InsightMath California

Grade 2

Program Overview Guide

MIND EDUCATION

Our Vision

At MIND Education, our mission is to ensure all students are mathematically equipped to solve the world's most challenging problems.

MIND Education is the leading curriculum developer creating math programs entirely based on **how the brain naturally learns**. Backed by over 25 years of applied research and classroom experience, we design student-centered programs rooted in visual learning, spatial-temporal reasoning, and structured problem solving.

By focusing on **conceptual understanding from the very beginning**, we help prevent learning gaps before they start—giving every student the opportunity to grow into a **confident, capable mathematical thinker**.

Our belief is simple and powerful: **when we design learning to match how the brain learns, every student can thrive in math**.

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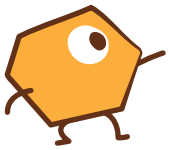
Welcome to InsightMath California!

You're about to teach math in a whole new way—one that brings learning to life—for your students and for you.

InsightMath California is designed with the brain in mind. That means more visual thinking, more student voice, and more moments where real understanding clicks into place.

What to expect:



Your students will:

- Jump into puzzles that get them thinking right away
- Talk about math—out loud, with each other, and with you
- Build real understanding, as they develop computational fluency and procedures

You will:

- See your students engaged, curious, and persistent
- Facilitate rich conversations using built-in supports
- Get everything you need—organized, clear, and ready to go

Your classroom will:

- Come alive with mathematical thinking
- Support every learner, every day
- Feel like a community where math makes sense

This guide walks you through the year. We're excited for everything you and your students are about to discover.

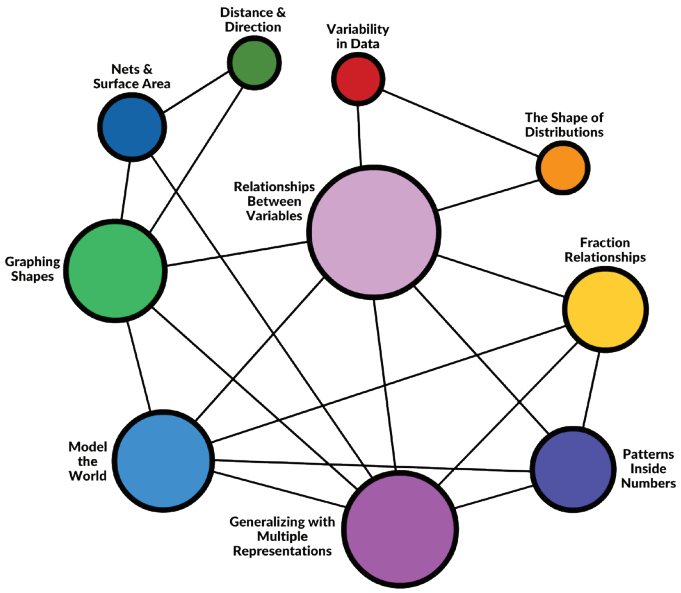
Let's do this!

—The Team at MIND Education

What's in InsightMath California?

InsightMath California is not just aligned with the new California Mathematics framework—it brings its vision to life. Students experience math as a coherent, sense-making journey built on Big Ideas, visual reasoning, and student-driven inquiry. Grounded in neuroscience and designed for all students from the start, InsightMath aligns with the **Five Components of Equitable and Engaging Teaching for All Students**:

- planning around big ideas
- using open and engaging tasks
- teaching for social justice
- inviting student questions and conjectures
- prioritizing reasoning and justification



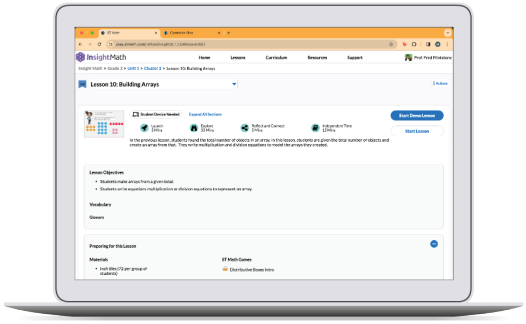
Our visual-first program supports deep understanding, encourages mathematical discourse, and helps students develop the confidence to persevere through challenging problems.

From its rigorous, grade-level curriculum and dynamic problem-solving process to its robust teacher support and inclusive assessments, the program fosters critical thinking, positive math identities, and lasting learning. **InsightMath California** empowers all students to see themselves as mathematical thinkers – ready to tackle the challenges of tomorrow.

Projects

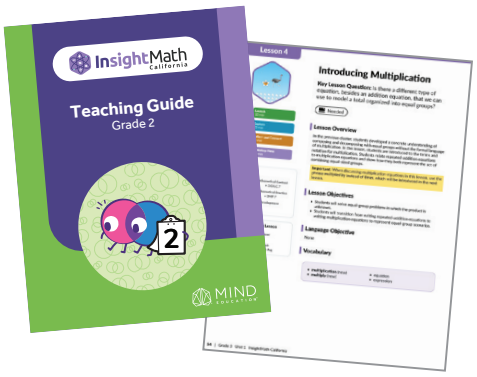
InsightMath California includes projects in each grade level that can be flexibly implemented by teachers at any appropriate time during the school year. The projects focus heavily on interweaving **Data and Statistics** with the **Environmental Principles & Concepts**, helping students explore connections between math, their classroom, and the world around them.

Grade 2 Program Components



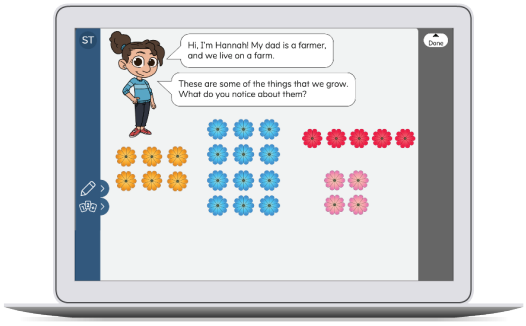
Digital Planning Guide

All Program Resources



Teaching Guide

Digital/Print Resources
for Daily Instruction

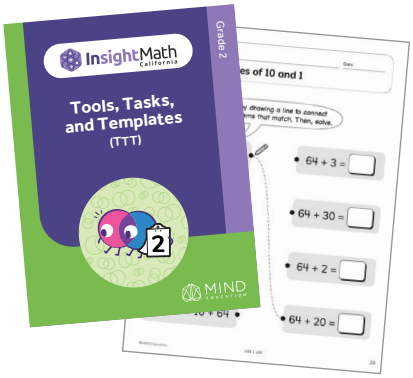


Digital Student Edition

Student Portal into
the Lessons

Playbook

Digital/Print Student
Activity Pages

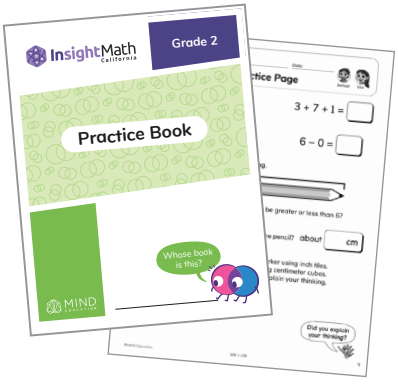


Tools, Tasks, and Templates

Digital/Print Teacher Blackline Masters

Classroom Manipulative Kit

Grade Level Manipulative Kit



Practice Book

Digital/Print Daily Practice Pages

Classroom Poster Pack

Classroom Character and Strengths Posters

Grade 2 Scope and Sequence

Unit 0 Doing Mathematics

Big Idea **All students are doers, knowers, and sensemakers of mathematics.**

Cluster1 Collaborating to Do Mathematics

Cluster2 Persevering to Do Mathematics

Unit 1 Estimating and Measuring Length

Big Idea **Measuring length with standardized units and tools helps to communicate precisely, compare lengths, and solve problems.**

Cluster1 Standard Units of Length

Cluster2 Length Measurement Tools

Cluster3 Line Plots

Cluster4 Indirect Comparison of Length Measurements

Unit 2 Discovering Addition and Subtraction on the Number Line

Big Idea **The number line is a powerful tool that can show magnitudes of numbers and relationships between them.**

Cluster1 The Number Line

Cluster2 Using a Number Line to Add and Subtract Numbers Within 20

Cluster3 Using a Number Line to Model and Solve Additive-Comparison Problems

Cluster4 Using a Number Line to Add and Subtract 2-Digit Numbers

Unit 3 Exploring Addition and Subtraction Within 100

Big Idea **Addition and subtraction can help to describe and solve word problems.**

Cluster1 Modeling Place Value Strategies for Addition and Subtraction

Cluster2 Using Decomposition and Grouping Strategies to Add

Cluster3 Choosing Appropriate Models and Strategies to Add

Cluster4 Choosing Appropriate Models and Strategies to Solve Two-Step Addition and Subtraction Problems

Unit 4 Extending Place Value to 1000

Big Idea **The place value system is based on patterns which makes expressing and working with numbers efficient.**

Cluster1 100 and 1000 as Single Units

Cluster2 Composing and Decomposing Three-Digit Numbers

Cluster3 Comparing and Ordering Three-Digit Numbers

Unit 5 Extending Addition and Subtraction Within 1000

Big Idea **Place-value understanding helps to efficiently add, subtract, and estimate reasonableness of answers.**

Cluster1 Composing and Decomposing Groups of 10 to Add and Subtract

Cluster2 Composing and Decomposing Groups of 100 to Add and Subtract

Cluster3 Flexibly Composing and Decomposing Place Value Groups to Add and Subtract

Unit 6 Investigating Data

Big Idea **Asking questions, and using data to critically answer those questions, help to make sense of the world.**

Cluster1 Displaying and Comparing Data Categories

Cluster2 The Data Investigation Process

Cluster3 Planning and Conducting a Data Investigation

Unit 7 Counting in Groups

Big Idea **Creating structured, equal groups supports visualizing numbers, efficient counting, and understanding money.**

Cluster1 Even and Odd Numbers

Cluster2 Introduction to Arrays

Cluster3 Money Problems

Unit 8 Exploring Shapes and Time

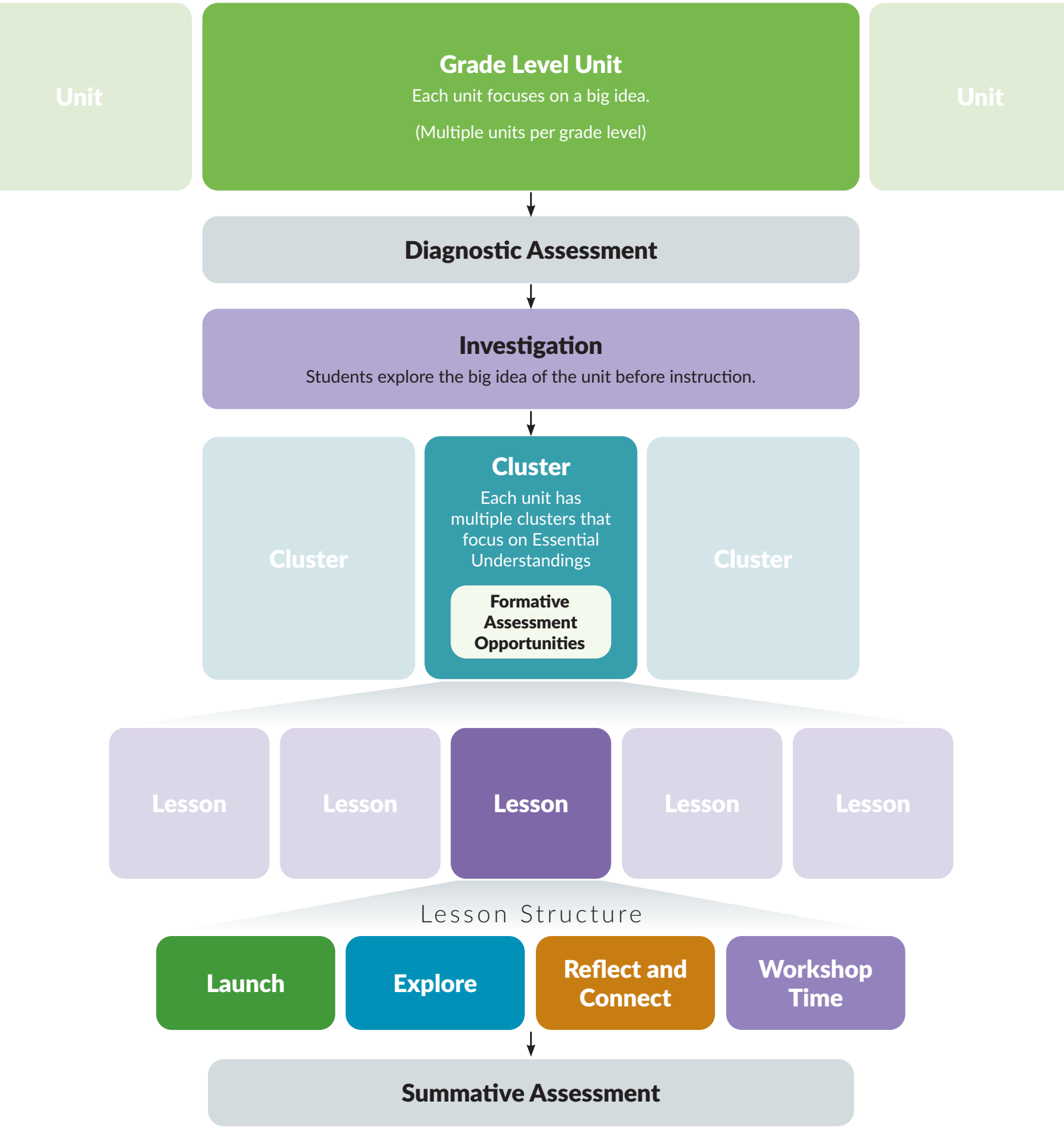
Big Idea **Wholes and parts of wholes can be named by the number of equal-size parts which compose them.**

Cluster1 Defining Attributes of Shapes

Cluster2 Halves, Thirds, and Fourths

Cluster3 Telling and Writing Time

Unit Structure



Grade 2 Pacing Guide

Week	
1	Unit 0: Doing Mathematics (5–10 days)
2	
3	Unit 1: Estimating and Measuring Length (16–20 days)
4	
5	
6	
7	Unit 2: Discovering Addition and Subtraction on the Number Line (20–25 days)
8	
9	
10	
11	
12	Unit 3: Exploring Addition and Subtraction Within 100 (20–25 days)
13	
14	
15	
16	
17	Unit 4: Extending Place Value to 1000 (15–20 days)
18	
19	
20	
21	Unit 5: Extending Addition and Subtraction Within 1000 (18–23 days)
22	
23	
24	
25	
26	Unit 6: Investigating Data (15–19 days)
27	
28	
29	
30	Unit 7: Counting in Groups (15–19 days)
31	
32	
33	
34	Unit 8: Exploring Shapes and Time (15–19 days)
35	
36	

A Visual Approach to Math Instruction Based on How the Brain Learns

Changing the Math Story for Every Student

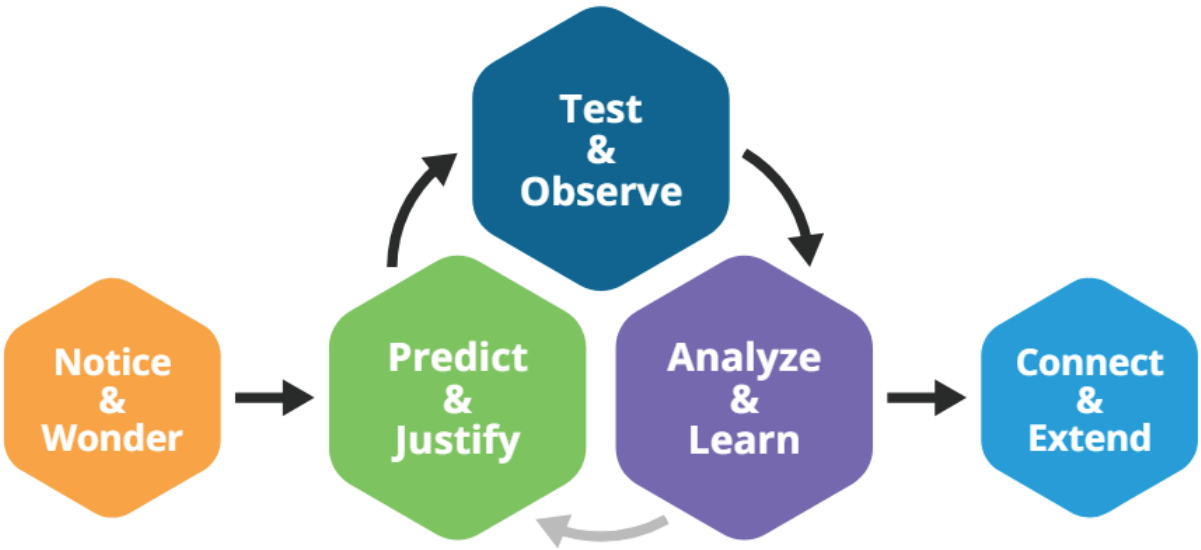
Developed by MIND Education, **InsightMath California** is a core program grounded in how the brain learns. It brings visual-first, spatial-temporal, and problem-based learning into the classroom.

InsightMath California builds deep understanding from the start through visual and manipulative-based activities—helping all students become confident math thinkers. Computation strategies, written language, and procedural fluency are developed on top of this strong foundation.

With digital and optional print formats, **InsightMath California** supports flexible teaching, equipping teachers to prioritize student thinking.

Instruction Designed Around How Students Learn Best

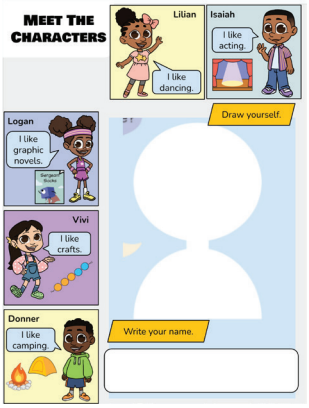
At the center of **InsightMath California** is the MIND Education Problem-Solving Process—a flexible, neuroscience-based routine, that supports open-ended questioning and deep exploration. Teachers guide students to reflect, reason, and connect their thinking with peers—promoting meaningful understanding and growing confident math thinkers.



An Asset-Based Approach

InsightMath California focuses on harnessing students' strengths. By starting with what students know, and giving them a chance to bring themselves and their thinking into the lessons, you will use their ideas as a launchpad for growth.

Every child has mathematical insight—**InsightMath California** helps you uncover and nurture it.



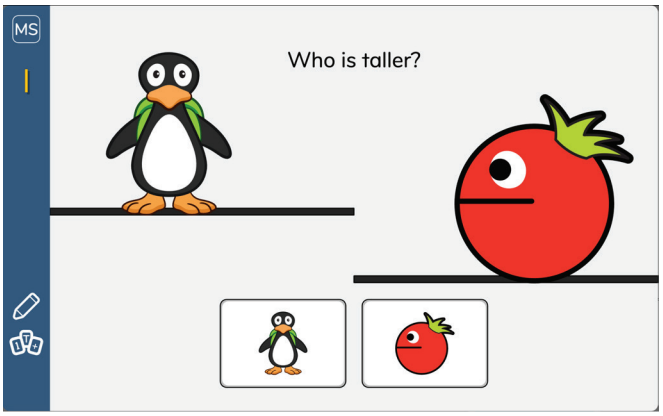
Unit 0 Starts the Year

Unit 0 is a weeklong introduction at the start of each grade level to establish classroom listening, speaking, collaborating and thinking routines to be used throughout the year.

Students are also introduced to a cast of characters who encourage students to bring their experiences into the classroom as they see themselves in the math.

Investigations Build Mathematical Thinkers from the Beginning

In **InsightMath California** classrooms, students don't just follow steps—they think like mathematicians. Every unit opens with an Investigation where students explore new ideas before the content is formally introduced. Students see patterns, explain ideas, and gain confidence and flexibility as mathematical thinkers.

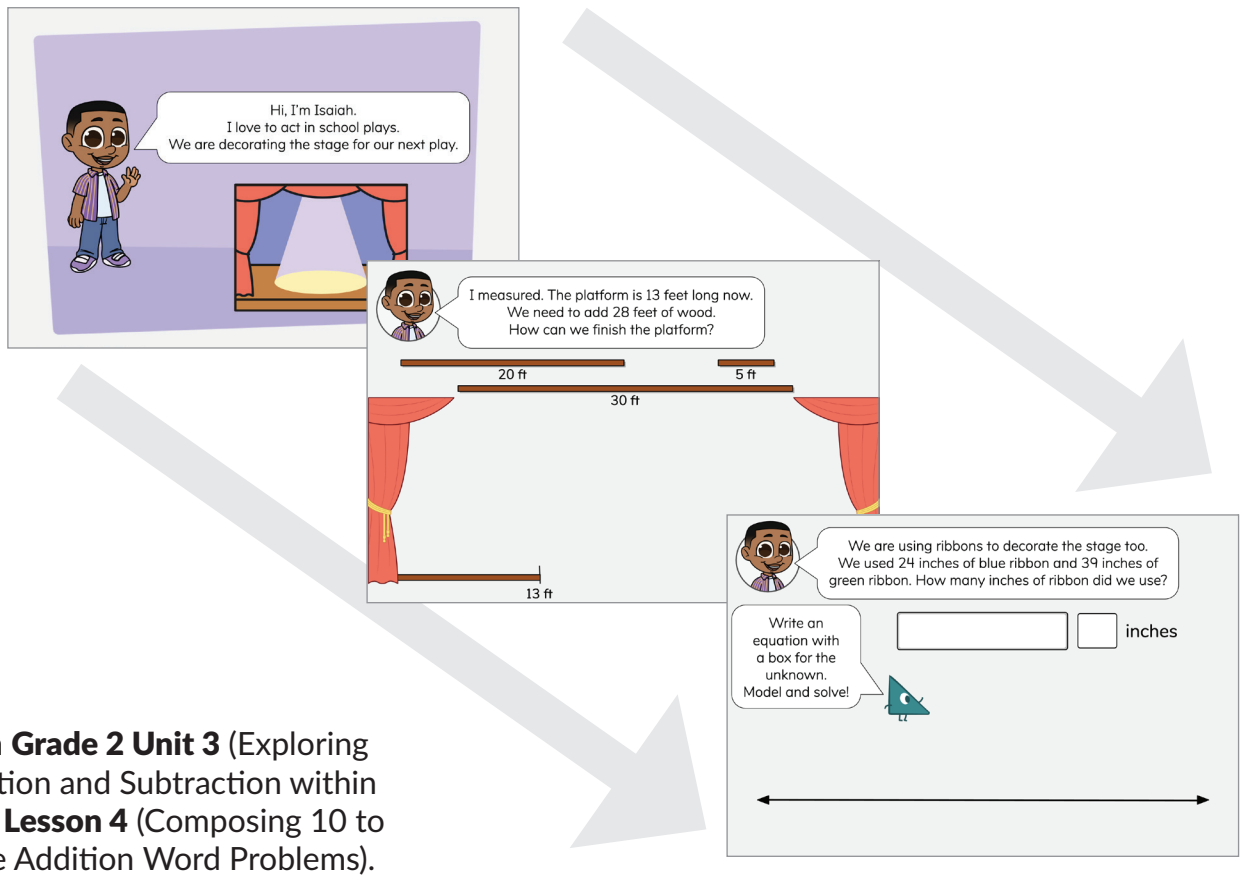


Reaching All Learners

InsightMath California is built on **Universal Design for Learning (UDL)** principles to ensure all students can access meaningful, engaging math. Units follow **research-based learning progressions** and are rooted in relevant contexts that connect to what students already know, supporting deeper understanding.

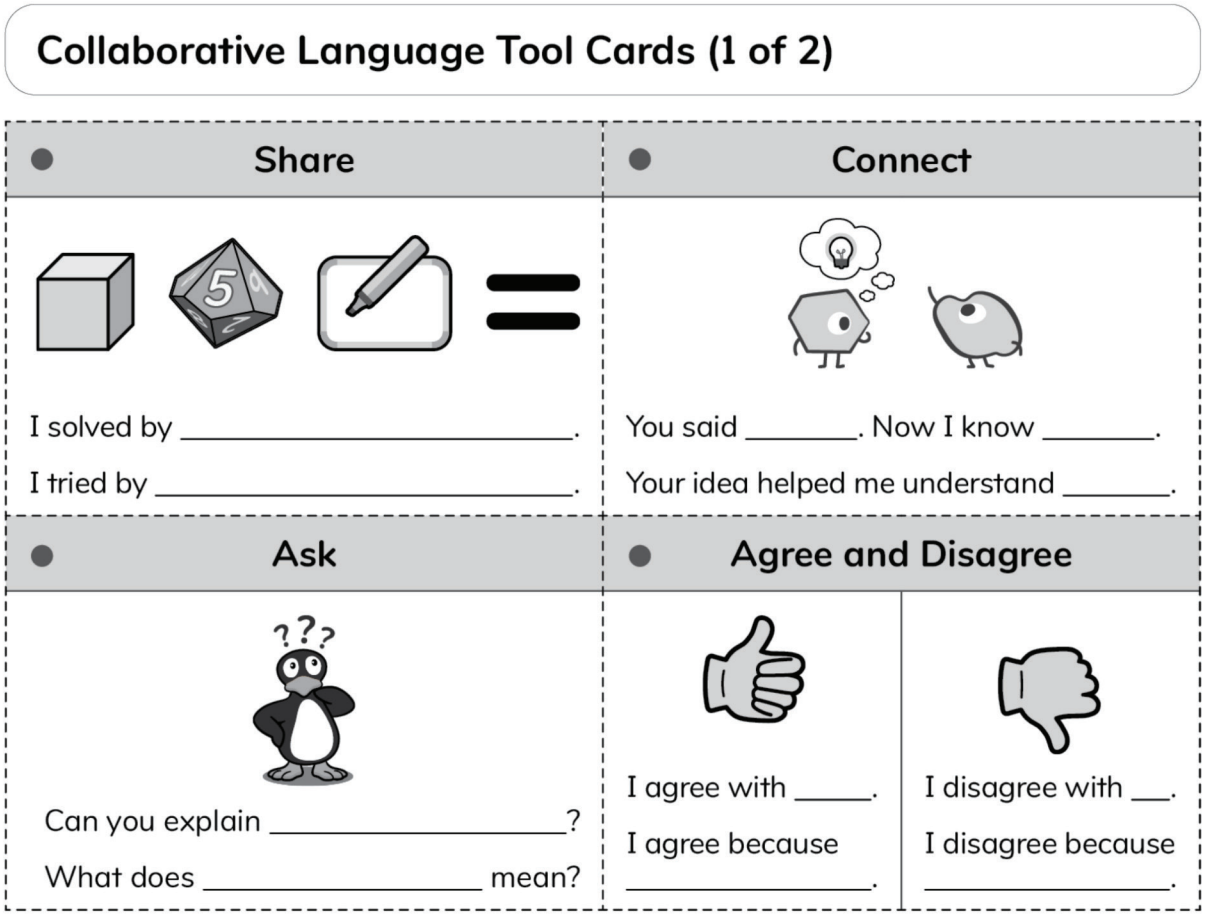
Students have choices in tools, models, and strategies, **building confidence and ownership**. Lessons develop conceptual understanding before introducing symbols. Vocabulary is introduced intentionally—students first describe ideas in their own words, then learn the formal math terms.

Problem solving is taught through a structured path focused on **real-world meaning**, not just word problem practice. Visual models support understanding and allow students to move between **concrete, representational, and abstract forms**, strengthening both content and language skills.



From **Grade 2 Unit 3** (Exploring Addition and Subtraction within 100) **Lesson 4** (Composing 10 to Solve Addition Word Problems).

The program highlights **connections across big ideas** and includes built-in complexity so all students can access core learning, with optional extensions for deeper exploration. Tools like the **Collaborative Language Tool** encourage discussion and teamwork, helping students learn from one another.



Collaborative Language Tool Cards (1 of 2)

Share	Connect
I solved by _____.	You said _____. Now I know _____.
I tried by _____.	Your idea helped me understand _____.

Ask	Agree and Disagree	
Can you explain _____?	I agree with _____.	I disagree with ___.
What does _____ mean?	I agree because _____.	I disagree because _____.

Students are supported in showing what they know in multiple ways. **Academic language scaffolds** help with math vocabulary and text structure. Most importantly, the program is designed with access and opportunity in mind, helping teachers recognize and apply UDL strategies in every lesson.

Differentiation in InsightMath California

InsightMath California is designed with built-in supports to ensure that all students can access rigorous, grade-level math content. These supports help meet the diverse needs of learners—whether a student needs a little extra help to stay engaged or is ready to be challenged with deeper thinking.

The program offers four types of differentiation that can be used flexibly with any student who needs support. These tools are designed to promote meaningful participation and understanding for every learner, right where they are.

Differentiation

Use the suggestions in this section as part of daily instructional practice to tailor the learning experience for all students—not only students with disabilities—by removing barriers and extending opportunities for learning.

A Supporting Access

Task Initiation (Exec. Func.)	Before beginning the task, ask students to identify what they know and what they need to determine.
Impulse Control (Exec. Func.)	See RC1

L Supporting Language

Receptive/Interpretive Language	Provide visual cues or examples for lesson vocabulary as well as for this additional mathematical term: • equation
Expressive/Productive Language	If students refer to operations using casual language when reading an expression or equation (e.g., "seven and two" or "seven and two makes nine"), rephrase their statement with mathematical terms (e.g., "seven plus two" or "seven plus two equals nine"). Provide these sentence frames: • The equation is __ [plus / minus] __ equals __. • I would use [addition / subtraction] to find the missing number because _____. • A known addition fact can help me subtract because _____.

C Supporting Content

Meaning of Operations	To help students see the relationship between subtraction and addition, provide six sticky notes with these words and symbols: part, part, total, +, -, and =. Ask students to show a word equation for addition. Then, rearrange the sticky notes to show subtraction (i.e., "+ =" becomes "- =").

E Extension

Challenge students to represent their thinking with a number bond to identify the unknown information, and then challenge students to describe how the unknown information can be found using both subtraction and addition.

Meeting the Needs of Special Populations

Many students belong to one or more special populations, and their needs are unique and varied. All students—whether identified as part of a special population or not—will need support at times and enrichment at others. **InsightMath California** is designed with flexibility in mind, using Universal Design for Learning (UDL) and differentiation to help every student engage and grow in math.

Multilingual Learners

All students build language skills, but Multilingual Learners may need extra support. UDL and language differentiation are key tools, offering scaffolded sentence frames that vary in support so students can choose what fits their readiness. Language objectives guide instruction, and lesson-specific supports help students understand and express math ideas.

Students Receiving Special Education Services

InsightMath California provides multiple access points and built-in depth to support varied learning needs. Differentiation tools address content, language, and participation challenges so students can engage in grade-level math with meaningful support.

Gifted and Talented (GT) Students

Students ready for more advanced work benefit from layered complexity and built-in extensions. These provide deeper challenges and opportunities to apply thinking in new ways.

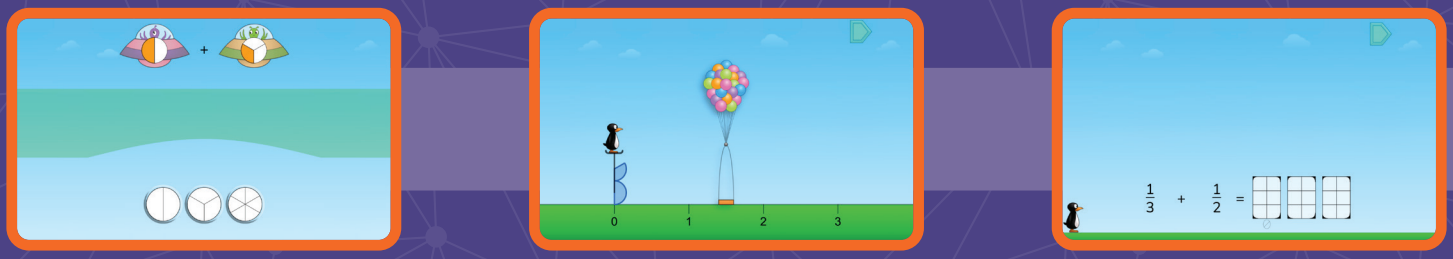
Students with Unfinished Learning

Some students have learning gaps for various reasons. Low-floor, high-ceiling activities allow access to grade-level content while targeted supports address unfinished learning. Formative assessments include guidance to help teachers support students struggling with specific concepts.

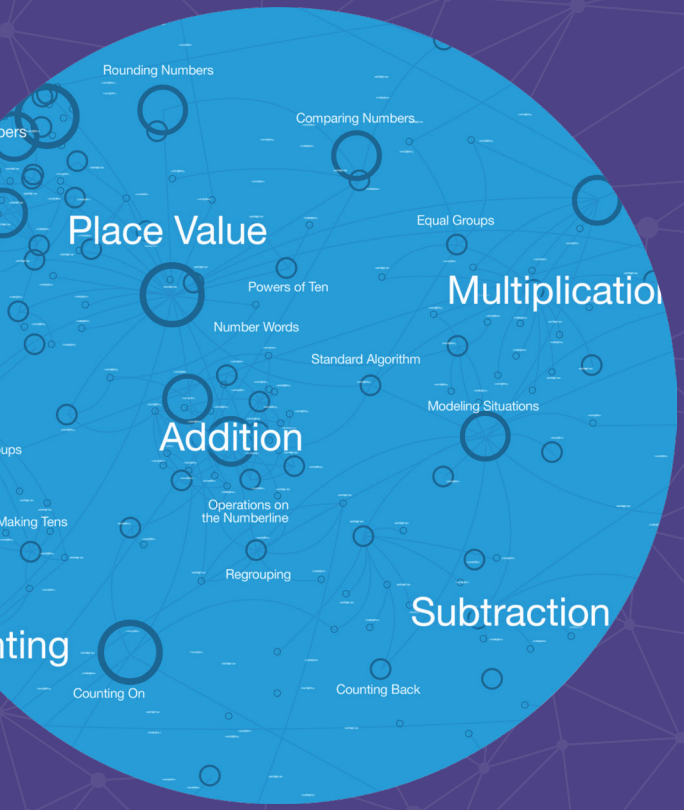
Building Mathematical Progressions Within and Across Grade Levels

Visual-First Learning That Makes Math Click

InsightMath California is built around a patented visual-first approach that helps students see and understand math. Interactive visuals activate students' spatial-temporal reasoning, building deep understanding even before introducing formal language or procedures.



Multiple models for every concept within a grade level

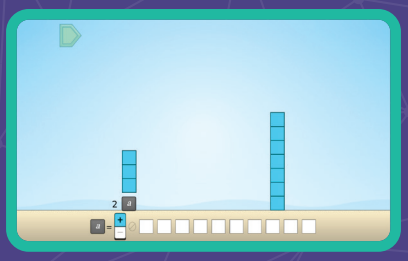


These scaffolded models support problem-solving, strategy sharing, and big-picture thinking—making math feel coherent and connected across and within grade levels.

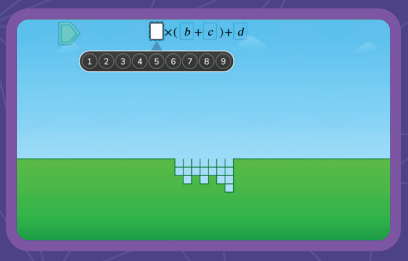
To deepen learning, lessons use multiple representations—visuals, numbers, words, and symbols—helping students form a rich network of ideas they can apply to new problems.

With **InsightMath California** students go beyond memorization. They develop a connected understanding of math concepts, apply their learning flexibly, and build lasting confidence.

Equations
Grade 6

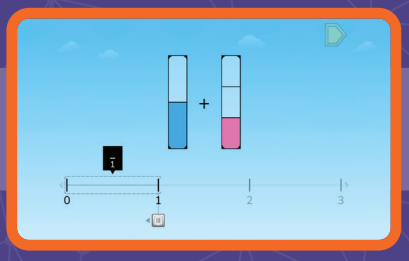


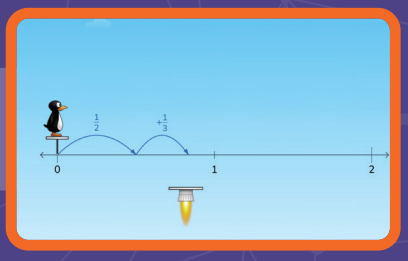
Expressions
Grade 5



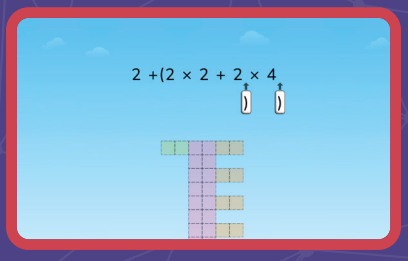
Connected visual models build in complexity across grade levels

Fractions
Grade 4

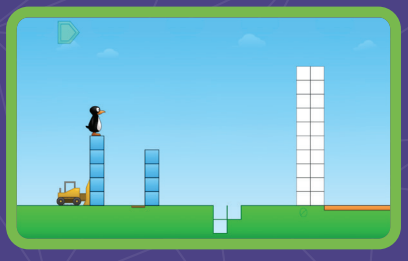




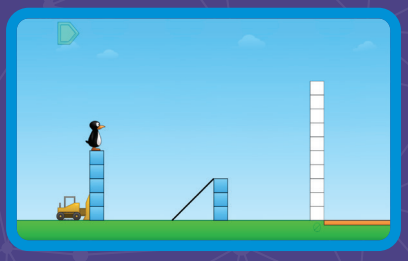
Multiplication
Grade 3



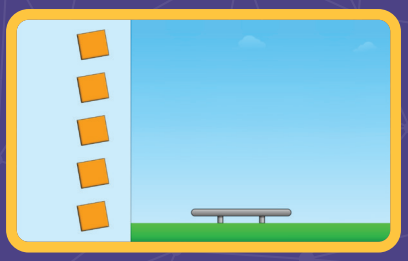
Subtraction
Grade 2



Addition
Grade 1



Counting
Grade K



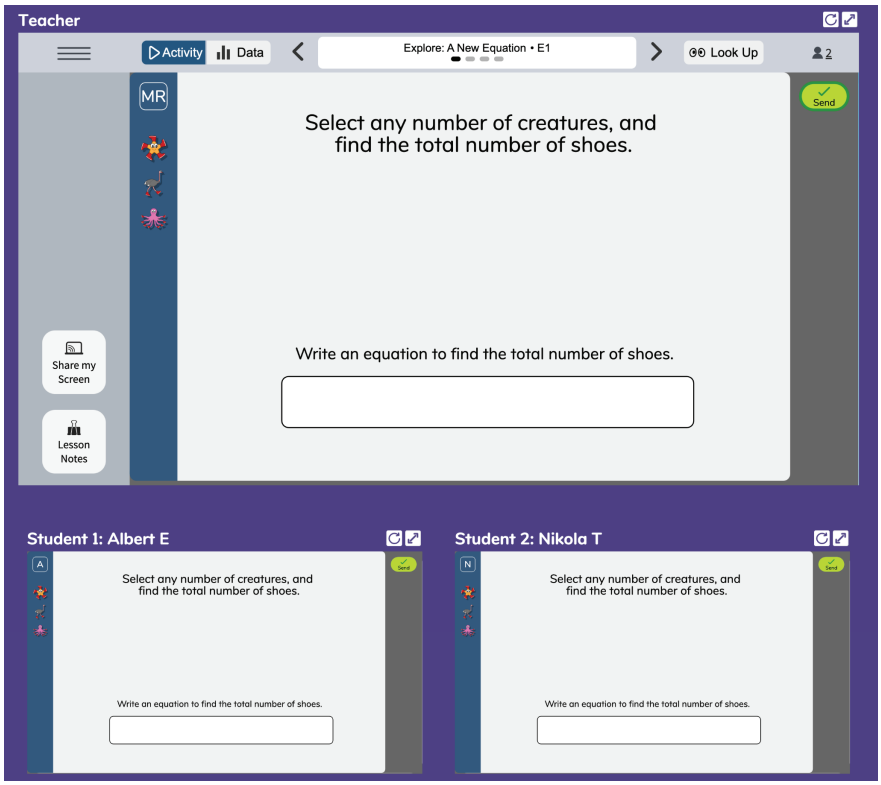
Insight into Student Thinking with Digital Planning Guide

InsightMath California lessons contain whole class activities that equip elementary educators with tools to teach math with confidence and clarity. The program blends technology, high quality mathematical content and practical support to make every teaching moment count.

1 Launch the interactive activity from the Digital Planning Guide.

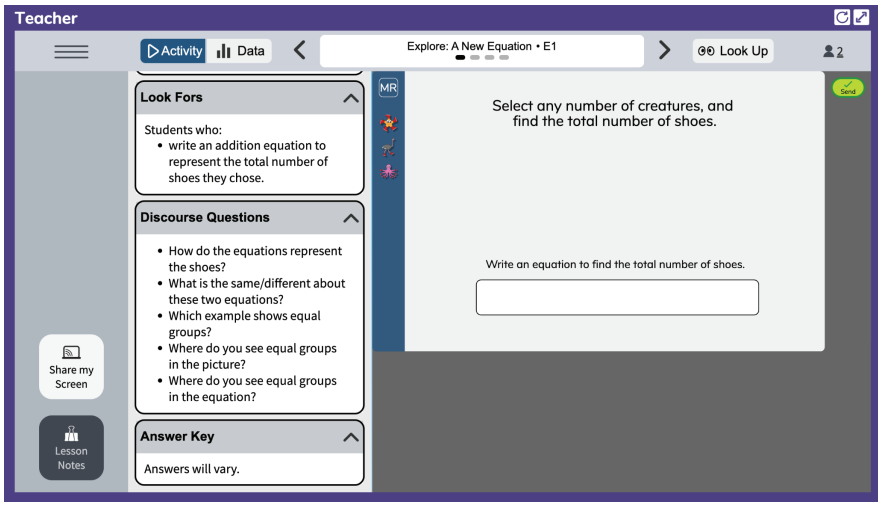
Teacher console →

Student screens →



2 Teachers access detailed notes including insights, "look fors," and discourse prompts.

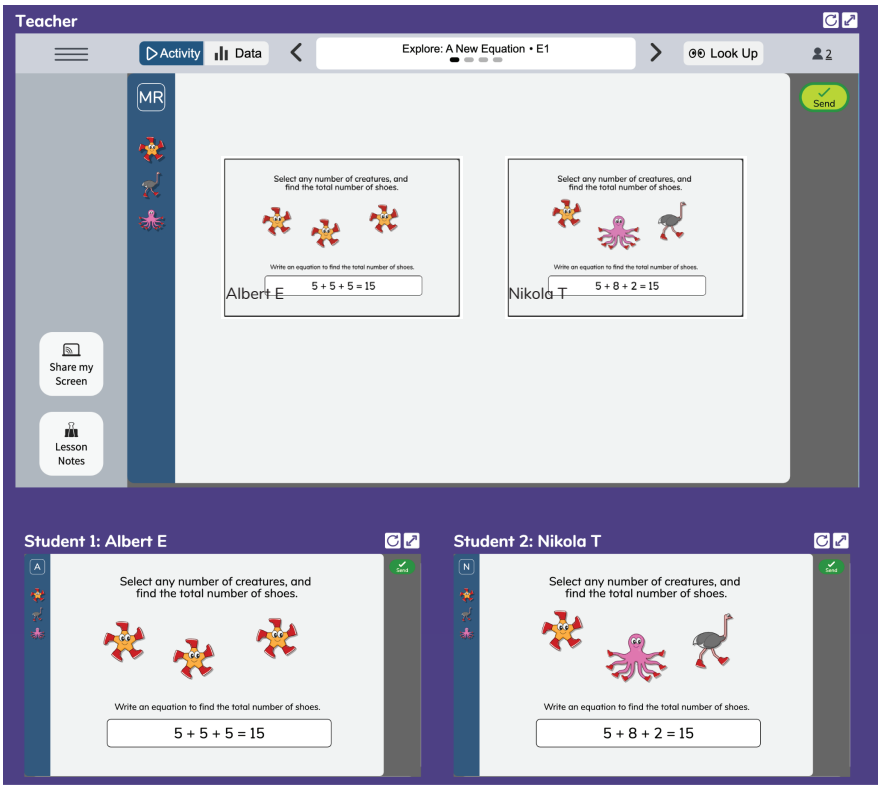
Support is available for every stage at point of use—unit, cluster, and lesson. These tools help create a classroom where students are seen, heard, and eager to engage with math.



3 Students submit responses, visible to teachers in real time.

The built-in data dashboard shows real-time student progress, making it easy to adjust instruction and keep every learner moving forward.

Teachers can project student work, and compare and contrast up to four different solution paths for whole-class discussion.



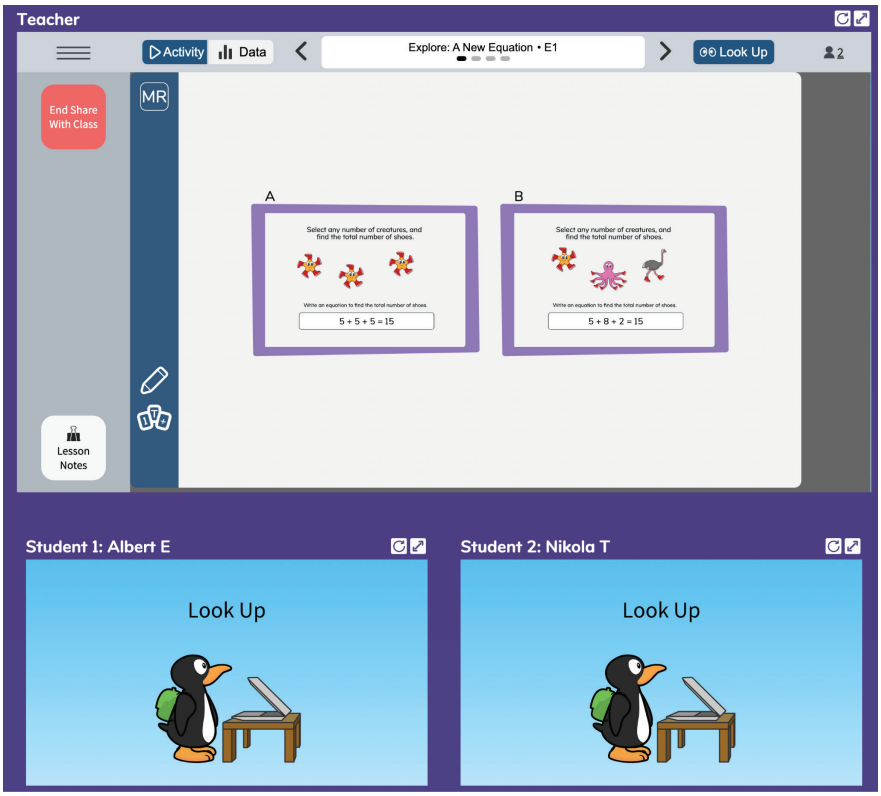
4 Teachers guide class discussion using selected student responses or Argumenteers.

In-Lesson Argumenteers

Argumenteers are sample student responses that can be used to spark discussion, inspire curiosity, showcase varied problem-solving approaches and highlight common misconceptions.

Look Up

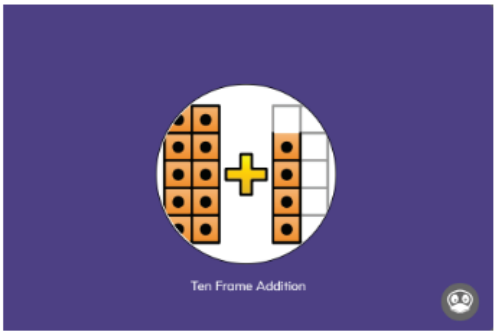
The “look up” button allows teachers to instantly direct student attention to the main screen—ideal for focusing during key moments.



Puzzle-Based Learning and Practice

Personalized Learning Through Game-Based Puzzles

In **InsightMath California**, personalized instruction is powered by **game-based puzzles** built on patented Spatial-Temporal (ST) models. These puzzles present non-routine problems that promote deep thinking and offer visual, immediate feedback—supporting reflection, productive struggle and helping students revise their thinking in real time.



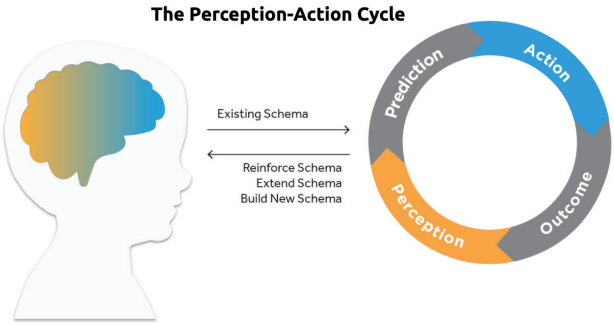
Ten Frame Addition

Students engage with puzzles independently during lessons or practice, applying learning in new contexts and extending their thinking. Because puzzles use visual models, they offer **language-free access**—making them especially effective for diverse learners before mathematical vocabulary is introduced.

Integrated into lessons, the visual interactive puzzles help students build **conceptual understanding** and **perseverance**. Teachers also gain real-time performance data, offering insight into student thinking and guiding targeted support.

Immediate Formative Feedback for Students

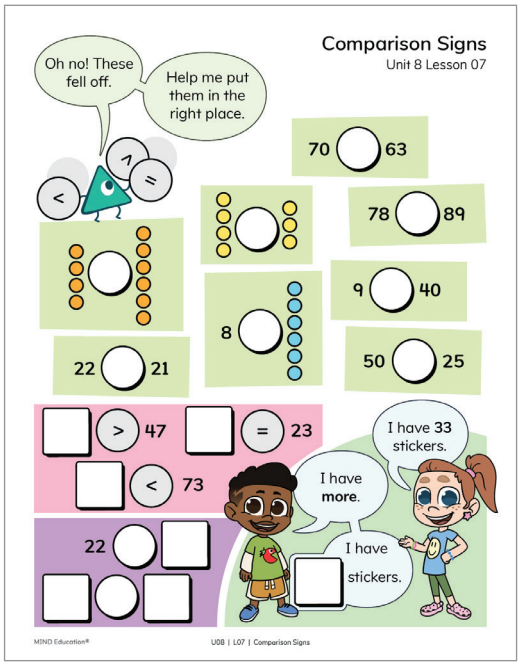
The game-based puzzles provide instant, visual feedback, engaging students' **Perception-Action Cycle**, the brain's natural mechanism active when learning-by-doing.

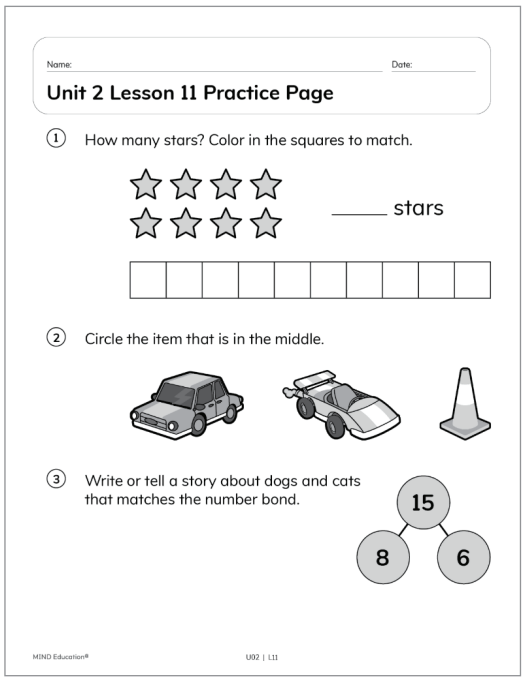


Student Playbooks: A Playground for Math Thinking

In addition to puzzle-based games, **InsightMath California** features a printed student **Playbook**—a hands-on space where students explore and extend their math thinking. It's a creative "math playground" that deepens understanding and encourages ownership.

Playbook activities connect the visual models from puzzles to lesson concepts, helping students test strategies, build connections, and grow their reasoning skills in a student-friendly format.

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Unit 2 Lesson 11 Practice Page

1. How many stars? Color in the squares to match.

_____ stars

2. Circle the item that is in the middle.

3. Write or tell a story about dogs and cats that matches the number bond.

15
8 6

MIND Education® U02 | L11

Student Practice Books

Each lesson includes a student **Practice Page** with a balanced mix of:

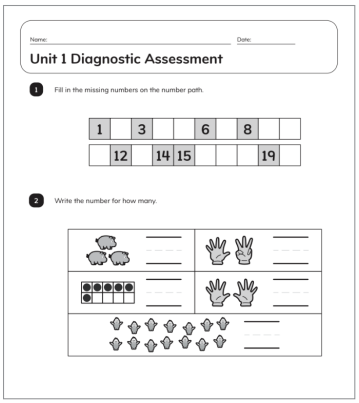
- **Spiral review** to strengthen prior learning
- **Targeted practice** aligned to the day's focus
- **Real-world word problems** for application in varied contexts

This structure ensures students consistently practice, reflect, and transfer learning—building confidence and fluency over time.

Assessments and Formative Feedback

Assessment That Supports and Celebrates Learning

InsightMath California features a comprehensive, embedded assessment system that informs instruction and celebrates growth, making ongoing assessments a seamless part of teaching and learning. Tools include **diagnostic, formative**, and **summative** assessments, all aligned to grade-level standards.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Unit 1 Diagnostic Assessment

1 Fill in the missing numbers on the number path.

1		3			6		8		
	12		14	15				19	

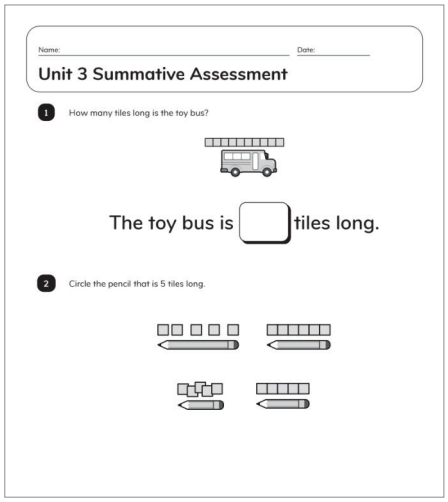
2 Write the number for how many.

Diagnostic Assessments at the start of each unit quickly check key prerequisite skills to see what students already know and what they may need help with.

Item Map and Supports

Item Number	Texas Standard	Supporting Students with Emerging Skills
1	1.5.A	**Rote Counting** • Rote count with students while dragging a finger along the number path in order to memorize the sounds of number words and match them to numerals. • Show numerals out of order and have students think, then say the name of the number on a silent signal. • **Ongoing Differentiation:** Provide number paths for students to use while calculating throughout the unit.
2	Prepares students for 1.2.A	**Counting and Subitizing Objects** • Provide students with bags that contain up to 20 items (e.g., 13 bears or 9 erasers). • Students count the items with a partner, then repeat with a new bag. • Show a number of fingers on one or both hands. • Have students think, then say the number on a silent signal and explain how they knew. • Emphasize groups of 5 and some more.

The **Assessment Guide** connects each question to helpful routines and activities teachers can use to build those skills as students begin the new unit.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Unit 3 Summative Assessment

1 How many tiles long is the toy bus?

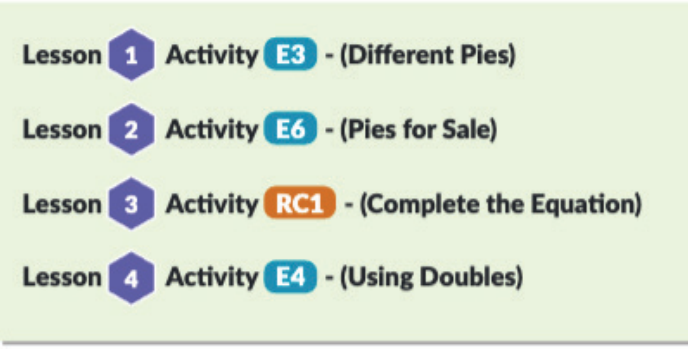
The toy bus is ____ tiles long.

2 Circle the pencil that is 5 tiles long.

Summative Assessments at the end of each unit check for mastery through both skill and problem-solving tasks. In grades K–2, they are read aloud and look like regular class activities. Kindergarten uses one-on-one interviews with manipulatives and pictures, gradually adding more writing as students grow.

Formative Assessment in Action

InsightMath California includes built-in formative assessment opportunities in every lesson. Each activity features "Look Fors" to help teachers spot how students are thinking and support their learning. Teachers can check student work in real time or review it later to give feedback and plan next steps.



How-To-Guide: Formative Assessment Recording Log

Use this recording log while students are working.

- Listen to student discussion and pay attention to student reasoning. Ask questions as needed.
- Record evidence of mastery of the Cluster Outcome (CO), and circle the appropriate indicator.
- Pay attention to students' strengths and barriers to success.
- Determine if support is needed. Make notes about specific barriers and the type of support provided or needed in the future.
  Act = Activity; Lang = Language; Con = Concept; Ext = Extension.
- It is not necessary to record something for every student in your class every time, take notes that are useful to you.

Formative Assessment Recording Log

Grade 2 Unit 2 Cluster 3

Cluster outcome (CO): *Students can use a number line to model and solve additive comparison situations and word problems within 20.*

Class *Williams*

Date *October 3rd*

Student Name	CO Met?		Notes about Student Strengths and Barriers to Success	Support Provided (P) / Needed (N)			
Jiji	(Yes)	Not Yet	*Difficulty with pen tool. Provided hands on manipulatives to show thinking.*	(Act P)	Lang	Con	Ext
Vivi	(Yes)	Not Yet	*Had a breakthrough understanding comparison word problems.*	Act	Lang	Con	Ext
Leilah	Yes	(Not Yet)	*Not confident modeling on the number line. Small-group support needed?*	Act	Lang	(Con N)	Ext
Paco	Yes	Not Yet	*Slower to speak in groups. Using peers to understand activity, but seems to be grasping for content-specific language when explaining thinking.*	Act	(Lang N)	Con	(Ext P)
Miles	(Yes)	Not Yet	*Worked through activity very quickly. Challenged to think about if his method always works.*	Act	Lang	Con	Ext
Isaiah	Yes	Not Yet	*Asking great questions!*	Act	Lang	Con	Ext

Remember: Every time a student does or says anything is an opportunity for formative assessment!

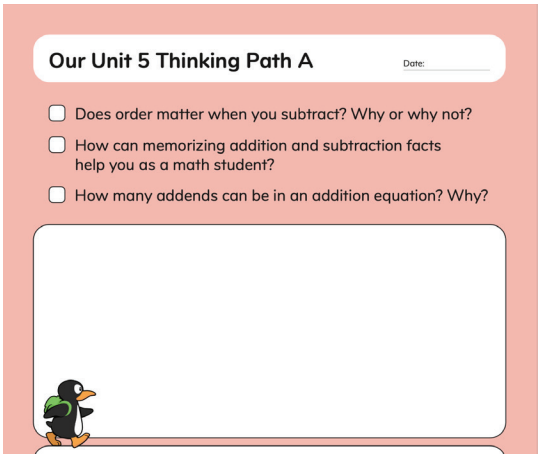
TIP: You are unlikely to hear evidence of mastery one way or the other for every student during every activity. In subsequent opportunities, adjust your time and attention such that you check in with students for whom you do not yet have enough evidence to make a determination, as well as those students who have not yet met the CO.

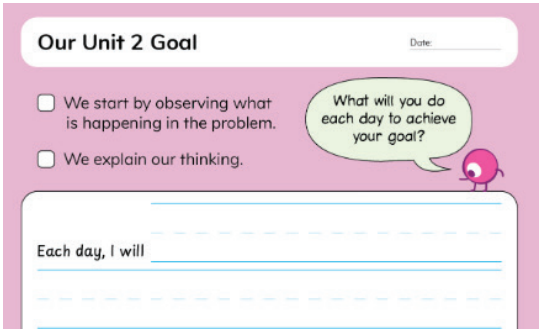
How-To-Guide: Formative Assessment Recording Log MIND Education

The **Supporting Students After This Unit** resource offers follow-up activities and routines to help students strengthen and maintain their skills.

Student Metacognition and Self-Assessment

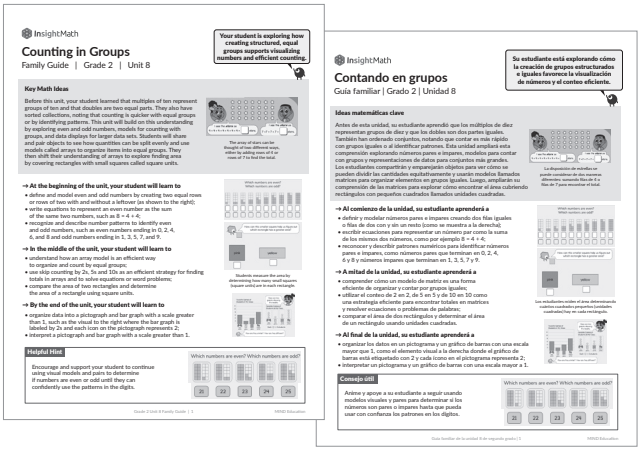
Students use the **Thinking Path** to reflect on conceptual understandings and skills that they've gained across each unit.





Our **Unit Goal** supports the class in noticing their growing strengths in thinking like mathematicians.

Each **InsightMath California** unit includes a bilingual English/Spanish Family Guide with activities to support and extend student learning at home



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