

# Differentiated Instruction and Content Mastery in Math

## An iLearn Report

There is growing recognition that one of the most difficult issues facing teachers in the classroom is that students can vary widely in their entering achievement level. The problem this poses is that instruction directed to the average student will inevitably leave some students behind, while frustrating some students by holding them back. This is a particular problem in math, in which later content builds on earlier content. This report summarizes data from research using iLearn Math to teach sixth-grade math using a fully-differentiated, mastery-based system implemented on the personal computer. iLearn Math is designed specifically to address the variation in entering achievement levels across students by providing a fully-individualized course of instruction for each student. Charts 1 and 2 below show data for 4,534 sixth grade students using iLearn Math.

**Chart 1**

**Percent Students Exempting by Chapter  
All Sixth Grade Students**

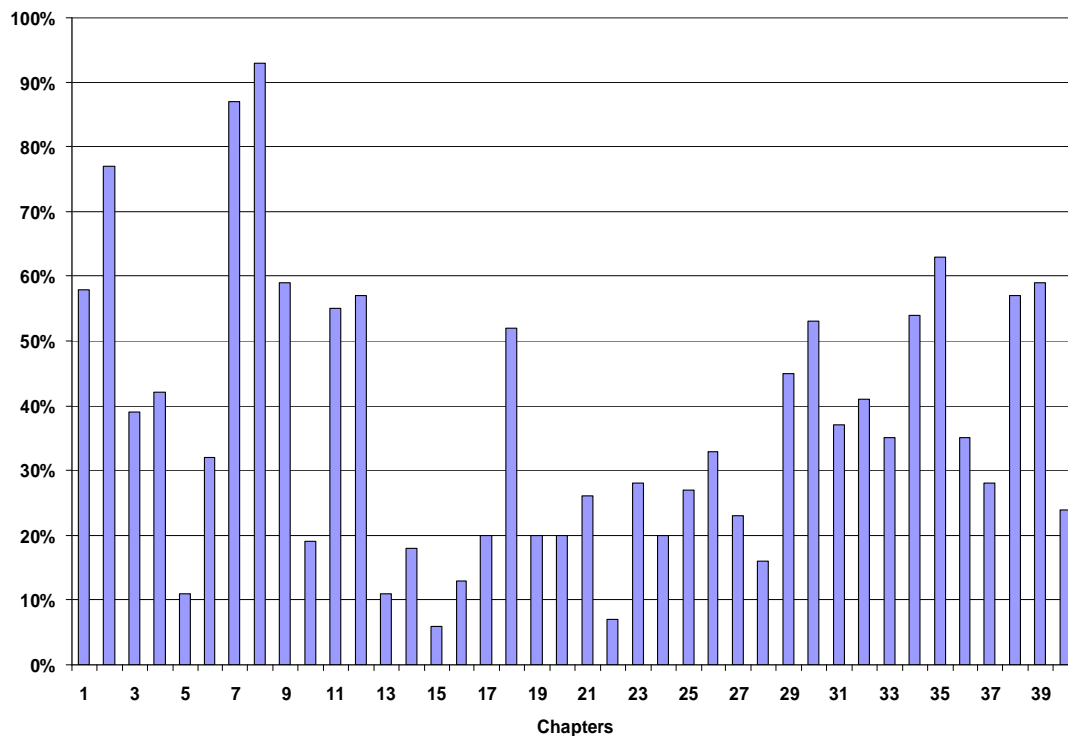
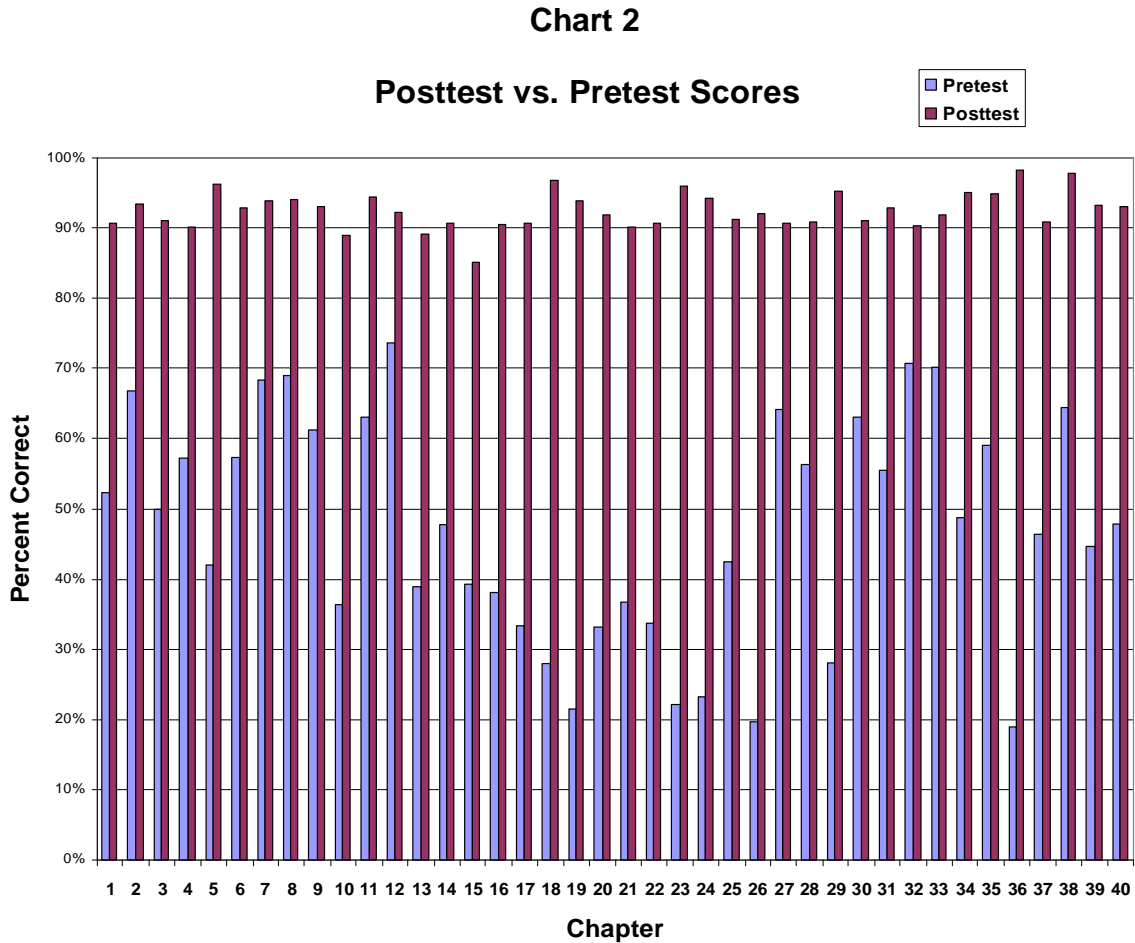


Chart 1 above shows the percentage of sixth-graders who passed an exemption test for each Chapter in the sixth-grade curriculum. The variation in the percentage of students who were able to exempt instruction for the various Chapters indicates that students' mastery of topics varied widely across topics prior to the beginning of instruction.

Chart 2 below shows the data for those students who were required to complete each Chapter.



In Chart 2 above, the average percent correct score is shown for each Chapter on the Chapter Challenge Test (pretest) and the Chapter Mastery Test (posttest). The blue bars above indicate that students who were required to take each Chapter scored an average of from just below 20% on Chapter 36 to just over 70% on Chapter 12 on the Chapter Challenge Test that preceded each Chapter. However, by the end of the year, the average performance of the students who had completed each Chapter had improved substantially. The red bars, shown on the right for each Chapter, indicate that the average score ranged from a low of 85% to a high of 98%, with most scores falling above 90% across Chapters. This pattern of results provides strong evidence that students did indeed master the content of the Chapters they completed, which is the critical objective of a differentiated, mastery-based approach to instruction.

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