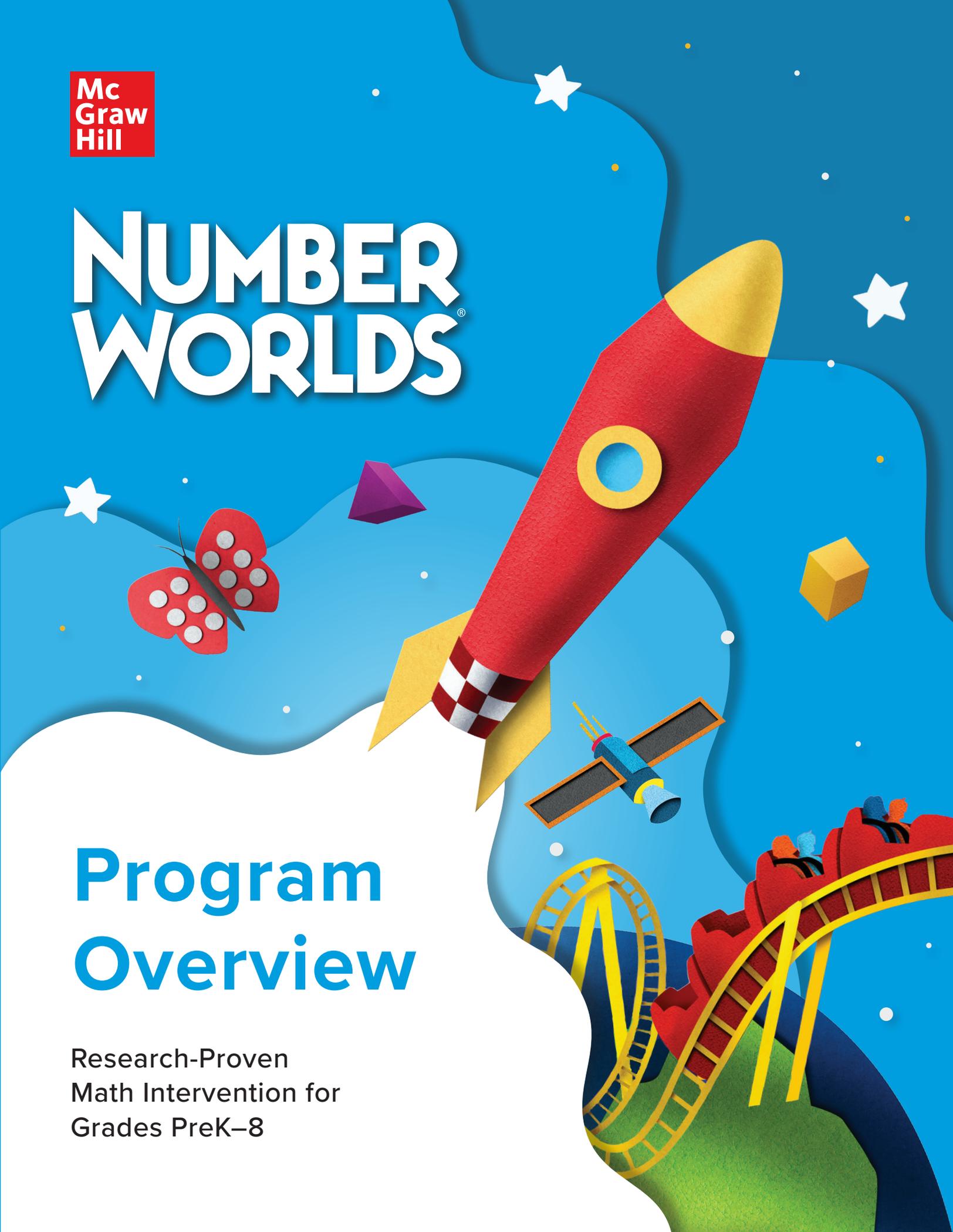


Mc  
Graw  
Hill

# NUMBER WORLDS<sup>®</sup>

## Program Overview

Research-Proven  
Math Intervention for  
Grades PreK–8



# NUMBER WORLDS<sup>®</sup>

With decades of proven results in the classroom, *Number Worlds* is the only **PreK–8 math intervention** program with built-in prevention for PreK–1, and English and Spanish equity for all students. *Number Worlds* accelerates mathematical understanding and effectively brings all students to grade-level proficiency and beyond.

Educators asked, and we listened—this revolutionary program:

- is supported by long-standing research and efficacy.
- helps school districts remediate declining math scores.
- provides multiple implementation models for abbreviated and extended instruction.
- complements any core math program.
- empowers students to build conceptual understanding, procedural skills, and fluency, and apply their knowledge in real-life scenarios.
- supports multiple learning modalities with digital components, interactive activities, hands-on learning, and adaptive practice powered by *Building Blocks*.
- offers a seamless, fully-digital user experience with hands-on manipulatives and optional print materials to support in-person, remote, or hybrid learning and instruction.
- equips teachers with effective Tier 2 and Tier 3 instructions, in-lesson differentiated support for ELL students, and Spanish equity for students.

*District-wide, we had double-digit gains in our middle school math scores after using Number Worlds for one year.*

—Curriculum Coordinator,  
Oklahoma City Public Schools

# A PreK–8 Math Intervention Program

## Proven to Work

Decades of field testing demonstrates that *Number Worlds* closes gaps in math. Research shows that *Number Worlds* students who begin at a disadvantage will surpass students who begin on-level using other programs.

## What Teachers Want

In today's busy classrooms, flexibility is key. *Number Worlds* pairs seamlessly with any core math program by accommodating targeted, Tier 2 instruction in as little as 30–45 minutes a day and requires no more than 60 minutes a day for Tier 3 intensive intervention.

## What Students Need

Students learn best when they are immersed in their learning. This revolutionary update includes exciting digital features that promote engagement and bring math to life, motivating students to build deeper understanding as they explore a world of mathematical concepts.



# A Program Designed for Students to Succeed

*Number Worlds* accelerates mathematical understanding through five research-based instructional principles:

**Build upon students' current knowledge:** The program regularly assesses students and provides carefully sequenced activities that span several developmental levels.

**Follow the natural developmental progressions when selecting new knowledge to teach:** *Number Worlds* provides routine opportunities for students to use their current knowledge to hit developmental milestones they may have missed.

**Teach computational fluency and conceptual understanding:** Game-based and interactive activities throughout allow students to visualize math concepts; contextualize what they learn; perform arithmetic in their heads, digitally, or on paper; and practice writing formal mathematical expressions.

**Provide ample opportunity for hands-on exploration, problem-solving, and communication:** The program reinforces math learning with activities that expose students to the language of mathematics and require them to explain their reasoning.

**Expose students to major ways we represent and talk about numbers:** As students progress through the program, they explore multiple representations of numbers encountered in real life.



*Number Worlds* was designed with prevention levels (A–C) and intervention levels (D–J) to support Grades PreK–8.

## Prevention: Levels A–C

Prepare PreK–1 students with foundational skills and concepts necessary to be successful with more complex mathematics in the future. Each Prevention Level consists of 32 weeks of daily instruction including lessons on time and money.

Level A Building Foundations for Grade PreK	Level B Grade K Key Standards	Level C Grade 1 Key Standards
Students acquire well-developed counting and quantity schemas.	Students develop a well-consolidated central conceptual structure for single-digit numbers.	Students link their central conceptual structure of the number to the formal number system.

## Intervention: Levels D–J

Help students in Grades 2 through 8 learn the foundational skills and concepts needed to master key mathematical standards. Designed for flexibility, units can be taught in any order or in isolation with placement tests to help identify student needs.

	Level D Grade 2	Level E Grade 3	Level F Grade 4	Level G Grade 5	Level H Grade 6	Level I Grade 7	Level J Grade 8
Unit 1	Number Sense within 100	Number Sense	Number Sense	Number Sense	Number Sense	Number Sense	Number Sense
Unit 2	Number Sense to 1,000	Addition	Addition & Subtraction	Multiplication & Division	Operations Sense	Operations Sense	Operations Sense
Unit 3	Addition	Subtraction	Multiplication	Operations with Decimals	Algebra	Algebra	Algebra
Unit 4	Subtraction	Multiplication & Division	Division	Operations with Fractions	Statistical Analysis	Statistical Analysis	Statistical Analysis
Unit 5	Geometry & Measurement	Geometry & Measurement	Geometry & Measurement	Geometry & Measurement	Geometry & Measurement	Geometry & Measurement	Geometry & Measurement

# Teacher Resources

## Digital

### Teacher Course

functions as the digital control center where teachers can plan, teach, assess student progress, and access digital instructional components.

### Teacher Edition eBook

now provides built-in, point-of-use resources such as Activity Cards, Warm-Up Cards, and Vocabulary Cards.

### English Learner Support Guides

provide extra lessons, strategies, and resources to support English Language Learners.

### eTool Kit

helps bring lessons alive with interactive manipulatives.

### Professional Learning Environment

offers on-demand professional development resources, classroom videos, and implementation support.

## Print

### Teacher Edition

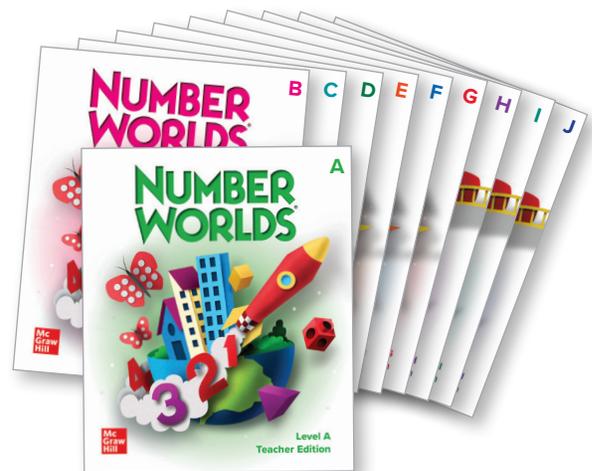
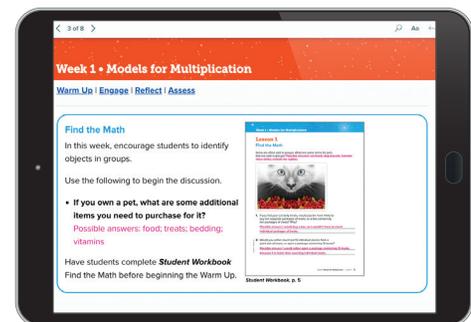
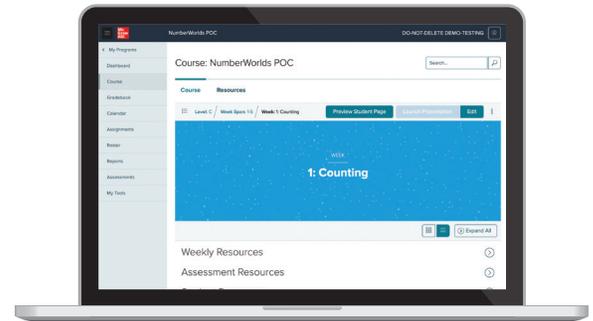
provides routine lesson plans, projects, and guidance for facilitating learning in the classroom.

### Placement Test Guide

determines the appropriate level for students to start the program.

### Manipulative Kit

includes math manipulatives for use in groups of five students.



# Student Resources

## Digital

### Student Dashboard

functions as the digital access point for all student assignments, assessments, and activities.

### Interactive Student Workbooks (English & Spanish)

include activities that help students develop and practice basic and higher-order thinking skills.

### Online Assessments (English & Spanish)

enable students to access and complete in-program assessments.

### eTool Kit

includes games and digital manipulatives that encourage student practice and modeling of math concepts.

### Building Blocks Adaptive Learning

utilizes research-proven game-based activities designed to engage students and guide them through individualized learning trajectories.

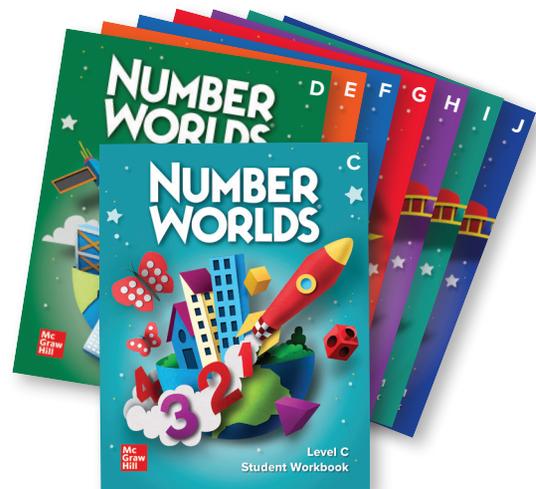
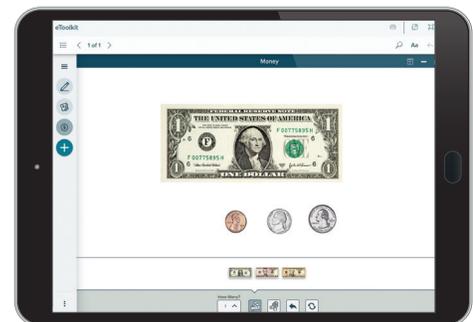
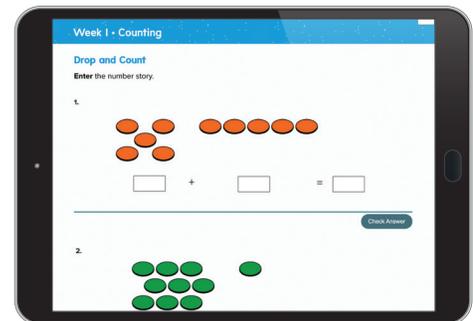
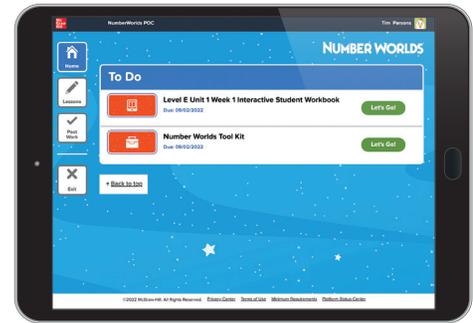
## Print

### Student Workbooks (English & Spanish)

provide activities that help students develop and practice basic and higher-order thinking skills.

### Print Assessments (English & Spanish)

provide printable informal and formal assessments.



# Weekly Planner: Your Roadmap to Success

The Weekly Planner provides helpful information before lessons begin, making teacher preparation simple and effective. Weekly Planners map out the entire week of lessons, complete with Learning Objectives and all of the resources needed to maximize instructional time.

## Week at a Glance

gives an overview of the week's goals.

## Background

gives teachers math context for the lesson.

## Skills Focus

gives a snapshot of the weekly learning objectives.

## How Students Learn

provides a refresher of the mathematics principles relevant to the unit.

## Week 1 • Counting

### Week at a Glance

This week students begin **Number Worlds**, Week 1 and are introduced to Object Land.

### Background

In Object Land, numbers are represented as groups of objects. This is the first way numbers were represented historically, and this is the first way students naturally learn about numbers. In Object Land, students work with real, tangible objects, such as Counters.

### Teaching for Understanding

As students play the Object Land activities, they will learn to move back and forth between the world of objects and the world of numbers without counting. For example, students will be able to say which is greater, seven cents or nine cents, without counting out two sets of objects and comparing them.

Observe closely while evaluating the Engage activities assigned for this week.

- Are students counting to 20?
- Can students order numbers from smallest to biggest?
- Can students predict the next number in a sequence?

### Skills Focus

- Count to 100.
- Compare and order numbers.
- Predict the next number.

### How Students Learn

Students may enter school having already learned to count and perhaps even to add small groups of objects. They may also understand terms such as *more* and *less*.

This week, students should become as familiar with numbers from 11–100 as they are with numbers from 1–10. Students should also learn to count down just as easily as they count up, which paves the way for subtraction at higher grade levels.

## Weekly Planner

lists objectives that explain how the key concepts are developed lesson by lesson and which resources can be used in each lesson.

### Key

**Boldface Text** = Online Resources

 = eTool

 = English Language Learners

 = Printable Resources

 = Printed Resources

### Warm-up and Activity Cards

set the stage for learning by offering explicit instruction on how to introduce, demonstrate, practice, and assess activities.

## Weekly Planner

Lesson	Learning Objectives	Program Materials
1	Students learn to count sequentially and to count to 100 by ones and tens.	<ul style="list-style-type: none"> <li>• Student Workbook </li> <li>• Warm Up Card, Pointing and Winking</li> <li>• Activity Card, Drop and Count</li> <li>• English Learner Support Guide Teacher eBook  <b>ELL</b></li> <li>• Sets Former Tool </li> <li>• 100 Counters</li> <li>• Letters to Home  </li> </ul> <p><b>Additional Materials</b></p> <ul style="list-style-type: none"> <li>• coffee can or box</li> <li>• chart paper and marker</li> </ul>
2	Students count a set of objects and also arrange quantities from smallest to biggest.	<ul style="list-style-type: none"> <li>• Student Workbook </li> <li>• Warm Up Card, Pointing and Winking</li> <li>• Activity Card, Feed the Animals</li> <li>• Sets Former Tool </li> <li>• Counters, varying quantities from 11 to 20</li> <li>• Number Cards (11–20)</li> <li>• Zoo Pictures</li> </ul> <p><b>Additional Materials</b></p> <p>four different colored bags</p>
3	Students continue to count sequentially and understand adding 10.	<ul style="list-style-type: none"> <li>• Warm Up Card, Pointing and Winking</li> <li>• Activity Card, Drop and Count</li> <li>• Sets Former Tool </li> <li>• 100 Counters</li> </ul> <p><b>Additional Materials</b></p> <ul style="list-style-type: none"> <li>• coffee can or box</li> <li>• chart paper and marker</li> </ul>
4	Students continue to count sets of objects and arrange quantities and numerals from smallest to biggest.	<ul style="list-style-type: none"> <li>• Warm Up Card, Pointing and Winking</li> <li>• Activity Card, Feed the Animals</li> <li>• Sets Former Tool </li> <li>• Counters, varying quantities from 11 to 20</li> <li>• Number Cards (11–20)</li> </ul> <p><b>Additional Materials</b></p> <p>Zoo Pictures four different colored bags</p>
5	<p><b>Review and Assess</b></p> <p>Students will review and reinforce skills and concepts learned this week.</p>	<ul style="list-style-type: none"> <li>• Student Workbook </li> <li>• Arrays Tool </li> <li>• Weekly Test, Assessment </li> <li>• Assessment Teacher eBook</li> </ul>
<b>Project</b>	Students count to 100. Students predict what number comes next.	<p><b>Additional Materials</b></p> <p>activity sheet</p>

### ELL

indicates supports to help English Language Learners understand both the math vocabulary and context of the lesson.

### eTools

are developmentally appropriate digital manipulatives used to demonstrate, explore, and build specific skills and concepts.

# Engaging Four-Part Lesson Structure

Every lesson in *Number Worlds* is organized by four distinct sections—**Warm Up, Engage, Reflect, and Assess**—for simplified time management. Whether it’s time for concept building or skill building, in-depth discussion or assessment, *Number Worlds* helps you keep learning objectives within reach.

## Find the Math

In Levels D–J, each week begins with an opportunity for students to connect mathematics with real-world experiences. In **Find the Math**, students respond to questions based on a real-world context that relates to the week’s mathematical focus.

**Week 1 • Models for Multiplication**

[Warm Up](#) | [Engage](#) | [Reflect](#) | [Assess](#)

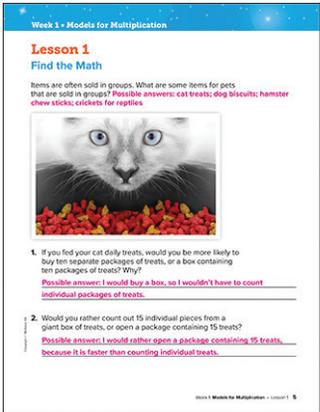
### Find the Math

In this week, encourage students to identify objects in groups.

Use the following to begin the discussion.

- **If you own a pet, what are some additional items you need to purchase for it?**  
Possible answers: food; treats; bedding; vitamins

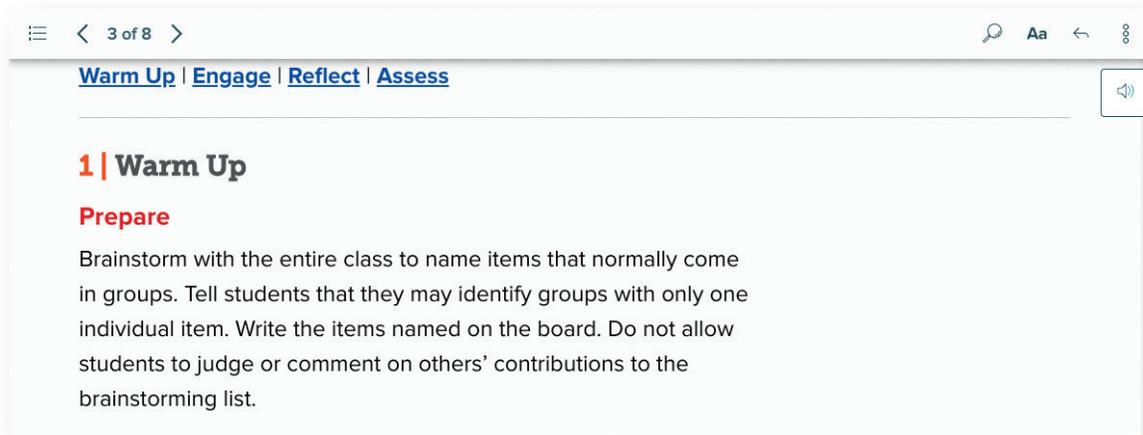
Have students complete ***Student Workbook***  
Find the Math before beginning the Warm Up.



*Student Workbook*, p. 5

## Part 1: Warm up

**Warm Up** provides cumulative review and practice to set the stage for learning.



☰ < 3 of 8 > 🔍 Aa ← ⋮

[Warm Up](#) | [Engage](#) | [Reflect](#) | [Assess](#)

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### 1 | Warm Up

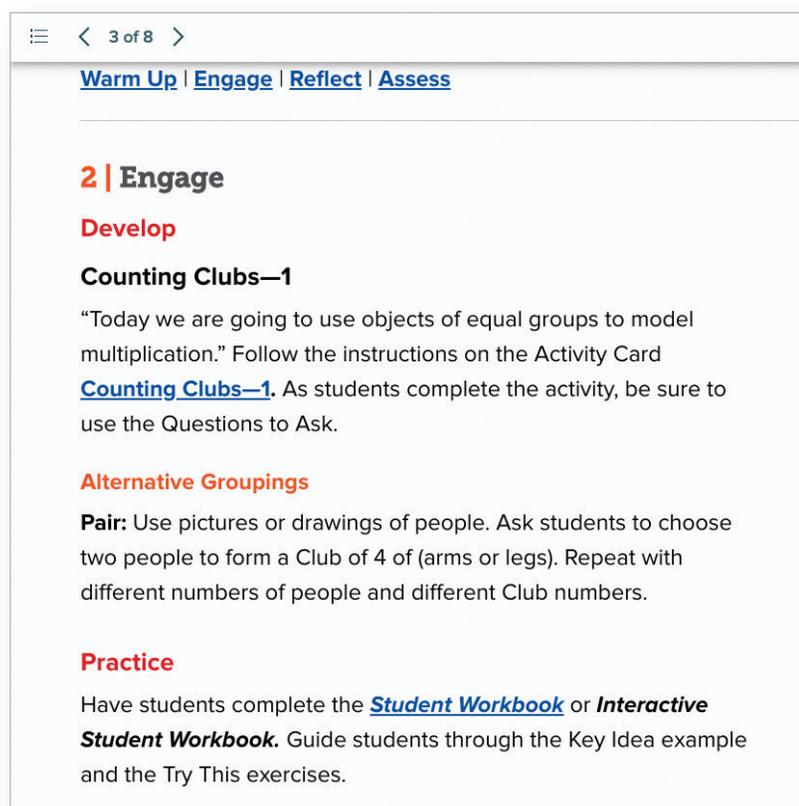
**Prepare**

Brainstorm with the entire class to name items that normally come in groups. Tell students that they may identify groups with only one individual item. Write the items named on the board. Do not allow students to judge or comment on others' contributions to the brainstorming list.

## Part 2: Engage

**Engage** is the core of the lesson instruction. Research-based strategies built upon field-test results provide teachers with effective, engaging instructional strategies to give students a firm foundation and multiple opportunities to understand the math concept in the lesson.

This section provides instructional models, hands-on activities, discussion, and exercises that offer a variety of ways for students to understand the lesson concepts.



☰ < 3 of 8 > 🔍 Aa ← ⋮

[Warm Up](#) | [Engage](#) | [Reflect](#) | [Assess](#)

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### 2 | Engage

**Develop**

**Counting Clubs—1**

“Today we are going to use objects of equal groups to model multiplication.” Follow the instructions on the Activity Card [Counting Clubs—1](#). As students complete the activity, be sure to use the Questions to Ask.

**Alternative Groupings**

**Pair:** Use pictures or drawings of people. Ask students to choose two people to form a Club of 4 of (arms or legs). Repeat with different numbers of people and different Club numbers.

**Practice**

Have students complete the [Student Workbook](#) or **Interactive Student Workbook**. Guide students through the Key Idea example and the Try This exercises.

## Part 3: Reflect

**Reflect** provides opportunities for students to summarize and apply lesson concepts and to engage in critical thinking. Students explain their thinking in multiple ways—discussion, drawing, writing, or modeling with manipulatives.

The screenshot shows a digital document interface with a navigation bar at the top containing 'Warm Up', 'Engage', 'Reflect', and 'Assess'. The main content area is titled '3 | Reflect' and includes a 'Think Critically' section with a paragraph and a list item. Below that is a '4 | Assess' section with an 'Informal Assessment' paragraph and a table titled 'Counting Clubs—1' containing four assessment questions.

☰ < 3 of 8 > 🔍 Aa ← ☰

[Warm Up](#) | [Engage](#) | [Reflect](#) | [Assess](#)

### 3 | Reflect

**Think Critically**

Review students' answers to the Reflect prompt in the [Student Workbook](#) and then review the Engage activity.

- **Can twelve pencils be divided into a different number of equal groups?** Yes; two groups of 6; three groups of 4; four groups of 3; six groups of 2.

### 4 | Assess

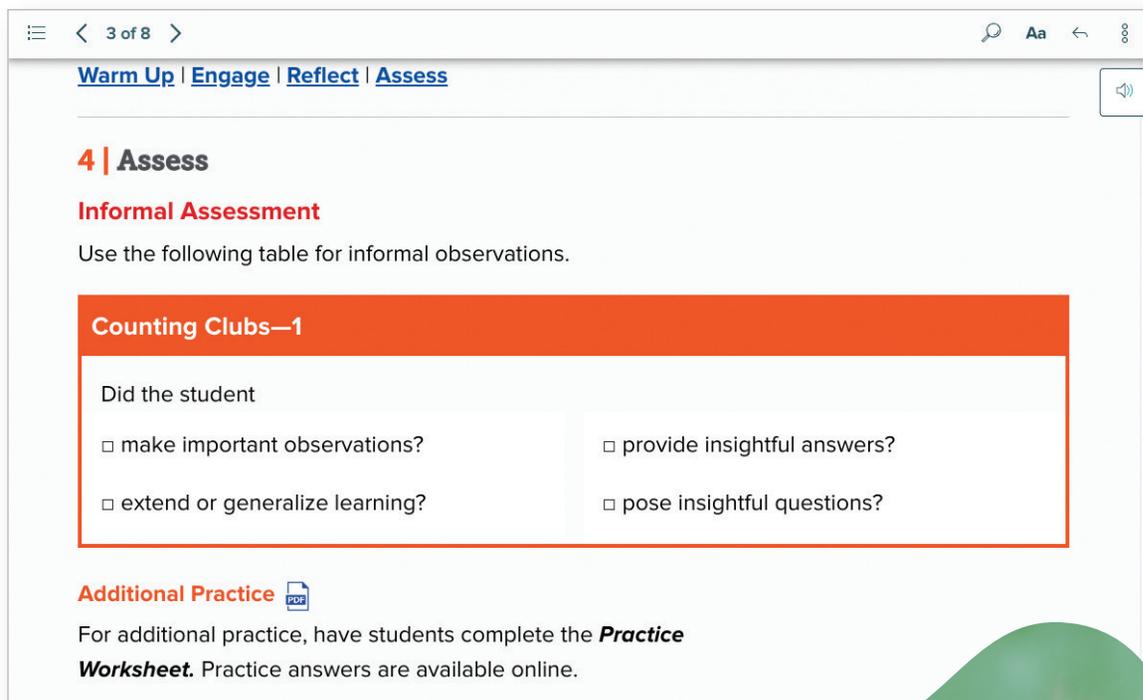
**Informal Assessment**

Use the following table for informal observations.

Counting Clubs—1	
Did the student	
<input type="checkbox"/> make important observations?	<input type="checkbox"/> provide insightful answers?
<input type="checkbox"/> extend or generalize learning?	<input type="checkbox"/> pose insightful questions?

## Part 4: Assess

**Assess** provides an opportunity to informally assess student progress, evaluate understanding of key concepts, and determine the need for additional practice. Formal assessment takes place after Lesson 5 each week.



The screenshot shows a digital interface with a navigation bar at the top containing 'Warm Up', 'Engage', 'Reflect', and 'Assess'. The main content area is titled '4 | Assess' and 'Informal Assessment'. It includes a table for 'Counting Clubs—1' with four assessment questions. Below the table is an 'Additional Practice' section with a PDF icon and text about a 'Practice Worksheet'.

3 of 8

[Warm Up](#) | [Engage](#) | [Reflect](#) | [Assess](#)

### 4 | Assess

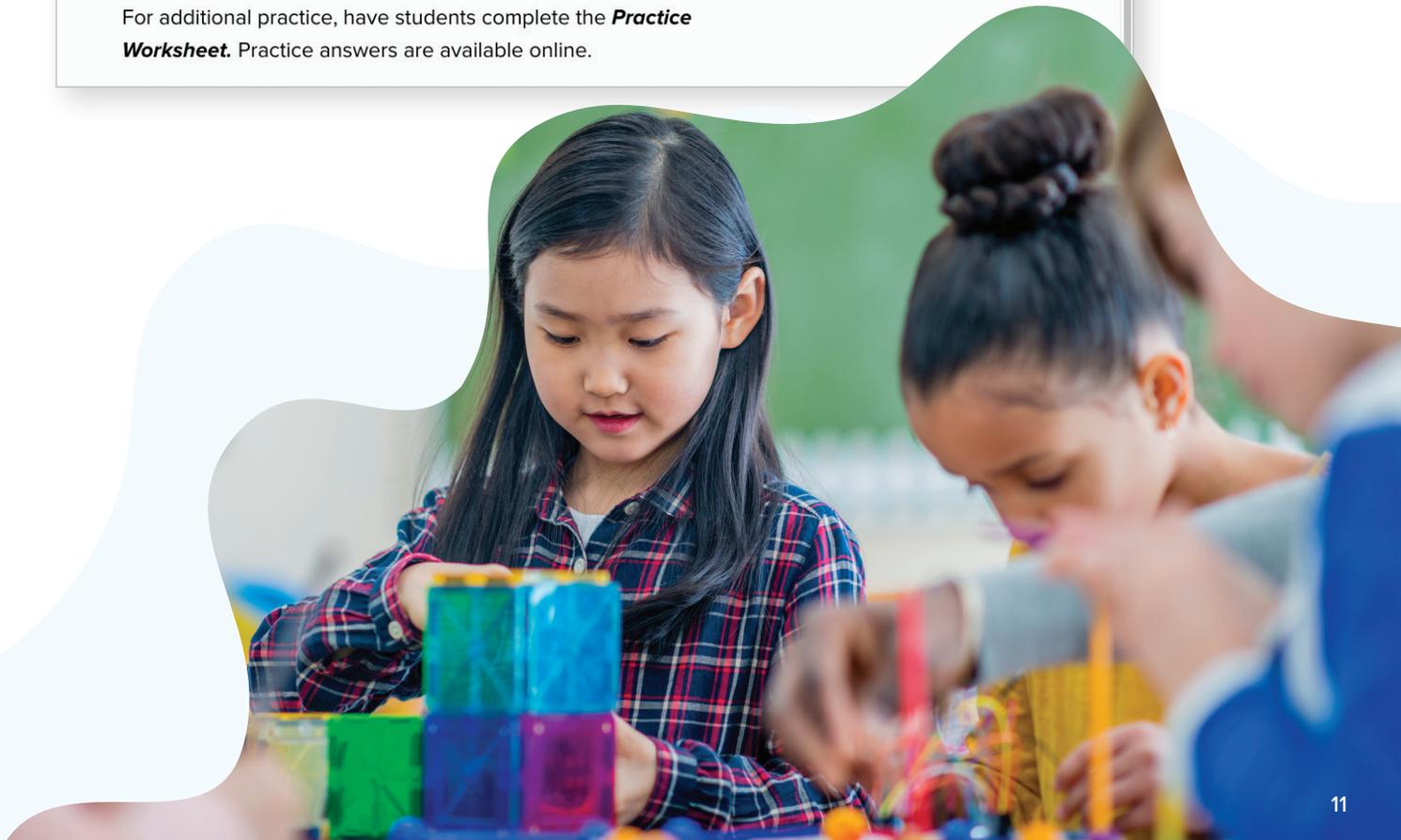
#### Informal Assessment

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Counting Clubs—1	
Did the student	
<input type="checkbox"/> make important observations?	<input type="checkbox"/> provide insightful answers?
<input type="checkbox"/> extend or generalize learning?	<input type="checkbox"/> pose insightful questions?

**Additional Practice** 

For additional practice, have students complete the **Practice Worksheet**. Practice answers are available online.



# Boost Student Engagement with Project-Based Learning

Weekly Project-Based Learning activities increase long-term retention of concepts. Every week, students collaborate on projects to answer an essential question that builds on what they learned in prior weeks. They are challenged to apply and demonstrate mastery of concepts and skills by expressing understanding through discussion, research, and presentation.

Each project includes an easy-to-follow routine and features real-world scenarios to help build college and career readiness for all students. Each project then wraps up with a discussion, presentation, or reflection.

## Project Preview

This week, students learned models for multiplication. The project for this unit requires students to apply the models they learned to help them determine the number of items they will need to help dogs at a dog shelter.

**Note:** Students using the *Interactive Student Workbook* will complete projects on a sheet of paper.

## Project-Based Learning

Standards-driven Project-Based Learning is effective in building deep content understanding. Project-Based Learning increases long-term retention of concepts and has been shown to be more effective than traditional instruction. Completing a project to answer an essential question challenges students to apply and demonstrate mastery of concepts and skills by expressing understanding through discussion, research, and presentation.

## Essential Question

**How** can I use multiplication and division to plan for the future?

## Project Evaluation Criteria

Review project evaluation criteria with students prior to beginning the project.

### Exceeds Expectations

- Project result is explained and can be extended.
- Project result is explained in context and can be applied to other situations.
- Project result is explained using advanced mathematical vocabulary.
- Project result is explained and extended, and shows advanced knowledge of mathematical concepts and skills.

### Meets Expectations

- Project result is explained.
- Project result is explained in context.
- Project result is explained using mathematical vocabulary.
- Project result is described, and mathematics are used correctly.
- Project result is explained, and shows satisfactory knowledge of mathematical concepts and skills.

### Does Not Meet Expectations

- Project result is not explained.
- Project result is explained, but out of context.
- Project result is explained, but mathematical vocabulary is oversimplified.
- Project result is described, but mathematics are not used correctly.
- Project result is not explained and or extended, or shows less than satisfactory knowledge of mathematical concepts and skills.

## Support the Dog Shelter

### Objective

Students can find products and write multiplication equations using the  $\times$  symbol.

### Materials

- |                          |                                 |
|--------------------------|---------------------------------|
| <b>Program Materials</b> | <b>Additional Materials</b>     |
| • Counters               | • letter-sized blank paper      |
| • Number Cube (1-6)      | • folded vertically into thirds |

### Best Practices

- Organize the materials before the lesson.
- Allow students to think industriously.
- Provide project directions that are clear and brief.



## Introduce

Imagine that a hurricane has caused the dog population at a local shelter to increase. How many items could you collect to help the shelter take care of its new residents?

- Shelters welcome donations of items and volunteer time to help their animals.
- What are the basic needs of these shelters?
- Let's brainstorm a list of items that we could collect for a dog shelter.

## Explore

- Today you will begin to create a brochure to show how you are helping the shelter.

Have each student respond to question 1 by listing an item to collect for the shelter.

- Use your age to decide how many dogs you will help. For example if you are 8 years old, you will help 8 dogs. This number is your first factor.
- Roll the Number Cube. Add 3 to the number on the Number Cube to determine how many of the item you will give each dog. For example, if you roll a 2, you will donate 5 of the item to each dog. This number is your second factor.
- Complete the *Student Workbook* to find the total number of this item you will donate to the local shelter. This is the product.

## Wrap Up

- Allow students time to tell which item they decided to collect.
- Make sure each student can explain how they determined the total number of items to collect.
- If students struggle to find the product, have them first find the answer using repeated addition or have them use Counters to create an array to find the product.
- Discuss students' answers to the Reflect prompts in the *Student Workbook*.

Distribute to each student one piece of letter-size blank paper, folded vertically into thirds. Show students the first panel on the left.

- On this panel of the brochure, you will tell what you are donating.
- Writer "I will collect [number] [item]." Possible answer: I will collect twenty-four boxes of dog treats.

If time permits, allow each student to add an illustration to the brochure panel. Be sure to save this brochure, as they will continue to add to it over the next 6 weeks.

# Warm-up Cards and Activity Cards

Warm-up cards used in Levels A–C set the stage for learning and to informally assess student readiness.

Activity Cards used in Levels A–J offer explicit instruction on how to introduce, demonstrate, practice, and assess activities, and offer questioning strategies for each activity. Real-world scenarios are used to build college and career readiness. Each project wraps up with a discussion, presentation, or reflection.

## Activity 4A: Counting Clubs - 1

**Objective**

Students can use pictures of equal groups to create models for multiplication.

---

**Materials**

**Program Materials**

No materials needed.

**Alternative Groupings**

**Pair:** Use pictures or drawings of people. Ask students to choose two people to form a Club of 4 (arms or legs). Repeat with different numbers and different club numbers.

**Progress Monitoring**

**If...** students struggle to create groups from **Then...** provide students with Counters that

## Project

**Week 1 • Models for Multiplication**

**Project**  
Support Your Local Dog Shelter

Write the answer to each question on this card.

- Which item will you collect for the shelter?  
I will help \_\_\_\_\_ dogs.
- Use your age to find the number of items to help.  
I will collect \_\_\_\_\_ items.
- Roll a Number Cube. Add 3 to the number to find how many of the item you will collect.  
I will collect \_\_\_\_\_ items.
- Write a number sentence to show the items you will collect.  
\_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_

number of items for each dog      number of dogs      to

I will collect \_\_\_\_\_ items for \_\_\_\_\_

**Reflect**

What do you need to know before you begin for the shelter?

*You need to know how many of the items you will be helping.*

How does using multiplication compare to find the total number of items?

*Possible answer: You can usually write it than with repeated addition.  $8 \times 4 = 32$*

16 Level 4: Use 4 Multiplication and Division

### Teacher Reflect

- Did I explain the directions of their projects?
- Were students able to answer solutions?
- Did I adequately explain and discuss the questions with the students?

# Assessment and Reporting Made Easy

Wide-ranging assessment tools allow teachers and administrators to correctly place and monitor at-risk students, evaluate student proficiency, inform instruction, and visually track progress.

## Placement Tests

*Number Worlds* is equipped with two placement tests that can be used to determine the appropriate program level:

### Number Knowledge Test

The Number Knowledge Test can be used as an initial screener in Grades PreK–1 to place students in one of the three prevention levels.

### Placement Test

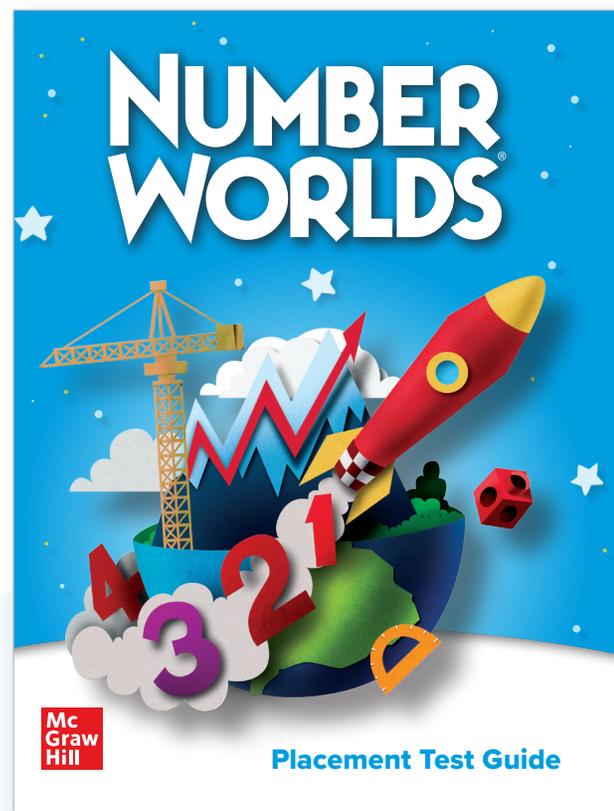
The Placement Test can be used for student placement in any of the program levels. After using the Placement Test to identify students' levels within *Number Worlds*, teachers can assign a unit pretest to determine students' baseline measures for the selected unit.

## Informal Assessments

Each lesson has embedded ongoing, informal assessment that allows for a more complete picture of students' performance.

## Formal Assessments

*Number Worlds* evaluates student understanding weekly, at the end of each unit, and through cumulative pre- and post-test assessments to inform instruction. Online testing measures and prepares students for high-stakes tests.



## Reporting

**Student reports** allow teachers to see which skills an individual student has mastered and where each student can improve.

**Class reports** allow teachers and administrators to see how an entire class is performing on specific skills and topics.

**School- and District-level reporting** helps administrators make decisions and compare student proficiency across classes and schools.



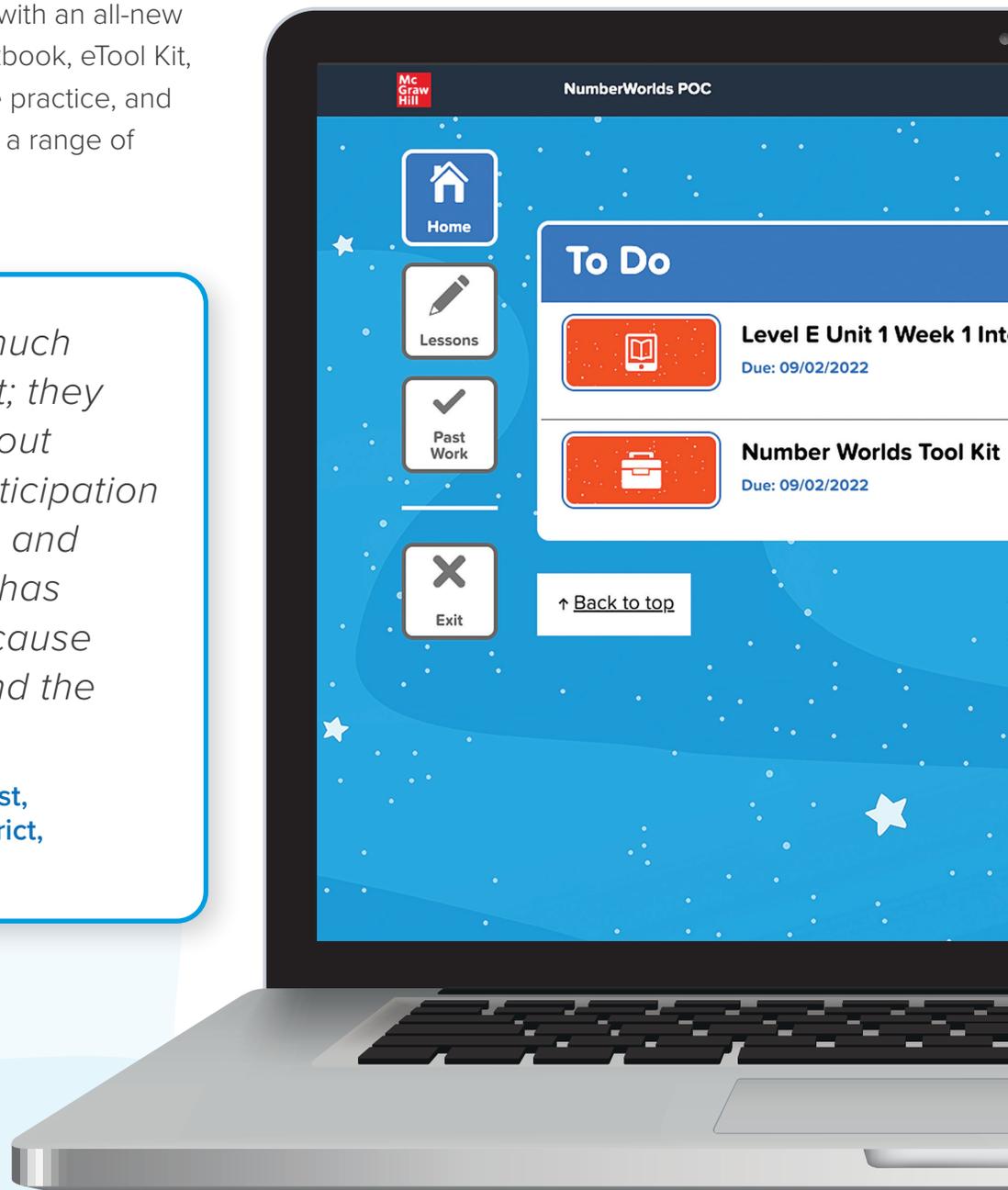
# An All-New Digital Experience Keeps Students Engaged

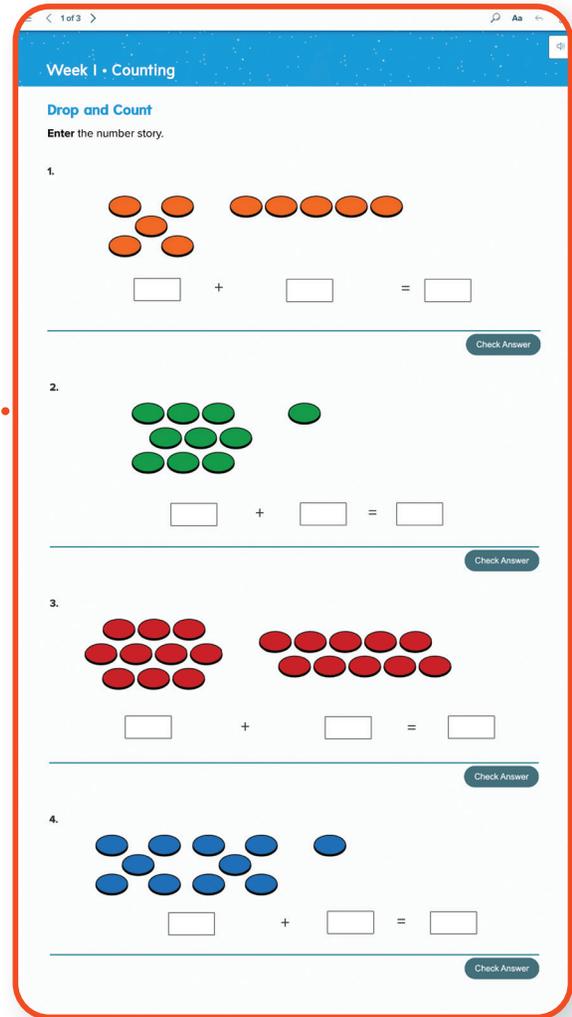
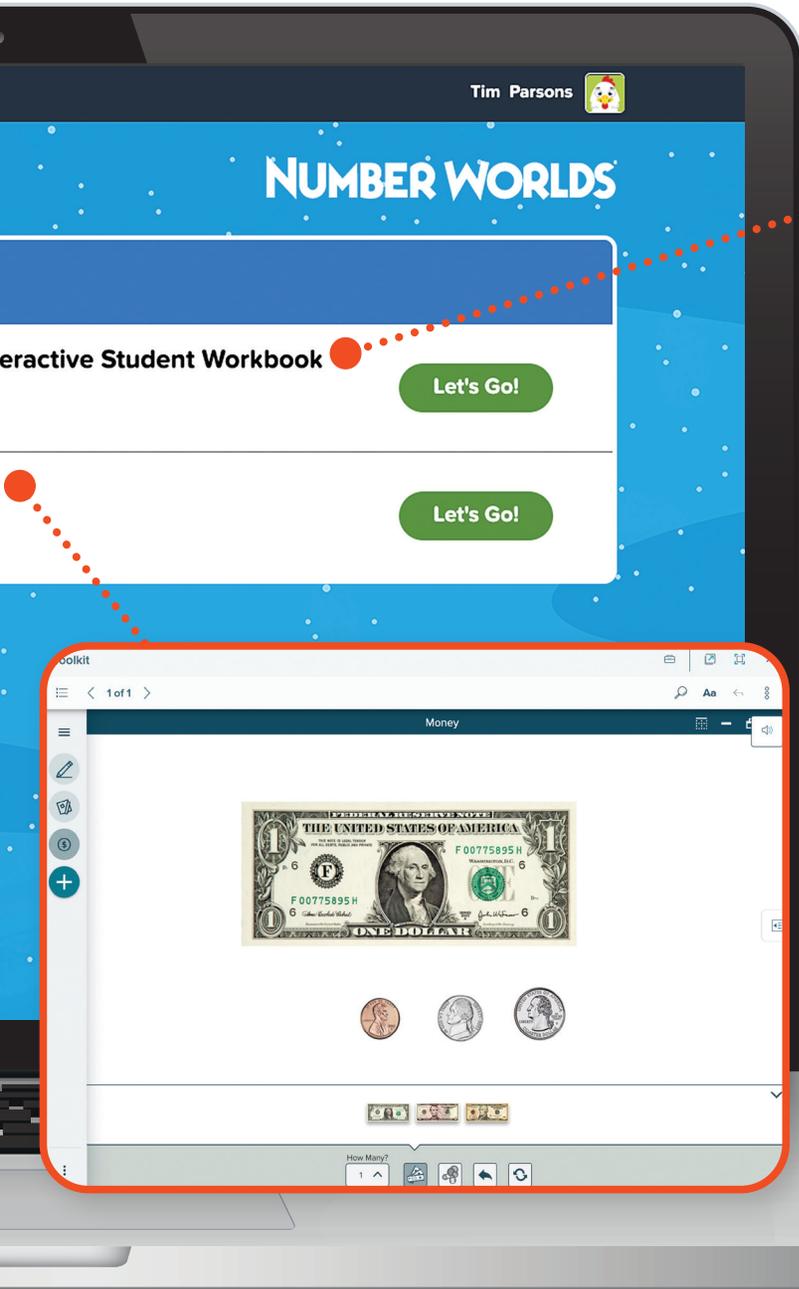
When students get excited about math, nothing can hold them back. With *Number Worlds*, you can build that excitement no matter how much acceleration your students need.

This program is packed with an all-new Interactive Student Workbook, eTool Kit, *Building Blocks* adaptive practice, and games to accommodate a range of learning styles.

*Students are much more confident; they are excited about math; their participation has increased; and their behavior has improved—because they understand the material.*

—Math Interventionist,  
Ladue School District,  
Missouri





# Adaptive, Personalized Learning Builds Proficiency

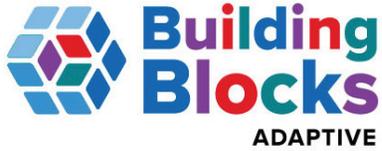
Coupled with *Number Worlds*, *Building Blocks* adaptive practice includes a collection of game-based activities for independent practice as well as conceptual development and remediation for Grades PreK–8.

Activities are sequenced along research-based developmental paths called **learning trajectories** to help students move through stages of understanding. The program is **adaptive** and **personalized** so that all students can follow unique learning paths based on their performance. Detailed progress reports give teachers the feedback they need to monitor the progress of every student and every class.

***Building Blocks* is designed to:**

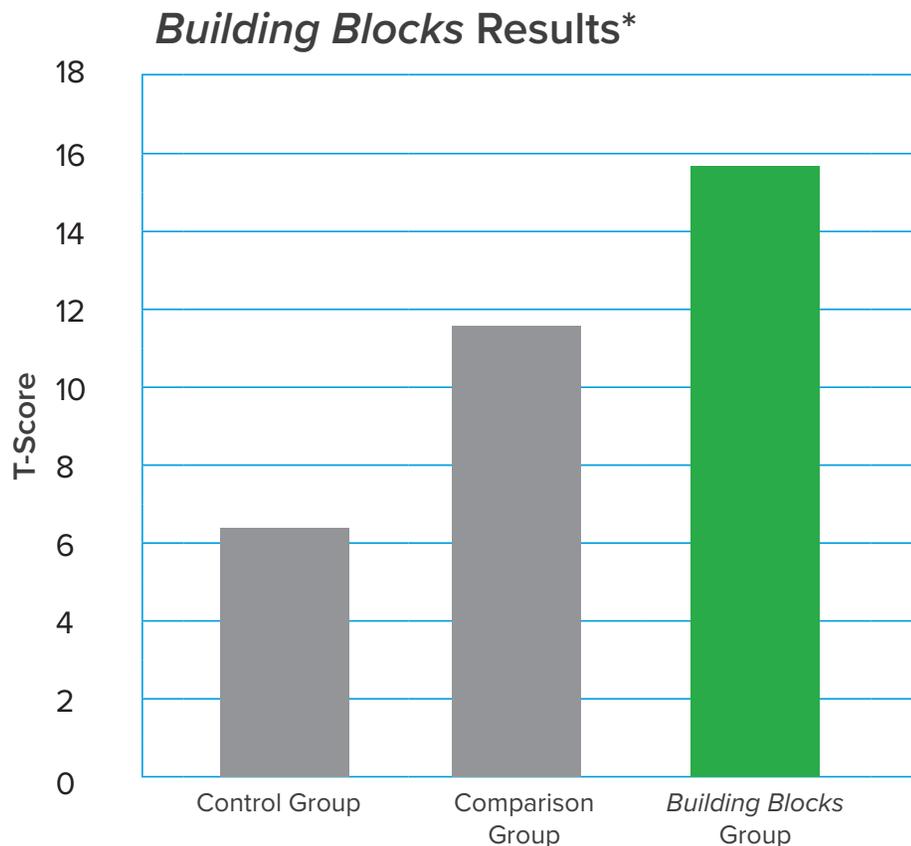
- harness adaptive learning technology to reinforce mathematical development.
- build young students' experiences with mathematics through engaging activities.
- involve students in “doing mathematics.”
- develop a strong conceptual framework.
- emphasize students' mathematical thinking and reasoning abilities.





A National Science Foundation-funded study on randomly assigned classrooms tested *Building Blocks* against a comparable math program and a no-treatment control group. Students using *Building Blocks* significantly outperformed both the comparison group and the control group. In these research studies, *Building Blocks* was shown to increase young children's knowledge of multiple essential skills.

Another study tests *Building Blocks* against a comparable preschool math program and a no-treatment control group. All classrooms were randomly assigned, the gold standard of scientific evaluation. *Building Blocks* significantly outperformed both the comparison group and control group. Results indicate strong positive effects with achievement gains near or exceeding those recorded for individual tutoring.



\*Source: Clements, Douglas H., Julie Sarama, and Ann-Marie DiBiase eds. *Engaging Young Children in Mathematics: Standards for Early Childhood Mathematics Education*. Mahwah, NJ: Lawrence Erlbaum Associates, 2004.

# Empower Teachers with Professional Learning

The Professional Learning Environment offers on-demand professional development resources for *Number Worlds* and *Building Blocks*, including an online course, implementation guide, and administrator support.

## Extended Professional Development

**Online Courses:** Embedded within the product platform, the online course helps teachers implement the curriculum and use digital resources and technology in more effective ways.

**Author Video Series:** In these videos, our authors highlight specific pedagogical opportunities for teachers and administrators to effectively apply the research-based instructional models in which our programs were developed.



**Classroom Video Libraries:** These videos showcase *Number Worlds* in action, demonstrating how real teachers use our programs and pedagogy in the classroom.

**Live (Virtual and/or In-Person) Initial Training Sessions:** Implemented based on a plan developed with the district, these sessions prepare teachers to use curriculum resources.



# Program Research

*Number Worlds* authors have made significant contributions to mathematics education research. This research forms the foundation of our program.

*Number Worlds* was designed to expose and develop students' understanding of the three worlds of mathematics: quantity, number, and symbols. Students develop understanding by exploring five different ways numbers and quantities are represented:

				
<p>In <b>Object Land</b>, students explore the world of numbers by counting and comparing sets of objects or pictures of objects. In Object Land you might ask:</p> <ul style="list-style-type: none"> <li>■ How many or few do you have?</li> <li>■ Which is bigger or smaller?</li> </ul>	<p>In <b>Picture Land</b>, numbers are represented as sets of stylized, semi-abstract dot-set patterns, such as in a die, tally marks, or numerals. In Picture Land you might ask:</p> <ul style="list-style-type: none"> <li>■ What did you roll/pick?</li> <li>■ Which has more or less?</li> </ul>	<p>In <b>Line Land</b>, number is represented as a point on a path or line. The language used for numbers in Line Land refers to a particular place on a line and also to moves along a line. In Line Land you might ask:</p> <ul style="list-style-type: none"> <li>■ How far did you go?</li> <li>■ Do you go forward or backward?</li> </ul>	<p>In <b>Sky Land</b>, number is represented as a position on a vertical scale such as on a thermometer or in a bar graph. In Sky Land you might ask:</p> <ul style="list-style-type: none"> <li>■ How high or low are you now?</li> <li>■ Who is above or below?</li> </ul>	<p>In <b>Circle Land</b>, number is represented as a point on a dial, such as a clock face or a sundial. In Circle Land you might ask:</p> <ul style="list-style-type: none"> <li>■ How many times did you go around?</li> <li>■ What did you land on?</li> </ul>

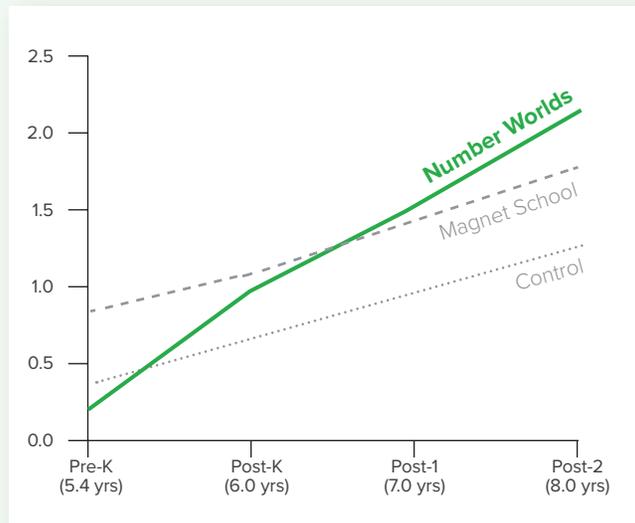
*“Research-based, scientifically validated interventions/instruction provide our best shot at implementing strategies that will be effective for a large majority of students.”*

—Response to Intervention Policy Considerations and Implementation, National Association of State Directors of Special Educations, Inc. ©2006 p. 20

*Number Worlds* has been developed and refined since the mid-1980s and has shown proven results through years of rigorous field testing. These results show that students who performed below their peers surpassed the performance of those who began on-level with their peers simply by participating in the *Number Worlds* program.

As the figure shows, the magnet school group began kindergarten with substantially higher scores on the Number Knowledge Test than students in the *Number Worlds* and control groups. The gap indicated a developmental lag that exceeded one year, and was closer to two years for many students in the *Number Worlds* group. By the end of the kindergarten year, however, the *Number Worlds* students had narrowed this gap to a small fraction of its initial size.

By the end of second grade, the *Number Worlds* students outperformed the magnet school group. In contrast, the initial gap between the control group and the magnet school group did not narrow over time. The control group students did make steady progress over the three years; however, they were never able to catch up.



Griffin, Sharon. *Fostering the Development of Whole-Number Sense. How Students Learn: Mathematics in the Classroom*. Washington, D.C.: The National Academies Press, 2005.



## Meet the Authors

**Sharon Griffin** is Professor Emerita of Education and Psychology at Clark University in Worcester, Massachusetts. She received a B.A. in Psychology from McGill University, an M.A. in Education from the University of New Hampshire, and a Ph.D. in Cognitive Science from the University of Toronto. Before coming to Clark University in 1989, she worked as a Research Associate at the Ontario Institute for Studies in Education.

Dr. Griffin has received several research awards for applying the findings of cognitive science to (a) improve mathematics learning and achievement for at-risk children, (b) teach number sense, and (c) enable teachers of mathematics to acquire the skills needed to enhance their students' math learning and achievement.

Dr. Griffin has also served on several national and international advisory boards on projects designed to enhance the cognitive, mathematical, and language development of children from birth through the elementary school years.

As a member of the Mathematical Sciences Education Board at the National Academies of Science (NAS) and the Center of Education Research and Innovation at the Organization for Economic Collaboration and Development (OECD), she also helped shape the direction of education research and policy for the United States, Canada, the U.K., and several European countries.

**Dr. Douglas Clements**, Kennedy Endowed Chair in Early Childhood Learning and Professor at the University of Denver, is widely regarded as “the major scholar” in the field of early childhood mathematics education, with equal relevance to the academy, to the classroom, and to the educational policy arena. At the national level, his contributions have led to the development of new mathematics curricula, teaching approaches, teacher training initiatives, and models of “scaling up” interventions. His contributions have also had a tremendous impact on educational planning and policy, particularly in the area of mathematical literacy and access. Most recently, Dr. Clements was selected to sit on the National Research Council Committee on Science of Children Birth to Age 8: Deepening and Broadening the Foundation for Success for The National Academies of Sciences’ Institute of Medicine.

**Dr. Julie Sarama**, Kennedy Endowed Chair in Innovative Learning Technologies and Professor at the University of Denver, conducts research on young children’s development of mathematical concepts and competencies, the implementation and scale-up of educational reform, professional development models and their influence on student learning, and the implementation and effects of software environments in mathematics classrooms. These studies have been published in more than 50 refereed articles, 4 books, 30 chapters, and 60 additional publications. She has been both Principal and Co-Principal Investigator on seven projects funded by the National Science Foundation. Dr. Sarama is also co-directing three large-scale studies funded by the U.S. Education Department’s Institute of Educational Studies (IES).

# NUMBER WORLDS<sup>®</sup>

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for Grades PreK–8**



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