

More for the Money

I have been looking through catalogs for new pencils to order for my class of 16 students. Every time the ones I have get sharpened, all the lead falls out of them. So, I have decided to give mechanical pencils a try, even though they are more expensive.

Please help me!!! I need to find the best deal. Please refer to the price sheet to see the information I have.

Which pencils should I order?

Which are the least expensive per pencil? Which are the most expensive per pencil?

How many sets or individual pencils do I need to order? How much will my total order cost?

Why do you think all the pencils are not the same price?

Grade Levels 3 - 5

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Context

The pencils I have for my kids seem to be defective. All the lead falls out when they are sharpened! This is a frustrating situation for us all. Thus, the context for this problem.

In math I have also just introduced division. This problem seemed to pull it all together and the kids really liked it a lot.

What This Task Accomplishes

This task allowed the children to explore division and marketing ploys in a situation that was meaningful to them. They were invested in the solution and intrigued by their findings. This problem was a catalyst for some great discussions revolving around better buys and cost analysis.

What the Student Will Do

Most students will use a calculator if available. It was necessary for my students, as they had not learned the mechanics of long division yet. If calculators are used, children will spend some time exploring the difference between the divisor and dividend.

Some students may have a difficult time understanding that some pencils can only be bought in packs of five, 10 or 12 even though they have a cost per pencil for those pencils.

Time Required for Task

More for the Money

Exemplars

Two to three, 45-minute periods

Interdisciplinary Links

This problem would go well with a number of different units or themes such as advertising, marketing or money.

I often let my students look through teacher catalogs in order to help me pick out things to order for the next year. They love to do this and it gives them experience at reading catalogs and doing a lot of math.

Teaching Tips

Let kids use calculators. If you have not introduced your kids to them formally yet, this is a great time. If you use Explorer calculators, this is a great time to let the kids experiment with the "INT div." button and let them come to a conclusion of what an integer is and is not.

Use real catalogs and have the original colorful copy available for the students to use.

Before we did this problem we did some much easier problems together, such as, "If two hot dogs cost \$1.75, how much does each one cost?" These simple problems allowed the children to discover the powerful tool of making a simpler problem to decide what to do, (in their words...how to figure out what is divided by what).

Suggested Materials

- Explorer calculators
- Graph paper
- Money manipulatives
- Base-10 blocks
- Catalogs
- Price sheet (see page 5)

Possible Solutions

Cost per pencil will/should be consistent if children are using the same catalogs although final responses will vary depending upon the decisions made. For example, some students did not choose the least expensive pencils because they did not like them. Some children included containers of lead refills; other children wanted each child to have more than one pencil. Some children felt it was important to buy all the same pencils in order to be fair while others felt that a variety would offer choice.

Benchmark Descriptors

More for the Money

Exemplars

Novice

This piece contains no evidence of a strategy or procedure used. The information the student gives is incorrect; the Sports® pencils are not the least expensive. The student's response contains no representation or explanation and is incomplete.

Apprentice

This solution is incomplete. It is not clear that the student understood the problem. Some evidence of mathematical reasoning is shown although it is unclear that the student understands that two packs of pencils would be needed for students. S/he seemed to decide on two packs by rounding 16 to 20.

Practitioner

This student solves the problem and includes an explanation of how s/he solved the problem and what conclusions were drawn from the work. S/he understands that cost is an issue and combines sets of pencils to get close to 16, one for each student.

Expert

This student shows a clear understanding of the problem. S/he employs complex reasoning for a third grader and applies procedures correctly to solve the problem. A clear explanation is provided as part of the response so that the reader does not need to infer how and why decisions were made.

Exemplars

Mechanical Pencils












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<p>A. 096G Sharpwriter 7mm \$2.65/ pk/12</p> <p>B. 7474B Bic 5mm \$1.45 pk/5</p> <p>C. 095B Bic 7mm \$2.50 pk/10</p>	<p>D. 3825B Color Combo 7mm \$1.76 /5</p> <p>E. 5204B Color Burst 7mm \$1.76 /5</p> <p>F. 9349ST Soft Touch Mechanical Pencil Refillable! 5mm Mechanical pencils with assorted color barrels. (48c each) \$5.76 /12</p> <p>G. 9350ST Mechanical Pencils \$2.00 /12 Refillable! 5mm refillable lead pencils. Assorted neons.</p>	<p>H. 6305K 7mm lead refill 59c for 12 leads</p> <p>I. 6306K 5mm lead refill 59c for 12 leads</p> <p>J. Zebra Posi Grip 5mm 79c each</p> <p>8807K Blue 8821K Rose</p> <p>8822K Lilac 8823K Teal</p> <p>8847K Black</p> <p>8806SP Zebra Eraser Refill, 5-pack 69c pack</p>
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Sports

Mechanical Pencils

(5mm lead)
Only 49¢ each

Refillable

9561U	Phoenix Suns
9562U	Chicago Bulls
9563U	Charlotte Hornets
9564U	Orlando Magic
9565U	L.A. Lakers
9566U	Houston Rockets
9567U	Atlanta Braves
9568U	Colorado Rockies
9569U	Florida Marlins
9570U	Chicago Cubs
9571U	Chicago White Sox



Wow!

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