

When the Bullied Become Bullies: A Statistical Analysis of Bullying and School Shooter Cases

PURPOSE

To examine the effect of bullying in school shooter cases and to use the process of scientific inquiry, data collection, and data analysis draw conclusions about a problem.

GRADE LEVELS

Middle and High School

CONTENT AREAS

Math

Science

TIME

4-5 class periods

STUDENT OBJECTIVES

- Students will engage in the process of scientific inquiry.
- Students will conduct surveys and collect data about bullying in their school.
- Students will analyze data using charts and graphs in order to understand an issue.
- Students will form and test hypotheses to draw conclusions about a problem.

PSAE/ACT SKILLS

Scientific Investigation

Interpretation of Data

Evaluation of Models, Inferences, and Experimental Results

Probability, Statistics, and Data Analysis

Graphical Representations

STANDARDS AND BENCHMARKS

Math State Goals 8B, 10A, 10B

Science State Goals 11A

LEARNING STYLES

Interpersonal

Logical/Mathematical

Visual/Spatial

MATERIALS

Graph paper

Scientific Inquiry Handout

Scientific Inquiry Assessment

School Shooter Profiles

Sample Survey (teacher reference)

Zero Tolerance Policies Handout

Zero Tolerance Arrest Data

VOCABULARY

Scientific Inquiry/Process

Bar Graph

ASSESSMENT

Scientific Inquiry Assessment

ACTIVITIES

Anticipatory Set

Ask students to write about a time they have experienced bullying in school. They may write about a time they were bullied, acted as a bully themselves, or witnessed someone bullying another student. Allow volunteers to share their responses.

Lesson:

Point out to students that all (or most) of them were able to recall an instance of school bullying and tell them that they will be engaging in scientific inquiry to understand more about bullying from a statistical standpoint. **Note: students should already have experience using graph paper to create bar graphs**

- Begin by reviewing the process of **Scientific Inquiry**:
 - Recognize a problem
 - Form a hypothesis
 - Design an experiment
 - Test the hypothesis by making observations
 - Draw a conclusion
- Before asking students to design their own experiment, complete the following activity together:
 - **The problem:** the issue of bullying and more specifically, how it relates to cases of school shooters.
 - **Hypothesize:** Ask students to help form a hypothesis about the relationship of bullying to school shooting cases. Examples: 75% of school shooters are students with a history of bullying other students. 50% of school shooters are between the ages of 16 and 18. More school shooters are male than female.
 - **Design:** Distribute the **School Shooter Profiles** handout and ask students to read through in groups to highlight key information, such as age, gender, and motivation.
 - **Make Observations:** Divide the class into groups and allow them time to graph and chart the data from the profiles. Using graph paper, they will create a **bar graph** to represent the percentages of school shooters by gender, a bar graph displaying the ages of school shooters, and a bar graph showing the breakdown of motivations for the shooters (this last task will be more difficult and require students to first **classify** the different motivations).
 - **Draw Conclusions:** As a class, compare and discuss the data from the graphs and review the hypotheses to correct or modify any to make them true statements.
- As an **exit slip** (see resource section for explanation) for Day One, ask students to summarize the findings from the data.
- **DAY TWO:** Begin Day Two by reviewing the data and conclusions from the day before and correcting any misinformation on Day One's exit slips. Remind students of the beginning of class the day before when people shared their own experiences with bullying and tell them that the problem for today's inquiry is concerning bullying within their own school community.
- Students should write down this problem on their **Scientific Inquiry** handout and then form 2-3 hypotheses about bullying in their school. Guide students to be specific and use specific numbers in their predictions. Remind them that they should also be hypotheses that are able to be tested.
- Brainstorm with students about how to design the experiment to test their hypotheses and guide them to the idea of creating and distributing a student survey.
- Allow students to spend some time in groups constructing survey questions on the Design portion of their **Scientific Inquiry** handout before debriefing and revising as a class to come up with one version of a survey to distribute to other students. A **sample survey** is available for teachers to use in guiding students.
- **DAY THREE: Data Collection** With previously obtained permission, send groups of students to visit other classrooms and administer the surveys. This will likely take a full class period but any groups that return earlier can begin analyzing and categorizing the data.
- **DAY FOUR:** Using the data from the surveys, students will work in groups to graph using self-selected categories. Once they have graphed the information, they will summarize the data in words under the **Observations** section of the **Scientific Inquiry** handout. Under **Draw Conclusions**, they will revise and correct their initial hypotheses to make them true statements.

Debrief/Assessment:

- Using the **Zero-Tolerance Policies and Rebuttal Quotes Handout**, inform students of Zero-Tolerance policies which require schools to expel any student caught on campus with a firearm and in some cases, for possession of drugs and other weapons. Tell students that in Chicago Public Schools, this has led to numerous arrests of students ages 7-18.
- As an assessment, students will be completing a scientific inquiry into these arrests. Portions of the **Scientific Inquiry Assessment** have been completed for them and students will need to first complete the hypothesis section before obtaining the **Zero Tolerance Arrest Data (two per page so need to be cut in half)** from the teacher.
- This is ideally used as an in-class quiz grade to assess student mastery of forming hypothesis, bar graph construction, data analysis, and drawing conclusions. Use the rubric below (also attached to the assessment handout) to grade student work.

RESOURCES:

What Is an Exit Slip?

Purpose: To engage students in summarizing their learning

Description: Using this strategy, students will synthesize learned information, skills, and processes by writing an Exit Slip. An Exit Slip can be a One Sentence Summary of what students learned or can be used in a variety of other ways. Other uses are: to answer a review question, to pose a question related to the topic studied, to make a short list of facts learned, to set a learning goal for the next day, etc.

Procedure:

1. Prior to using the Exit Slip as a summary activity in your classroom, decide upon its purpose (including whether or not it will be used as an assessment or evaluation tool).
2. During the last 5-10 minutes of class, inform students of the purpose/task associated with their Exit Slip.
3. Tell students to take out a half-sheet of paper and complete the assigned Exit Slip.
4. As students exit your classroom that day, collect their Exit Slips as a pass out the door.
5. Review the exit slips before moving on to the next lesson and use the beginning of class the following day to clarify any incorrect or misguided understanding among students as indicated in their answers.

Hint: Exit Slips are a great way to assess your own teaching. They will often indicate whether or not students understood the presented material or whether reviewing or re-teaching is required.

Rubric: Scientific Inquiry Assessment

	A	B	C
5	Student formed at least two hypotheses that address the problem and are able to be tested	Bar graph is neat, complete, and an accurate depiction of the data provided	Student draws reasonable conclusions from data by revising initial hypotheses to correct them
3	Student formed one hypotheses to address the problem and the hypotheses is able to be tested	Bar graph is mostly accurate and neat but contains some mistakes	Student draws reasonable conclusions from data but they may not be reflective of the initial hypotheses
1	Student did not form hypotheses relevant to the problem and/or hypotheses is unable to be tested	Bar graph is largely inaccurate and misrepresents the data provided	Student does not draw reasonable conclusions from the data and does not revise initial hypotheses

Total Points Possible: 15

Suggestions for Extension Activities:

1. You may wish to use this lesson as a way to begin or continue a conversation about stereotyping and prejudice.
2. Coordinate with a colleague in the Language Arts or Social Studies departments to simultaneously approach this issue using the **Bullying and Bullets School Shooters** lesson plan.
3. You may wish to address and examine statistics from the more recent Virginia Tech shooting using media footage and other news sources as material.
4. Access a lesson plan on the documentary **Bowling for Columbine** to provide background information about school shooter cases or use the data and statistics in the film as another assignment.