When Will We Use This? Getting the Context Right!

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NCTM 2016

Fun & Games at the Class Outing: At the class outing, 24 boys and 16 girls want to play in a softball tournament. There will be 4 teams of 10 players. Coach Cabrera, who organized the tournament, wants to have same ratio of boys to girls on each team. How many boys and how many girls should she put on each team?

At the same outing, 20 boys and 40 girls want to play in a volleyball tournament. There will be 10 teams of 6 players. Coach Anderson, who organized the tournament, wants to have same ratio of boys to girls on each team. How many boys and how many girls should be assigned to each team?

Why do you think the coaches wanted to keep the ratios of boys to girls on each team the same? ***How does this question compare to the boy-girl ratio question?***

Consider this problem: Yellow and blue paint were mixed in a ratio of 5 to 3 to make green paint. After 14 liters of blue paint were added, the amount of yellow paint and blue paint in the mixture was equal. How much green paint was in the mixture at first? (Common Core Tools, commoncoretools.wordpress.com). ***What makes this problem inauthentic? How would you revise it?***

Goldilocks' Chair - If the Chair Fits...The Goldilocks Chair Company is making a new armchair. They want the chair to fit 90% of all adults. They decide to ask 778 adults to sit in the chair to test four chair measurements: the height of the seat above the floor, the depth of the seat from front to back, the height of the armrests above the floor, and the height of the lower back support. ***What would you ask students?***

Chair measurement	**Number of people who did not fit**
height of the seat	85
depth of the seat	58
height of the armrests	117
height of the lower back support	55

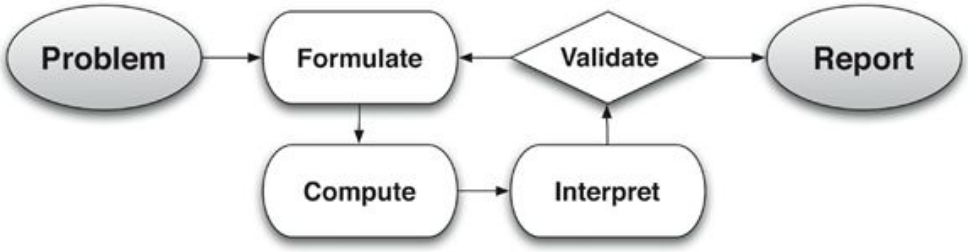
Solar Hot Water Heater: According to the U.S. Department of Energy, a solar hot water heating system cuts the cost of heating water by 50%, based on the average consumption by a household that has on average 2.6 occupants. Suppose a family of 5 is considering installing a new solar water heating system that costs a total of $1,595. If the average cost of heating water with electricity for households averaging 2.6 occupants is $520 per year and if the average cost per year of heating water by natural gas for households averaging 2.6 occupants is $200...***What would you ask students?***

A FRAMEWORK FOR AUTHENTIC PROBLEMS

1. Ought to have clear connections to the real world.
2. Should be somewhat ill-defined and require more than a few minutes to solve.
3. Require taking more than a single perspective and use information from multiple sources.
4. Allow for student collaboration.
5. Demand student reflection, on the problem itself as well as its solution.

(Herrington and Oliver, 2000 & Lombardi, 2007)

CCSSM MODELING CYCLE



“The basic modeling cycle...involves (1) identifying variables in the situation and selecting those that represent essential features, (2) formulating a model by creating and selecting geometric, graphical, tabular, algebraic, or statistical representations that describe relationships between the variables, (3) analyzing and performing operations on these relationships to draw conclusions, (4) interpreting the results of the mathematics in terms of the original situation, (5) validating the conclusions by comparing them with the situation, and then either improving the model or, if it is acceptable, (6) reporting on the conclusions and the reasoning behind them.”

(CCSS, 2010, p.72).