

Hands-on Design + Math

Discover how useful—and how much fun—math is, as you design and build a three-dimensional scale model of your dream home. You'll learn about the problems (and solutions!) encountered by professional designers and builders. Whether you are designing a real or fantasy home, the 3-D Home Kit will make your project exciting and rewarding. The kit is so effective that it's a key part of the annual SummerMath Architecture & Mathematics Workshop at Mount Holyoke College.

The 3-D Home Kit provides complete materials from siding, roofing and decking to windows, doors, stairs, kitchen cabinets and appliances necessary to construct a detailed, 1/4-inch scale model of almost any home design. Designing and building a model teaches important math concepts and sharpens practical skills from arithmetic, measurement and scale to geometry, trigonometry and spatial relations. The predominant skills developed and nurtured while working with the 3-D Home Kit—complex problem solving and precision—are the same skills which are crucial to success at all levels of mathematics and on the job. To help you with the design and model building process, Design Notes, which outline a step-

by-step approach to house design and Model Construction sections are included in the kit.

To design a house you have to constantly analyze many things at the same time, establish priorities, and try various approaches to solve each problem. For example, if one wall is moved, it generally has multiple consequences. Moving a wall not only changes the area and proportion of the room you are working on, but it changes the space on the other side of the wall as well. In a chain of events, you start by moving one wall, then have to move other walls in other rooms to keep their proper size and shape. Next, the windows and doors have to be moved to compensate for the wall changes—which affects the elevations and possibly the layout of the other floors and roof. These complex, interdependent relationships are what make house design so challenging and interesting. The beauty of house design as a teaching tool is that the challenges that arise always seem to stretch your understanding a little further: house design is easy enough that everyone is eager to try it, but hard enough that no one has yet perfected it.

☆☆☆☆☆ Five Stars, Duke University, "Gifted Student Letter"

"The Home Quick Planner (see homeplanner.com) & 3-D Home Kit combine mathematics, geometry, creativity, and precision and bring the user through the architectural process from idea to finished product."



Front Elevation



Side Elevation



Lower Level Floor Plan

SummerMath

Since 1981, SummerMath at Mount Holyoke College in South Hadley, Massachusetts, has been on the leading edge of developing new approaches to learning math. In the program, middle and high school students with a wide range of math skills experience how math is used by professionals. Workshops range from Genetics, where students

explore probability, to Brain Imaging, where they visualize three-dimensional objects from two-dimensional data. The Architecture & Mathematics Workshop was introduced in 1993. Daniel Reif, who invented the 3-D Home Kit, also developed and teaches this workshop.

