

## Questions Module 2.4

What is the purpose of using visualizations in a problem-solving or improvement project?

- ☐ a. Visualizations are pretty. People like to see bright colors.
- ☐ b. Visualizations are a good way to show how much you know.
- ☐ c. Visualizations help you communicate your message.
- ☐ d. You can use visualizations instead of doing a formal analysis.
- ☐ e. Using good visualizations is the best way to impress others.

**Incorrect.**

The correct answer is **c**. Visualizations have a purpose. In exploratory data analysis, visualizations help you understand your data, see patterns, identify anomalies, and make discoveries. When visualizations are used for data presentation, they can help you communicate your message to others. They are particularly useful if you are presenting the results of your analysis to a nontechnical audience.

How do you know whether your visualization is effective?

- ☐ a. The visualization addresses a compelling question.
- ☐ b. Your audience can understand and interpret the visualization.
- ☐ c. The visualization represents what the data are telling you.
- ☐ d. The visualization is based on data that address your question.
- ☐ e. All of the above.

**Incorrect.**

The correct answer is **e**. You must have a compelling question, the right data to address the question, and a visualization that represents what the data are telling you. The audience must also be able to interpret and understand the visualization.

In the text box beside each description, enter the letter of the correct visualization. Scroll down if necessary and click the **Check My Answer** button. The correct answer will display below the button.

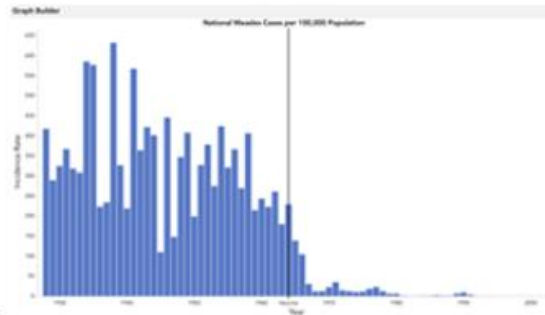
trellis plot of run charts



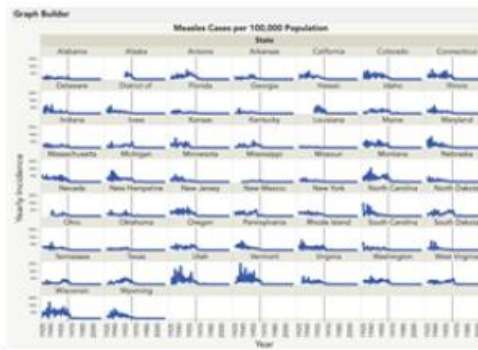
heat map with annotations



☐ series of geographic maps



☐ time-ordered bar chart



**Incorrect.**

The correct answers from top to bottom are **d, b, a, c**.

Let's say you're exploring delays for the major airlines that service the United States. The data are in the file **Airline Delays EDA.jmp** in the course data folder.

Using the tools you have learned in this module, explore these data. Then create one or more visualizations that best answer this question: When are you likely to experience the longest flight delays?

Remember that the type of graph you use depends on both your data and the question you are trying to answer. For the sake of this task, let's assume that the data are current and that you have the "right" data to answer this question.

There are many ways to visualize these data, so there isn't one correct answer.

An effective way to answer the question "When?" is to use a heat map. You can use a heat map of **Month** and **Day of Week**, colored by the average of **Arrival Delay**. December and the summer months have the longest average flight delays. Of the days of the week, Thursdays and Fridays are the worst.

But this depends on the airline. Delta and Southwest are better, in terms of delays, than the other airlines. For Delta and Southwest, none of the months or days stand out as being particularly bad.

Overall, the average delays for American, Northwest, United, and US Airways are similar to one another. The average delays for Delta and Southwest are much lower than the other airlines.

If you email a static graph to a stakeholder, you should provide sufficient background information on the graph itself.

- ☐ a. True
- ☐ b. False

**Incorrect.**

The correct answer is **a**. If you send a static graph or image to a stakeholder, you should add a "sufficient" amount of information to the graph to make sure that your message is communicated as you intended.

You should always use the same visualization to communicate your message to different audiences.

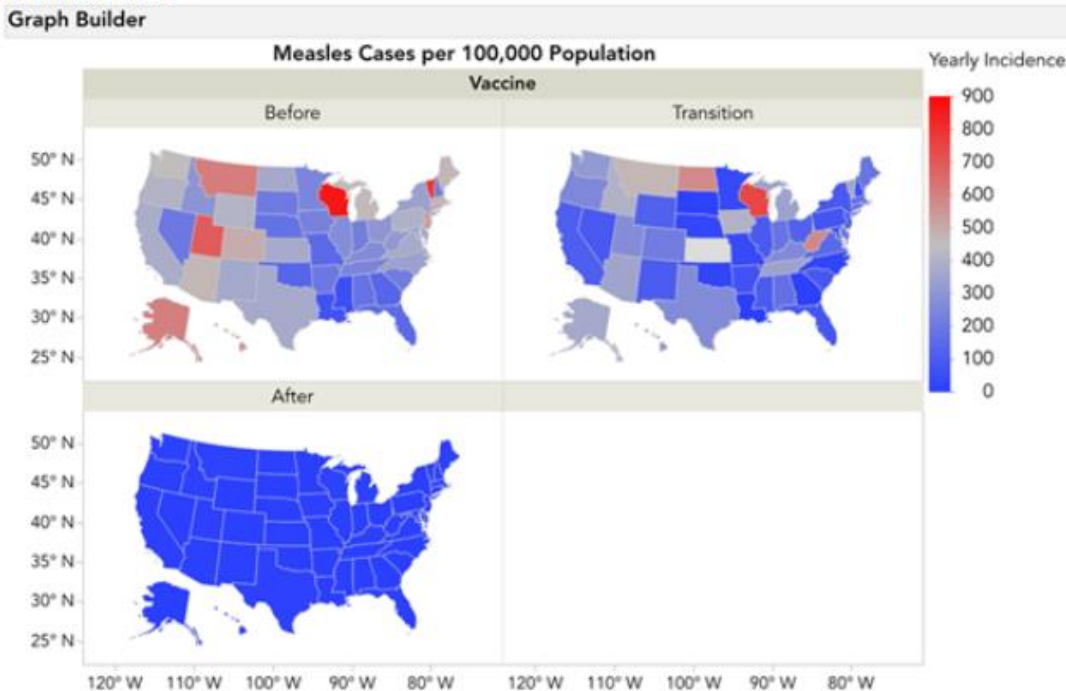
- ☐ a. True
- ☐ b. False

**Incorrect.**

The correct answer is **b**. You should customize your visualization to your audience, based on who they are, what they know, what you want them to know, and how they will receive or view the visualization.

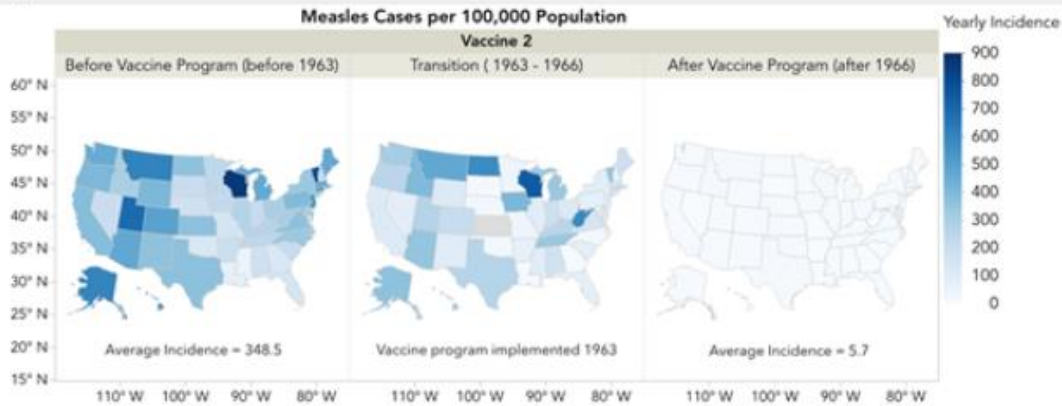
Consider the Measles scenario, and these two visualizations:

Visualization A:



## Visualization B:

Graph Builder



1. Which visualization is easier to interpret? Why?
2. Which customizations were applied to create Visualization B?

Show Answer

1. Visualization B is easier to interpret. It has more background information (the titles and the annotations), the sequential color scale is easier to interpret, and it is easier to interpret the changes across the maps when they are displayed in one row.
2. The color was changed from diverging to sequential. The titles for the individual graphs were changed. Annotation was added to the bottoms of the graphs. The Y-axis scales were changed slightly to accommodate the annotation. The layout was changed to show the three maps in one row.