

ISTEP+ Performance Level Descriptors

Mathematics – Grade 7

Grade 7

Pass+

Pass+ students demonstrate advanced mathematical and problem-solving skills. Students solve complex multi-step problems with integers, fractions, decimals, ratios, percents, and square roots, and demonstrate expertise in the areas of geometry, measurement, data analysis, and statistics. *Pass+* students display highly developed skills with algebra concepts, including writing and solving equations and inequalities, as well as using coordinate planes to represent proportional relationships and unit rates. *Pass+* students solve sophisticated problems, support their solutions, and apply the results to other situations.

Some examples of specific knowledge, skills, and abilities for Grade 7 students scoring at the *Pass+* level include:

- Solve complex multi-step problems involving any/all of the following: integers, decimals, fractions, ratios, unit rates, square roots, percents, and proportional relationships
- Determine the relationship between area and circumference of a circle and understand their formulas
- Find surface area of right rectangular prisms and cylinders using nets
- Organize, analyze, and interpret data in multiple representations, and approximate the probability of a chance event
- Develop probability models
- Analyze and solve problems by sequencing, prioritizing, and identifying relevant information; breaking complex problems into simpler ones; using words and symbols to support solutions; using simpler problems to solve more difficult ones; drawing mathematical conclusions; and determining the reasonableness of solutions

Grade 7

Pass

Pass students demonstrate proficient mathematical and problem-solving skills. Students are capable of solving problems with integers, fractions, decimals, ratios, percents, and square roots, and they are competent in the areas of geometry, measurement, data analysis, and statistics. *Pass* students are skilled with algebra concepts, such as writing and solving equations. *Pass* students experience success when solving problems, communicating ideas, and applying mathematical knowledge to a variety of situations.

Some examples of specific knowledge, skills, and abilities for Grade 7 students scoring at the *Pass* level include:

- Find the prime factorization of whole numbers
- Identify, compare, and order rational and irrational numbers
- Compute and solve real-world problems with rational numbers
- Apply the properties of operations to create equivalent linear expressions
- Solve inequalities
- Identify slopes of lines and graph a line based on its slope and one point
- Identify real-world situations that involve proportional relationships
- Draw triangles with given conditions
- Solve real-world problems involving scale drawings
- Find the volume of right rectangular prisms and cylinders
- Interpret, use, and calculate measures of central tendency and measures of spread for numerical data
- Determine how data added to a data set may affect the mean and/or median
- Understand the probability of a chance event
- Solve problems by breaking complex problems into simpler ones, making calculations in word problems, using words and symbols to support solutions, and determining the reasonableness of solutions

Grade 7 Did Not Pass

Did Not Pass students demonstrate limited mathematical and problem-solving skills. Students may have difficulty when solving problems with fractions, percents, and square roots, and the complexity of algebra may be an obstacle for *Did Not Pass* students. Also, math topics including geometry, measurement, data analysis, and statistics can be stumbling blocks for students. *Did Not Pass* students may have difficulty making decisions about how to approach problem-solving situations, how to communicate their ideas, and how to apply mathematical knowledge to other situations.

Some examples of specific knowledge, skills, and abilities for Grade 7 students scoring at the *Did Not Pass* level include:

- Understand the inverse relationship between squaring and square roots
- Understand and work with the additive inverse of a number
- Solve equations
- Solve problems that involve vertical, adjacent, complementary, and supplementary angles
- Use data from a random sample to draw inferences about a population
- Determine the validity of statistics when gathering information about a population
- Identify important information and make calculations when solving basic word problems