What the WorkKeys® Applied Mathematics Test Measures

The Applied Mathematics test is one of three WorkKeys assessments used with the National Career Readiness Certificate program. This assessment measures the skill people use when they apply mathematical reasoning, critical thinking, and problem-solving techniques to work-related problems. The test questions require the examinee to set up and solve the types of problems and do the types of calculations that actually occur in the workplace.

This test is designed to be taken with a calculator. A formula sheet that includes all formulas required for the assessment is provided. While individuals may use calculators and conversion tables to help with the problems, they still need to use math skills to think them through.

There are five levels of difficulty. Level 3 is the least complex, and Level 7 is the most complex. The levels build on each other, each incorporating the skills assessed at the previous levels. For example, at Level 5, individuals need the skills from Levels 3, 4, and 5.

Level	Characteristics of Items	Skills
3	- Translate easily from a word problem to a math equation - All needed information is presented in logical order - No extra information	- Solve problems that require a single type of mathematics operation (addition, subtraction, multiplication, and division) using whole numbers - Add or subtract negative numbers - Change numbers from one form to another using whole numbers, fractions, decimals, or percentages - Convert simple money and time units (e.g., hours to minutes)
Level	**Characteristics of Items**	**Skills**
4	- Information may be presented out of order - May include extra, unnecessary information - May include a simple chart, diagram, or graph	- Solve problems that require one or two operations - Multiply negative numbers - Calculate averages, simple ratios, simple proportions, or rates using whole numbers and decimals - Add commonly known fractions, decimals, or percentages (e.g., 1/2, .75, 25%) - Add up to three fractions that share a common denominator - Multiply a mixed number by a whole number or decimal - Put the information in the right order before performing calculations
Level	**Characteristics of Items**	**Skills**
5	Problems require several steps of logic and calculation (e.g., problem may involve completing an order form by totaling the order and then computing tax)	- Decide what information, calculations, or unit conversions to use to solve the problem - Look up a formula and perform single-step conversions within or between systems of measurement - Calculate using mixed units (e.g., 3.5 hours and 4 hours 30 minutes) - Divide negative numbers - Find the best deal using one- and two-step calculations and then compare results - Calculate perimeters and areas of basic shapes (rectangles and circles) - Calculate percent discounts or markups

Level	Characteristics of Items	Skills
6	• May require considerable translation from verbal form to mathematical expression • Generally require considerable setup and involve multiple-step calculations	• Use fractions, negative numbers, ratios, percentages, or mixed numbers • Rearrange a formula before solving a problem • Use two formulas to change from one unit to another within the same system of measurement • Use two formulas to change from one unit in one system of measurement to a unit in another system of measurement • Find mistakes in questions that belong at Levels 3, 4, and 5 • Find the best deal and use the result for another calculation • Find areas of basic shapes when it may be necessary to rearrange the formula, convert units of measurement in the calculations, or use the result in further calculations • Find the volume of rectangular solids • Calculate multiple rates
Level	**Characteristics of Items**	**Skills**
7	• Content or format may be unusual • Information may be incomplete or implicit • Problems often involve multiple steps of logic and calculation	• Solve problems that include nonlinear functions and/or that involve more than one unknown • Find mistakes in Level 6 questions • Convert between systems of measurement that involve fractions, mixed numbers, decimals, and/or percentages • Calculate multiple areas and volumes of spheres, cylinders, or cones • Set up and manipulate complex ratios or proportions • Find the best deal when there are several choices • Apply basic statistical concepts