

**Mathematics Governor's Institute 2003
Problem-in-a-Bag Template**

LET'S BAG IT!

Team Members:

**Leanne Yurkanin
Katie Holzman
Larry Porterfield
Scott Fisher**

A Problem-in-a-Bag for 5th graders

Concept(s) used: Measurement, Prediction, Fractions, Decimals, Estimation, Problem-solving

PA Standard(s) Addressed:

2.2.5B. Develop and apply algorithms to solve word problems that involve addition, subtraction and/or multiplication with decimals with and without regrouping.

2.2.5C. Develop and apply algorithms to solve word problems that involve addition, subtraction and/or multiplication with fractions and mixed numbers that include like and unlike denominators.

2.2.5G. Apply estimation strategies to a variety of problems include time and money.

2.3.5E. Add and subtract measurements.

2.5.5A. Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense and explain how the problem was solved.

NCTM Standard(s) Addressed:

Compute fluently and make reasonable estimates.

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Apply appropriate techniques, tools and formulas to determine measurements.

Objectives / applications: Students will create a bag containing three types of candy that meets the weight and cost criteria determined by the instructor.

Problem: Using the data provided, create a bag of candy that weighs 5 lbs. and costs between \$7.00 and \$8.00. You must have some of each type of candy in your bag. Explain your choices.

Model: Before beginning the activity, you may want to pose questions that use weight and cost criteria. For instance, "If I have \$2.00 and candy costs \$0.50 per pound, how many pound of candy can I buy?" "If I have \$2.00 and candy costs \$0.50 per $\frac{1}{2}$ pound, how many pounds of candy can I buy?" and "I have \$2.00 and candy costs \$0.50 per $\frac{1}{4}$ pound, how many pounds of candy can I buy?"

Resources and Materials (estimated cost):

Three types of candy
Bags
Calculators
Paper
Pencils

Procedures & Activities: see attached

[Teacher Procedure.doc](#)

[Let's Bag It worksheet.doc](#)

Answers / Rubric:

- 5 Student met weight criteria and purchased all types of candy within cost range. Student included an explanation with advanced understanding.
- 4 Student met weight criteria and purchased all types of candy or fell within cost range. Student included an explanation with satisfactory understanding.
- 3 Student met weight criteria but did not purchase all types of candy and did not fall within the cost range. Student included an explanation with almost satisfactory understanding.
- 2 Student did not meet weight criteria but did either purchase all types of candy or fell within the cost range. Student included an explanation with partial understanding.

- 1 Student made an attempt to solve the problem. Student included an explanation with minimal understanding.
- 0 Student made no attempt to solve the problem.

Accommodations/Adaptations

ESL: Depending on your population, you may choose to set up this problem using metrics.

Special Ed: To accommodate these students, you may drop the cost criteria and work with only the weights. You may also decide to work with the cost and eliminate the weight requirement.

Enrichment: To extend this project, you could set up the problem in ounces and have the students convert the measurements to pounds. You could also add another type of candy to the mix. Finally, you could have the students actually weigh samples of the candy using a balance scale and work with the exact weights and costs.

Teacher Procedure for "Let's Bag It!"

1. Students must have previous experience with guess and check problem solving, fractions and decimals.
2. To introduce the lesson, begin with questions that lead children to the relationship between weight and cost when buying candy in bulk.
3. Model some possible purchases using one candy with many weights per cost criteria.
4. Display candy and explain the problem.
5. Reveal the pricing by weight for each candy selection.
6. Hand out student worksheet and point out the pricing that is listed on the top of the page.
7. Allow students to begin working on the problem. Monitor their discussions. Answer any questions they may have.
8. After a reasonable amount of work time, bring the group back together as a class and allow them to present their solutions in front of the class. Address any problems or errors during these presentations.
9. Collect the worksheets and grade according to the rubric.

Note: You may want to construct a presentation area using a tri-fold backboard. You will need a large gift bag, plastic bowls, a glue gun, markers and candy. Cover the backboard with colorful paper. Cut the front out of the bag and hot glue the bag onto the backboard. Cut three bowls in half and hot glue three of the halves to the inside the bag that is on the backboard. Glue the bowls in a diagonal pattern. Label the backboard with the name of the problem and the weight and price data for each candy. The student may present their solution by placing the three candy choices, the total weight and total cost in the three bowls.

