APPENDIX C: A MATH LESSON

A Math Lesson

When Mrs. Middleweiss asked if anyone had ever painted a room at home, many hands shot in the air. But when she asked how you could know how much paint to buy, only Karl braved a guess. Karl said, “The label on the paint can tells you how many square feet a gallon will cover and so you just figure it out.” “But how?” she asked the class. “What is a square foot anyway, and how do you count square feet in a room?” The problem of defining square feet was quickly settled, and the class decided to follow Juanita’s suggestion that they try a picture-solution approach on the blackboard by drawing a representative wall of a room. Mary volunteered, “We need to know the measurements first,” and Mrs. Middleweiss made the wall 8 feet high and 10 feet wide. Then Paul suggested drawing square feet on the wall and counting them. Everybody thought that was a good idea, and it was done. They counted 80 squares. Karl noticed something: 8 times 10 is 80. He asked to try something. He added 2 more feet to the drawing, filled in the squares, counted 96, and then announced to the class that he had found an easier way—multiply height by base! Mrs. Middleweiss agreed that it was a good strategy and then complicated the picture by putting a 2-foot by 4-foot window in the wall. Hands shot up. “Subtract 8 square feet from 96 and you get 88!” a number of children shouted in unison. “Unless you’re going to paint the windows,” someone added sub rosa. The problem of the amount of paint needed was soon settled, and the children had learned the general idea of how to find the area of a rectangle.

Mr. Provider, the math teacher next door to Mrs. Middleweiss, also prided himself on making abstract math principles sufficiently concrete and practical that his students could easily learn them and see their use in everyday life. Today he was going to cover ways to compute areas of plane surfaces bounded by straight lines. He wanted at least to get through rectangular area \( A = bh \), but if there was time, he would like to cover \( A = \frac{1}{2} bh \) for triangles, too. He began by showing students how much of their everyday world was made up of rectangles—in rooms, windows, and doors; in the yard, tennis court, and football field; and so forth. He noted that such ordinary tasks as painting rooms, curtaining windows, and seeding yards required that we know how much area we were dealing with so we could get the right amount of paint, fabric, or seed. “Fortunately,” Mr. Provider added, “there is a simple formula that will help us figure this area. It is base times height.” He did a number of examples of yards, tennis courts, and windows on the board until he was sure his students had the basic idea. Mr. Provider first had Andrew figure the area of a 10-foot by 8-foot wall without a window; he then added the same window that had been used to find curtain area in the earlier example. This made it easy for the class to see that \( A = bh \) should be modified by subtracting any subarea within the total area that was not to be treated in the same way as the rest of \( A \). Mr. Provider wrote his version of this new formula on the board \( A = bh - a \), and then he added a pitched roofline triangle to the wall to move the class along to consider the next formula he wanted to present before the period ended.

These cases should make it clear that not only are there different ways to teach the same things (and probably very effectively), but also that a teacher’s approach, his or her general conception of the teacher’s role, plays an important part in how one teaches. In this book, we are going to help you explore and think about three very basic approaches to teaching. For convenience, we have named them the “executive,” the “therapist,” and the “liberationist” approaches, although they go by many names. Each has its historical roots as well as its contemporary


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