



“Enough Money to Live on for the Rest of Your Life, Plus 25 Cents...”

National Standards: Mathematics > Number and Operations

NM-NUM.3.-5.2, NM-NUM.6-8.2 Understand meanings of operations and how they relate on one another (Grades 4, 5 & 6)

- Understand the effects of multiplying and dividing whole numbers.
- Identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems.
- Understand the meaning and effects of arithmetic operations with fractions, decimals, and integers.
- Use the associative and commutative properties of addition and multiplication and the distributive property of multiplication over addition to simplify computations with integers, fractions, and decimals.

NM-NUM.3.-5.3, NM-NUM.6-8.3 Compute fluently and make reasonable estimates (Grades 4, 5 & 6)

- Develop fluency in adding, subtracting, multiplying, and dividing whole numbers.
- Develop and use strategies to estimate the results of whole-number computations and to judge the reasonableness of such results.
- Select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools.
- Select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods.
- Develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use.
- Develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results.

National Standards: Mathematics > Algebra

Understand patterns, relations, and functions

NM-ALG.3-5.2 Represent and analyze mathematical situations and structures using algebraic symbols (Grades 4, 5 & 6)

- Represent the idea of a variable as an unknown quantity using a letter or a symbol.
- Express mathematical relationships using equations.
- Develop an initial conceptual understanding of different uses of variables.
- Use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships.

NM-ALG.3-5.3 Use mathematical models to represent and understand quantitative relationships (Grades 4, 5 & 6)

- Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.

- Model and solve contextualized problems using various representations, such as graphs, tables, and equations.

NM-ALG.3-5.4 Analyze change in various contexts (Grades 4 &5)

- Investigate how a change in one variable relates to a change in a second variable.
- Use graphs to analyze the nature of changes in quantities in linear relationships.

National Standards: Mathematics > Problem Solving

NM-Prob.PK-12.1, Build new mathematical knowledge through problem solving (Grades 4, 5 & 6)

NM-PROB.PK-12.2 Solve problems that arise in mathematics and in other contexts (Grades 4, 5 & 6)

NM-Prob.PK-12.3 Apply and adapt a variety of appropriate strategies to solve problems (Grades 4, 5 & 6)

NM-Prob.PK-12.4 Monitor and reflect on the process of mathematical problem solving (Grades 4, 5 & 6)

Kentucky: Mathematics Standards

- Develop and apply strategies to problems from everyday and mathematical situations an evaluating the solutions relative to the original problem situation.
- Multiple strategies for modeling, interpreting, and formulating problems based in real-world situations, within and outside mathematics, and aids in investigating and understanding mathematical content.
- Recognizing patterns and relationships and using model, known facts, and mathematical properties to explain and justify thinking.
- Relate concepts to other concepts and procedures.
- Relate mathematical ideas within mathematics and to other disciplines using graphic, numerical, physical, algebraic, and verbal models.
- Relate concepts of a mathematical topic to other disciplines.

Number and Computation

M-4-NC-10

- Understand and apply computational procedures for adding, subtracting, multiplying and dividing whole numbers using memorized basic facts.

M-4-NC-12, M-6-NC-7

- Add, subtract, multiply and divide whole numbers.

M-5-NC-12

- Explore appropriate estimation procedures.

M-6-NC-11

- Use prime numbers, composite numbers, factors, multiples an divisibility to solve problems.

Algebraic Ideas

M-4-A-2, M-5-A-2, M-6-A-4

- Explore variables and solve equations using variables.

M-6-A-3

- Write and solve equations with one variable, using concrete and/or informal methods that model everyday situations.

M-6-A-5

- Solve problems involving simple formulas.

Probability and Statistics

M-4-PS-2, M-5-PS-2, M-6-PS-3

- Choose appropriate means to collect and represent data

M-4-PS-5, M-6-PS-2

- Draw conclusions based on data

M-4-PS-4, M-5-PS-2, M-6-PS-1

- Pose questions, collect, organize, and display data; and choose an appropriate way to collect and represent data; analyze, and interpret data in a variety of graphical methods, including line plots, line graphs, bar graphs, and stem and leaf pods.

Ohio: Mathematics > Number, Number Sense and Operations Standards

- Demonstrate number sense, including an understanding of number systems and operations and how they relate to one another.
- Compute fluently and make reasonable estimates using paper and pencil, technology-supported and mental methods.

Benchmark(s)

Grade 4

- J. Estimate the results of whole number computations using a variety of strategies, and judge the reasonableness.
- K. Analyze and solve multi-step problems involving addition, subtraction, multiplication and division of whole numbers.
- L. Use a variety of methods and appropriate tools (mental math, paper and pencil, calculators) for computing with whole numbers.

Grades 5 & 6

- F. Apply number system properties when performing computations.
- I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.

Ohio: Mathematics > Patterns, Functions and Algebra Standard

- Use patterns, relations and functions to model, represent and analyze problem situations that involve variable quantities.
- Analyze, model and solve problems using various representations such as tables, graphs and equations.

Benchmark(s)

Grade 4

- E. Use variables to create and solve equations representing problem situations.
- G. Describe how a change in one variable affects the value of a related variable.

Grades 5 & 6

- D. Use symbolic algebra to represent and explain mathematical relationships.
- E. Use rules and variables to describe patterns, functions and other relationships.
- F. Use representations, such as tables, graphs and equations, to model situations and to solve problems, especially those that involve linear relationships.
- G. Write, simplify and evaluate algebraic expressions.

Ohio: Mathematics > Mathematical Processes Standard

- Use mathematical processes and knowledge to solve problems.
- Apply problem-solving and decision-making techniques, and communicate mathematical ideas.

Benchmark(s)

Grades 4, 5, & 6

A-K

Objective

Students will demonstrate an understanding of the concept for “cost of living.”
Students will use numbers and number sense to calculate and compute monetary values for various needs.

Materials

- Paper
- Pencil
- Calculators or computers
- Graph paper
- Spreadsheet program

Vocabulary

- Computation
- Division
- Remainder
- Round
- Analyze
- Variable

Activity

Teacher will:

- Have students recall the scene in the play, *Aesop's Fables*, in which Terrier gives Mouse “enough money to live on for the rest of your life, plus twenty-five cents”.
- Ask students to write down how much money they think they personally would need for the rest of their lives. *Students will not share this information with peers, but keep it for revisiting at a later time in the activities.*
- Have students brainstorm ideas of what is needed to live for “the rest of one’s life.” *All reasonable answers are acceptable.*
- Take all items from the brainstormed list and narrow items down to only those that are essential (e.g., food, shelter, clothing, gas, electricity, transportation, etc.) for living.
- Have students research and discover the average ages for an adult male and female.

Students will:

- Research the cost of living today; price of current items.
- Use calculations to find out the cost of items for a daily basis. (e. g., If something normally costs \$60 per month, divide \$60 by 30 days and the answer is \$2 per day.)
- Determine the daily value of items and add them to calculate a daily cost of living total. *Students will round figure to the nearest dollar. If students calculate a weekly, monthly, or yearly cost, have them divide by 7 days, 30 days or 365 days to obtain a daily cost sum.*
- Make a table chart/graph that illustrates how much it costs to live for a week (multiply a daily total by 7), a month (multiply a weekly total by 4), and a year (multiply a monthly total by 12). *Students will complete computations with pencil and paper, and then check answers with a calculator.*
- Subtract their present age from the discovered average age for an adult male and female.
- Multiply the difference in ages with the previously calculated yearly cost of living total. *The result will be the amount of money needed for a student to live for the rest of his/her life.*

Activity Extensions

- Use a computer and a spreadsheet program to create a table illustrating the cost of living per day, week, month, year, and for life. Have students create and manipulate the spreadsheet through the use of programmed formulas to calculate data electronically. This allows for ease in changes and immediate visual results for any changes.
- Exploring inflation. Have students calculate the cost of the first year, and then add a certain percentage to the total of the second year. Have students continue this process for every year for a set number of years. This activity is also appropriate with use of a spreadsheet.
- Have students add in an item or two that are not needs, but “wants” (e.g., vacations, movies, golf, etc.). Students will compare the new costs for wants, to the costs for “needs” only.

Performance Assessment

Teacher will evaluate students' abilities to:

- Explain verbally or in writing their calculations for the numbers/totals obtained through problem solving.
- Create a graph representing the cost of living per day, week, month, and year.
- Change a variable with use of spreadsheet formula, if available, to explain changes in the final outcome for a cost of living.