

Organizing and Analyzing Data

1. Introductory Information:

Grade Level: 6-9

Subject(s): math, science, and social studies

Key Topics: mean, median, census data

Time Requirement: 3 to 4 Days

Safety Precautions: None

Materials Needed:

The teacher will need:

- Copies of Census Data
- Copies of Organizing and Analyzing Data
- An overhead copy of 2002 Census of Agriculture

The students will need:

- Journals
- Highlighters

2. Background Information:

Rationale: This lesson will engage the students in understanding the impact farming has on their everyday life. The students actually deal with the real numbers that National Agricultural Statistics Service (NASS) collects across the nation. The students are given the responsibility to evaluate and problem solve by giving them ownership through out the activities.

Pre-requisite Knowledge: Students will have a working understanding of the following concepts:

- Farming
- Regions of the United States
- How to create a Power Point presentation or a medium through which to present data

Pre-requisite Skills:

Students should be able to:

- Identify, Gather and Assess the value of facts
- Predict, Infer and Organize data

Content Overview: This lesson contains activities centered on the census data collected by the National Agricultural Statistics Service (NASS). The impact that the census data has on the students as consumers is an important concept for the students to grasp about the community

that surrounds them. The census data will be analyzed by computing the mean, median, range, minimum, and maximum values of the data. The census data includes the number of farms in each state and are categorized by the sales size of the farms in the state. Concepts that are addressed in this unit are as follows:

- **Mean**-computed by adding all the numbers in the set and dividing the sum by the number of elements added
- **Median**-a measure of the “middle” of the data
- **Statistics**-a branch of mathematics dealing with the collection, analysis, interpretation, and presentation of masses of numerical data
- **Census**-a count of a population

Grouping Strategies: The region groups will only be used as a resource if needed according to the students needs. The groups for the evaluation final project will not be given management roles, but each member will be expected to contribute equally to the group.

3. Student Learning Outcomes:

The students will:

- Analyze relationships between statistics and their everyday life.
- Compute mean, median, range, minimum, and maximum values of the census data.
- Determine the relationship between the statistics they computed from the census data and the impact that relationship has on our everyday life.
- Interpret the effects that data collection has on a certain population.
- Present an argument for why mean and median impact our lives.

4. Procedures

A. Engage:

1. Ask the students what they know about statistics or what comes to mind when they hear the concept of statistics. After a few students have answered, have the entire class write a response to the following question in their journals: How are statistics used here at the school during the school day and after school is out of session?
2. After the students are finished writing in their journals, ask a few students to share their response. Then, as a class, talk about the reasons why we use statistics and why they are important. Last, as a class, brainstorm reasons why it would be important to gather statistical information about farming in the United States and record answers on the over-head or board.

B. Explore

1. Share background information about the census of agriculture recorded by the National Agricultural Statistics Service (NASS). The information is recorded on *Census Data*. Explain why learning to interpret statistics can help them make good decisions as consumers and citizens. Depending on the prior knowledge of the students, a consumer might need to be defined.

2. Handout the *Census Data* showing statistical information about the number of farms in the U.S. between 1978 and 1992.
3. Once the students have received the data, have them highlight the bold names of the different regions names on the data sheet. Next, have the students look at a map, that can be written on, and circle the different regions that the students highlighted on the data sheet. Leave the map up for the students to refer to for the remainder of the lesson.

C. Explain

1. Simply define the concepts of mean and median to the class. If the class has been introduced to mean and median prior to this lesson skip to step 4.
2. Start with mean. Have all of the girls or all of the boys in the class stand up. State how tall they are, if needed measure. Have a recorder from the gender not being studied record all of the heights either on the chalkboard or the overhead. On scrap paper, have all of the students record with the recorder. As a class, start adding up the scores by starting with first two individuals. Once those two scores have been added they can sit down. Repeat as the third individual's score is added and then that individual can sit down and continue until the last individual has been added to the whole group. Also, as each individual sits down, have all of the students record a tally in the corner of their paper. Now tell the students to divide the grand total of heights by the number of individuals that they tallied. The result of the division problem is entitled the mean. Revisit the definition of mean. Next, discuss how census would be applied in this situation.
3. Move on to the median. Have all of the students line up by age in front of the class. It would be perfect if there were an odd number of students because the middle student has the median age. If there is an odd even of students, you must find the average of the two students in the middle. Revisit the definition of median.
4. As a class, find the mean and median of the data for the entire United States. This data is found at the bottom of each the compiled data pages (the last row of data).

D. Extend

1. Discuss with the students again why this activity is important. Discuss how it is important for them to know how many farms are in the United States and if this adds to the problem that the *Meet the Problem* presents. It could effect over population issues or even may help some students learn more about how the geographical issues of a state may effect a highly populated region. Tell the students that they will have an opportunity to explore some issues that they have questions on in their investigations later in the unit.
2. Divide the students into regions. Have the students work on their own for this activity. Have the students complete the data table on *Organizing and Analyzing Data* for their own region. The students are asked to find the mean and median of the given data. If they need help with a certain problem, the students can ask an individual who is analyzing data from their same region.

E. Evaluate

1. Divide the students into groups of 2 to 3 students and allow the students to collect data either from the Internet or from their classmates/faculty at the school. Have a variety of sources of collected data for the students to choose from so that they find valid data. For example, the students could collect the times that it takes students to run a certain distance. Once the students collect the data, have them compute a median and mean of the collected data.
2. Direct the students by telling them to then create a presentation for their fellow students on their data collection process and the impact that the mean and median has on either the subjects or the general population. The students may choose the medium in which they want to present their information. Some suggested media are Power Point and brochures.

5. References

Adapted from: [Making Sense of the Census.](#) (2001). Agriculture Counts: NASS.