THE GENDER PAY GAP

"Today, women on average are paid only 78 cents for every dollar a man earns."
— United States Department of Labor (http://www.dol.gov/equalpay/)

I always find it a little uncomfortable to talk about "women" and "men" without discussing whether those collecting and analyzing the data are thinking about sex or gender, or the fact that there are people who do not identify as a woman or a man. In the data sources I was able to find this is never explicitly addressed. Despite this, it is important to consider these data because systemic differences do appear when we look at these categories.

Discuss in Groups
1. Be sure to read the statistic and paragraph above.
2. Have you heard this statistic before? What do you know about this issue?
3. Some people argue that this statistic is misleading. What might make this misleading?
4. What additional information would you want to explore this issue in greater detail?

MATH PROBLEMS

The people in the problems below serve as representatives for the differences in earnings for that profession for males and females (with slight adjustments to make for easier computations).

Financial Managers
Courtney and Matt both work as managers at a financial firm. Over the last few days they both worked the same number of hours and Matt was paid $600, but Courtney was only paid $400. [1] Imagine that they always have the same work schedule (i.e., they work the same number of hours in any time period).

5. What are other amounts of money the two of them could be paid over different time periods? One answer is "Matt was paid $600 and Courtney was paid $400"—you have to come up with as many other pairs of earnings as you can (assuming their pay rate stays the same).
   a. Try to come up with more than one strategy for approaching this problem.
   b. Try to come up with at least one strategy that uses a representation of some kind.

6. If Matt makes $1,500 in a week, then how much does Courtney make? Can you come up with a strategy for this problem that builds on your work from the previous problem?

7. How much more does Matt make than Courtney in a year? Is that a lot? What could Matt do with that extra money?

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[1] The actual weekly values are $1,671 for men and $1,127 for women (see "Financial managers" in Table 39 here: http://www.bls.gov/cps/tables.htm). Note that some data sources adjust for how many hours males vs. females work in a week while others do not. This source give the "Median weekly earnings of full-time wage and salary workers", so it is only counting people working full time.

Private Middle School Teachers
Andy and Larissa both work as middle school teachers in a private school, but for every $850 Larissa makes, Andy makes $1,000. [2]

8. If Andy made $1,100 in a week, then how much does Larissa make in a week?

9. How much more per year does Andy make than Larissa? Is that a lot? What could Andy do with that extra salary?

10. Based on the problems above, do financial managers and middle school teachers have the same gender pay gap? If not, which is larger? How do you know?

THE RESEARCH

11. Read the information below and reflect on the calculations you did above. What are your reactions to this?

While some of the "78 cents on a dollar" statistic comes from men and women taking different jobs and/or working different hours, there are differences that continue even after controlling for many of these factors. For instance, consider the following:

> Rearranging women into higher-paying occupations would erase just 15 percent of the pay gap for all workers and between 30 and 35 percent for college graduates, [Dr. Goldin] found. The rest has to do with something happening inside the workplace.
>   Take doctors and surgeons. Women earn 71 percent of men's wages — after controlling for age, race, hours and education. Women who are financial specialists make 66 percent of what men in the same occupation earn, and women who are lawyers and judges make 82 percent.
>
> Source: http://www.nytimes.com/2014/04/24/upshot/the-pay-gap-is-because-of-gender-not-jobs.html

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[2] The actual weekly values are $1,096 for men and $956 for women (see "Elementary and middle school teachers" in Table 39 here: http://www.bls.gov/cps/tables.htm).

TEACHING RATIO AND PROPORTION

Ellis (2011) summarizes the research literature on how to teach ratio and proportion in the middle grades. In her summary she gives examples of different types of ratio and proportion problems, which I have summarized below. (This article lists additional types of problems one could use: http://www.cehd.umn.edu/ci/rationalnumberproject/88_8.html)

12. Identify which of these problems were used on this task and where.

13. Which problem type do you think is the most common in most classrooms and textbooks? What is the potential advantage of also using the other problem types?

Problem Type	Example	Abstract Summary
Find the Missing Value	A leaky faucet is dripping at a steady rate. It dripped 6 ounces of water in 8 minutes. How much water would it drip in 4 minutes?	Given three values, find the fourth. $\frac{a}{b} = \frac{c}{d}$
Create Equivalent Ratios	Frog walks 10 centimeters in 4 seconds. Find as many different ways to make Clown walk the same speed as Frog as you can.	Given two values, create other possible pairs. $\frac{a}{b} = \frac{?}{?}$
Compare Ratios	Does a batch of orange juice made with 3 cans of water taste equally orangey, more orangey, or less orangey than a batch made with 4 cans of orange concentrate and 6 cans of water?"	Given all four values, compare the ratios. $\frac{a}{b} \ (<,>,=) \ \frac{c}{d}$

Adapted from Ellis (2011). http://www.nctm.org/Research-and-Advocacy/research-brief-and-clips/Ratio-_-Proportion/