Agriculture

Corn Calculations
Maximum, Minimum, Mean, Median, Mode and Range

Math

Materials
Various ears of field corn preserved from harvest in freezer. OR use squirrel corn found in most farm supply stores. These ears will be smaller than normal field corn as they are considered "seconds" or substandard ears.
Paper
Copies of Appendix A

Overview
Corn is a crop widely grown in Kansas. Ears of corn can be used to teach data calculation such as finding minimum, mode, median, mean and range.

Grade Level: 4-5

Time: 50 min.
Standards:
Math
data measurement, range, mean, median, mode, maximum, minimum

For Kansas standards, visit www.ksde.org

Objectives
The student will examine ears of corn and gather data to calculate the minmum, maximum, mode, median, mean and range.

Background Information
Did you know corn is America's number one field crop? Corn leads all other crops in value and volume of production. Kansas ranked #7 in the nation for corn production in 2009. Here's some more interesting facts about corn:

• An ear of corn averages 800 kernels in 16 rows.
• A pound of corn consists of approximately 1,300 kernels.
• 100 bushels of corn produces approximately 7,280,000 kernels.
• Each year, a single U.S. farmer provides food and fiber for 154 people - In the U.S. corn production measures more than two times that of any other crop.

Corn Products
Your bacon and egg breakfast, glass of milk at lunch, or hamburger for supper were all produced with U.S. field corn.
Cornstarch is used as a sweetener in many food items like cereals, peanut butter, snack foods and soft drinks.
U.S. researchers have led the way in finding many industrial uses for corn such as super slurper polymers in disposable diapers and plant watering beads.

Another great resource from

Kansas Foundation
for **Agriculture**
in the **Classroom**
www.ksagclassroom.org

Page 1

Corn Calculations

Corn is used to produce fuel alcohol, ethanol, thereby using a renewable resource to produce fuel. Fuel alcohol makes gasoline burn cleaner, reducing air pollution, and it doesn't pollute the water.

**How to calculate the number of kernels on an ear of corn:**
Corn ears can come in all sizes depending on many factors throughout growth.
Water, sunlight, soil nutrients, temperature, humidity and other things all play a part in the number of kernels there are on an ear of corn.
Record the number of complete kernel rows per ear and average number of kernels per row. Then multiply each ear's row number by its number of kernels per row to calculate the total number of kernels for each ear. If row number changes from butt to tip (e.g., pinched ears) due to stress, estimate an average row number for the ear. Don't count the extreme butt or tip kernels, but rather begin and end where you perceive there are complete "rings" of kernels around the cob. Do not count the aborted kernels. If kernel numbers are uneven among the rows of an ear, estimate an average value for kernel number per row.
Calculate the average number of kernels per ear by summing the values for all the sampled ears and dividing by the number of ears.
EXAMPLE: For five sample ears with 480, 500, 450, 600, and 525 kernels per ear, the average number of kernels per ear would be (480+500+450+600+525) divided by 5 = 511.

Example of a 16-row ear of corn.

Example of a 14-row ear of corn.
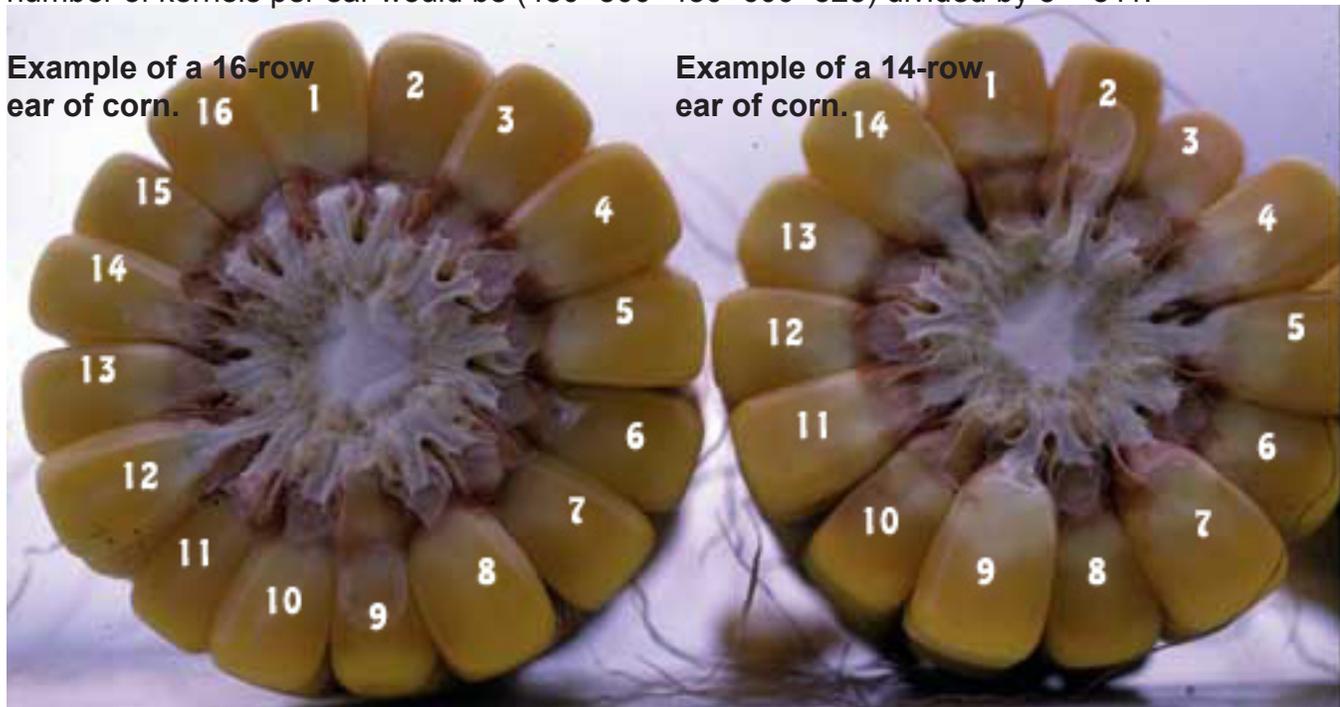
Preparation
Gather several ears of ripe field corn in the fall from a local farmer. Shuck the ears and store them in a cool dry place until the lesson is ready to be taught. Approximately one week prior to teaching this lesson, teach the students how to find maximum, minimum, mode, median, mean and range.

Corn Calculations

(See Appendix A.) Make copies of Appendix A.

Instructional Format
Share background information on corn with students. Tell them that they are going to use field corn to practice their math skills today.
Explain and show how to calculate how many kernels are on an ear of corn.
Do group math activity.
Students compare results with classroom discussion.
Students complete the assessment.

Procedures
Group Math
Divide the class into groups of five. Hand each group five ears of corn.
Each group of students is to count and calculate the number of kernels on their ear of corn.
Students take all five numbers and use them to find the maximum, minimum, mode, median, mean and range.
Teacher records data calculations for all groups and leads discussion on results.
This process can be repeated as a whole class using the number of corn kernels from each ear of corn calculated by each of the groups. This will provide much more data and challenge the students more.

Conclusion Questions (Assessments)
How do the numbers differ from group to group? How are they alike?
Which group had the maximum number of kernels? Which group had the minimum?
Did any of the groups have a mode to record?
What else do you notice?

Assessment: The student will show understanding of calculating data by finding the maximum, minimum, mean, median, mode and range when given a set of numbers.

Resources
Adapted from a lesson plan created by Kim Stilwell, White City, KS.

More information about corn can be found at www.ksagclassroom.org under plant science lesson plans.

Corn Calculation - Math Terms

Vocabulary

Maximum - the greatest number

Minimum - the least number

Mode - the number that occurs most often

Median - the number in the middle when data is arranged in order from least to greatest

Mean - the average of all the numbers

Range - the difference between the greatest and the least number

Corn Calculations

Name: _____   Date: _____

Instructions: Answer questions thoroughly as a group or individually.

1. How do the numbers differ from group to group?

2. How are the numbers alike?

3. Which group had the maximum number of kernals?

4. Which group had the minimum number of kernals?

5. Did any of the groups have a mode to record?

6. What else did you notice?

Another great resource from

Kansas Foundation
for **Agriculture**
in the **Classroom**
www.ksagclassroom.org

Page 5