

# Career Mathematics (2015): Grades 9, 10, 11, 12

Adopted 2015

## Measurement

**1. Critique the appropriateness of measurements in terms of precision, accuracy, and approximate error.** *CM.1*

- a. Determine dimensions by scaling plans or blueprints. *CM.1.A*
- b. Apply knowledge of fractions for reading a ruler to 1/16 inch. *CM.1.B*
- c. Convert decimals to fractions for interpreting blue prints and measuring materials. *CM.1.C*
- d. Compare Metric and English systems of measurements used in industry. *CM.1.D*
- e. Identify various measuring tools and demonstrate their use to verify precision, accuracy, and approximate error. *CM.1.E*

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**2. Use ratios of perimeters, areas, and volumes of similar figures to solve applied problems.** *CM.2*

- a. Calculate area utilizing the Pythagorean Theorem. *CM.2.A*
- b. Demonstrate an understanding of blueprints and drawings. *CM.2.B*
- c. Calculate estimates for construction or repair projects. *CM.2.C*

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## Entrepreneurial Economics and Finances

**3. Use algebraic and geometric reasoning and problem-solving skills to make informed financial and economic decisions, including those involving banking and investments, insurance, personal budgets, credit purchases, recreation, and deceptive and fraudulent pricing and advertising.** *CM.3*

- a. Create graphs and tables related to personal finance and economics. The use of appropriate technology is encouraged for numerical and graphical investigations. *CM.3.A*
- b. Analyze job opportunities and career pathways related to business or industry. *CM.3.B*
- c. Evaluate the economics of establishing and owning a business. *CM.3.C*
- d. Make inferences and justify conclusions from economic conditions that can affect hiring and layoff decisions. *CM.3.D*

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**4. Use formulas or equations of functions to calculate outcomes and analyze models of exponential growth or decay.** CM.4

- a. Interpret depreciation cost of decay relationships. CM.4.A
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**5. Approximate rates of change of nonlinear relationships from graphical and numerical data.** CM.5

- a. Graph functions expressed in tables, equations, or classroom-generated data to model consumer costs and to predict future outcomes. CM.5.A
- b. Analyze interest rates, depreciation, and tax rates in order to determine how each affects the cost of owning and/or operating a business. CM.5.B
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**6. Summarize and interpret data represented in tables or graphs in order to make predictions.** CM.6

- a. Predict trends about population change that will affect employment rate. CM.6.A
- b. Calculate pay scale based on occupational outlook projections. CM.6.B
- c. Calculate operating costs, including cost of materials, supplies, equipment, license fees, and insurance fees. CM.6.C
- d. Construct charts that reflect current demographics in various industries. CM.6.D
- e. Forecast growth and decline of various career fields by interpreting data from charts and graphs. CM.6.E
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**Algebra**

**7. Analyze and solve application-based problems relating to direct, inverse, and joint variation.** CM.7

- a. Utilize mathematical skills for trouble-shooting in business and industrial applications. CM.7.A
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**8. Calculate the maximum and minimum values of a function using linear programming procedures.** CM.8

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**9. Use the maximum value of a given quadratic function to solve applied problems.** CM.9

- a. Calculate operation cost to maximize profit. CM.9.A
- b. Calculate appropriate materials to use for an application. CM.9.B
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**Geometry**

**10. Solve application-based situations by using the properties of right triangles, including trigonometric ratios.** CM.10

- a. Determine overall angles or dimensions while working with various materials. CM.10.A
- b. Use trigonometric ratios to apply properties of a right triangle to drawings or blueprints. CM.10.B

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**11. Analyze and interpret the aesthetics of real-life situations using line symmetry, rotational symmetry, or the golden ratio.** CM.11

- a. Design drawings or blueprints to include pictorial, top, front, sides, back, and detailed views. CM.11.A
- b. Construct a project from designed drawings. CM.11.B

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**12. Apply arc lengths and areas of sectors of circles to solve problems.** CM.12

- a. Determine allowable geometric tolerance in various industrial applications. CM.12.A

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**Data Analysis and Probability**

**13. Estimate the equation of a curve of best fit from tables of values or scatter plots to model a set of data.** CM.13

- a. Formulate tables from occupational outlook data to predict employment rates in various industrial areas. CM.13.A
- b. Construct scatter plots to analyze data and develop a plan that is most suitable for the application. CM.13.B

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**14. Estimate probabilities given a frequency distribution.** CM.14

- a. Make decisions basis on probabilities. CM.14.A