School Store
Higher-Order Thinking Lesson #8
Fourth Grade, Calhoun
Date: Tuesday, February 19, 2007
Approximate Time: 1 hour

Concept: Open-ended task with multiple constraints (CMT Strand 25)

<u>**Learning Objectives:**</u>
Students will be able to:
1. Provide mathematical definitions for "between," "at least," and "exactly."
2. Determine the mathematical goals of the open-ended task.
3. Calculate the cost of each kind of school supply by adding or multiplying.
4. Follow the mathematical constraints of the task.

<u>**Language Objectives:**</u>
Students will be able to:
1. Apply open-ended problem strategies (reread the task, underline key words, etc.) to make sense of the task.
2. Give realistic examples to describe "between," "same number," "at least," "exactly," and "no more than."
3. Explain and give an example of what a constraint is.
4. Explain the process of solving an open-ended task.

<u>**Materials:**</u>
1. School Store task
2. School Store think questions
3. Checkpoint stickers
4. Manipulatives (cutouts with prices attached)??
5. Reflection & Rubric Sheet

<u>**Procedures:**</u>
1. Go over learning and language objectives (whole-class.)
2. Unpack task as whole-class (go sentence by sentence). Remind students of strategies (refer to laminated poster.) Here, many of the learning & language objectives will be addressed.
   Questions to guide whole-class discussion:
   - What are the key words in this sentence? Why?
   - What is the problem asking you to do?
   - What numbers are between 1 and 4? Who is sitting between Kevin and me?
   - How might we use estimation in this problem?
   - Is cost important in this problem?
   - Where might you see a similar situation?
3. Explain how checkpoint system works (all students should be able to explain how they solved the problem/thought process/any struggles they encountered, give each student a sticker when they do this.)
4. Students work in pairs. Remind students of pair norms (respect each other, encourage each other, always stay on task). Monitor, guide students. Enforce checkpoints!
5. Regroup as whole class to discuss processes and solutions. Is there only one right answer?

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6. Students independently reflect on task and difficulties they had. Self-evaluate.

<u>Assessments:</u>
   1. School Store task
   2. School Store think questions
   3. Reflection & Rubric
   4. Teacher Rubric
   5. Observations – whole-class and pairs discussions
   6. Checkpoints

Name: _____   Date: _____

Grade 4 – Strand 25

School Store

Your teacher has given you money to buy supplies at the school store. Your teacher has asked you to buy the following:

- Between 5 and 8 pencils
- The same number of erasers as pencils
- At least 5 folders
- Exactly 4 different items

Your teacher has asked you to spend **no more than $8.50** total on all of the school supplies.

Below is a price listing of what the school store sells:

Item	Price per item
Pencil	$.25
Eraser	$.10
Blue Pen	$.50
Red Pen	$.50
Folder	$1.25
Notebook Paper Pack	$2.00
Chalk	$2.50
Ruler	$1.00

Fill in the chart to show which items you would buy, the number of each item you would buy, the cost per item, and the total cost for each kind of item. Then, find the total cost of all of the supplies. On the next page, underline show all of your work AND explain in words how you solved this problem.

Item	Number of each item	Cost per item	Total cost

Total Cost of all supplies:

_____

SHOW YOUR WORK HERE:

EXPLAIN IN WORDS HOW YOU SOLVED THIS PROBLEM:

_____

_____

_____

_____

_____

☆   **CHECKPOINT!!** Please call over a teacher to check your work. You should be able to explain how you solved this problem.

Name: _____   Date: _____

School Store – Think Questions

1. For the price of one blue pen, what other supplies could you buy? Show your work.

2. Suppose your teacher allowed you to spend $10. What additional supplies could you buy? Show your work.

3. Your teacher made a mistake. She actually wanted twice as many erasers as pencils. How much more money will you need to buy the additional erasers? Show your work. Then, explain how you got your answer.

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_____

_____

_____

Name: _____   Date: _____

Reflection & Rubric for Open-Ended Problems

1. Write down the difficult words from this problem.

_____

_____

2. What was the hardest part about solving this problem?

_____

_____

_____

3. What did you like about solving this problem?

_____

_____

_____

Criteria	Score
wrong answer, no work shown/no explanation	0
right answer, no work shown/no explanation **OR** wrong answer, work shown/explanation given	1
right answer, work shown/explanation given	2