

RRRPS District Standards: MATHEMATICS

Statistics & Probability

10/2006

STRAND V: DATA ANALYSIS AND PROBABILITY

NM State Content Standard V: Students will understand how to formulate questions, analyze data, and determine probabilities.

NM State Benchmarks Grades 9-12

RRPS Statistics Power Standards

While all benchmarks are taught, Power Standards are consistently emphasized and regularly assessed.

NM State Benchmark V-A: Grades 9-12

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Power Standard 1 (Benchmark V-A)

Know the characteristics of a well-designed and well-conducted survey

NM Statistics Performance Standards

1. Understand the differences between the various methods of data collection.
2. Know the characteristics of a well-designed and well-conducted survey:
 - differentiate between sampling and census
 - differentiate between a biased and an unbiased sample
3. Know the characteristics of a well-designed and well-conducted experiment:
 - differentiate between an experiment and an observational study
 - recognize sources of bias in poorly designed experiments
4. Understand the role of randomization in well-designed surveys and experiments.

Power Standard 2 (Benchmark V-A)

Know the characteristics of a well-designed and well-conducted experiment

Power Standard 3 (Benchmark V-A)

Understand the role of randomization in well-designed surveys and experiments

Power Standard 4 (Benchmark V-B)

For univariate data, be able to display the distribution and describe its shape using appropriate summary statistics, and understand the distinction between a statistic and a parameter

NM State Benchmark V-B: Grades 9-12

Select and use appropriate statistical methods to analyze data.

Power Standard 5 (Benchmark V-B)

For bivariate data, be able to display a scatter plot and describe its shape

NM Statistics Performance Standards

1. Understand the meaning of measurement data and categorical data, and of the term “variable.”
2. Understand the meaning of “univariate” (i.e., one variable) and “bivariate” (i.e., two variable) data.
3. For univariate data, be able to display the distribution and describe its shape using appropriate summary statistics, and understand the distinction between a statistic and a parameter:
 - construct and interpret frequency tables, histograms, stem and leaf plots, and box and whisker plots
 - calculate and apply measures of central tendency (mean, median, and mode) and measures of variability (range, quartiles, standard deviation)
 - compare distributions of univariate data using back-to-back stem and leaf plots and parallel box and whisker plots
4. For bivariate data, be able to display a scatter plot and describe its shape:
 - fit a linear model to a set of data using technological tools
 - describe and interpret the relationship/correlation between two variables using technological tools

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NM State Benchmarks Grade 9-12

RRPS Statistics Power Standards

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NM State Benchmark V-C: Grade 9-12

Develop and evaluate inferences and predictions that are based on data

NM Statistics Performance Standards

1. Compare and draw conclusions between two or more sets of univariate data using basic data analysis techniques and summary statistics.
2. Draw conclusions concerning the relationships among bivariate data:
 - make predictions from a linear pattern in data
 - determine the strength of the relationship between two sets of data by examining the correlation
 - understand that correlation does not imply a cause-and-effect relationship
3. Use simulations to explore the variability of sample statistics from a known population and construct sampling distributions.
4. Understand how sample statistics reflect the values of population parameters and use sampling distributions as the basis for informal inference.
5. Evaluate published reports that are based on data by examining the design of the study, the appropriateness of the data analysis, and the validity of conclusions.

Power Standard 6 (Benchmark V-C)

Compare and draw conclusions between two or more sets of univariate data using basic data analysis techniques and summary statistics.

Power Standard 7 (Benchmark V-C)

Draw conclusions concerning the relationships among bivariate data:

- make predictions from a linear pattern in data
- determine the strength of the relationship between two sets of data by examining the correlation
- understand that correlation does not imply a cause-and-effect relationship

Power Standard 8 (Benchmark V-C)

Understand how to compute the probability of an event using the basic rules of probability

- complement rule
- addition rule (disjoint and joint events)
- multiplication rule (independent events)
- conditional probability

NM State Benchmark V-D: Grades 9-12

Understand and apply basic concepts of probability.

NM Statistics Performance Standards

1. Explain the concept of a random variable.
2. Understand the concept of probability as relative frequency.
3. Use simulations to compute the expected value and probabilities of random variables in simple cases.
4. Distinguish between independent and dependent events.
5. Understand how to compute the probability of an event using the basic rules of probability:
 - complement rule
 - addition rule (disjoint and joint events)
 - multiplication rule (independent events)
 - conditional probability