Applied Statistics

West Virginia math4life

Domain	Probability and Informed Decisions	
Cluster	Use probability to evaluate outcomes and make decisions.	
Standard(s)	M.ASHS.28	Perform appropriate calculations for given outcomes and decisions based on expected values for non-normal distributions. Instructional Note: Focus on uniform, discrete, continuous (geometric areas), or games of chance.

Content Examples:

» Video Illustrating the Use of a TI-84 Graphing Calculator to analyze the distribution of a random variable:
https://savi-cdn.macmillantech.com/brightcove/index.html?videoId=5731627660001

» Finding Mean (expected value) of a discrete random variable:
https://www.khanacademy.org/math/ap-statistics/random-variables-ap/discrete-random-variables/v/expected-value-of-a-discrete-random-variable

Relevant Content:

Vocabulary:

» Five-Number Summary: The five-number summary includes: the smallest observation, first quartile, median, third quartile, and largest observation, written in order from smallest to largest.

» Histogram: A histogram is a graph that displays the distribution of a quantitative variable by showing each interval of values as a bar. The heights of the bars show the frequencies or relative frequencies of values in each interval.

» Mean (expected value) of a discrete random variable: The mean describes the variable's long-run average value over many, many repetitions of the same chance process. To find the mean (expected value) of X, multiply each possible value by its probability, then add all the products:
$\mu X = E(X) = x_1 p_1 + x_2 p_2 + x_3 p_3 + \ldots = \Sigma x_i p_i$.

» Random Variable: A random variable is a numerical outcome of some chance process.

» Skewness: A distribution is skewed to the right if the right side of the graph (containing the half of the observations with larger values) is much longer than the left side. It is skewed to the left if the left side of the graph is much longer than the right side.

Stats Medic Chapter 5: Random Variables (this standard directly applies to 5.1-5.4):
https://www.statsmedic.com/introstats-chapter-5

Stats Medic Chapter 5 Big Ideas:
https://www.statsmedic.com/intro-day68

Assessment Links or Tasks:

» Mathalicious Three Shots: Basketball Problem *https://www.statsmedic.com/intro-day65*

» Allows you to modify a two-way table and see the graphical representation:
Discrete Variable Applet *http://bcs.whfreeman.com/webpub/statistics/spa3e/analyze_data/prob.html*