



Being the Change: Analyzing Statistics

OVERVIEW

During this lesson students will be introduced to how mathematical statistics influence real life situations so that they can use those skills to create solutions to problems in their everyday lives. Prior to this lesson students have researched a real-life current event that personally affects them.

AUTHOR
Shannon Bowman

GRADE LEVEL
6-8

CONTENT AREA
Leadership



ESSENTIAL QUESTIONS

TIME NEEDED

STANDARDS

How do you prove a problem with data?

What question can you ask your peers that will give you more information on how your problem affects those around you?

What does your data tell you?

Based on your survey, how do you need to alter your invention?

1 week

First day of the week to create survey questions and share electronically with peers and family.

End of week, analyze results and make implications for your invention.

8.TT.1 Use technology and other resources for assigned tasks.

8.TT.1.1 Use appropriate technology tools and other resources to access information

8.RP.1 Apply a research process to complete project-based activities.

8.RP.1.2 Implement a project-based activity independently.

Making Connections

Students may not know about the Alamance County case against Sheriff Johnson. The goal of this lesson is for students to find meaning in observing their environment, finding a problem, using facts to develop a solution, and then implementing the solution (or in this case, ruling). Many of our students have had interactions with racial profiling so this should tie into their personal experiences or events they have seen on television.

Background

Students will view a google slide that will explain the Alamance County vs. Sheriff Johnson case to them citing racial profiling. During this discussion, I hope for students to find a connection to a real-world event. The goal is for them to build suspense to what happens during the court case and to passionately view their environment for a problem they wish to solve. During this

introduction to the case, we will pause for student reactions and opinions on Sheriff Johnson's guilt or innocence. The purpose is for students to see how real-world events have to be proven a problem before they can be solved systematically.

Finally, students will analyze data from the Alamance County case to see that there was no correlation of race to traffic-stops. This will lead to a conversation on reading data on their own surveys to draw conclusions about the invention they should create.

It is important for students to see how everyday occurrences yield the products around them. They are created out of necessity as a solution to a problem. The solution comes after a lot of research, trial and error, and a conclusion after analyzing all of that mathematical and scientific work.

Materials

Google slide deck

- [A Problem. Now what? Alamance County Case Study](#)

Survey Building

- access to technology

- Google classroom, Google Forms
 - have a model survey for students to view so they get a concept of what types of questions to ask

Teacher Tips

Students had a difficult time at first coming up with questions for their survey. Remember that their survey questions need to be specific to the information they are trying to obtain such as race, demographics, relation to current events, etc. The questions need to answer a question they have about their problem so that they can analyze it to improve their invention that they are building. For example, if I am researching immigration and deportation process one of my questions could be, “Has anyone in your family been deported?”

The second hurdle that we came across was that they are very well versed in posting pictures of themselves but not necessarily how to network. For example, I asked them to share with their peers and family to have their survey answered or shared. They struggled with finding the link and sharing across networks. To increase the scope of their survey, I suggested sharing it with a parent and having

their parents share it on their networking site or work friends.

Please use the [Learning 4 All](#) presentation to support you as you use the following guidelines and tips.

The Activity

Put into Practice

- Students will be challenged to find a “problem” in their community.
- Once they have a problem, they will design a survey to be sent out to peers and family to gain a better understanding of people's interaction or knowledge of the problem. In order for students to create surveys we reviewed meaningful data, discussed questions that would provide feedback for their particular question, and skewed data. We also discussed populations of people being used (ex. all 11 year old Centennial students being asked vs. their family, friends, network outside of school) so that their data could be representative of a larger group.
- Students will then analyze the data to draw conclusions about the knowledge known or impact on their surrounding

peers and family. To analyze data they looked at the graphs created by Google forms and as a class we drew conclusions and made assumptions based on their data. We discussed assumptions that were supported and not supported by data. For example, we discussed looking at a graph on pizza toppings and how that we can not make assumptions about that being anyone's favorite food based on that graph. We would need a follow-up question or more information.

- The conclusions will be used to design a meaningful invention to solve their current even problem. Students used their conclusions and assumptions to narrow their "problem" focus. They then used their own creativity to design an invention that would solve a portion of that problem as supported by survey data.

WRAP UP AND ACTION

My plan is for this introduction to allow students to see worth in proving their facts. When I allow them to start the problem, solution, draft,

design, model process of a problem in their community, I want it to be systematic. They will use data such as census information and personally collected data to cite the problem. Then they can properly diagnose it and develop a solution for the problem. The final projects will be displayed during an after-school event to showcase their hard work and lessons learned.

In more detail: After students have analyzed their results, it is time for them to put in the work to design their invention. The invention has to be designed with their research in mind. Students will design their invention on the [Be The Change Invention Plan](#) worksheet. This is turned in so that we can have a one on one conference. Once we both approve the plan, they then pitch it to their peers. The goal is for peers to ask questions and poke "holes" in their plan so that they can make sure their invention solves their problem. Students then start building their inventions using daily household products such as tape, glue, paint, cardboard, plastic, etc. The final project, a 3-d model and Google Slides presentation are presented at a final exhibit for the community to view.

Extensions

[Project Timeline Calendar](#)

Resources

During this lesson, I utilized Google Forms for students to create their surveys.

Dr. David Banks

<https://statisticalatlas.com/county/North-Carolina/Alamance-County/Race-and-Ethnicity>

About the Author

Shannon Bowman is a veteran teacher of 14 years. During her educational career she has taught grades 3-8. She earned her masters in Instructional Leadership from Towson University. Shannon is committed to meaningful lessons that enrich student's interest in the world around them. She currently teaches in Wake County as

Leadership teacher and University Connections Liaison.

About the Fellowship

My fellowship was full of meaningful experiences. In addition to meeting influential teachers from around North Carolina, I also networked with key collaborators from our community. Learning from Dr. Banks at SAMSI taught me how to make my math lessons more real world applicable and gave me knowledge about other careers that my students can be exposed to. The visits from Kenan Fellows and SAMSI representatives into my classroom also showed my students that their learning is not only important to me, but also the community that surrounds them.

Student Pages

Links to documents:

[Police Brutality](#)

[Hunger](#)

[Tentative Course Unit Plan](#)

[Rubric and Project Outline](#)

[Research Organizer: Check-in #1](#)

[Check-In #2 Rubric](#)

[Be The Change Invention Plan](#)

[Introduction to Data Collection](#)

Appendix

[Project Outline](#)

[Project Example](#)

[Survey Example](#)