

Connected Cabbage Math

By **Bridgette Preston**

Materials

- Paper; pencils; markers
- Alaska State Fair “Giant Cabbage Weigh-Off” results 1996-2002 (included on CD)
- calculators
- poster board

Objectives

Develop a strategic approach to organizing data and processing statistical information.

Understand the relationship between numbers in a data set through the calculation of median, mode, mean and range.

Compare and contrast different sets of data on the basis of measures of central tendency.

Analyze data from tables and interpret the data through visual charts or graphs.



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Using Measures of Central Tendency

Introduction for students

For the last seven years, Alaskan farmers and gardeners have been growing giant cabbages to enter in the Alaska State Fair “Giant Cabbage Weigh-Off,” in hopes of winning big prize money for the largest/heaviest cabbage. Serious competitors have been perfecting their cabbage growing techniques in hopes of winning the big cash prizes. In this unit, we will be analyzing the data from the contest results to see if Alaska cabbages are getting bigger every year.



Prior to the session

Review and discuss the key vocabulary with students.

Hand out “Alaska Giant Cabbage Weigh-Off” Results to class.

Directions

Explain that the first step in solving the problem is to sort the cabbage weights from least to greatest. (The weights on the results sheets are pre-sorted.)

Using the Results of the 1996 “Giant Cabbage Weigh-Off” ask the following questions:

- What is the weight of the largest cabbage?
- What is the weight of the smallest cabbage?
- What is the middle weight in the set of cabbage weights ordered from least to greatest?
- What is the weight that occurs most frequently?
- What is the difference between the highest weight and the lowest weight? (This is the range.)
 - Based on the range, would you say the data are clustered together or spread out? Explain your reasoning.

Write the simplified definitions for mean, median, mode and range on the board for easy reference:

- Median – middle number
- Mode – most frequent number
- Mean – average
- Range – difference between greatest and lowest number.

Model your thinking

Explain and demonstrate how to find the mean, median, mode and range for the 1996 Giant Cabbage Data set. Organize students into groups of

Objectives, continued

Understand the application of statistics to answer real life questions.

Suggested grade levels:

6 – 8

Alaska Content Standards

Sixth grade: Math A6.2.1; A6.2.2; A6.2.3; C1.2.1; C1.2.2;
Eighth grade: Math A6.3.2; A6.3.3; A6.3.4; C1.3.1; C1.3.3.

Terms to Define

- raw data
- average
- sample
- central tendency
- mean
- median
- mode
- frequency chart
- range
- outliers



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three or four to complete the activity. Each group will be responsible for finding the mean, median, mode, and range of each data set for each year of the “Giant Cabbage Weigh-Off.”

Each group will create a poster to display the results of their “Giant Cabbage Weigh-Off” study. Using standard line and bar graphs, students will prove or disprove that Alaska cabbages are getting bigger every year.

Variations

Rather than using the complete data set for each year of the Giant Cabbage Weigh Off, have some groups use only the weights of the top twenty cash prize winners. Pose the question: “Are these data sets more accurate to use in answering the question, ‘Are cabbages getting larger every year?’”

Have students present their posters to the class. Each group should use Measures of Central Tendency to answer and visually represent the answer to the question, “Are Alaska cabbages getting larger every year?”

Assessment

Students should be able to:

- define median, mode, mean and range, and the steps or operations needed to find them.
- solve for the mean, median and mode from any ordered data set.
- analyze data from tables and interpret the data through visual charts or graphs.
- answer the question, “Are the cabbages getting larger?”

More activities

- Using the Measures of Central Tendency for the “Alaska Giant Cabbage Weigh-Off” for the years 1996 – 2002, have students predict what the winning weights will be for the next five years.
- Have students calculate the growth rate of a cabbage. Starting from the weight of a cabbage seed on April 1, to the last day of August when cabbages are harvested for the contest, students can use Scientific Notation to express the weight increase from seed to giant cabbage.
 - Students can calculate the price per pound that winners of the Giant Cabbage Weigh Off receive for their cabbages.
 - Obtain data from the State of Alaska Department of Agriculture to answer questions about cabbage production in Alaska.
 - Encourage students to grow a cabbage to enter in the Alaska State Fair Giant Cabbage Weigh-Off.

Lesson developer Bridgette Preston is a federal programs tutor/advisor in the Mat-Su Borough School District, and coordinator of the Alaska State Fair Giant Cabbage Weigh-Off.