Jamie Coleman

Role: Questioner

Ch. 18 Proportional Reasoning

1. The book says, Research on Chinese and U.S. teachers shows that Chinese teachers spend more time making sense of the subtle differences among fractions, ratios, and division, whereas U.S. teachers connect rations quickly to percents without discussion of these interrelated concepts. Why do you think U.S. teachers do this instead? Do you think that we should change the way we do this?
2. Proportional reasoning is something that you either can or cannot do.

Proportional thinkers understand relationships in which two quantities vary together and are able to se how the variation in one coincides with the variation in another.

Proportional thinkers recognize proportional relationships as distinct from nonproportional relationships in real-world contexts.

Proportional thinkers develop a wide variety of strategies for solving proportions or comparing ratios, most of which are based on informal strategies rather than prescribed algorithms.

Proportional thinkers understand ratios as distinct entities representing a relationship different from the quantities they compare.

It is estimated that more than half of the adult population cannot be viewed as proportional thinkers. That means that we do not acquire the habits and skills of proportional reasoning simply by getting older. There is research that indicates that instruction that focuses on reasoning (rather than a formula) can have an effect on a student’s ability to reason proportionally, which begins early with manipulative reasoning.

Chinese students begin their formal exploration of ratio and proportion in the elementary grades, whereas in the United States it is taught in grades 6 to 9. Do you think that the United States should begin teaching this in earlier grades? As a teacher, how would you feel about teaching ratio and proportion in the elementary grades versus grades 6 to 9?

1. Traditional textbooks show students how to set up an equation of two ratios involving an unknown, “cross multiply,” and solve for the unknown. This can be a very mechanical approach and can lead to confusion and error. It is well worth the time to have students use their own ideas to solve proportions. Since the traditional textbook version can sometimes confuse students, would you feel that you should spend more time on invented strategies or the same amount of time for both?

Blooms Taxonomy

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| Knowledge | Two weeks ago, two flowers were measured at 8 inches and 12 inches, respectively. Today they are 11 inches and 15 inches tall. Did the 8-inch or 12-inch flower grow more? |
| Comprehension | Can you explain to me why you think that flower grew more? |
| Application | Now, can you a table showing the growth from the two flowers? Then, can you show your information from the table in a graph? |
| Analysis | Is there a different way to represent how you came up with your answer? |
| Synthesis | What would the answer be if you added a third flower that started out 4 inches and grew to be 9 inches? |
| Evaluation | If you answer changed, can you tell me why it changed? |