

Data Visualization for 8th Grade Mathematics & Science

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Overview:

Two lessons were prepared with the goal of preparing students for working with data. One lesson had students simulate a viral transmission throughout the 8th grade population. The other lesson had students analyze real statistics and create a state map indicating the density of the data by color. Two types of data visualizations were covered with these lessons: the node graph and the color-density map.

The *viral transmission exercise* involved the creation of a social network. To do this, students passed around paper cards that represented a virus. Students were considered infected if they received a card from a classmate. Upon each transfer, the newly infected student would record the name of the person who gave the card to them. In this way, data were generated. At the end of the lesson, students submitted data which were compiled into a data file and graphed (Fig. 1) using yEd software (available free online). The graph was presented to the class and a lengthy discussion regarding its significance followed.

The *color-density map lesson* started with lessons on histograms and the creation of a scale with equal intervals. A brief lesson on visually acceptable color gradients was also presented. Students were then presented with Indiana statistics datasets. The students analyzed these sets to create an ideal interval for representing the data with colors of a gradient. A blank state map with county lines was distributed and students applied their knowledge to create a color-based representation of their particular dataset (Fig. 2). Student presentations allowed the entire class to observe and critique the maps.

Standards:

Math

- 8.7.1 Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, and observing patterns.
- 8.7.7 Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.

Science

- 8.7.3 Use technology to assist in graphing and with simulations that compute and display results of changing factors in models.
- 8.7.4 Explain that as the complexity of any system increases, gaining an understanding of it depends on summaries, such as averages and ranges, and on descriptions of typical examples of that system.

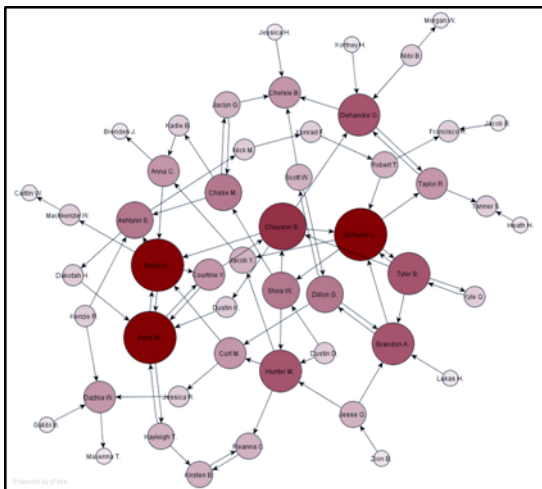


Figure 1. Example node graph

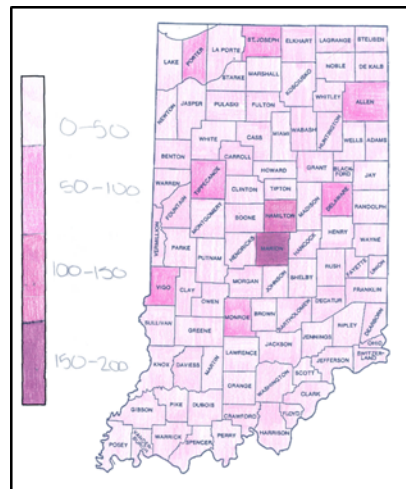


Figure 2. Example color-density map

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