# Grade 8: Standards-Based Skills Worksheet

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The skills inventory worksheets are designed to assist with data analysis and goal writing for standards-based IEPs. They are based on the [Virginia SOL Curriculum Frameworks](http://www.doe.virginia.gov/testing/sol/standards_docs/index.shtml). Go to [Standards-Based IEP](http://www.doe.virginia.gov/special_ed/iep_instruct_svcs/stds-based_iep/) for the *Standards-based Individualized Education Program (IEP) A Guide for School Divisions* for additional information on the process for creating standards-based IEPs.

## Directions

### **Step 1**

Go to [Standards-Based IEP](http://www.doe.virginia.gov/special_ed/iep_instruct_svcs/stds-based_iep/) for to print the appropriate PDF file **Skills Worksheet** that will match the projected (or current if mid-year) grade level for the student.

### **Step 2**

Gather and analyze data to identify how the student has performed in each of the strands included in the curriculum. **Review data on student performance** and indicate all data sources analyzed to assess performance in this strand:

* Present Level of Performance (PLOP)
* Prior SOL data
* Standardized test data
* Classroom assessments
* Teacher observations

### **Step 3**

Based on prior performance, predict what level of instruction ***will be*** necessary for the student to successfully master upcoming curriculum in each of the strands using the following worksheets. Check the areas that specially designed instruction and/or supports may be critical to meeting the standard.

### **Step 4**

After completing the Worksheet, based on data and your knowledge of the student as discussed in the present level of academic and functional performance (PLOP), determine if a goal(s) is/are needed to address the specific skill(s). Guiding Question:  **Is/Are standard-based goal(s) needed?**

* **YES** Address areas of need in PLOP
* **NO Check one or more justifications:** 
  + Accommodations Available (specify):
  + Area of Strength in PLOP
  + New Content
  + Other (Specify):

### **Step 5**

Additional space is provided under each strand for comments or notes on data analysis

## Essential Knowledge and Skills

### Strand: Number and Number Sense (SOL 8.1, 8.2, 8.3a-b)

*The student will:*

**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**

* Compare and order no more than five real numbers expressed as integers, fractions (proper or improper), decimals, mixed numbers, percents, numbers written in scientific notation, radicals, and π. Radicals may include both positive and negative square roots of values from 0 to 400. Ordering may be in ascending or descending order.
* Use rational approximations (to the nearest hundredth) of irrational numbers to compare and order, locating values on a number line. Radicals may include both positive and negative square roots of values from 0 to 400 yielding an irrational number.
* Describe and illustrate the relationships among the subsets of the real number system by using representations (graphic organizers, number lines, etc.). Subsets include rational numbers, irrational numbers, integers, whole numbers, and natural numbers.
* Classify a given number as a member of a particular subset or subsets of the real number system, and explain why.
* Describe each subset of the set of real numbers and include examples and non-examples.
* Recognize that the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.
* Estimate and identify the two consecutive integers between which the positive or negative square root of a given number lies. Numbers are limited to natural numbers from 1 to 400. (a)
* Determine the positive or negative square root of a given perfect square from 1 to 400. (b)

### Strand: Computation and Estimation (SOL 8.4)

*The student will:*

* Solve practical problems involving consumer applications by using proportional reasoning and computation procedures for rational numbers.
* Reconcile an account balance given a statement with five or fewer transactions.
* Compute a discount or markup and the resulting sale price for one discount or markup.
* Compute the sales tax or tip and resulting total.
* Compute the simple interest and new balance earned in an investment or on a loan given the principal amount, interest rate, and time period in years.
* Compute the percent increase or decrease found in a practical situation.

Strand: Measurement and Geometry **(SOL8.5, 8.6a-b, 8.7a-b, 8.8, 8.9a-b, 8.10)**

*The student will*

* Identify and describe the relationship between pairs of angles that are vertical, adjacent, supplementary, and complementary.
* Use the relationships among supplementary, complementary, vertical, and adjacent angles to solve problems, including practical problems, involving the measure of unknown angles.
* Distinguish between situations that are applications of surface area and those that are applications of volume. (a)
* Determine the surface area of cones and square-based pyramids by using concrete objects, nets, diagrams and formulas. (a)
* Determine the volume of cones and square-based pyramids, using concrete objects, diagrams, and formulas. (a)
* Solve practical problems involving volume and surface area of cones and square-based pyramids. (a)
* Describe how the volume of a rectangular prism is affected when one measured attribute is multiplied by a factor of , , , 2, 3, or 4. (b)
* Describe how the surface area of a rectangular prism is affected when one measured attribute is multiplied by a factor of or 2. (b)
* Given a preimage in the coordinate plane, identify the coordinate of the image of a polygon that has been translated vertically, horizontally, or a combination of both. (a)
* Given a preimage in the coordinate plane, identify the coordinates of the image of a polygon that has been reflected over the *x*- or *y*-axis. (a)
* Given a preimage in the coordinate plane, identify the coordinates of the image of a right triangle or a rectangle that has been dilated. Scale factors are limited to , , 2, 3, or 4.   
  The center of the dilation will be the origin. (a)
* Given a preimage in the coordinate plane, identify the coordinates of the image of a polygon that has been translated and reflected over the *x*-or *y*-axis, or reflected over the *x*- or *y*-axis and then translated. (a)
* Sketch the image of a polygon that has been translated vertically, horizontally, or a combination of both. (a)
* Sketch the image of a polygon that has been reflected over the *x*- or *y*-axis. (a)
* Sketch the image of a dilation of a right triangle or a rectangle limited to a scale factor of , , 2, 3, or 4. The center of the dilation will be the origin. (a)
* Sketch the image of a polygon that has been translated and reflected over the *x*- or *y*-axis, or reflected over the *x*- or *y*-axis and then translated. (a)
* Identify the type of translation in a given example. (a, b)
* Identify practical applications of transformations including, but not limited to, tiling, fabric, wallpaper designs, art, and scale drawings. (b)
* Construct three-dimensional models, given the top or bottom, side, and front views.
* Identify three-dimensional models given a two-dimensional perspective.
* Identify the two-dimensional perspective from the top or bottom, side, and front view, given a three-dimensional model.
* Verify the Pythagorean Theorem, using diagrams, concrete materials, and measurement. (a)
* Determine whether a triangle is a right triangle given the measures of its three sides. (b)
* Determine the measure of a side of a right triangle, given the measures of the other two sides. (b)
* Solve practical problems involving right triangles by using the Pythagorean Theorem. (b)
* Subdivide a plane figure into triangles, rectangles, squares, trapezoids, parallelograms, and semicircles.
* Determine the area of subdivisions and combine to determine the area of the composite plane figure.
* Subdivide a plane figure into triangles, rectangles, squares, trapezoids, parallelograms, and semicircles.
* Use the attributes of the subdivisions to determine the perimeter of the composite plane figure.
* Apply perimeter, circumference, and area formulas to solve practical problems involving composite plane figures.

### Strand: Probability and Statistics (SOL 8.11a-b, 8.12a-c, 8.13a-c)

*The student will:*

* Determine whether two events are independent or dependent. (a)
* Compare and contrast the probability of independent and dependent events. (a)
* Determine the probability of two independent events. (b)
* Determine the probability of two dependent events. (b)
* Collect and display a numeric data set of no more than 20 items, using boxplots. (a)
* Make observations and inferences about data represented in a boxplot. (b)
* Given a data set represented in a boxplot, identify and describe the lower extreme (minimum), upper extreme (maximum), median, upper quartile, lower quartile, range, and interquartile range. (b)
* Compare and analyze two data sets represented in boxplots. (c)
* Collect, organize, and represent a data set of no more than 20 items using scatterplots. (a)
* Make observations about a set of data points in a scatterplot as having a positive linear relationship, a negative linear relationship, or no relationship. (b)
* Estimate the line of best fit with a drawing for data represented in a scatterplot. (c

### Strand: Patterns, Functions, and Algebra (SOL 8.14a-b, 8.15a-b, 8.16a-e, 8.17, 8.18)

*The student will:*

* Use the order of operations and apply the properties of real numbers to evaluate algebraic expressions for the given replacement values of the variables. Exponents are limited to whole numbers and bases are limited to integers. Square roots are limited to perfect squares. Limit the number of replacements to no more than three per expression. (a)
* Represent algebraic expressions using concrete materials and pictorial representations. Concrete materials may include colored chips or algebra tiles. (a)
* Simplify algebraic expressions in one variable. Expressions may need to be expanded (using the distributive property) or require combining like terms to simplify. Expressions will include only linear and numeric terms. Coefficients and numeric terms may be rational. (b)
* Determine whether a relation, represented by a set of ordered pairs, a table, or a graph of discrete points is a function. Sets are limited to no more than 10 ordered pairs. (a)
* Identify the domain and range of a function represented as a set of ordered pairs, a table, or a graph of discrete points. (b)
* Recognize and describe a line with a slope that is positive, negative, or zero (0). (a)
* Given a table of values for a linear function, identify the slope and *y*-intercept. The table will include the coordinate of the   
  *y*-intercept. (b)
* Given a linear function in the form *y* = *mx* + *b*, identify the slope and *y*-intercept. (b)
* Given the graph of a linear function, identify the slope and   
  *y*-intercept. The value of the *y*-intercept will be limited to integers. The coordinates of the ordered pairs shown in the graph will be limited to integers. (b)
* Identify the dependent and independent variable, given a practical situation modeled by a linear function. (c)
* Given the equation of a linear function in the form *y* = *mx* + *b*, graph the function. The value of the *y*-intercept will be limited to integers. (d)
* . Write the equation of a linear function in the form *y* = *mx* + *b* given values for the slope, *m,* and the *y*-intercept or given a practical situation in which the slope, *m*, and *y*-intercept are described verbally.(e)
* Make connections between and among representations of a linear function using verbal descriptions, tables, equations, and graphs. (e)
* Represent and solve multistep linear equations in one variable with the variable on one or both sides of the equation (up to four steps) using a variety of concrete materials and pictorial representations.
* Apply properties of real numbers and properties of equality to solve multistep linear equations in one variable (up to four steps). Coefficients and numeric terms will be rational. Equations may contain expressions that need to be expanded (using the distributive property) or require collecting like terms to solve.
* Write verbal expressions and sentences as algebraic expressions and equations.
* Write algebraic expressions and equations as verbal expressions and sentences.
* Solve practical problems that require the solution of a multistep linear equation.
* Confirm algebraic solutions to linear equations in one variable.
* Apply properties of real numbers and properties of inequality to solve multistep linear inequalities (up to four steps) in one variable with the variable on one or both sides of the inequality. Coefficients and numeric terms will be rational. Inequalities may contain expressions that need to be expanded (using the distributive property) or require collecting like terms to solve.
* Graph solutions to multistep linear inequalities on a number line.
* Write verbal expressions and sentences as algebraic expressions and inequalities.
* Write algebraic expressions and inequalities as verbal expressions and sentences.
* Solve practical problems that require the solution of a multistep linear inequality in one variable.
* Identify a numerical value(s) that is part of the solution set of a given inequality.