

MA 5A	Mathematics Embedded Credit
Cape Career & Technology Center	Last Update: December 2004
Topic: Statistics	Focus: Measures of Central Tendency

Show-Me Standards: MA3, G1-5	MO Grade Level Expectations: D1A10, D2A6, D2A9	NCTM Standards: 14E, 15E
------------------------------	---	--------------------------

OBJECTIVE: Students will be able to identify and use measures of central tendency (e.g., mean, median and mode).

Introduction:

Statistics are important to technology and science. Statistics forms much of the data that drives decisions in the world of technology and business. The use of statistics in everyday life and real world business allow the individual to engage in analyzing information and formulating informed decisions. The bottom line is that statistics make one's input into work more productive, meaningful and worthy of compensation.

By definition, statistics is "the means of studying characteristics of populations through measurement and sampling." (Clawson, 1991) Components of populations include the manner in which members are selected for participation in the study, attributes (those things which you may want to study), measurements of the attributes you choose to study, and the collection of those measurements (called a 'distribution'). The main focus of this lesson will be on three measurements of attributes: the mean, the median and the mode.

MEAN: (also called 'average') "the sum of the measurements divided by the number of measurements." (Clawson, 1991)

MEDIAN: "a measure such that half the other measurements are larger than the median, and half the measurements are smaller than the median." (Clawson, 1991) If there is an even number of measurements, add the to middle measurements and divided by two (or the average of the two middle measurements).

MODE: simply the measurement that occurs the greatest number of times. If all of the measurements occur once, there is no mode for the sample attributes.

Take the following information and calculate the mean, median and mode.

DATA	Mean	Median	Mode
47.9", 48.1", 47.9", 45.4", 49.2", 51.4", 52.6", 50.5", 51.4"	$\frac{45.4 + 47.9 + 47.9 + 48.1 + 49.2 + 50.5 + 51.4 + 51.4 + 52.6}{9} =$ $\frac{444.4}{9} = 49.37777778$ $= 49.38$ <p style="text-align: center;">Mean = 49.38"</p>	45.4" 47.9" 47.9" 48.1" 49.2" 50.5" 51.4" 51.4" 52.6"	47.9" and 51.4"

Clawson, C., *Conquering Math Phobia: A painless primer*, John Wiley and Sons, New York, NY. 1991.

PROBLEMS:

1. After constructing a wall for the Building and Grounds Maintenance class, the instructor asks you to give some statistics on the 'scraps' from your cuts to 2x4" studs. The 'scrap' boards measure: 25", 12", 30", 14", 17.5", 32", 25" and 36". What are the mean, median and mode of your collected measurements?
2. Upon completing a project for the Graphic Arts instructor, students reported having the following number of defected items: 3, 1, 4, 5, 2, 4, 1, 3, 6, 8, 3, 9, 2, 4, 7, and 4. What are the mean median and mode of the collected measurements?
3. Over the course of a semester, your painting team completes there paint booth projects in the following amount of times: $1\frac{1}{2}$ hours, $2\frac{3}{4}$ hours, $1\frac{3}{4}$ hours, $5\frac{1}{4}$ hours, $1\frac{1}{2}$ hours, $2\frac{1}{4}$ hours, $1\frac{1}{2}$ hours and $6\frac{3}{4}$ hours. What are the mean median and mode of your collected measurements?
4. The Office Technology class completes a dictation exercise with the following times for individual students: 248 seconds, 251 seconds, 263 seconds, 248 seconds, 263 seconds, 252 seconds, 264 seconds, 295 seconds, 202 seconds, 242 seconds, 271 seconds and 272 seconds. What are the mean, median and mode for the instructors collected measurements?