Grade 7 Mathematics Performance Level Descriptors

Limited

A student performing at the **Limited Level** demonstrates a minimal command of Ohio's Learning Standards for Grade 7 Mathematics. A student at this level has an emerging ability to work with expressions and linear equations, solve problems involving scale drawings, and work with two- and three-dimensional shapes to solve problems involving area, surface area, and volume.

A student whose performance falls within the **Limited Level** typically can:

- Carry out some routine procedures to solve straightforward one-step problems;
- Recognize solutions to some simple computation, straightforward problems;
- Compute accurately a few grade level numbers and operations;
- Recognize a few grade level mathematical concepts, terms and properties, and use previous grade level mathematical concepts, terms and properties.

A student at the **Limited Level** can:

- Compute a unit rate of two whole numbers where the unit rate is explicitly requested;
- Identify proportional relationships presented in familiar contexts;
- Solve a one-step, straightforward ratio or percent problem;
- Model addition and subtraction of simple rational numbers on the number line;
- Recognize the additive inverse property;
- Recognize simple equivalent expressions;
- Solve simple equations;
- Identify a solution of an inequality;
- Recognize simple geometric shapes based on given conditions;
- Classify pairs of angles;
- Identify the parts of a circle;
- Calculate the area of triangles and rectangles;
- Calculate the volume of cubes;
- Determine whether a sample is random;
- Use the mean to compare and draw inferences about two different populations;
- Understand that probabilities are numbers between 0 and 1.

Basic

A student performing at the **Basic Level** demonstrates partial command of Ohio's Learning Standards for Grade 7 Mathematics. A student at this level has a general ability to work with expressions and linear equations, solve problems involving scale drawings, and work with two- and three-dimensional shapes to solve problems involving area, surface area, and volume.

A student whose performance falls within the **Basic Level** typically can:

- Carry out routine procedures;
- Solve simple problems using visual representations;
- Compute accurately some grade level numbers and operations;
- Recall and recognize some grade level mathematical concepts, terms and properties, and use more previous grade level mathematical concepts, terms and properties.

A student at the **Basic Level** can:

- Compute a unit rate of two familiar rational numbers where the unit rate is explicitly requested;
- Find the whole number constant of proportionality in relationships presented in basic familiar contexts;
- Solve a one-step, straightforward real-world ratio or percent problem.
- Add, subtract, multiply and divide integers;
- Convert between familiar fractions and decimals;
- Apply properties of operations to factor and expand linear expressions with positive integer coefficients;
- Solve two-step equations with integer coefficients;
- Solve simple inequalities with positive integer coefficients;
- Determine a scale from scale drawings of geometric figures and compute an actual length given a measurement in a scale drawing and the scale;
- Draw geometric shapes with given conditions;
- Determine whether a set of any three given angle or side length measurements can result in a triangle;
- Use supplementary, complementary, vertical, or adjacent angles to solve problems with angles expressed as numerical measurements;
- Calculate the area of quadrilaterals and polygons;
- Calculate the volume of right rectangular prisms;
- Calculate the circumference of a circle in mathematical problems;
- Explain whether a sample is random;
- Use measures of center to draw comparisons about two different populations;
- Find probabilities in straightforward situations;
- Use measures of center to draw comparisons about two different populations;
- Find probabilities in straightforward situations.

Proficient

A student performing at the **Proficient Level** demonstrates an appropriate command of Ohio's Learning Standards for Grade 7 Mathematics. A student at this level has a consistent ability to work with expressions and linear equations, solve problems involving scale drawings, and work with two- and three-dimensional shapes to solve problems involving area, surface area, and volume.

A student whose performance falls within the **Proficient Level** typically can:

- Solve most routine and straightforward problems accurately;
- Compute accurately with most grade level numbers and operations;
- Apply most grade level mathematical concepts, terms and properties, and use informal (visual representation and language) and some formal reasoning.

A student at the **Proficient Level** can:

- Compute a unit rate of two rational numbers where the unit rate is not explicitly requested;
- Represent proportional relationships in various formats;
- Use proportional relationships to solve routine real-world and mathematical ratio and percent problems with multiple steps;
- Solve mathematical problems using the four operations on simple rational numbers;
- Convert from fractions to decimals without technology;
- Apply properties of operations to factor and expand linear expressions with simple rational coefficients;
- Use variables to create and solve simple equations and inequalities that model word problems;
- Solve problems involving scale drawings of geometric figures, including computing actual areas from a scale drawing;
- Using technology or math tools, determine whether a set of any three given angle or side length measures can result in a unique triangle, more than one triangle, or no triangles at all;
- Identify the two-dimensional figures that result from routine slices of prisms and pyramids;
- Use supplementary, complementary, vertical, and adjacent angles to solve one- or two-step problems with angle measurements expressed as variables in degrees;
- Solve problems involving the area of two-dimensional objects composed of triangles, quadrilaterals, and polygons;
- Calculate the area and circumference of a circle in real-world and mathematical problems;
- Solve routine real world and mathematical problems involving the surface area and volume of three-dimensional objects composed of cubes and right prisms.
- Describe a random sample of a given population;
- Use measures of variability to draw comparisons about two different populations;

- Understand that a probability near 0 indicates an unlikely event, a probability near ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event;
- Compare theoretical and experimental results from a probability experiment.

Accelerated

A student performing at the **Accelerated Level** demonstrates a strong command of Ohio's Learning Standards for Grade 7 Mathematics. A student at this level has a superior ability to work with expressions and linear equations, solve problems involving scale drawings, and work with two- and three-dimensional shapes to solve problems involving area, surface area, and volume.

A student whose performance falls within the **Accelerated Level** typically can:

- Accurately solve routine and straightforward problems;
- Solve a variety of routine and multi-step problems;
- Compute accurately and efficiently with familiar numbers;
- Recognize connections between mathematical concepts, terms and properties, and use informal and some formal reasoning with symbolic representation.

A student at the **Accelerated Level** can:

- Compare unit rates in a real-world context;
- Use different representations of proportional relationships to solve real-world problems;
- Apply proportional relationships to routine real-world and mathematical ratio and percent problems with multiple steps;
- Solve mathematical problems using the four operations on rational numbers;
- Apply properties of operations to factor and expand linear expressions with rational coefficients;
- Understand that rewriting an expression can show how quantities are related in familiar problem-solving contexts;
- Construct equations and inequalities with a variable to solve routine problems;
- Create and use scale drawings to solve real-world problems;
- Identify the two-dimensional figures that result from non-routine slices of prisms and pyramids;
- Use supplementary, complementary, vertical, and adjacent angles to solve multi-step problems with angle measurements expressed as variables in degrees.
- Given the circumference of a circle, determine its area;
- Solve real-world and mathematical problems involving the surface area three-dimensional objects composed of triangles and rectangles;
- Use measures of variability for numerical data from random samples to draw informal comparative inferences about two populations;
- Find probabilities of compound events in a real-world context;
- Use example situations to explain the differences between theoretical and experimental probabilities.

Advanced

A student performing at the **Advanced Level** demonstrates a distinguished command of Ohio's Learning Standards for Grade 7 Mathematics. A student at this level has a sophisticated ability to work with expressions and linear equations, solve problems involving scale drawings, and work with two- and three-dimensional shapes to solve problems involving area, surface area, and volume.

A student whose performance falls within the **Advanced Level** typically can:

- Solve routine and straightforward problems accurately and efficiently;
- Solve a variety of non-routine multi-step problems;
- Compute accurately and efficiently;
- Recognize, apply and justify mathematical concepts, terms and properties and their connections, and use more formal reasoning and symbolic representation (precise mathematical language).

A student at the **Advanced Level** can:

- Analyze a graph of a proportional relationship in order to explain what the points (x, y) and (1, r) represent, where r is the unit rate, and use this to solve problems;
- Apply proportional relationships to non-routine real-world and mathematical ratio and percent problems with multiple steps;
- Interpret products and quotients of rational numbers in real-world contexts;
- Apply properties of operations to factor and expand linear expressions with complex rational coefficients;
- Understand that rewriting an expression can show how quantities are related in an unfamiliar problem-solving context;
- Construct equations and inequalities with more than one variable to solve non-routine problems;
- Use variables to represent and reason with quantities in real-world and mathematical situations;
- Reproduce scale drawings at a different scale to solve real-world problems;
- Construct triangles from given conditions that involve a variable;
- Solve problems using formulas for the area and circumference of a circle;
- Informally describe the relationship between the two measures;
- Solve complex problems involving the surface area and volume of three-dimensional figures with polygonal faces;
- Assess the degree of visual overlap of two numerical data distributions with similar variability;
- Use measures of variability for numerical data from random samples to draw informal comparative inferences about multiple populations;
- Explain why events are likely or unlikely and use this explanation to make predictions;
- Develop a probability model and use it to find probabilities of events;
- Compare theoretical probabilities (from a model) to observed frequencies (experimental); explain possible sources of the discrepancy between the two measures.