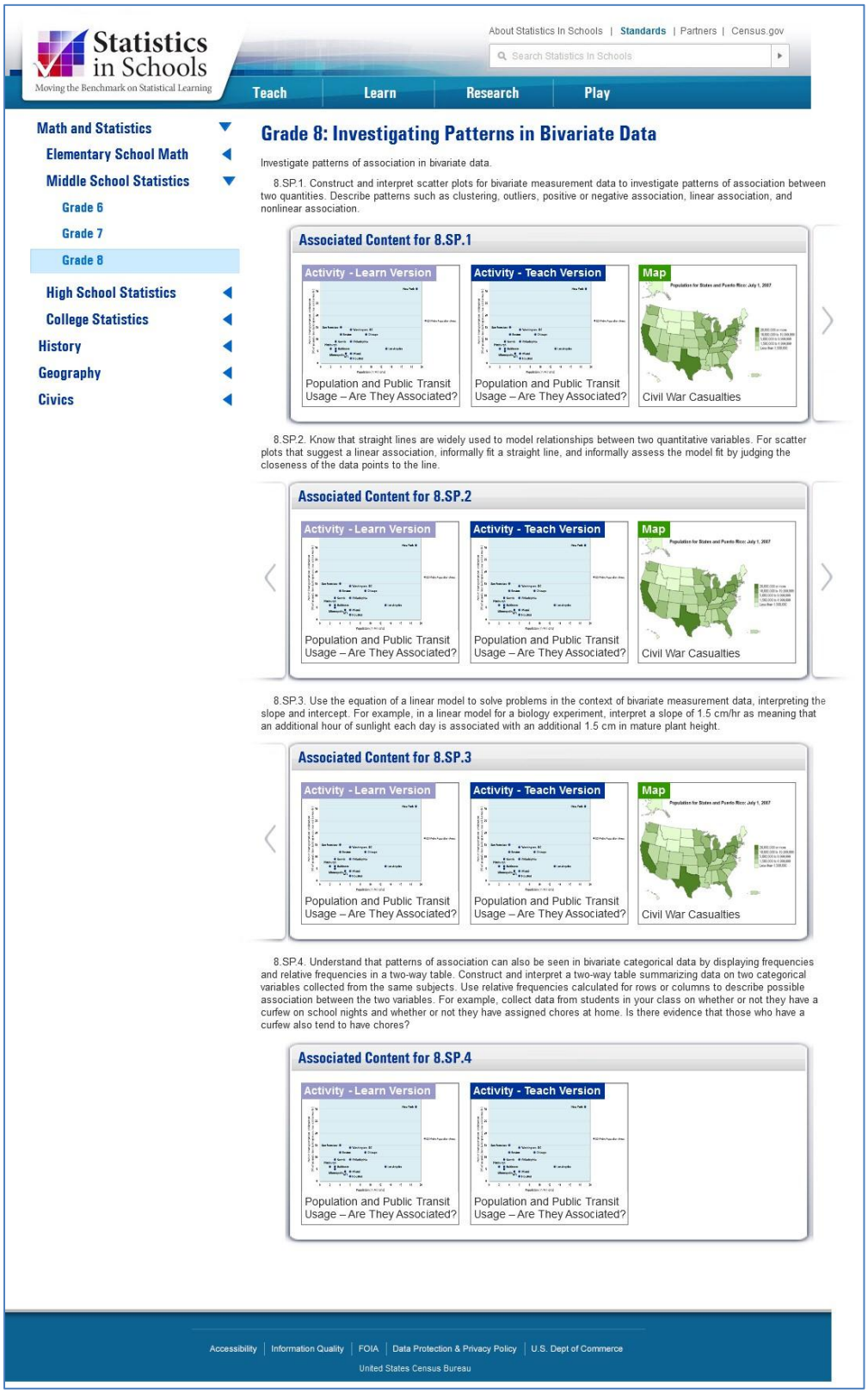
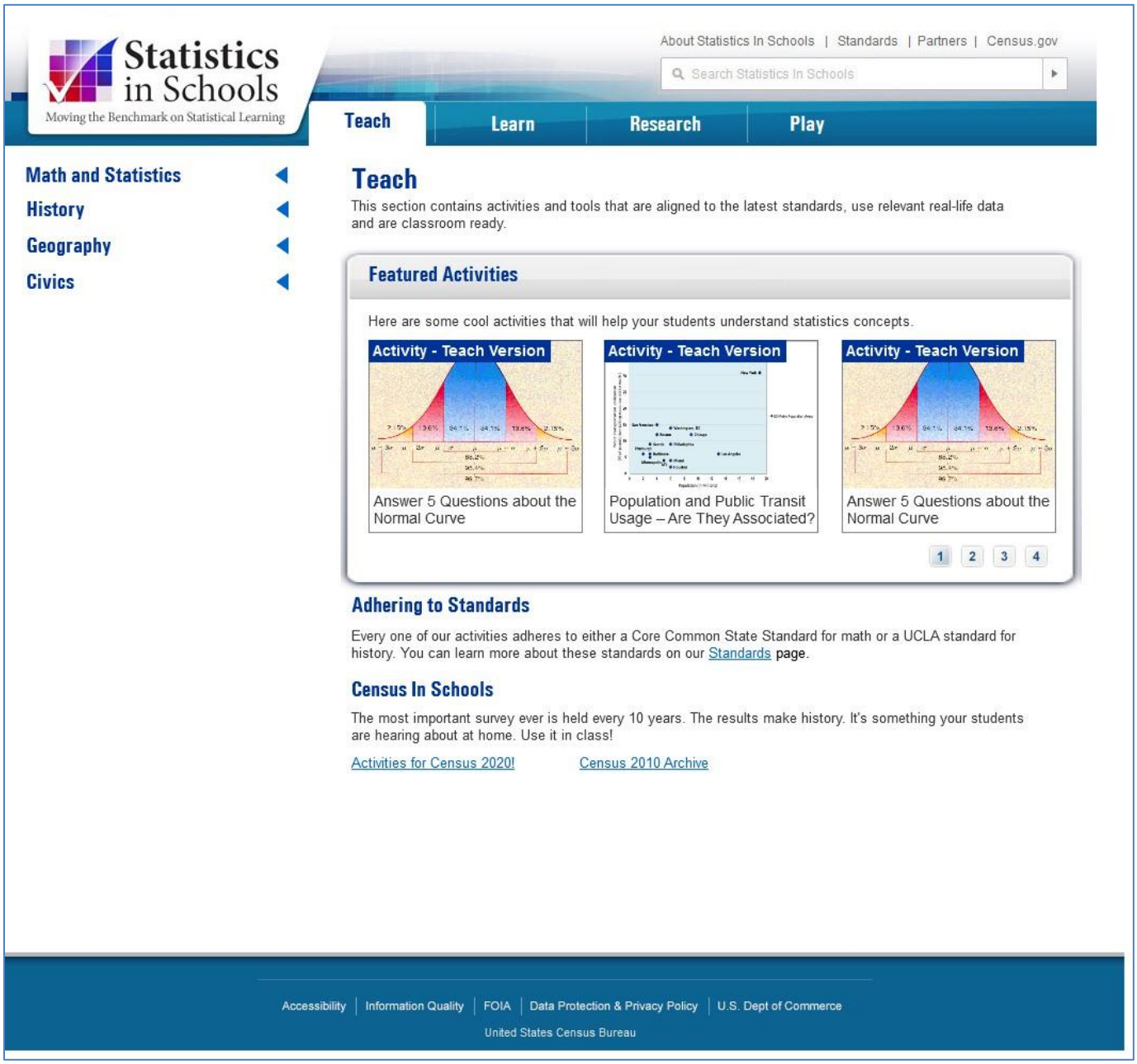
Standards Landing Page



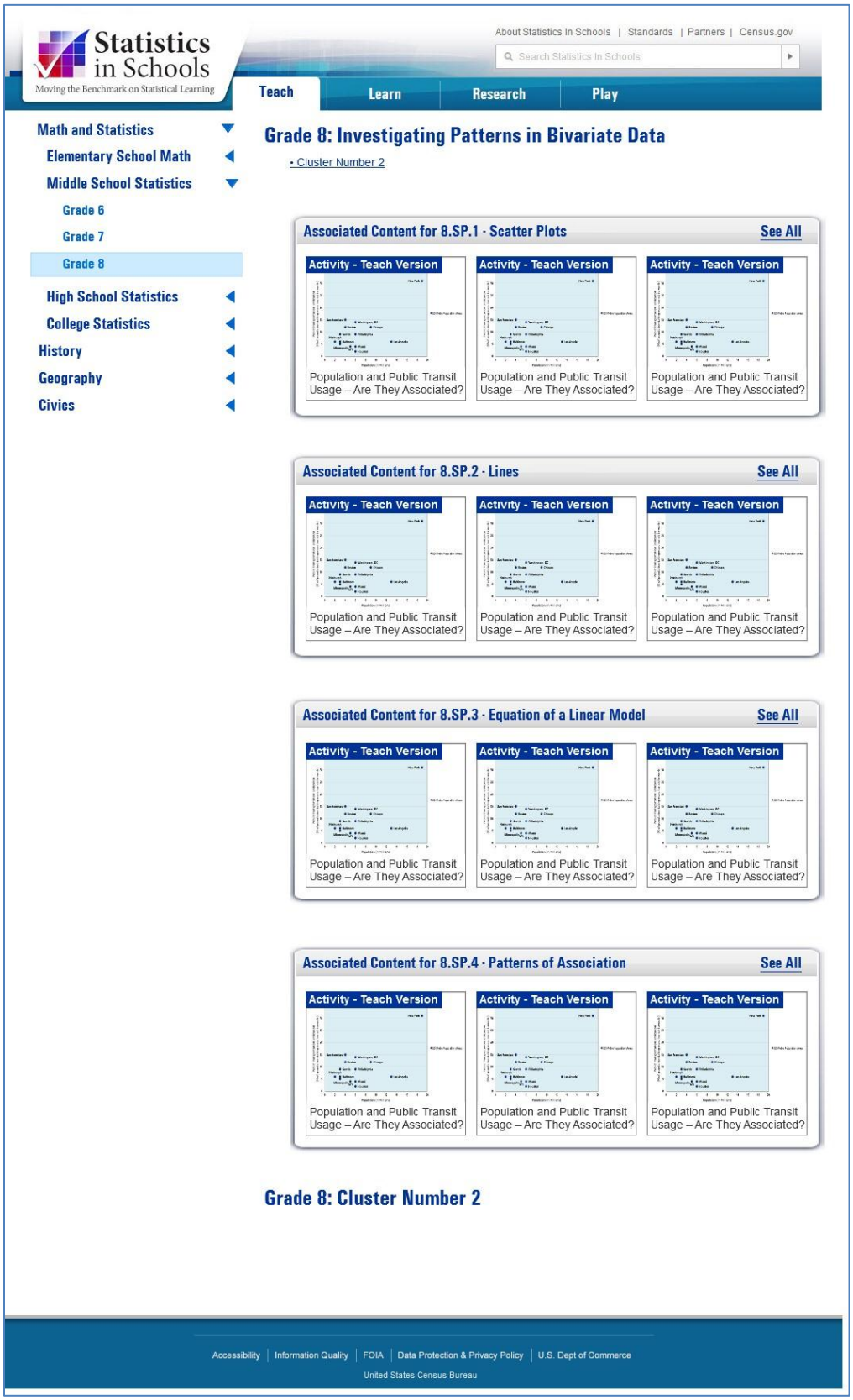
Standards Detail Page



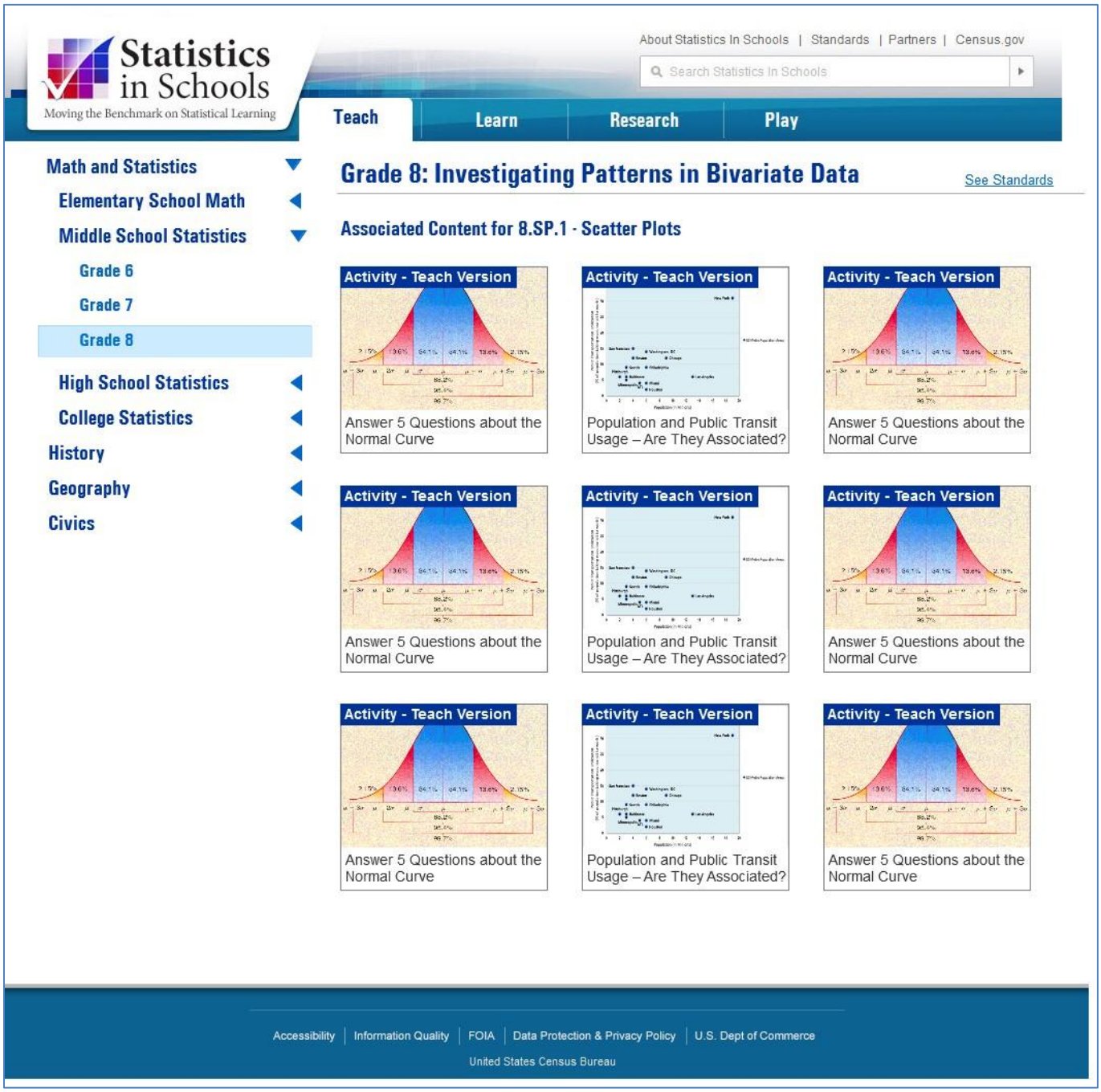
Teach Landing Page



Teach Grade Landing Page



Teach Grade Standard Detail Page



Teach Activity Page

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Population and Public Transit Usage – Are They Associated?

About this Activity

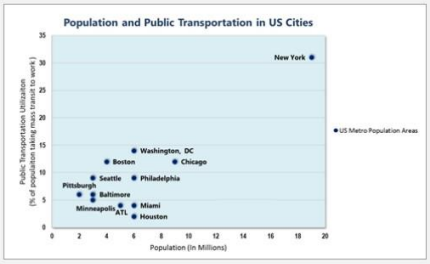
Aligned to: Statistics, Grade 8, Bivariate Data, Patterns of Association, 8.SP.1
Associated with: Statistics, Grade 8, Bivariate Data, Linear Associations, 8.SP.2
Associated with: Statistics, High School, Categorical & Quantitative Data, S-ID.6

Bloom's Taxonomy: Analyzing

Description: In this activity, students examine and interpret variate data from two US Census Bureau resources – the 2010 Decennial Census and the 2009 American Community Survey – in order to investigate and answer the following question: Is a metro region's population related to its public transit usage?
Optional Activity Extension: Students informally fit a straight line to the scatter plot and assess the degree of linear association based on the closeness of the data points to the line.

Tags: 8.SP, bivariate, scatter plot, clustering, outliers, association, linear, positive

Link: http://www.census.gov/schools/AFG6eU Copy Share



Instructions for Teachers

This activity is intended for use with students in Grade 8 and is aligned to the Common Core State Standard 8.SP 1. By completing the optional activity extension, it can also be used to introduce students to the concepts in Standard 8.SP2 or as review and remediation for the high school standard S-ID 6.

This activity is intended to be used as a warm-up or opening activity for Standard 8.SP 1. The activity's suggested questions for students can be completed as part of a class discussion, in pairs or groups, or individually in a written format. Approximate time for this activity is 10 – 15 minutes.

Activity Instructions

How do you get to school every day? Do you ride in a car, walk, bike, or use some other form of transportation? In this activity, you will examine data on mass transit usage – bus, subway, or railroad – in some of the United States' largest cities and determine people living in larger cities are more likely to take public transportation to work.

Activity Questions

Question #1: What two variables are being measured in the graph?
Answer: The populations of US metro areas and public transit usage.

Question #2: In the graph, the variables are measured using which units?
Answer: Population is measured in millions of people and public transit usage is measured in percent of the population taking public transit to work.

Question #3: According to the graph, which city has the largest population? The second largest?
Answer: New York City, Los Angeles

Question #4: According to the graph, which city has the highest public transportation utilization? The lowest?
Answer: New York, Houston

Question #5: Do you observe any patterns of clustering? What about outliers?
Answer: Clustering: The data points for Baltimore and Minneapolis are very close; almost all of the points have population values of <10 million and almost all have public transportation utilization rates of ≤15% of the population. Outliers: New York and Los Angeles could both be argued to be outliers.

Question #6: Does the data show a pattern of association or correlation? If yes, what kind of association – positive or negative? Provide evidence from the graph to develop your answer.
Answer: Students could successfully argue that the data either does or does not show patterns of association or correlation. There does seem to be a modest positive correlation, but some data points – for example, Los Angeles – that do not fit the model.

Instructions for Teachers

In closing the activity, lead students in a review of their answers, placing particular emphasis on the question of whether the data shows linear association. Discuss with students that data can often be interpreted in multiple ways and that there often is not a "right" interpretation.

Extend the activity by asking students to draw a line of best fit for the data, reminding them that a good rule of thumb to use with best fit lines is to make an equal number of data points fall above and below the line. The graph with a trend line added is provided in the Related Resources section of the activity page.

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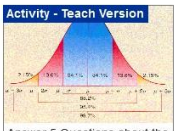
Related Items



Answer 5 Questions about the Normal Curve

This shows the data table that was used to make this activity. Click here to see where the data in this activity came from.

Population and Public Transit Usage – Are They Associated?

This shows the line of best fit applied to the graph of public transit usage, and can be used with the extension.

Learning Objectives

- Students will be able to correctly identify the two variables being measured in a scatter plot as well as the units of measurement used.
- Students will be able to examine and describe a scatter plot's measurement data and identify areas of clustering, outliers, and patterns of association.
- Students will be able to decide whether the variables do or do not show an association and defend their choice using data from the scatter plot.
- Extension: Students will be able to informally fit a straight line to the scatter plot and informally assess the fit by judging the closeness of the data points to the line (Standard 8.SP 2)

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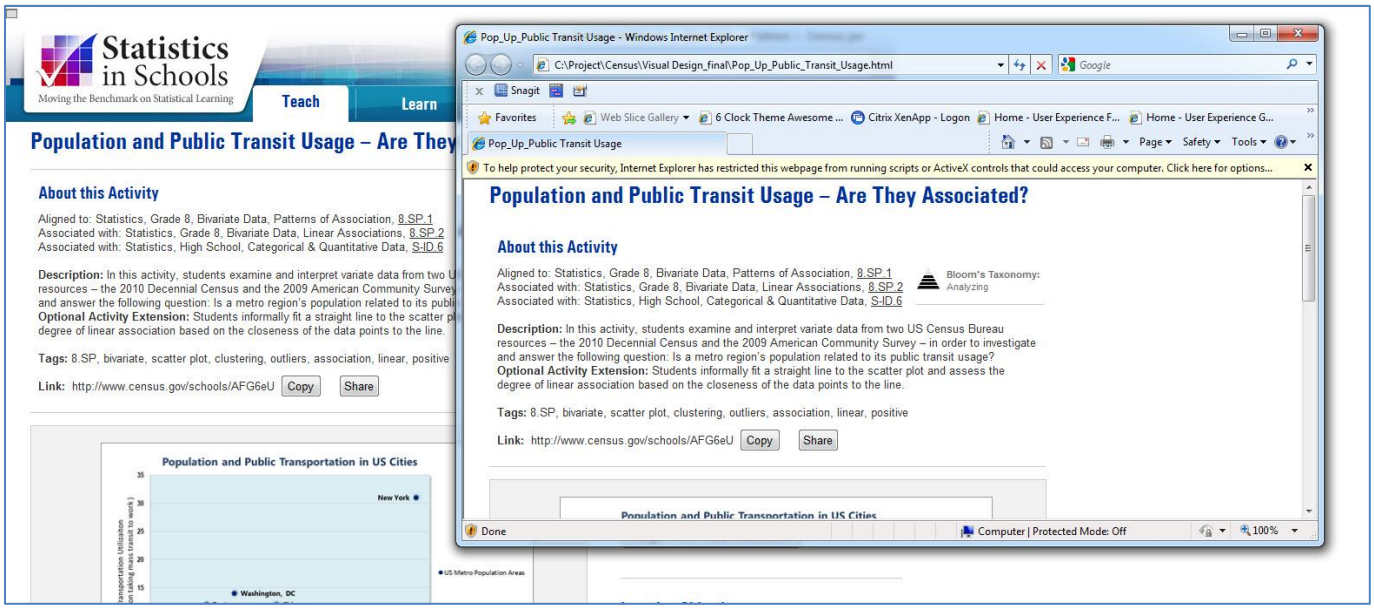
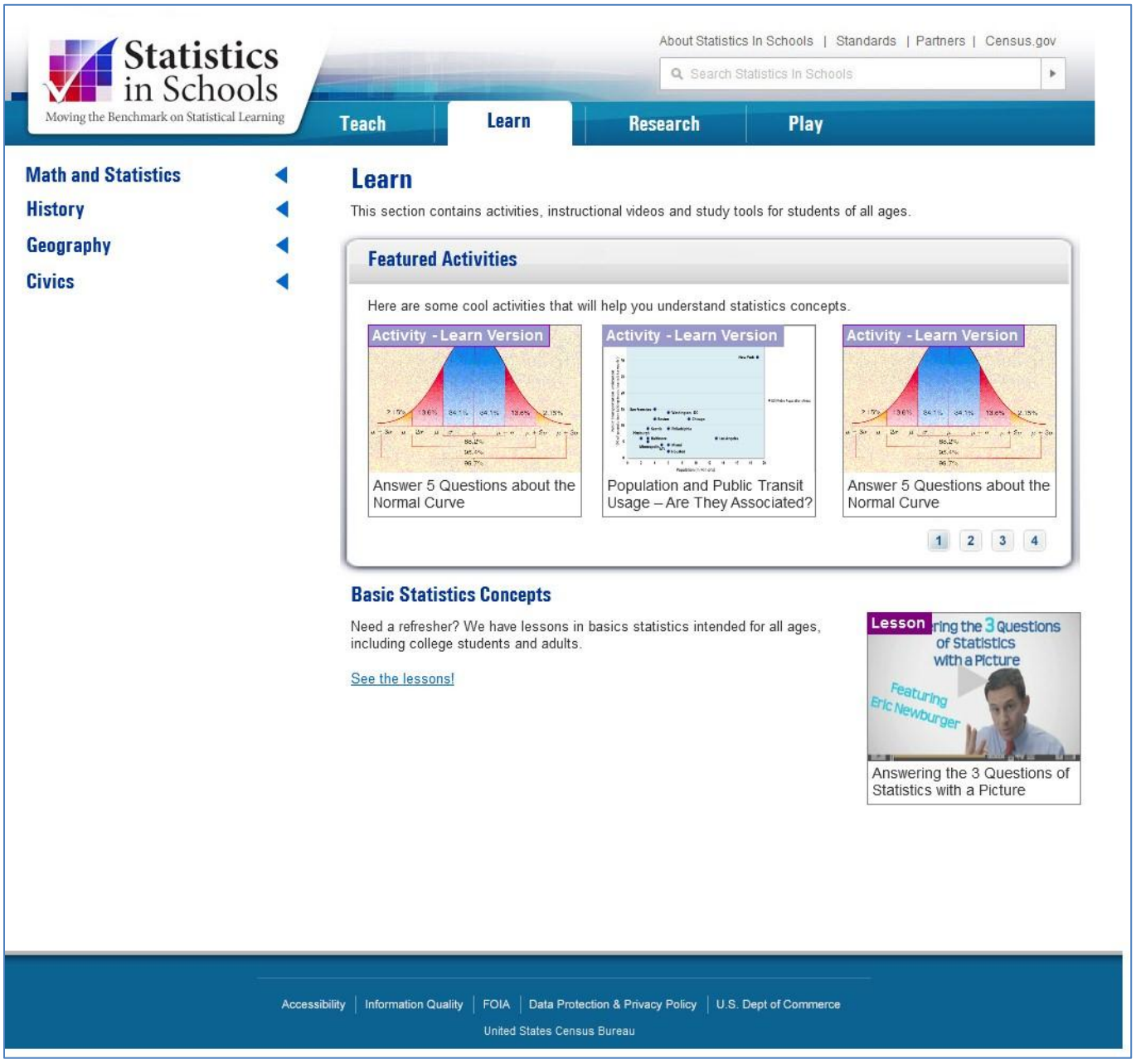
Teach Activity/Learn Pop-Up

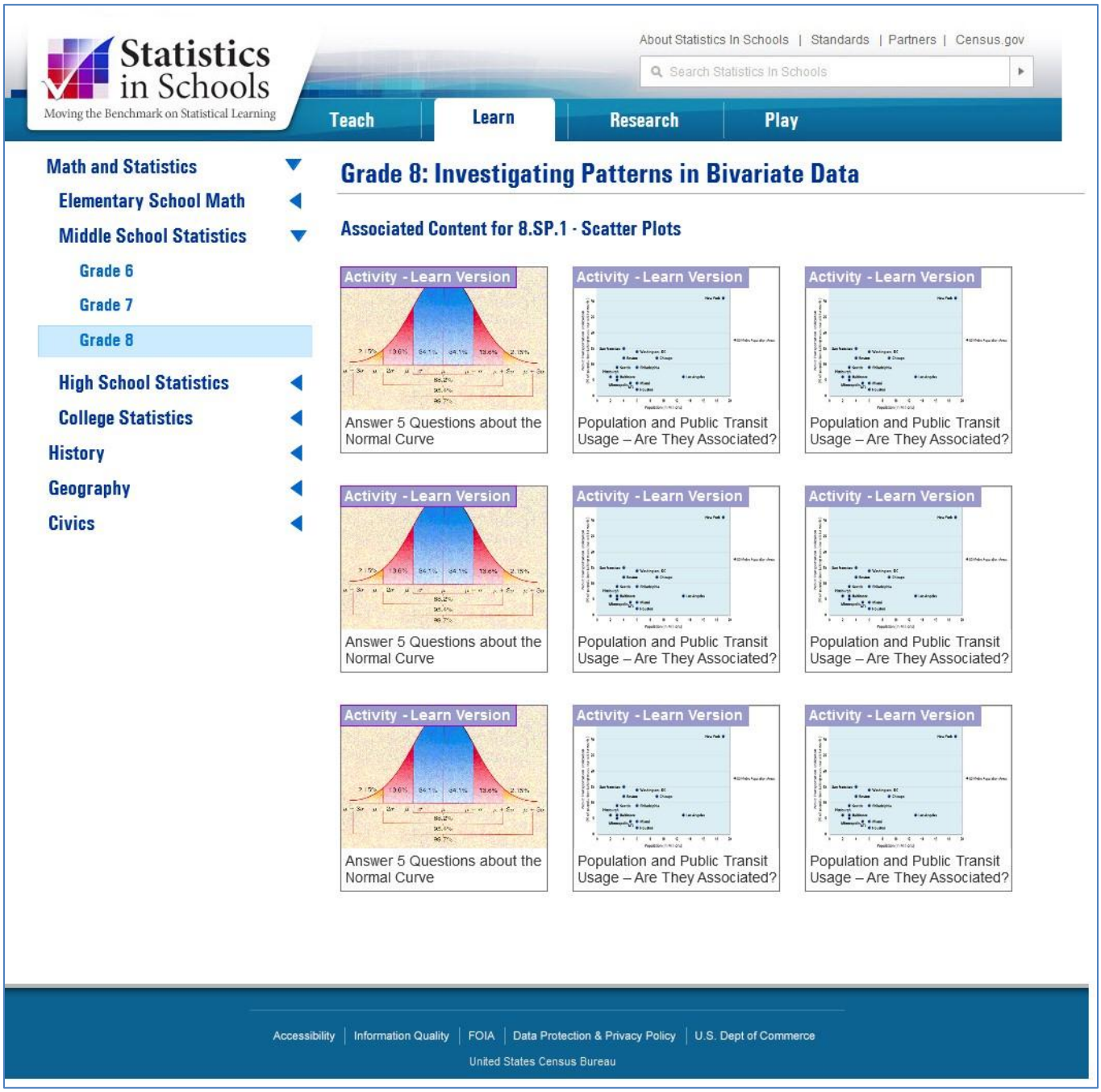


Learn Landing Page



Learn Grade Landing Page

Learn Grade Standard Detail Page



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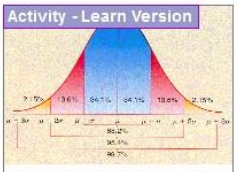

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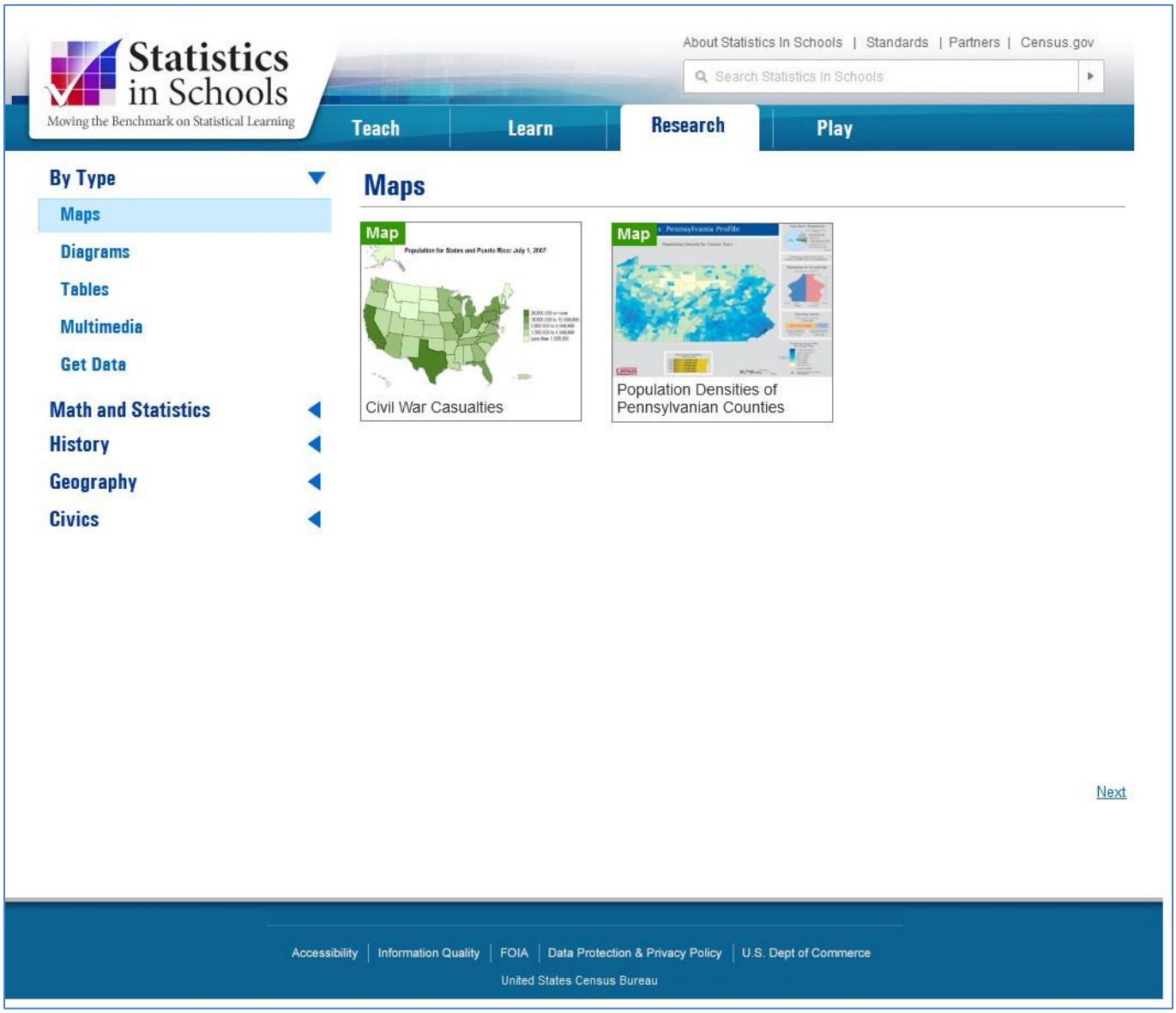
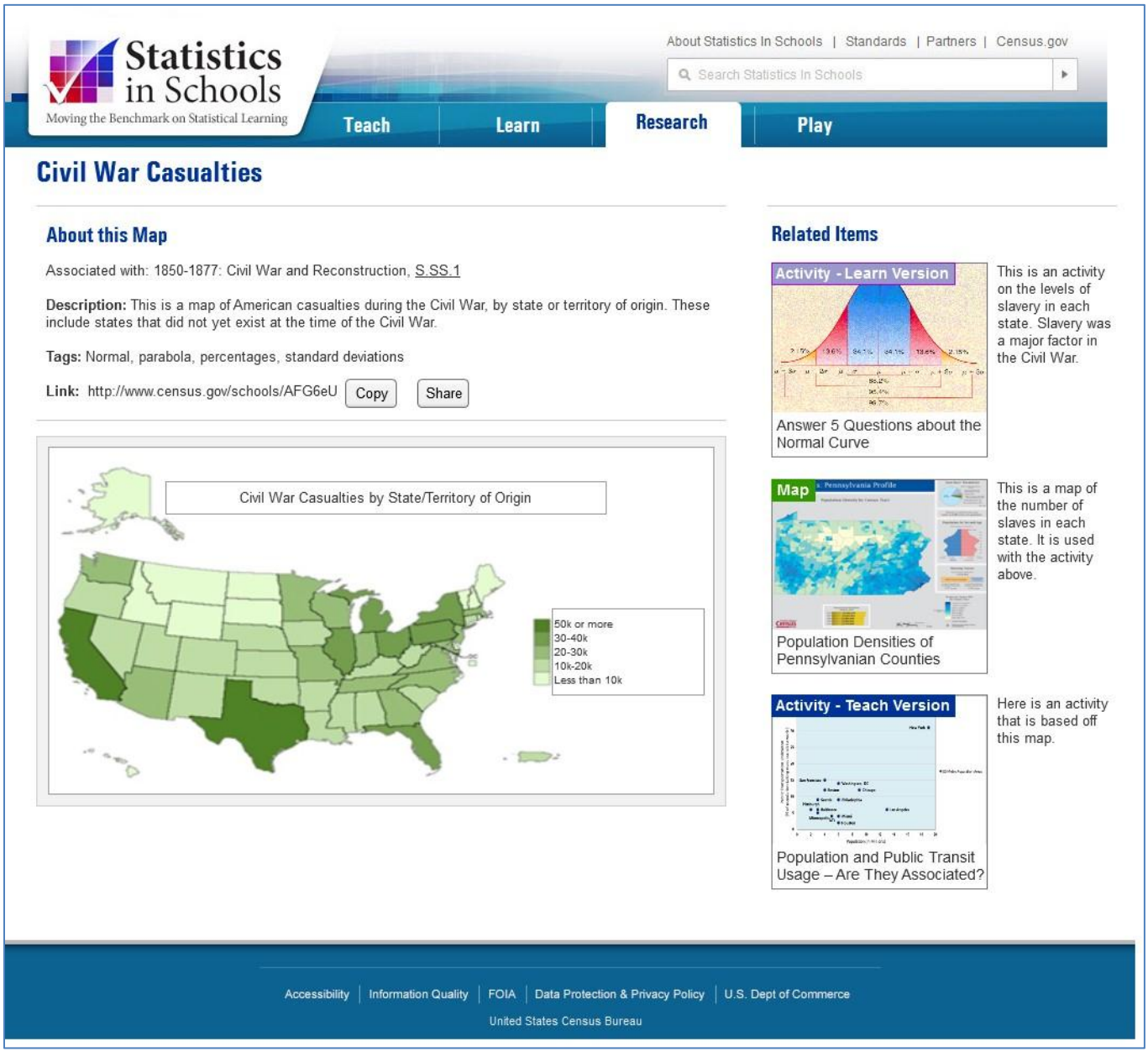
Research Landing Page

Research Maps Page



Research Maps Detail Page



Get Data Landing Page

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Research Open History Navigation

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- Audio file [WAV]
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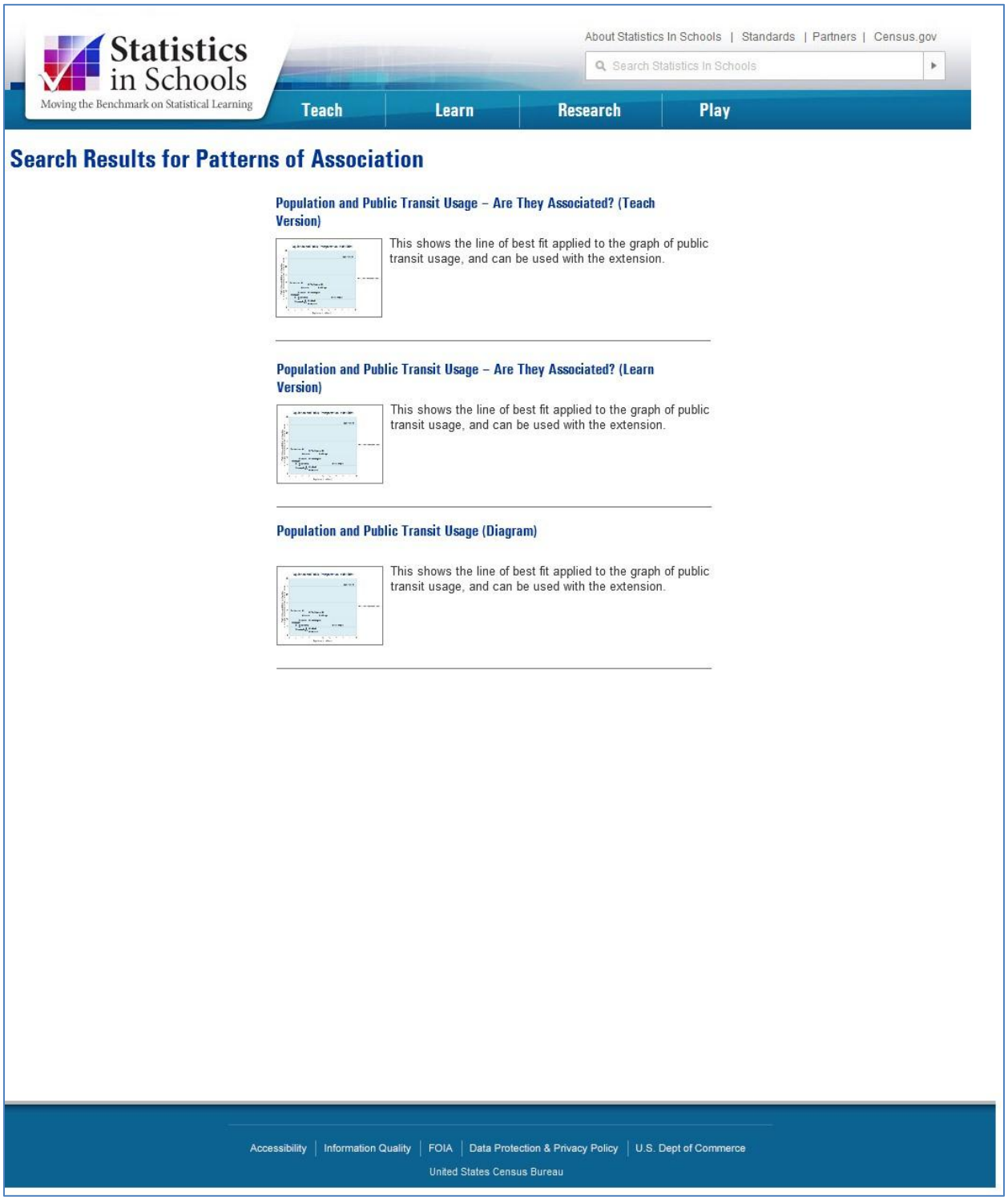
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