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PROFESSIONAL DEVELOPMENT

Kid Blink Beats the World

A Lesson for Sixth and Seventh Graders

by Nancy Canavan Anderson

featured in *Math Solutions Online Newsletter,* Summer 2008, Issue 30

The students in this seventh-grade class were soon to begin a formal study of ratios and proportions. They were familiar with using multiplicative comparisons to solve problems. They were also familiar with using tables to represent relationships between quantities. Nancy Canavan Anderson wanted to present these students with an open-ended, real-world problem that would allow them to use informal representations of multiplicative relationships as building blocks toward a more profound understanding of proportional reasoning.

As a springboard for giving her students this experience, Nancy used the book Kid Blink Beats the World, by Don Brown (Roaring Brook, 2004). This nonfiction picture book tells the story of the 1899 New York "newsies" who went on strike when the publishers of the city's two most popular newspapers decided to charge them an extra penny to buy the papers. The newsies, who worked hard to earn a typical daily wage of twenty-five cents, protested this increase because it meant less money in their pockets and less food on their families' tables. This lesson helps middle school students use multiplicative reasoning to figure out how an increase of only a penny could so drastically affect the lives of those young men and women.

Before reading the story *Kid Blink Beats the World*, I explained to the seventh-grade students that they were about to hear a true story of hardworking young men and women, about their age, who took a stand when they felt that they were being treated unfairly. I explained that after reading the story, we would use mathematics to figure out why these young people were motivated to protest the injustice. After reading the story aloud, I asked the students to talk with the other people at their tables about how a newsie earned a living. While the students talked, I wrote three words on the board: *expenses*, *income*, and *profit*. After a few minutes, I called the class back together and asked the students if they could share something that they had discussed at their tables using any of these three words.

Jamie raised her hand and said, "Expenses are the money the newsies have to pay the newspaper publishers for the newspapers." I wrote this statement on the board next to the word *expenses*.

I asked the students if they could remember how much the newsies had to pay, and many remembered that the rate was five cents for ten papers. I wrote this information on the board as well.

David raised his hand and said, "Income is what the newsies get from selling the newspapers. They got a penny a paper." I wrote David's statement next to the word *income*.

Next, Dina shared, "Profit is the money that the newsies earn. It's what they get—one penny for each newspaper."

I asked Dina and the rest of the class, "So is profit the same as income?" I gave each table about one minute to talk about this question for before calling on Andre.

Andre explained, "Profit is what is left after the newsies pay the publishers."

I pushed on Andre's thinking by asking him what he meant by "what is left." He responded, "The newsies may get, like, two dollars from selling the papers, but they have to go back the next day and buy more newspapers from the publisher. So not all of that money is theirs to keep."

I called on Dina again and asked her what she was thinking. She said, "If the newsies have to buy the newspapers from the publisher, they have to give them some of their money."

I asked her specifically what the difference between income and profit was. She said, "Income is how much they make from selling the newspapers. Profit is how much they have left after they pay the publishers for the papers."

I referred to the passage on the fourth page of the book that reads,

> At the end of the day and scores of sold copies later, a newsie might have made twenty-five cents, a generous wage in a time when a family survived on ten dollars a week and fifteen cents fetched a dinner of soup, stew, and pie.

I asked the students to figure out how a newsie might go about earning this daily wage. How many newspapers would the newsie have to buy? How many would he or she have to sell? I asked them to work as a group at each table and to record their thinking so that later on they would be able to share it with the whole class. As I walked around the room, I noticed that students were using a variety of methods to answer these questions. Some were using a guess-and-check method, others were using mental calculations, and still others were using multiplication number sentences.

One group was having difficulty keeping track of the changing quantities. The students were talking about a lot of numbers without writing any of them down. I said, "Let's talk about the expenses. How much did it cost a newsie to buy ten papers?" After the students said five cents, I told them to record that information. I followed up by asking how much it would cost a newsie to buy twenty papers. The students quickly answered ten cents and added that to their notes. Immediately they started to add the cost of thirty and forty papers to their notes in what looked like a series of equations set up in a chart (see Figure 1). I was curious to see how they would use their equations to find figures for expenses and income that would yield a profit of twenty-five cents. Confident that this group was on its way toward finding a reasonable solution, I moved on to another group but made a note to revisit with this group later on.

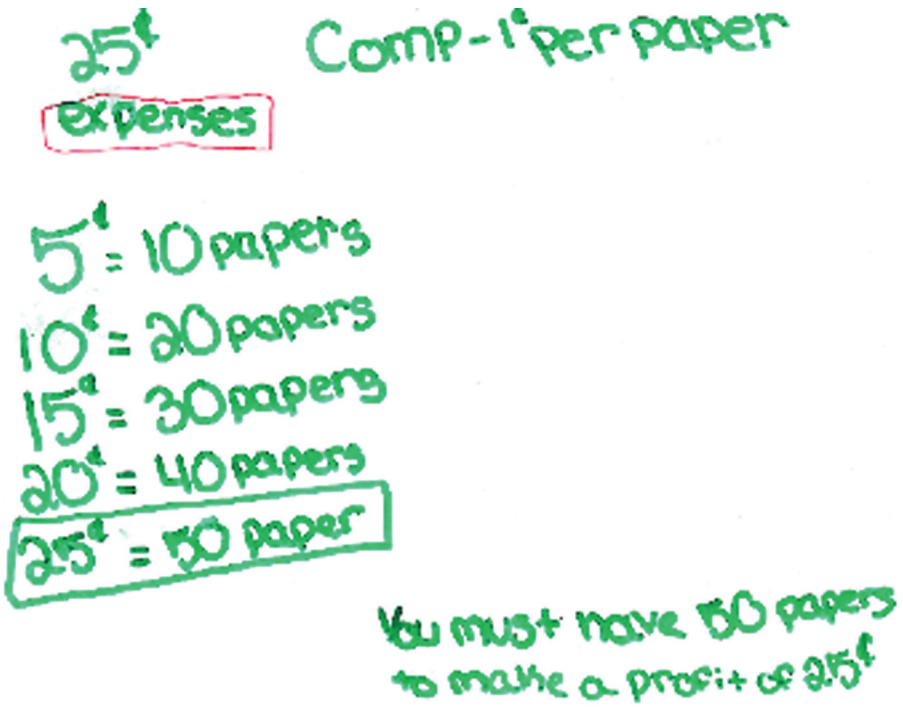

Figure 1. The first group used equations to solve the problem.

When I visited with another group, the students told me that the newsies would have to buy and sell twenty-five papers to make a profit of twenty-five cents. I asked them to defend this solution by telling me what the expenses, income, and profit would be for twenty-five papers.

Tim said, "If they sell twenty-five papers, they would get twenty-five cents since it's a penny a paper."

I said, "OK, so how much would it cost a newsie to buy twenty-five papers from the publisher?"

Another student at the table, Joan, said, "It would cost them twelve and a half cents. Oh! That wouldn't be enough then."

A third member at that table, Brianna, said, "But how can you have half a cent?"

I asked Joan to explain to the other members of the table how she determined that twenty-five papers would cost 12.5 cents.

Joan said, "Well, it's five cents for ten, so that's ten cents for twenty papers. Then they need five more papers, and half of five cents is two and a half cents."

Tim then said, "Oh, I get it. That means that their profit is only twelve and a half cents. So we were wrong."

I explained that all of their reasoning was correct, but they had the right answer to a different question. They had figured out how many papers a newsie would have to sell for a profit of

12.5 cents. But according to the book, a newsie typically earned 25 cents. I left this group to keep working, but I was worried that Brianna and other students would be distracted by the idea of half cents.

I revisited the group that had begun to make the chart and asked the students what they had determined for their solution.

"We got fifty papers. It costs them twenty-five cents to buy fifty papers," Alicia said, pointing to her recordings. "Then, it's a penny a paper, so that's fifty cents for selling fifty papers. And fifty minus twenty-five is twenty-five cents for them."

I gave Alicia's group and another group, who had solved the problem with different reasoning, overhead transparency sheets and markers to record their thinking and solutions.

I called the class together to share strategies and solutions. I posted the overhead from the first group (see Figure 1). I gave the students one minute to read the contents of the transparency and see if they could follow the reasoning. I called on different students to explain what each part of the solution strategy meant.

I then posted the second transparency (see Figure 2). Again, I gave the class about one minute to read through the posting before we discussed it as a class. I pointed to the last four lines on the posting and asked students how they thought this group had determined this information.

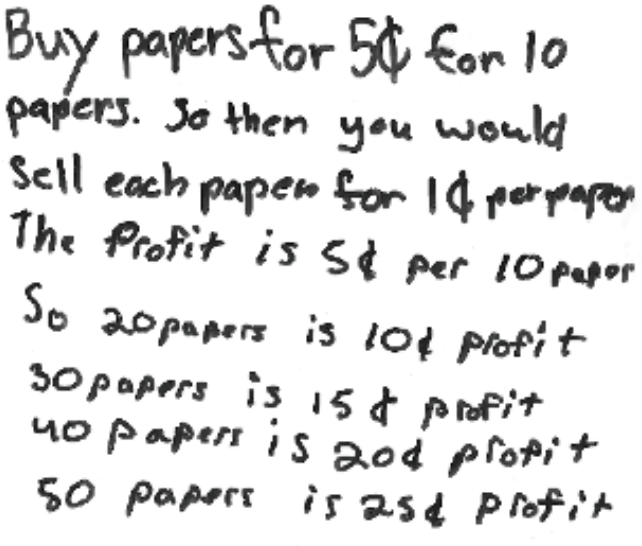

Figure 2. The second group used additive reasoning to solve the problem.

Mariah raised her hand and said, "They just kept adding. Every time they added five more cents, that's ten more papers."

Billy raised his hand and said, "This one is like the other one except that this group used words and the other group used numbers."

I explained that it made sense to me that the group kept adding until it found the number of papers that would give the newsies a profit of twenty-five cents. But it was not clear to me how the group determined that the profit for ten papers would be five cents. I asked the creators of the posting to explain how they figured this out. George, one member of that group, said, "They buy ten papers for five cents and sell those ten papers for ten cents. So, ten minus five is five cents profit for the ten papers."

I asked the students whether or not they thought selling fifty papers a day was hard work. They seemed unsure of how to answer this. I asked if any of them had ever been involved in a fund-raiser, selling items either outside a store or door-to-door.

Carey said she had sold candy for her soccer team each year. When I asked her how many candy bars she sold in a day, she said, "I don't know, like three or four maybe."

I asked Carey if she thought selling fifty papers sounded like a lot of work and she agreed it did.

I then said to the students, "Now that we have a sense of how the newsies might have been earning their daily wage of twenty-five cents, let's see if we can figure out why they were so upset about the publishers charging them only one penny more for the papers. Looking at your figures on your papers, figure out how the expenses, income, or profit would be affected by this one-penny increase."

The students immediately got to work on this task. Most of the students began to make a chart for expenses and number of papers, similar to the one their classmates had made and displayed on the overhead. These groups were investigating the new cost for buying fifty papers and how it would affect the profit.

I noticed one group was thinking about the question differently. Instead of keeping the number of papers the same, this group was adjusting the number of papers bought and sold to keep the profit at twenty-five cents. I handed several groups overhead transparencies and markers to record their thinking.

After the groups had finished working, I asked one of the groups to post its overhead transparency (see Figure 3).

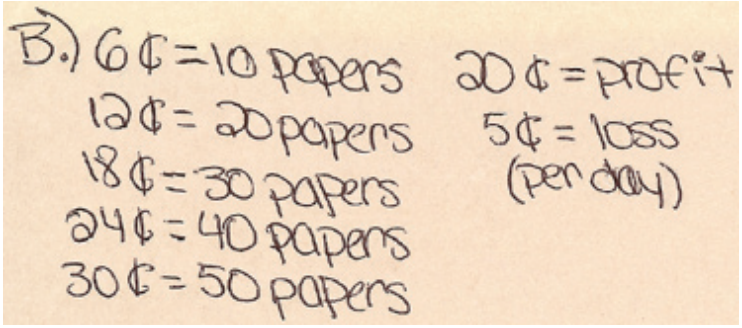

Figure 3. This group determined what a newsie's new profit would be if he sold the same amount of papers per day.

One member of this group, Trey, explained, "We figured out that it would now cost the newsies thirty cents to buy fifty papers, but they were still only making a penny for each paper. So that means that they still get fifty cents, but only twenty cents is their profit."

I asked Trey, "What do you mean by 'five cents equals loss (per day)'?" referring to the group's transparency.

Trey said, "The newsies used to get twenty-five cents, and so it's now five cents less."

Brianna, a member of another group, added, "So that's thirty-five cents less each week."

I asked, "Is that a lot?"

Many students responded, "Yeah, back in those days."

I referred to the earlier passage again, drawing students' attention to the cost of a meal. I asked if they could use this information to describe the loss in wages.

Again, Brianna made a strong connection. "So that means like two less meals a week."

Next, the group that had adjusted the number of newspapers (rather than the profit) posted its work (see Figure 4). I asked one member of this group to explain the group's strategy.

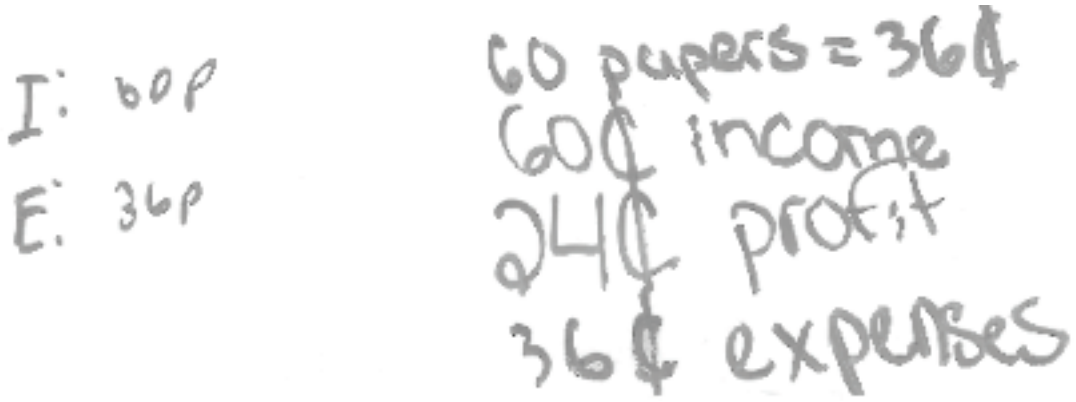

Figure 4. This group figured out how many papers a newsie would have to sell in order to continue to earn (almost) the same profit each day.

Marco said, "We figured out how many newspapers the newsies would have to sell to make the same profit."

I asked another group if it could validate that sixty papers would cost the newsies thirty-six cents.

Dounte said, "Our group made a chart. We did ten is six—"

I stopped Dounte and asked him what him meant by "ten is six."

He explained, "Ten papers would cost six cents."

I began to model the chart Dounte was describing to me, labeling the left column of the chart *p* for number of papers and the right column ¢ (see Figure 5).

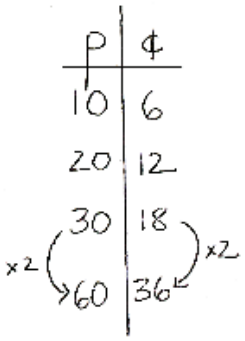

Figure 5. Chart showing cost per *p* number of newspapers.

Dounte then told me the costs for twenty and thirty papers. Since my goal for using this problem was to get students to think about using their charts to reason multiplicatively, I asked the class, "Let's see if we can use this information, that thirty papers cost eighteen cents, to figure out the cost of sixty papers."

After waiting about thirty seconds, I called on Rachel, who said, "It's thirty-six cents, 'cause you add another thirty, so you have to add another eighteen."

I wanted to encourage the students to think about the quantities multiplicatively and not additively, so I drew an arrow from 30 to 60 and asked, "What else can we do to thirty to get sixty?" After several students answered, "Double it," I responded by saying, "Yes. And we can write that as 'times two.' If we double the number of newspapers, what happens to the cost?" After students told me that it doubled too, I showed this with an arrow labeled × 2 as well (see Figure 5).

Marco continued by saying, "Since sixty papers cost thirty-six cents, that's a profit of twenty-four cents, which is still one less penny than what they made before."

In an effort to incite students' protests, I responded flippantly, "Well, that's not a big deal—one less penny."

Sterling exclaimed, "But that's ten more papers a day!"

Dina added, "And that's seventy more papers a week—and for less money! That's not fair to have to work harder and not get any more money."

I ended the lesson by summarizing many of the conclusions students had made. Even though it was just a penny more, those individual pennies added up meant a significant loss for the newsies or a significant amount of more work for them without any additional money. And that's why they took a stand against the publishers.

Note: In 1992, Disney released a musical film titled *Newsies*, which is based upon the 1899 strike.