# Mathletics

## NWEA Common Core - Statistics & Probability

### Skill Quests


## RIT Score Band

May, 2022

Mathletics

# NWEA Common Core

## Statistics and Probability 6–8

Skill Quests

May 2022

# RIT Score Band 218–221

## 1 Develop understanding of statistical variability

| Outcome | Quests | Content |
|---|---|---|
| 6.SP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. | Statistical questions | Evaluating statistical questions |
| 6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. | Shape of data distribution | Introducing the shape of data distribution |
| 6.SP.A.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. | Measures of center and variation | Introducing the upper and lower quartiles |
| | | Introducing interquartile range |
| | | Understanding the median |
| | | Understanding the mean |

## 2 Summarize and describe distributions

| Outcome | Quests | Content |
|---|---|---|
| 6.SP.B.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots. | Data displays | Constructing data displays |
| | | Reading and interpreting data in a dot plot |
| | | Reading and interpreting data in a histogram |
| | | Reading and interpreting box-and-whisker plots |
| 6.SP.B.5 Summarize numerical data sets in relation to their context. | Summarizing numerical data | Summarizing numerical data |
| 6.SP.B.5.A Reporting the number of observations. | Reporting observations | Reporting observations in a data display |
| 6.SP.B.5.B Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. | Attributes of data | Describing attributes of data in data displays |
| 6.SP.B.5.C Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute | Calculate measures of center & variation | Calculating the mean absolute deviation |
| | | Calculating the median |
| | | Calculating the mean |

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| deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. | | Identifying clusters, gaps and outliers |
| | | Identifying skewed and symmetrical sets of data |
| 6.SP.B.5.D Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. | Relating measures of center & variation | Choosing appropriate measures of center & variation |
| | | Comparing measures of center and variation |

# RIT Score Band 222–226

## 1 Use random sampling to draw inferences about a population

| Outcome | Quests | Content |
|---|---|---|
| 7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. | Understanding sampling | Understanding sampling |
| 7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. | Drawing inferences from samples | Drawing inferences from samples |

## 2 Draw informal comparative inferences about two populations

| Outcome | Quests | Content |
|---|---|---|
| 7.SP.B.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. | Comparing data distributions | Comparing data distributions |
| 7.SP.B.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. | Drawing comparative inferences | Drawing comparative inferences |
| 7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the | Introducing probability | Introducing probability |

| | | |
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| event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. | | |
| 7.SP.C.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. | Probability of chance events | Probability of chance events: relative frequency |
| 7.SP.C.7.A Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. | Determining the probability of events | Theoretical probability |
| | | Predicting outcomes of chance experiments |
| | | Finding the complement of an event |
| 7.SP.C.7.B Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. | Observing frequencies in data | Finding the approximate probability |
| | | Comparing observed frequency & expected frequency |
| 7.SP.C.8.A Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. | Probability: compound events | Investigating mutually exclusive events |
| | | Calculating probabilities of compound events |
| 7.SP.C.8.B Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. | Sample spaces for compound events | Representing sample spaces & identifying outcomes |
| 7.SP.C.8.C Design and use a simulation to generate frequencies for compound events. | Independent & dependent compound events | Independent/dependent compound events |

# RIT Score Band 227–228

## 1 Investigate patterns of association in bivariate data

| Outcome | Quests | Content |
|---|---|---|
| 8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. | Using and interpreting scatter plots | Using and interpreting scatter plots |
| 8.SP.A.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. | Estimating the line of best fit | Estimating the line of best fit |
| 8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. | Interpreting the line of best fit | Interpreting the line of best fit |
| 8.SP.A.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. | Two-way tables | Constructing and interpreting two-way tables |

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