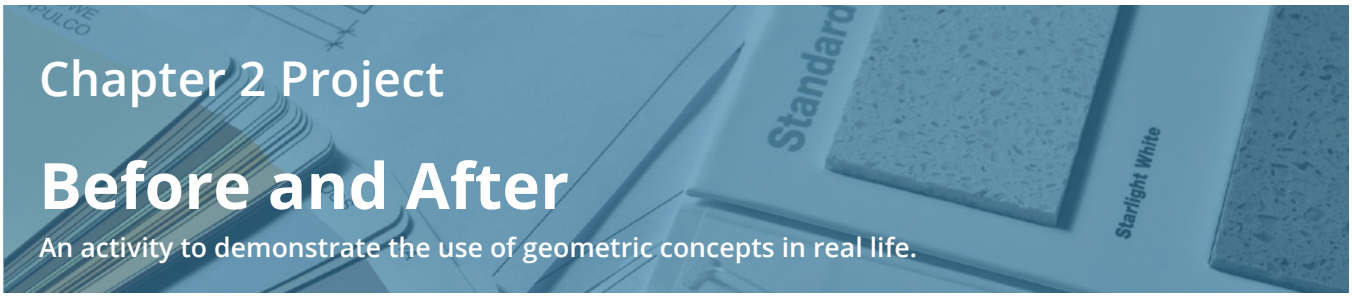

Chapter 2 Project

Before and After

An activity to demonstrate the use of geometric concepts in real life.

Suppose HGTV came to your home one day and said, "Congratulations, you have just won a FREE makeover for any room in your home! The only catch is that you have to determine the amount of materials needed to do the renovations and keep the budget under $2000." Could you pass up a deal like that? Would you be able to calculate the amount of flooring and paint needed to remodel the room? Remember it's a FREE makeover if you can!

Let's take an average size room that is rectangular in shape and measures 16 feet 3 inches in width by 18 feet 9 inches in length. The height of the ceiling is 8 feet. The plan is to repaint all the walls and the ceiling and to replace the carpet on the floor with hardwood flooring. You are also going to put crown molding around the top of the walls for a more sophisticated look.

1. Take the length and width measurements that are in feet and inches and convert them to a fractional number of feet and reduce to lowest terms. (Remember that there are 12 inches in a foot. For example, 12 feet 1 inch is $12\frac{1}{12}$ feet.)
2. Now convert these same measurements to decimal numbers.
3. Determine the number of square feet of flooring needed to redo the floor. (Express your answer in terms of a decimal and do not round the number.)
4. If the flooring comes in boxes that contain 24 square feet, how many boxes of flooring will be needed? (Remember that the store only sells whole boxes of flooring.)
5. If the flooring you chose costs $74.50 per box, how much will the hardwood flooring for the room cost (before sales tax)?
6. Figure out the surface area of the four walls and the ceiling that need to be painted, based on the room's dimensions. (We will ignore any windows, doors, or closets since this is an estimate.)
7. Assume that a gallon of paint covers 350 square feet and you are going to have to paint the walls and the ceilings **twice** to cover the current paint color. Determine how many gallons of paint you need to paint the room. (Again, assume that you can only buy whole gallons of paint. Any leftover paint can be used for touch-ups.)
8. If the paint you have chosen costs $18.95 per gallon, calculate the cost of the paint (before sales tax).
9. Determine how many feet of crown molding will be needed to go around the top of the room.
10. The molding comes in 12-foot sections only. How many sections will you need to buy?
11. If the molding costs $2.49 per linear foot, determine the cost of the molding (before sales tax).
12. Calculate the cost of all the materials for the room makeover (before sales tax).
    a. Were you able to stay within budget for the project?
    b. If so, then what extras could you add? If not, what could you adjust in this renovation to stay within budget?
    c. Using sales tax in your area, calculate the final price of the room makeover with sales tax included.