

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](#)

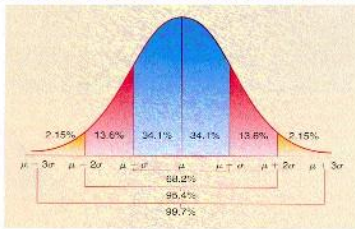
Federal Statistical Agencies

[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 6th 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!](#)

About



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About Statistics in Schools

Who We Are

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam interdum pulvinar nibh. Maecenas eget nunc in justo rhoncus aliquam. Phasellus nisl mi, convallis ut, lacinia vel, sodales tempus, ante. Praesent eros. Aenean feugiat fringilla odio. Donec porttitor volutpat elit. Proin metus justo, accumsan vitae, egestas nec, porttitor nec, felis. Nam vel odio a arcu consectetur fringilla. Nam vel odio a arcu consectetur fringilla. Vivamus eget arcu eget nisi adipiscing egestas. Donec venenatis pretium sem. Etiam nec sapien. Cras mauris. Maecenas vitae dui quis nisl tincidunt faucibus

What We Do

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Standards Information

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- [Standards](#)

Career Information


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Standards Landing Page



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Standards Introduction

These are the standards adopted on this site. Here you can see all the standards by type, and link to pages with the items for each standard.

- [Learn more about the Core Common State Standards for Math](#)
- [Learn more about the UCLA History Standards for US History](#)

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Standards Detail Page



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Grade 8: Investigating Patterns in Bivariate Data

Investigate patterns of association in bivariate data.

8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.


Associated Content for 8.SP.1

Activity - Learn Version




Population and Public Transit Usage – Are They Associated?

Activity - Teach Version



Population and Public Transit Usage – Are They Associated?

Map




Civil War Casualties

8.SP.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.


Associated Content for 8.SP.2

Activity - Learn Version




Population and Public Transit Usage – Are They Associated?

Activity - Teach Version



Population and Public Transit Usage – Are They Associated?

Map




Civil War Casualties

8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.


Associated Content for 8.SP.3

Activity - Learn Version




Population and Public Transit Usage – Are They Associated?

Activity - Teach Version



Population and Public Transit Usage – Are They Associated?

Map




Civil War Casualties

8.SP.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?


Associated Content for 8.SP.4

Activity - Learn Version



Population and Public Transit Usage – Are They Associated?

Activity - Teach Version



Population and Public Transit Usage – Are They Associated?

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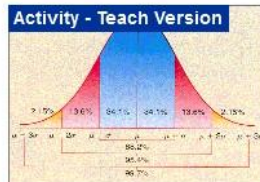
Teach

This section contains activities and tools that are aligned to the latest standards, use relevant real-life data and are classroom ready.

Featured Activities


Here are some cool activities that will help your students understand statistics concepts.

Activity - Teach Version



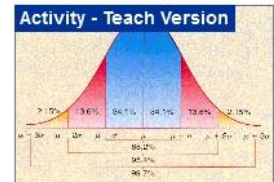
Answer 5 Questions about the Normal Curve

Activity - Teach Version



Population and Public Transit Usage – Are They Associated?

Activity - Teach Version



Answer 5 Questions about the Normal Curve

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Adhering to Standards

Every one of our activities adheres to either a Core Common State Standard for math or a UCLA standard for history. You can learn more about these standards on our [Standards](#) page.

Census In Schools

The most important survey ever is held every 10 years. The results make history. It's something your students are hearing about at home. Use it in class!

[Activities for Census 2020!](#)

[Census 2010 Archive](#)

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Grade 8: Investigating Patterns in Bivariate Data

• Cluster Number 2

Associated Content for 8.SP.1 - Scatter Plots [See All](#)

<p style="text-align: center; background-color: #0056b3; color: white; padding: 2px;">Activity - Teach Version</p> <p style="text-align: center; font-size: small;">Population and Public Transit Usage – Are They Associated?</p>	<p style="text-align: center; background-color: #0056b3; color: white; padding: 2px;">Activity - Teach Version</p> <p style="text-align: center; font-size: small;">Population and Public Transit Usage – Are They Associated?</p>	<p style="text-align: center; background-color: #0056b3; color: white; padding: 2px;">Activity - Teach Version</p> <p style="text-align: center; font-size: small;">Population and Public Transit Usage – Are They Associated?</p>
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Associated Content for 8.SP.2 - Lines [See All](#)

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Associated Content for 8.SP.3 - Equation of a Linear Model [See All](#)

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Associated Content for 8.SP.4 - Patterns of Association [See All](#)

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Grade 8: Cluster Number 2

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Grade 8: Investigating Patterns in Bivariate Data

[See Standards](#)

Associated Content for 8.SP.1 - Scatter Plots

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Answer 5 Questions about the Normal Curve

Activity - Teach Version

Population and Public Transit Usage – Are They Associated?

Activity - Teach Version

Answer 5 Questions about the Normal Curve

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Answer 5 Questions about the Normal Curve

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](#)

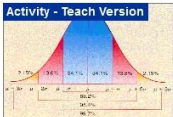
Description: In this activity, students examine and interpret variate data from two US Census Bureau resources – the 2010 Decennial Census and the 2009 American Community Survey – in order to investigate and answer the following question: Is a metro region's population related to its public transit usage?
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/AFG6U>

Related Items


Activity - Teach Version



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

[Answer 5 Questions about the Normal Curve](#)

Activity - Learn Version



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

[Population and Public Transit Usage – Are They Associated?](#)

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)

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.SP.2 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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Teach Activity/Learn Pop-Up

The image shows a web browser window displaying a 'Teach' activity page for 'Population and Public Transit Usage - Are They Associated?'. A 'Learn' pop-up window is overlaid on top of the main page, showing the same activity content but with a different layout and additional details like Bloom's Taxonomy.

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Teach **Learn**

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](#)

Description: In this activity, students examine and interpret variate data from two US resources - the 2010 Decennial Census and the 2009 American Community Survey - and answer the following question: Is a metro region's population related to its public transportation 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>

Population and Public Transportation in US Cities

City	Population (Millions)	Public Transportation Usage (per 1000 people)
New York	~18	~30
Washington, DC	~6	~15

Learn Pop-Up Content:

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>



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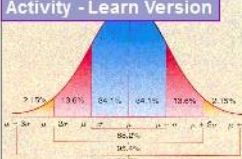
Learn

This section contains activities, instructional videos and study tools for students of all ages.

Featured Activities


Here are some cool activities that will help you understand statistics concepts.

Activity - Learn Version



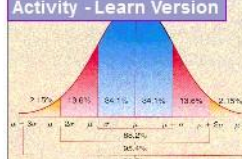
Answer 5 Questions about the Normal Curve

Activity - Learn Version



Population and Public Transit Usage – Are They Associated?

Activity - Learn Version



Answer 5 Questions about the Normal Curve

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Basic Statistics Concepts

Need a refresher? We have lessons in basics statistics intended for all ages, including college students and adults.

[See the lessons!](#)

Lesson Answering the 3 Questions of Statistics with a Picture


Featuring Eric Newburger



Answering the 3 Questions of Statistics with a Picture

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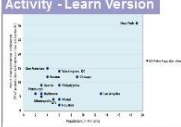

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Grade 8: Investigating Patterns in Bivariate Data

[Cluster Number 2](#)




Associated Content for 8.SP.1 - Scatter Plots [See All](#)

<p style="font-size: small; margin: 0;">Activity - Learn Version</p>  <p style="font-size: x-small; margin: 0;">Population and Public Transit Usage – Are They Associated?</p>	<p style="font-size: small; margin: 0;">Activity - Learn Version</p>  <p style="font-size: x-small; margin: 0;">Population and Public Transit Usage – Are They Associated?</p>	<p style="font-size: small; margin: 0;">Activity - Learn Version</p>  <p style="font-size: x-small; margin: 0;">Population and Public Transit Usage – Are They Associated?</p>
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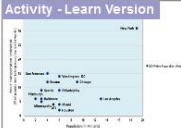

Associated Content for 8.SP.2 - Lines [See All](#)

<p style="font-size: small; margin: 0;">Activity - Learn Version</p>  <p style="font-size: x-small; margin: 0;">Population and Public Transit Usage – Are They Associated?</p>	<p style="font-size: small; margin: 0;">Activity - Learn Version</p>  <p style="font-size: x-small; margin: 0;">Population and Public Transit Usage – Are They Associated?</p>	<p style="font-size: small; margin: 0;">Activity - Learn Version</p>  <p style="font-size: x-small; margin: 0;">Population and Public Transit Usage – Are They Associated?</p>
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Associated Content for 8.SP.3 - Equation of a Linear Model [See All](#)

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Associated Content for 8.SP.4 - Patterns of Association [See All](#)

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Grade 8: Cluster Number 2

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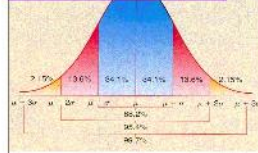
Geography

Civics

Grade 8: Investigating Patterns in Bivariate Data

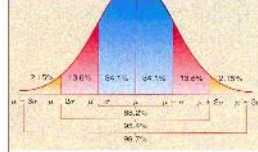
Associated Content for 8.SP.1 - Scatter Plots

Activity - Learn Version



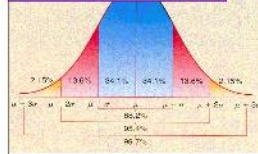
Answer 5 Questions about the Normal Curve

Activity - Learn Version



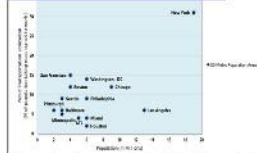
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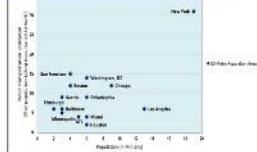
Answer 5 Questions about the Normal Curve

Activity - Learn Version



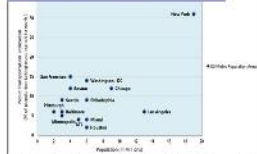
Population and Public Transit Usage – Are They Associated?

Activity - Learn Version



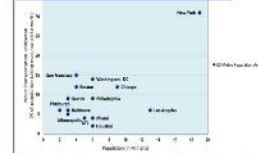
Population and Public Transit Usage – Are They Associated?

Activity - Learn Version



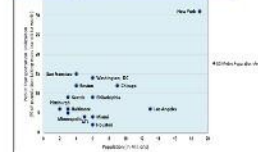
Population and Public Transit Usage – Are They Associated?

Activity - Learn Version



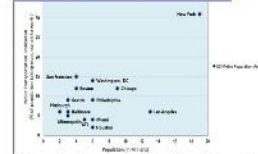
Population and Public Transit Usage – Are They Associated?

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Population and Public Transit Usage – Are They Associated?

Learn 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](#)

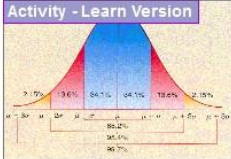
Description: In this activity, students examine and interpret variate data from two US Census Bureau resources – the 2010 Decennial Census and the 2009 American Community Survey – in order to investigate and answer the following question: Is a metro region's population related to its public transit usage?
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

Related Items


Activity - Learn Version



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

Answer 5 Questions about the Normal Curve


Activity - Learn Version



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

Population and Public Transit Usage – Are They Associated?

Population and Public Transportation in US Cities



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?

Question #2: In the graph, the variables are measured using which units?

Question #3: According to the graph, which city has the largest population? The second largest?

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

Question #5: Do you observe any patterns of clustering? What about 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.

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Featured Maps

Here are some cool maps displaying data the Census has gathered through its surveys.

Map: Population for States and Puerto Rico, July 1, 2007. Legend: 25,000,000 or more, 10,000,000 to 25,000,000, 5,000,000 to 10,000,000, 1,000,000 to 5,000,000, Less than 1,000,000. Civil War Casualties

Map: Pennsylvania Profile. Population Densities of Pennsylvania Counties

Map: Population for States and Puerto Rico, July 1, 2007. Legend: 25,000,000 or more, 10,000,000 to 25,000,000, 5,000,000 to 10,000,000, 1,000,000 to 5,000,000, Less than 1,000,000. Civil War Casualties

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Featuring Eric Newburger




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Population for States and Puerto Rico: July 1, 2007



Civil War Casualties

Map

Population Profile: Pennsylvania Profile



Population Densities of Pennsylvanian Counties

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Civil War Casualties

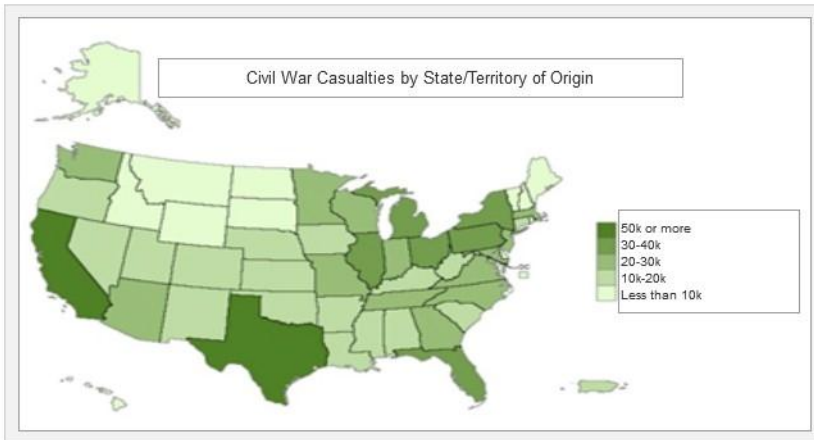
About this Map

Associated with: 1850-1877: Civil War and Reconstruction, [S.SS.1](#)

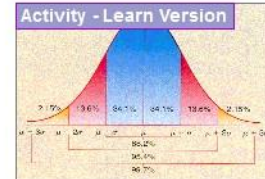
Description: This is a map of American casualties during the Civil War, by state or territory of origin. These include states that did not yet exist at the time of the Civil War.

Tags: Normal, parabola, percentages, standard deviations

Link: <http://www.census.gov/schools/AFG6eU>



Related Items



This is an activity on the levels of slavery in each state. Slavery was a major factor in the Civil War.

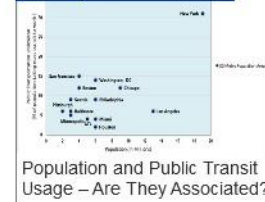
Answer 5 Questions about the Normal Curve



This is a map of the number of slaves in each state. It is used with the activity above.


Population Densities of Pennsylvanian Counties

Activity - Teach Version



Here is an activity that is based off this map.

Population and Public Transit Usage – Are They Associated?



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Research Resources


Every tool has a different intent and level of complexity. Choose the one that's right for you.

State Facts for Students

This is a tool for students to browse state facts, such as the state flower and miles of roads.


A U.S. state is a federated state of the United States of America that shares its sovereignty with the United States federal government. Since the admission of Hawaii as a state in August 1959, there are fifty U.S. states. Because of the shared sovereignty between a U.S. state and the U.S. federal government, an American is a citizen of both the federal entity and of his or her state of domicile. State citizenship and residency are flexible and no government approval is required nor obtained to move between states, except for persons covered by certain types of court orders (e.g., paroled convicts and children of divorced spouses who are sharing custody).

[Go to State Facts for Students](#)



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QuickFacts

Quick, easy access to facts about people, business, and geography


State & County QuickFacts

To begin, select a state from this list or use the map to the right.

Alabama GO

QuickFacts includes statistics for all states and counties, and for cities and towns with more than 5,000 people

[Student State Facts](#) - a site specifically for younger students.



Description

QuickFacts can give you all sorts of data. Find demographics and business information about your community. This takes results from the 2010 Census.

By law, no one is permitted to reveal information from these censuses and surveys that could identify any person, household, or business.

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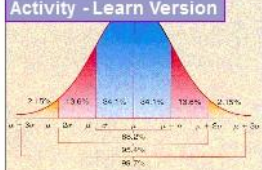
[Use QuickFacts Tool](#)



[QuickFacts Guide \(PDF\) 2.5 MB](#)

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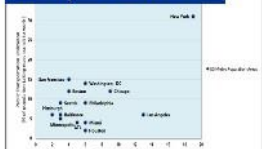
Activity - Learn Version



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.

Activity - Teach Version



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.

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Expansion & Reform
1801-1861

Civil War & Reconstruction
1850-1877

The Development of US Industry
1870-1900

The Emergence of Modern America
1890-1930

The Great Depression & WWII
1929-1945

Postwar United States
1945-1970s

Contemporary United States
1968-Present

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Civil War Casualties

Population Densities of Pennsylvania Counties

Civil War Casualties

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Census for Kids Song

- Sheet music [PDF]
- Audio file [WAV]

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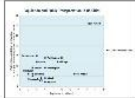


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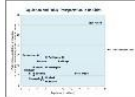
Search Results for Patterns of Association

Population and Public Transit Usage – Are They Associated? (Teach Version)



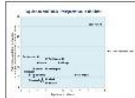
This shows the line of best fit applied to the graph of public transit usage, and can be used with the extension.

Population and Public Transit Usage – Are They Associated? (Learn Version)



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

Population and Public Transit Usage (Diagram)



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

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