ISAT Mathematics Performance Definitions
Grade 6

EXCEEDS STANDARDS

Sixth-grade students whose measured performance exceeds standards demonstrate a solid knowledge and sense of numbers that allows them to apply their understanding of the relative magnitude of numbers in a broad range of settings. They are able to order and compare whole numbers, decimals, fractions and mixed numbers with like and unlike denominators and to apply these skills in one- and two-step problems involving the four operations. They can convert between improper fractions and mixed numbers, and they demonstrate clear understanding of the relationship between fractions and decimals. These learners can apply their understanding of ratios, proportions and percents to solve two-step problems involving these concepts. They can describe the relationship between two sets of data using appropriate notations. These sixth-grade students are able to apply estimation skills to predict solutions to complex problems. Furthermore, they understand and have the ability to accurately test the validity of logical arguments.

Sixth-grade students at the exceeds level are able to make and use measurements to apply concepts of precision, accuracy and greatest possible error. These students consistently use appropriate technology, instruments, and formulas to accurately solve problems and interpret results. They can estimate conversions between measures within the customary and metric systems. These students are able to make conversions within a measurement system to perform operations with compatible units. They can determine, compare, and sketch area and perimeter of triangle, parallelogram, and irregular shapes, using formulas and/or other strategies, and they can apply these concepts to solve more complex problems.

Algebraically, the exceeds student at sixth grade can solve multi-step problems and equations using whole numbers. They can solve equations and expressions using order of operations, and they demonstrate an understanding of number properties including commutative, associative, distributive, transitive, zero and equality. These students can construct algebraic expressions using variables to describe a pattern and/or represent an unknown quantity. They can analyze and interpret data from various types of tables and graphs, transfer data from tables to graphs, and make predictions based on implications from the data. They can routinely estimate probabilities from experimental simulations.

Geometrically, sixth-grade students at the exceeds level can apply their knowledge of two- and three-dimensional objects to solve complex problems. They can identify, describe, classify and compare relationships using points, lines, planes and solids. These students apply their knowledge of polygonal relationships to compare and classify geometric figures. They easily recognize and predict the result of reflections, translations, and rotations of shapes, and they can identify and describe relationships between radius, chord, diameter and circumference of a circle.

Sixth-grade students at the exceeds level are able to collect, organize, interpret, compare and analyze data and make predictions and decisions based on that data. These students can determine mean, median, mode, and range and apply these concepts of data analysis. They determine and apply basic properties of probability to solve problems, and they represent the probability of the event as a fraction, decimal or percent. These students are also able to estimate probabilities from experimental simulations.

Overall, sixth-grade students at the exceeds level have a solid grasp of the mathematics curriculum along with the ability to extend and apply their knowledge in a wide range of problem-solving situations. They consistently use reasoning and communications skills in mathematics, not only to solve the immediate problem but also to make further inquiries and create additional problems from their own interests. Their work is characterized by its insightful nature and by consistent and sustained high performance across the various content areas.

MEETS STANDARDS

Sixth-grade students whose measured performance meets standards demonstrate a knowledge and sense of numbers that allows them to order and compare whole numbers, decimals, fractions and mixed numbers (with like or unlike denominators) and to recognize the relative magnitude of these numbers. These students are able to solve practical two-step problems involving whole numbers using addition, subtraction, multiplication and division. They can add and subtract decimals, fractions and mixed numbers and can translate and solve word problems that involve these concepts and skills. These learners have a conceptual understanding of ratios, proportions and percents and are able to extend that understanding to the solution of problems involving these concepts. They can round whole numbers and decimals to a specified place and can use rounding and estimation skills to predict solutions to simple problems and check the reasonableness of their answers.

Additionally, sixth-grade students at the meets standards level are able to use tools to make measurements that are accurate within the range of precision of the instruments used. They are also able to estimate a given measure and/or a conversion between measures within the customary and metric systems. They understand and apply concepts of length, volume, weight/mass, and angles.

Algebraically, sixth grade students at the meets standards level can identify and extend geometric and numeric patterns and can write and solve two-step equations that involve the four fundamental operations and whole numbers. These students can recognize and use variables to represent unknown quantities, and they demonstrate an understanding of number properties including commutative, associative, and distributive. These learners can plot and read, and interpret ordered pairs in the first quadrant.

Geometrically, sixth-grade students at the meets standards level can compare and contrast the attributes of two- and three-dimensional shapes. These learners can identify geometric properties, including parallel, perpendicular, intersecting, similar, congruent, and line symmetry. These students demonstrate an understanding of angle properties including right, acute, obtuse, and straight angles, and they are able to determine the measures of angles and sides in congruent figures.

Sixth-grade students at the meets standards level are able to collect, organize, interpret, analyze and display data. They can determine mean, median, mode and range. These students have the ability to predict outcomes from experiments involving chance, calculate the probability of a simple event, and represent that probability.

Overall, sixth-grade students at the meets standards level have a solid grasp of the mathematics curriculum. They exhibit an acceptable range of problem-solving abilities, reasoning skills and communication abilities. They are able to use calculators and other forms of technology productively to carry out computation and to test or extend familiar patterns. They are on a solid path of progress in the mathematics curriculum.

BELOW STANDARDS

Sixth-grade students whose measured performance is below standards are generally able to order and compare whole numbers, simple fractions and decimals. They are usually able to solve one-step problems involving whole numbers using addition, subtraction, multiplication and division. They are beginning to develop the ability to solve simple problems using fractions and decimals, but may experience difficulty with mixed numbers when attempting to solve number and word problems. They can identify and name a ratio that describes a given situation and are beginning to be able to solve problems using decimals and percents. These learners are also able to round whole numbers to a specified place and can often round decimals to the tenths and hundredths. Generally, sixth-grade students at this level use a single strategy to solve problems.

Sixth-grade students at the below standards level are able to use tools to make measurements to the nearest whole, half, and quarter unit. They can more frequently estimate a given measure within the customary system as compared to the metric system. They demonstrate an understanding of area and perimeter by counting units on a grid, and can inconsistently determine correct perimeter by applying a formula.

Sixth-grade students at the below standards level are inconsistent in their demonstration of understanding measurement of volume and mass.

Algebraically, sixth-grade students who are below standards can identify geometric and numeric patterns. They can inconsistently solve one-step and simple two-step equations with whole numbers that involve the four fundamental operations. These students recognize that variables represent unknown quantities, and they are beginning to develop an understanding of number properties, including commutative, associative, zero and equality. These learners can inconsistently plot and read ordered pairs in the positive quadrant.

Geometrically, sixth-grade students at the below standards level can identify, compare, and contrast the attributes of two-dimensional shapes, and they can inconsistently identify and compare the attributes of three-dimensional shapes. They can identify similar, congruent and symmetric figures and can locate the line(s) of symmetry in the latter. They can identify right angles and angles that are greater than and less than a right angle; however, they are inconsistent in their ability to use and understand the terms “acute” and “obtuse.”

Sixth grade students at the below standards level can read and interpret information contained in tables, charts and graphs. They are also able to collect and display data. They can inconsistently determine mean and range from a given set of data. These students are able to calculate simple probabilities and can inconsistently predict the outcome of an event.

Overall, sixth-grade students who operate at the below standards level have an emerging sense of numbers, but they are somewhat limited in their understanding of what may be accomplished within the whole number system. Their computational abilities are limited by the four basic operations, and they inconsistently recognize how and when to use technology. These learners have limited ability to transfer their knowledge and skills beyond the content and approaches used in their classes.

ACADEMIC WARNING

Sixth-grade students at the academic warning level are generally able to order and compare whole numbers. They can identify simple fractions and decimals and can compare simple fractions with like denominators. These students can inconsistently solve one-step problems with whole numbers using the four operations. They can inconsistently identify a ratio that describes a given situation. These students are very limited in their ability to estimate; however, they are sometimes able to round whole numbers to a specified place value. Generally, sixth-grade students at this level have difficulty identifying an appropriate strategy for solving problems.

Sixth-grade students at the academic warning level use tools inconsistently to make measurements to the nearest whole unit. They can occasionally estimate a given measure within the customary system. These learners demonstrate understanding of area and perimeter, and they occasionally can calculate area and perimeter correctly either by counting units on a grid or by applying formulas.

Algebraically, sixth-grade students at the academic warning level can infrequently identify the more complex geometric and numeric patterns. They can inconsistently solve simple two-step equations that involve multiplication and division. These learners have an elementary understanding of variables representing unknown quantities. Sixth-grade students at the academic warning level demonstrate an emerging ability to recognize number properties including commutative, zero and equality.

Geometrically, sixth-grade students at the academic warning level can identify the attributes of two-dimensional shapes and can inconsistently identify attributes of some three-dimensional shapes. These learners may be able to inconsistently identify symmetry and congruence. They may be able to locate some lines of symmetry in a figure. These students have some recognition of right, acute, and obtuse angles.

Sixth grade students at the academic warning level can inconsistently read and interpret information contained in simple tables, charts and graphs. These students may be able to collect and display data but are rarely able to make predictions based on that data. They are able to inconsistently calculate simple probabilities, and they can occasionally predict the outcome of an event.

Overall, sixth-grade students at the academic warning level have a limited sense of numbers and what may be accomplished within the number system. Their computational abilities are underdeveloped, and their problem-solving skills are limited. These learners are infrequently able to transfer their knowledge and skills beyond the content and approaches used in their mathematics classes.