Gold Seal Lesson:

Copernicus Education Gateway

Author(s): **Ben Lindeman**			*Lesson Title:* **Tossing Out the Pans**			
Grade Span			***ICLE Application Model***			
K-4	***5-8*** ***XX***	***9-12*** ***XX***	***A***	***B***	***C***	***D*** ***XX***

Instructional Focus:

Number Operation and Concepts
Students use number, number sense, and number relationships in a problem-solving situation. Students communicate the reasoning used in solving these problems.

Algebraic Concepts and Relationships
Students use algebraic methods to investigate, model, and interpret patterns and functions involving numbers, shapes, data, and graphs in a problem-solving situation. Students evaluate and communicate the reasoning used in solving these problems.

Statistics and Probability
Students use statistics and probability to analyze given situations and the results of experiments. Students communicate the reasoning used in arriving at a conclusion.

Writing
Students write for a variety of purposes and audiences with sophistication and complexity appropriate to the grade level.

Tools and Technology
Students use appropriate tools and technologies to model, measure, and apply the results in a problem-solving situation. Students communicate the reasoning used in solving these problems.

Problem-Solving and Mathematical Reasoning
Students apply a variety of problem-solving strategies to investigate and solve problems from across the curriculum as well as from practical applications.

Performance Task

The accompanying chart ("Percent of Households with Item on Hand") shows that fewer U.S. households have some common kitchen items in 1999 than they did in 1993. The figures are given in percentages. Your task is to pretend that you are the manager of the kitchen department in a large department store and that you need to place an order to the warehouse to have a sufficient number of pans in stock in your department. You should order according to the guidelines and constraints stated below. Show all necessary work and write a good explanation of how you made your decision of how many boxes of each to order. You may use the calculator as needed to complete this task.
Complete the "Warehouse Order Form."

Guidelines and Constraints:

1. You have room in your store's stockroom to store no more than 500 pans.
2. Your present inventory is as follows:
   frying pans: 42
   sauce pans: 16
   roasting pans: 5
   mixers: 29
   popcorn poppers: 85
3. You should use the 1999 percent numbers to help you determine the quantity of each type of pan you need to order.
4. Pans are packaged in boxes containing the following number of pans:
   frying pans: 25 per box
   sauce pans: 25 per box
   roasting pans: 15 per box
   mixers: 35 per box
   popcorn poppers: 10 per box

***Note to the teacher*: The table "Percent of Households with Item on Hand"** is based on a graph from the daily newspaper *USA Today*, which is a good source of graphs and data.

ICLE Essential Skills

Perform ***operations with signed*** (positive and negative) ***numbers***, including decimals, ratios, percents, and fractions (m1)
Understand the ***use of variables*** in expressions such as 4x, x+2, and 2x-1, solve for the variable, and know how to represent expressions such as "twice the number" or "four more than the number" using variables (m7)
Understand the best procedures for statistical ***data collection, organization, and display*** including making estimates and predictions and drawing inferences (m5)
Understand and use graphs, charts, and visuals to enhance informational writing and oral presentations (ela29)

Scoring Guide:

4 The student completes the entire task. All numerical calculations are shown and correct. The student uses a correct strategy to determine the number boxes of each item to be ordered and follows all guidelines/constraints given in the problem. The explanation of the strategy used is complete, concise, and clear. The student demonstrates an understanding of how to use charts and data to solve problems involving mathematics. The "Warehouse Order Form" is completed and made out neatly.

3 The student completes the entire task. All numerical calculations are shown , but may contain one or two minor errors in. The student attempts to use a correct strategy to determine the number boxes of each item to be ordered, but has some difficulty following the guidelines/constraints given in the problem. Some minor assistance is needed to complete the problem. The explanation of the strategy used is fairly complete, but is not particularly clear nor concise. The student demonstrates some understanding of how to use charts and data to solve problems involving mathematics. The "Warehouse Order Form" is completed and made out neatly.

2 The student needs a lot of help to complete the entire task. Most numerical calculations are shown , but contain several errors. The student has difficulty finding a strategy to determine the number boxes of

each item that need to be ordered. The guidelines and constraints given in the problem are not followed completely. The explanation of the strategy used is incomplete, unclear, and only partially correct. The student demonstrates only minimal understanding of how to use charts and data to solve problems involving mathematics. The "Warehouse Order Form" is not totally completed.

1 Even with considerable help, the student is unable to complete the entire task. Little, if any, of the numerical calculations are shown, and they contain numerous errors. The student does not develop a viable strategy to determine the number boxes of each item that need to be ordered. The guidelines and constraints given in the problem are hardly followed. There is no explanation of any strategy used to find the number of boxes of each item to be ordered. The student demonstrates little, if any, understanding of how to use charts and data to solve problems involving mathematics. The "Warehouse Order Form" is missing, incomplete, or contains errors.

Keywords

English Language Arts	Mathematics	Science
Reading	**Algebra** Computation Cost Analysis Equations Ratio	**Earth Science**
Writing Technical Writing	**Geometry**	**Life Science**
Communications	**Statistics** Charts Graphs Problem Solving Tables Technology	**Chemistry**
Literature	**Calculus**	**Physics**
Other	**Trigonometry**	**Other**
	Other	

Picture, Chart, or Graph file:

Tossing Out the Pans

Fewer U.S. households have these common kitchen items. Percent of households with item on hand:

Item	1993	1999
Frying Pan	99%	94%
Sauce Pan	99%	92%
Roasting Pan	67%	57%
Mixer	91%	81%
Popcorn Popper	52%	34%

SOURCE: NPD Group
Research/Pat Carr; Graphic/Paul Trap