Digital Directions International

Instructional Pedagogy

Helping *all* students achieve in Math!

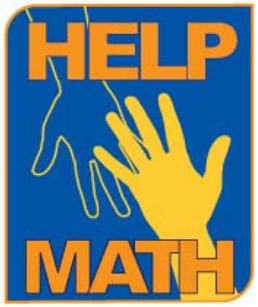
2009 SIIA //CODiE// WINNER

2010 SIIA //CODiE// WINNER

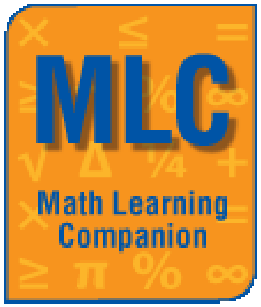
2010

Digital Directions International

Thought Leaders in Math Interventions



For English language learners (ELLs), Students with Learning Disabilities, & Students struggling to learn math



For students with math learning disabilities; currently under development, partially developed with a U.S. Department of Education IES grant

HELP Math and the Math Learning Companion

- Although HELP Math and MLC are different products, each with a unique instructional design, they share a number of common features:
  - Web-based and portable
  - Evidence-based
  - Supplements teacher instruction
  - Highly interactive and engaging
  - Comprehensive, fully aligned to math standards
  - Provide individualized learning pathways
  - Customizable lessons & curriculum for individualized instruction
  - Works at all 3 tiers of RTI (Response to Intervention)
  - Highly interactive and engaging
  - Read aloud support

HELP Math and MLC Embed Instructional Pedagogy Directly into the Content

- HELP Math and MLC also share an underlying core curriculum with an important instructional pedagogy that is discussed in this PowerPoint presentation
  - Note that in the pages that follow, some screen shots are taken from HELP Math and others from the Math Learning Companion

Programs Supports All Students Learning Wherever they are at the Moment

Grade-level instruction in class

Intensive intervention

HELP enables teachers—at their discretion—to meet students' individual abilities and needs

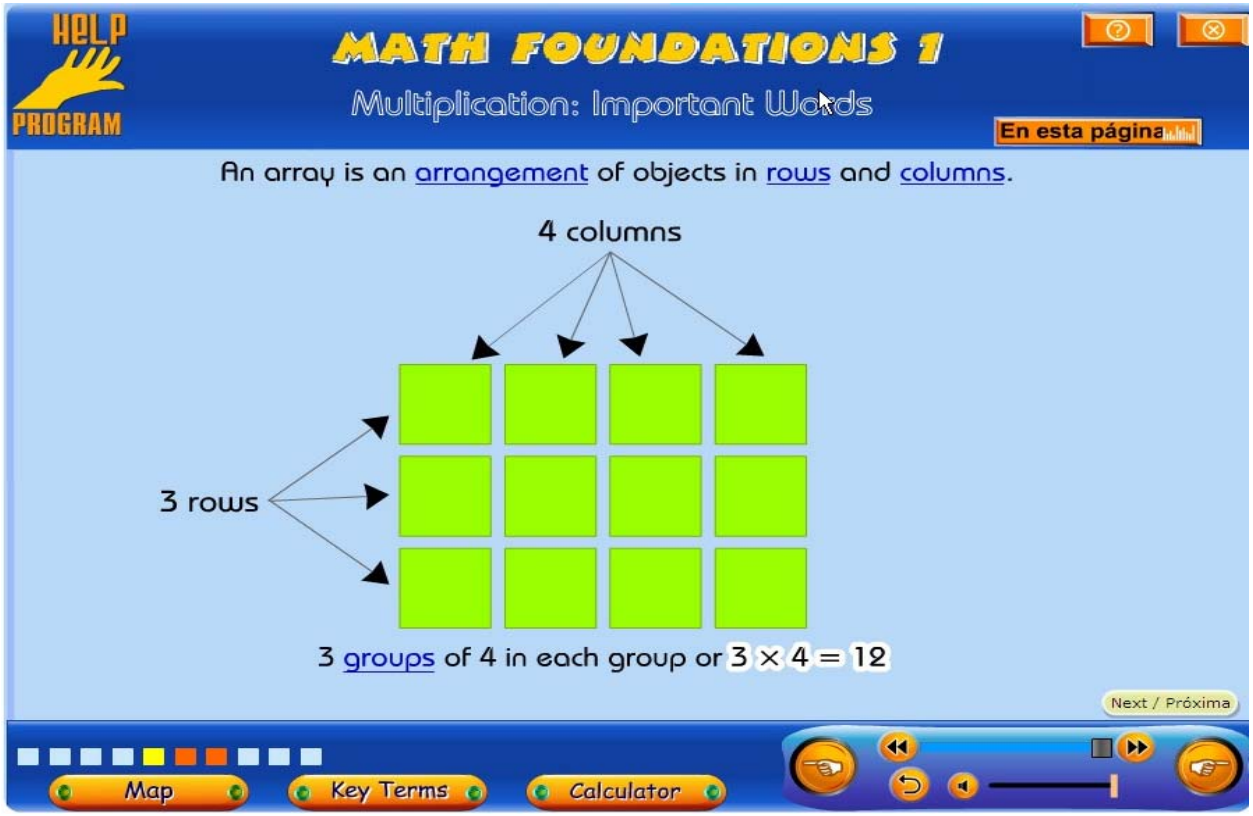
Works at all RTI tiers

Shared Instructional Pedagogy

Key Features

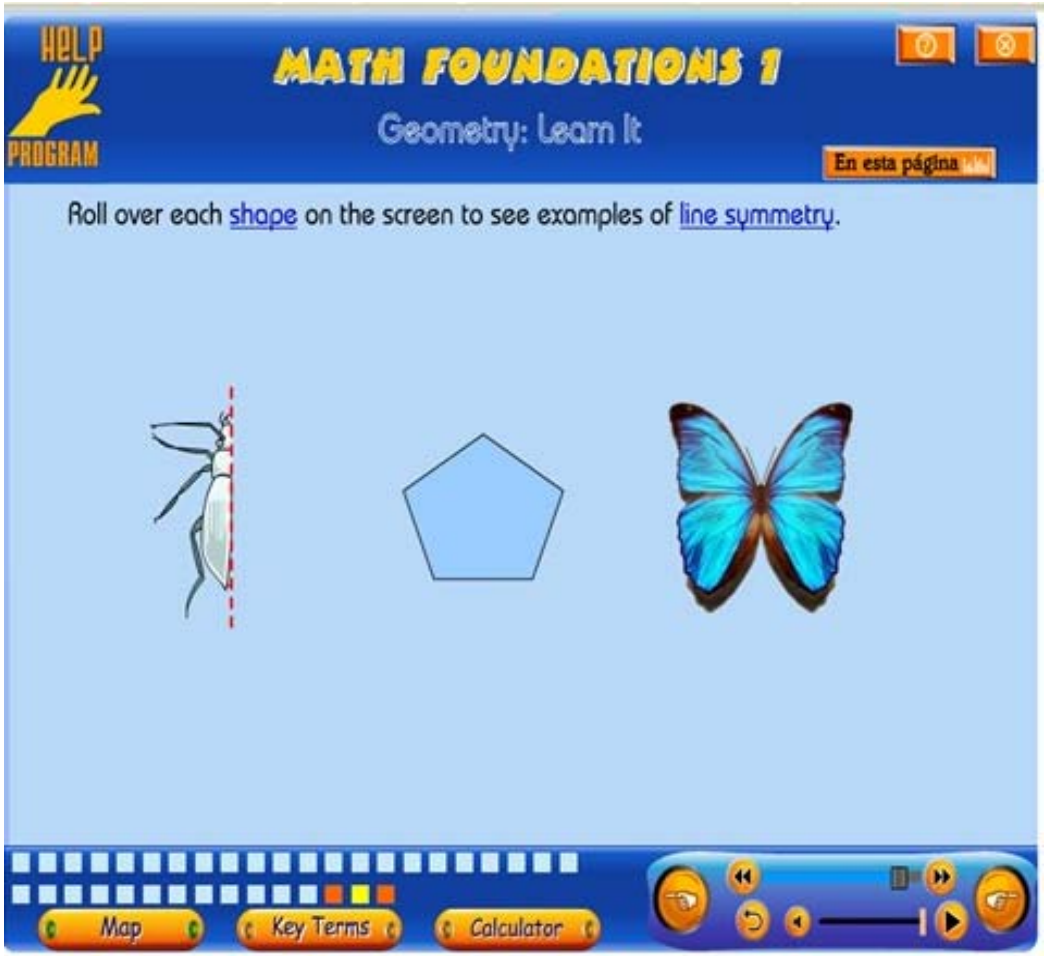
- Scaffolds learning, makes math comprehensible without simplification
- Uses Sheltered Instruction and complements proven SIOP classroom-based pedagogy (Short & Echevarria, 1999)
- Builds math background concept knowledge and skills
- Focuses on development of academic vocabulary and language
- Breaks concepts into learning chunks with step-by-step procedures provided
- Ties prior knowledge to current learning
- Guided practice, visual contextual hints, modeling, sequencing tasks and practice

Sheltered Instruction Using Technology



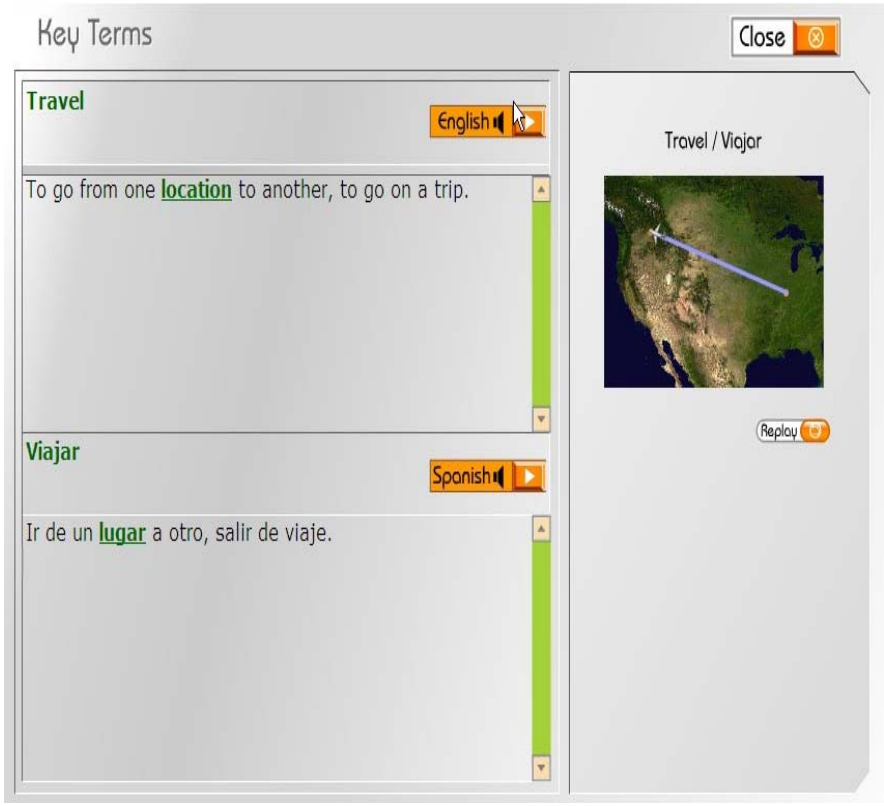
Sheltered instruction is an approach for teaching content to English language learners in strategic ways that make the subject matter concepts comprehensible, while promoting the students' English language development. Krashen (1985) referred to making subject-matter understandable to students as *comprehensible input*. In HELP, this means employing clear, comprehensible language reducing interference for ELLs, as well as for students with learning disabilities as they process the language. Techniques include, for example, visual representation, scaffolding the linguistic load through repeated exposure in a variety of contexts, clear description of academic tasks, appropriate speech (pace, sentence structure, paraphrasing), etc.

Visual Representation



HELP adds extra-linguistic cues (Krashen, 1992) by synchronizing audio, visual, and text to create a visual connection between words, symbols, and meaning (e.g., corresponding vocabulary, symbols, or pictures flash in sync with audio).

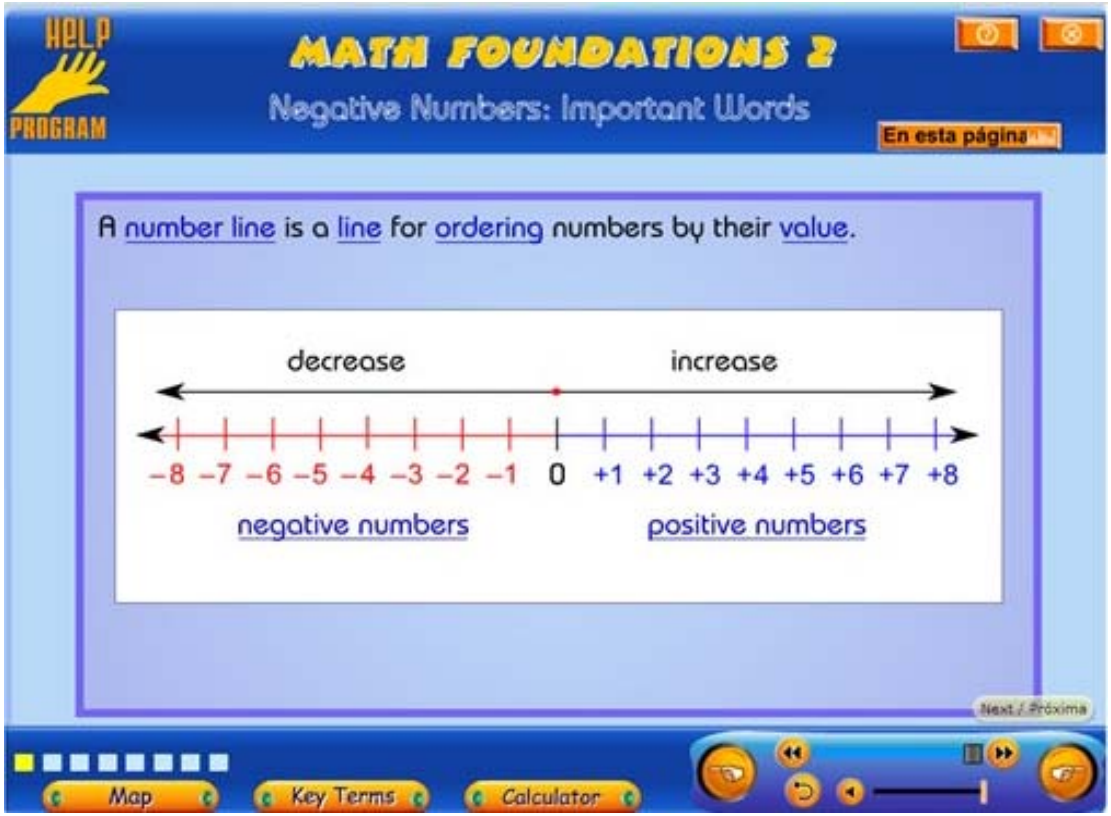
Emphasizes & Academic Vocabulary ith Audio Support



Marzano (2004) is a strong proponent of increasing students' academic vocabulary in the content areas to develop background knowledge in the content areas. He cites research that shows that students who've been taught specific content area vocabulary via a specific strategy, increase their comprehension 33% points over their original ranking.

Scaffolding Math Concepts & Skills

Building Background Knowledge



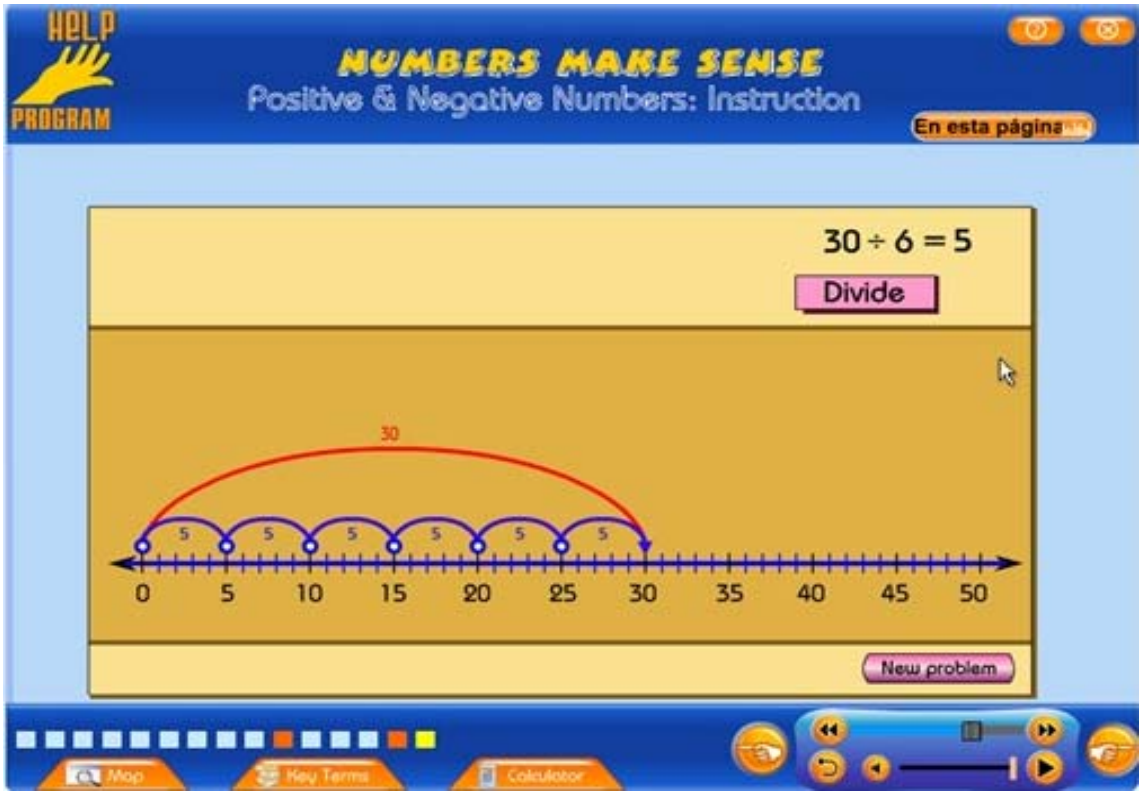
In order to achieve higher levels of understanding foundational emphasis is on key math milestones, including rational numbers, fractions, decimals, ratios, and pivotal concepts in geometry and measurement (National Mathematics Advisory Panel, 2008).

Students use a number line to help them visualize the operation. Number lines are an excellent tool for developing students' number sense (Gersten et al. 2009).

This figure was taken from an Grade 4 lesson (the term Math Foundations 2 is used instead of grade 4 so that the older student does not know that they are working at a lower grade level) shows more elementary development of the concept of the number line.

Scaffolding Math Concepts & Skills

Reaching Grade Level



This is a middle school lesson in which students are working on a division problem using a number line.

The figure on the left is a snapshot of a fully developed screen. The squares at the bottom of the screen (above the Map, Key Terms, and Calculator tabs) show that this is one of 15 pages in this particular instructional sequence. When this screen is presented in real-time, it develops point by point and the pictures and audio are synchronized (e.g., like the build function in a PowerPoint presentation), visualization, drag and drop activities to order numbers, and so forth.

Instruction & Modeling

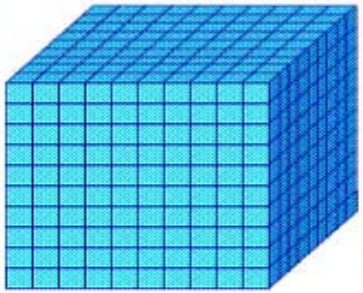
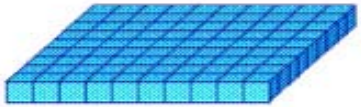
MLC
Math Learning Companion

MATH FOUNDATIONS 3

Place Value: Learn It

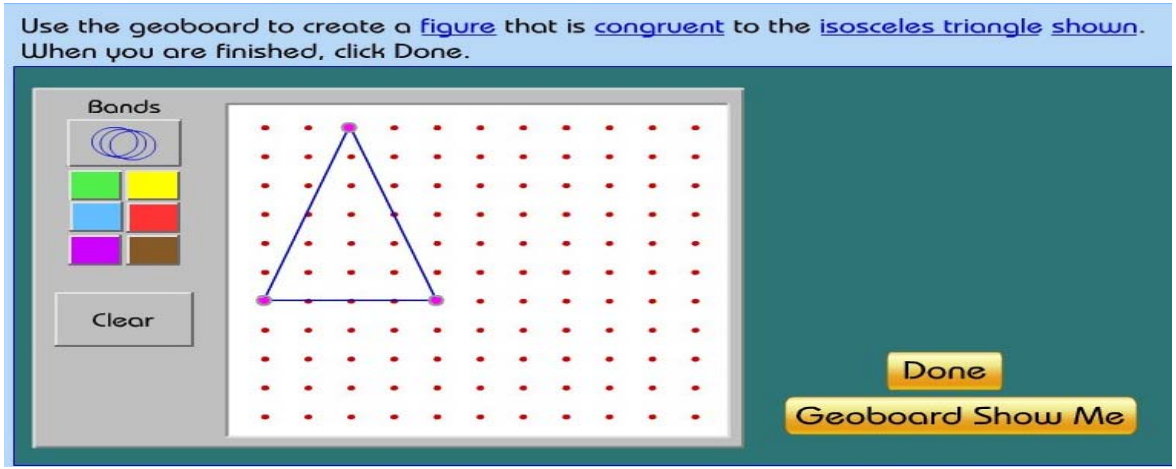
En esta página

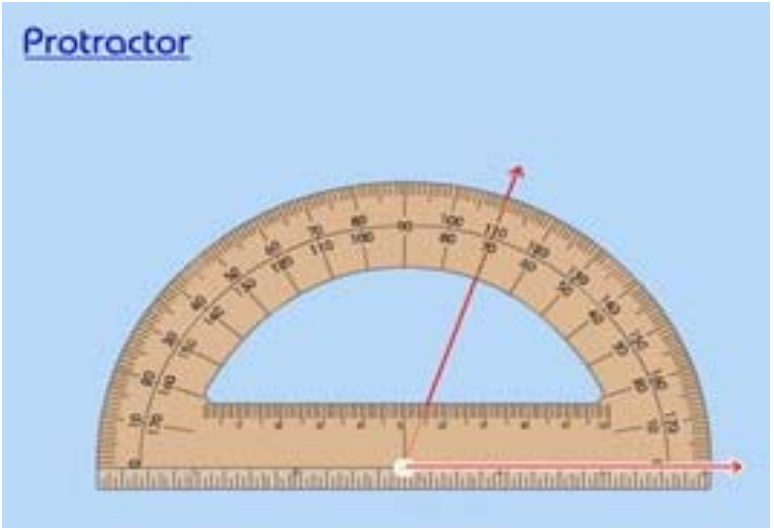
A base ten number system is based on groups of ten. So the value of each place in the base ten system is ten times greater than the value of the place to its right.

Thousands	Hundreds	Tens	Ones
			
cube	*flat*	*rod*	*unit*
100 x 10 =1000	10 x 10 =100	1 x 10 =10	1

Map | Key Terms | Calculator

Engaging Interactivities & Manipulatives

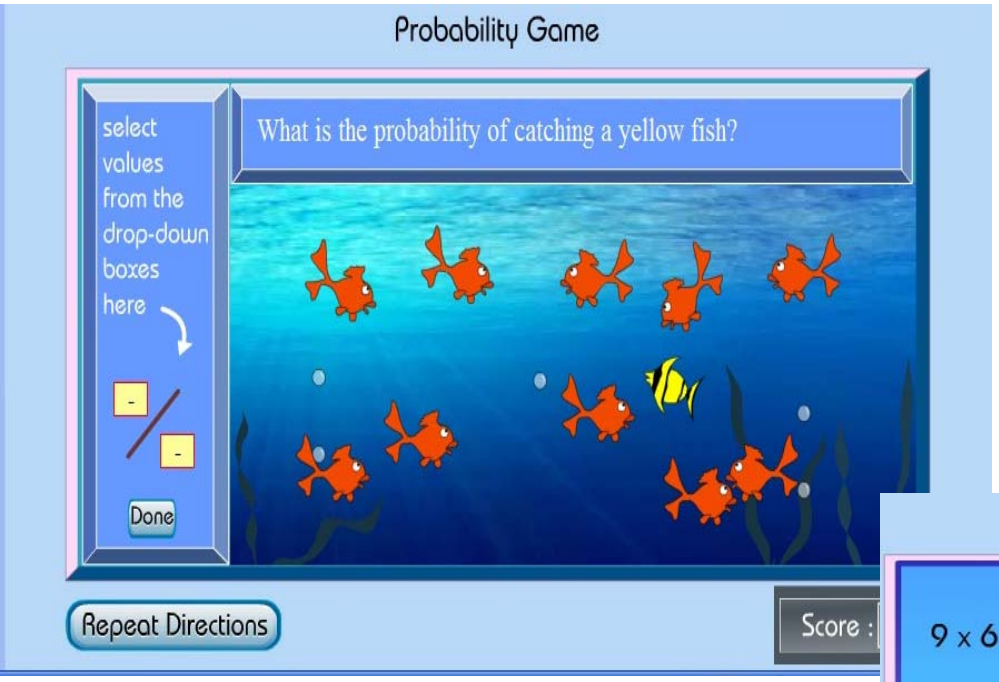


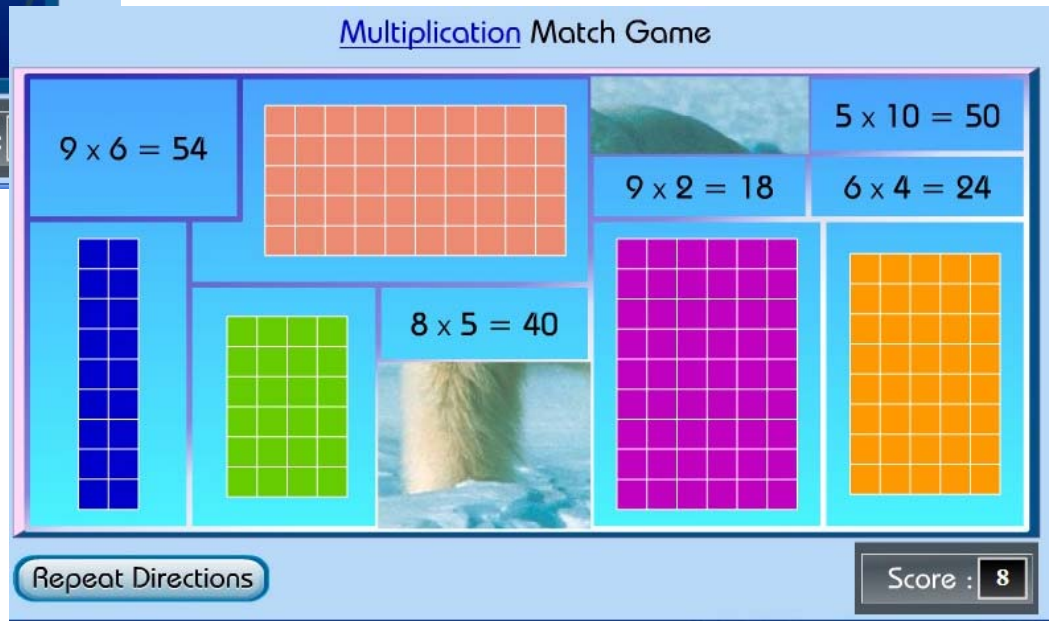


HELP concurrently develops number fluency and number sense through engaging, hands-on activities distributed continuously throughout the program, offering learners an opportunity to practice, construct, and interact.

Interactivities include: number cards to reinforce basic skills, number lines that build number sense and illustrate addition, subtraction, multiplication, and division facts, money and "counting on" activities, base-10 blocks to encourage students to think conceptually about place value, place value charts for number fluency.

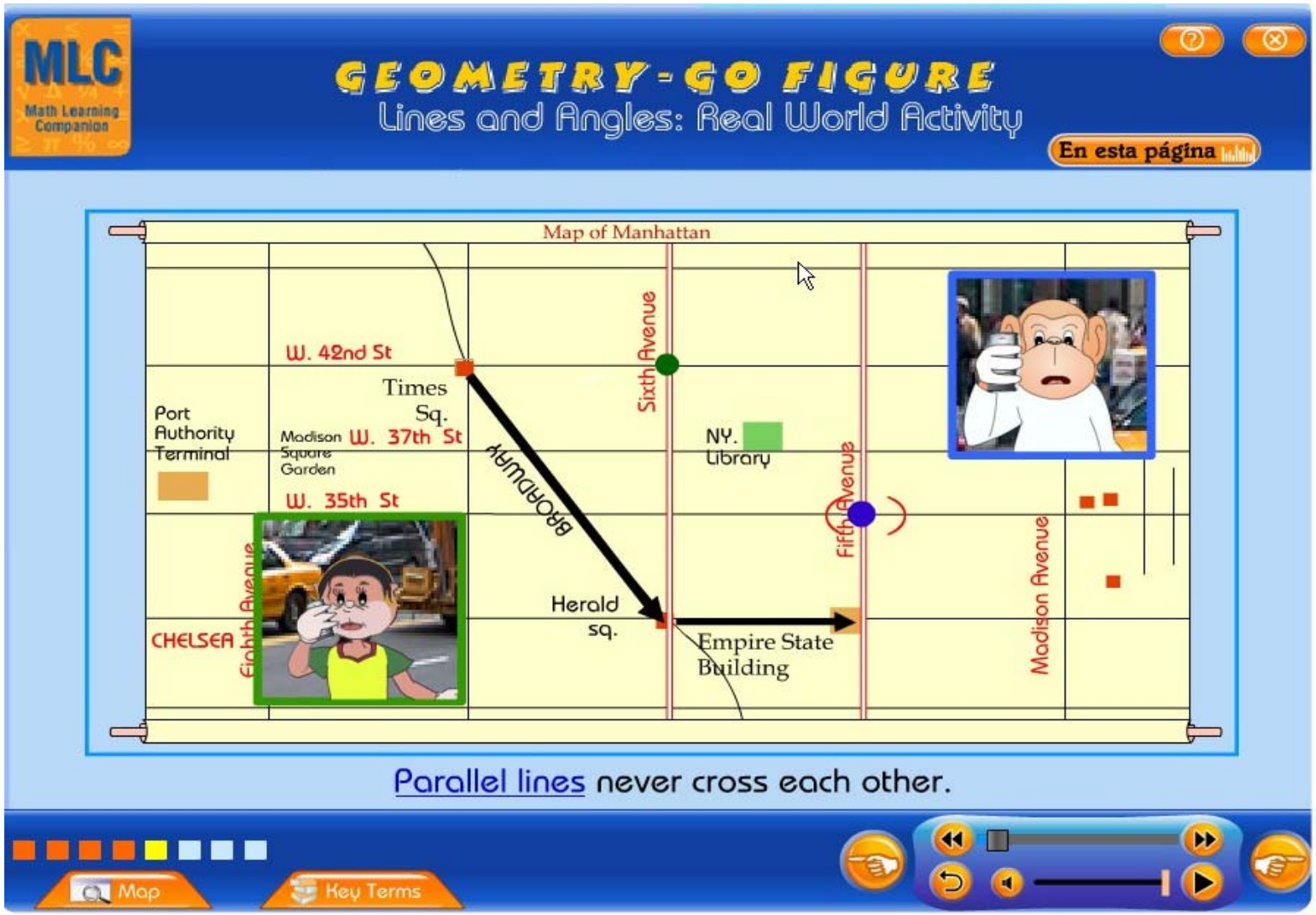
Engaging Games & Interactive Scenarios





Real World Scenarios

Linking Prior Knowledge to Real Life

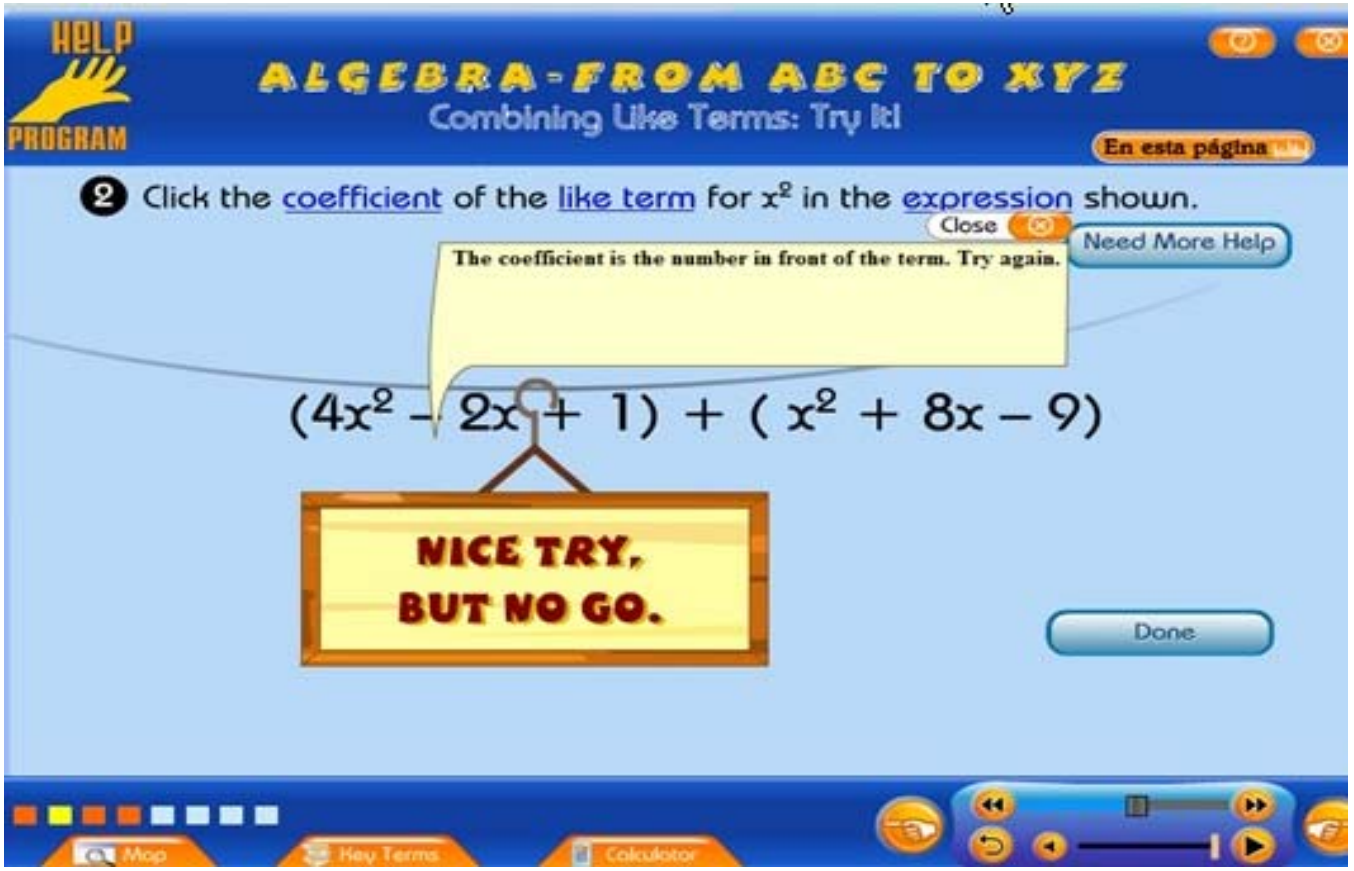


Key Support Tools

Supportive yet challenging learning environment

HELP Support Tools	
Key Terms: Dictionary and Hyperlinks (Available in English and Spanish text and audio)	
Hints/Need More Help	
Math Tools (e.g. Calculator, Protractors, Rulers, Thermometer)	
Digital Interactives (e.g. Base 10 Blocks, Number Lines, DigiCards, 100's Chart, GeoBoards, Place Value Charts, Balance Scale, Factor Grids)	
Spanish Audio	
Map	
Social Network Tools	

Systematic and Specific Instructional Feedback



Systematic feedback and cumulative and judicious review throughout the program (Heward, 2009)

Most Importantly, Students like working with DDI programs!

- Students find HELP content engaging
- Proven to raise ELL math test scores for AYP
- Proven to raise ELL scores on state English language proficiency test
- Proven to raise math scores for students with learning disabilities

Learn more about DDI's programs; go to:
www.digitaldirections.us
www.helpprogram.net
www.mathlearningcompanion.net

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