

CSD 13 Small Group Intervention Math Lessons Grades 6-8

School Visit Summary: MS 301 & MS 351

During visits to MS 301 and MS 351, the primary focus of our collaborative work centered on strengthening small group intervention structures to ensure that every student's academic needs were identified and addressed. At both schools, teachers and coaches worked together to analyze iReady diagnostic data, A.I.M. assessments, and unit assessment results to form flexible, data-driven small groups organized by skill level and standards mastery-rather than by grade alone.

Observations across 6th, 7th, and 8th grade math classes revealed growing teacher capacity to differentiate instruction: students in each group received targeted materials and tasks matched to their readiness level, while management systems and rotation structures were refined to maximize instructional time and student engagement. At MS 301, specific attention was given to using AIM and iReady data to identify students and adjust group compositions accordingly. At MS 351, Learning Lab periods were restructured to support at least three strategic small groups per session-one focused on grade-level pre-teaching, one on skill-gap remediation, and one extending learning through the Roadmaps program-ensuring every learner received appropriately leveled support. These intervention lessons were developed in direct response to the patterns observed during school visits, and are aligned to the New York State Next Generation Learning Standards for Mathematics and the Year 2 objectives of the Accelerate A.H.E.A.D! LTG Grant, which prioritizes testing and implementing technology-infused, culturally relevant instructional resources in grades 6-8 classrooms.

Grade 6 Small Group Intervention Lesson

Understanding Ratios and Unit Rates in Real-World Contexts

NY Standard: 6.RP.A.2 – Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$; use rate language in the context of a ratio relationship.

LTG Grant Alignment: Year 2 – Technology-infused lesson using digital tools (Desmos, iReady) to visualize ratio relationships and support data-driven small group instruction.

Group Size: 3–5 students (grouped by iReady diagnostic level: Tier 2/3 intervention)

Learning Target: I can find and explain a unit rate from a ratio and use it to solve real-world problems.

Objective

Students will be able to identify a ratio, determine the unit rate, and apply unit rates to solve real-world problems involving proportional reasoning.

Prerequisites

Students should already know:

- What a ratio is and how to write it in multiple forms ($a:b$, a/b , a to b)
- How to perform division with whole numbers and simple fractions
- How to identify the relationship between two quantities in a table or graph
- Basic multiplication and division fact fluency

Materials

- iReady – pre-assigned lesson on Unit Rates (assigned based on diagnostic data)
- Desmos Activity Builder – 'Rate Runners' interactive activity (teacher-created via Desmos)
- Ratio/Rate anchor chart (posted in small group area)
- Small group recording sheet (scaffolded (see differentiated versions below))
- Mini whiteboards or scratch paper
- Markers and erasers

Differentiated Materials

Below Level: Recording sheet includes a worked example with sentence frames: 'For every __ __, there is __ __. The unit rate is __.'

On Level: Recording sheet includes tables to complete with partial scaffolding.

Above Level / Accelerated: Recording sheet includes open-ended extension: create your own real-world unit rate problem and solve it two ways.

Lesson Overview

The teacher introduces unit rates through a relatable context (cost per item at a school store). Students engage with an interactive Desmos activity to explore how unit rates appear in tables, graphs, and equations. Working in a small group, students rotate through three short tasks: a guided example with the teacher, a partner-practice using mini whiteboards, and an independent task on iReady. The lesson closes with a group share-out and an exit ticket.

Pacing

Activity	Description	Length
Warm-Up	The teacher displays two ratio situations on a card (e.g., '12 pencils for 4 students' vs. '15 pencils for 5 students'). Students write on mini whiteboards: Which is the better deal? How do you know? Brief discussion to activate prior knowledge of division and fairness.	5 min
Mini Lesson	Teacher models finding the unit rate from a ratio using the 'per one' strategy. Think aloud: 'If I have 12 pencils for 4 students, I need to find out how many per ONE student. I divide $12 \div 4 = 3$. The unit rate is 3 pencils per student.' The teacher shows the same process with a second example. Students complete one guided example alongside the teacher on their recording sheet.	7 min
Desmos Activity	Students open the pre-assigned 'Rate Runners' Desmos activity on a device. They drag cards to match ratios with unit rates, complete an input-output table, and see the unit rate appear as a slope on a graph. The teacher circulates and asks: 'What does the unit rate look like on the graph? Where do you see it on the table?' Students write one observation on their recording sheet.	10 min
Partner Practice	In pairs, students use mini whiteboards to solve 3 unit rate problems drawn from real-world school contexts (cafeteria servings, library books per shelf, laps around the track). Partner A solves, Partner B checks and coaches. Partners switch roles for problem 2. Teacher pulls one student aside for a quick check-in if needed.	8 min
Independent Practice / iReady	Students complete 3–5 problems on their iReady assigned lesson on Unit Rates. Teacher monitors dashboard in real time to note who is struggling and who is ready for the next level.	8 min
Exit Ticket	Students independently write the unit rate for one problem and explain in one sentence how they found it. Teacher collects to inform next session's grouping.	4 min
Reflection	Group closes: 'What is one place in real life where you use unit rates without realizing it?' Brief share-out. Preview:	3 min

	next session will connect unit rates to proportional relationships.	
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Grade 7 Small Group Intervention Lesson

Proportional Relationships: Connecting Tables, Graphs, and Equations

NY Standard: 7.RP.A.2 – Recognize and represent proportional relationships between quantities; decide whether two quantities are in a proportional relationship; identify the constant of proportionality (unit rate) in tables, graphs, equations, and diagrams.

LTG Grant Alignment: Year 2 – Technology-infused lesson using Desmos graphing tool and iReady to represent proportional relationships digitally and support differentiated small group instruction.

Group Size: 3–5 students (grouped by iReady diagnostic and unit assessment data: students not yet proficient with proportional reasoning)

Learning Target: I can identify whether a relationship is proportional and find the constant of proportionality from a table, graph, or equation.

Objective

Students will be able to determine if a relationship is proportional by analyzing tables and graphs, identify the constant of proportionality (k), and write the equation $y = kx$.

Prerequisites

Students should already know:

- How to find a unit rate from a ratio (Grade 6 foundational skill)
- How to plot ordered pairs on a coordinate plane
- How to create and extend a ratio table
- How to simplify fractions and perform operations with rational numbers

Materials

- iReady – pre-assigned lesson on Proportional Relationships (assigned based on diagnostic data)
- Desmos Graphing Calculator (desmos.com/calculator), teacher-prepared table activity
- Proportional Relationships graphic organizer (4-box: Table / Graph / Equation / Real World)
- Anchor chart: 'Is It Proportional? Checklist' (goes through the origin, constant ratio)
- Task cards with four scenarios: two proportional, two non-proportional
- Mini whiteboards and markers

Differentiated Materials

Below Level: Graphic organizer is partially completed (table and graph pre-filled); students identify k and write the equation with sentence frame support.

On Level: Graphic organizer with table provided; students complete graph using Desmos, identify k , and write the equation.

Above Level / Accelerated: Students create their own real-world scenario, build all four representations, and explain why the relationship is or isn't proportional.

Lesson Overview

The lesson opens by connecting to students' prior knowledge of unit rates. The teacher guides students through building all four representations of a proportional relationship using a real-world context (e.g., a student earning money babysitting). Students then use Desmos to graph a table of values and observe that proportional relationships always pass through the origin and form a straight line. A card sort activity challenges students to classify relationships as proportional or not, and the lesson ends with an exit ticket and brief iReady practice.

Pacing

Activity	Description	Length
Warm-Up	The teacher shows a table: 'Mia earns \$8 per hour babysitting.' Hours: 1, 2, 3, 4 / Earnings: ?, ?, ?, ? Students complete the table on mini whiteboards. Discussion: 'How are the two quantities related? Is there a pattern?' Students share their rules in words.	5 min
Mini Lesson	The teacher introduces the term 'constant of proportionality (k).' Using the babysitting table, the teacher shows: $k = \text{earnings} \div \text{hours} = 8$ for every row. The teacher opens Desmos on the projector, enters the table, and students observe the graph: 'What do you notice? Does it start at (0,0)? Is it a straight line?' The teacher writes $y = 8x$ and connects each representation in the graphic organizer.	8 min
Desmos Exploration	Students open Desmos on their devices. The teacher has pre-loaded a table with blanks. Students enter values from their own scenario (e.g., a different rate) and watch the graph update. They answer: Does it pass through the origin? Is the ratio constant? They record k and write the equation in their graphic organizer.	10 min
Card Sort	Each student receives 4 task cards. They sort: 'Proportional' vs. 'Not Proportional.' They check each table for a constant ratio and verify on Desmos if unsure. Small group discussion: 'How did you know? What was your deciding factor?'	8 min
Independent Practice / iReady	Students complete 3–5 problems in iReady on Proportional Relationships. Teacher monitors live dashboard and notes students who skip to the next skill or need re-teaching.	7 min

Exit Ticket	Given a table, students write: (1) Is this proportional? (2) What is k ? (3) Write the equation. Teacher collects to adjust next session's grouping.	4 min
Reflection	Group share: 'What's one place outside of math class where you see a proportional relationship?' Students connect to real life (speed, recipes, prices). Preview: next lesson introduces non-proportional linear relationships.	3 min

Grade 8 Small Group Intervention Lesson

Understanding Slope and Linear Equations ($y = mx + b$)

NY Standard: 8.F.B.4 – Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph.

LTG Grant Alignment: Year 2 – Technology-infused lesson using Desmos graphing tool and iReady to explore slope and y-intercept dynamically, supporting small group data-driven intervention.

Group Size: 3–5 students (grouped by unit assessment data and iReady diagnostics: students below proficiency on linear functions)

Learning Target: I can find the slope and y-intercept of a linear relationship and write its equation in $y = mx + b$ form.

Objective

Students will be able to calculate slope (rate of change) from a table or graph, identify the y-intercept (initial value), and write the linear equation that models a real-world relationship.

Prerequisites

Students should already know:

- How to plot points and read coordinates on a coordinate plane
- What a proportional relationship looks like in a table and graph ($y = kx$)
- How to find a unit rate / constant of proportionality
- How to perform operations with integers and rational numbers
- The concept of a function (each input has exactly one output)

Materials

- iReady – pre-assigned lesson on Slope and Linear Equations (assigned based on unit exam data)
- Desmos Activity Builder – 'Slope Slider' (teacher-created; students manipulate m and b sliders and observe how the line changes)
- Slope-Intercept graphic organizer: Graph | Table | Equation | Story
- Anchor chart: 'Slope = Rise/Run = $(y_2 - y_1) / (x_2 - x_1)$ '
- Real-world scenario cards (e.g., phone plan cost, distance-time, savings account)
- Mini whiteboards, markers, and graph paper

Differentiated Materials

Below Level: Graph and table are pre-drawn; students identify slope using the 'rise over run' visual and identify where the line crosses the y-axis. Equation is partially filled in: $y = __x + __$.

On Level: Table is provided; students graph using Desmos, calculate slope, identify y-intercept, and write the full equation.

Above Level / Accelerated: Students are given two points only; they calculate slope, determine y-intercept algebraically, write the equation, and verify using Desmos. Extension: What happens if slope is negative or zero?

Lesson Overview

This lesson builds on students' prior knowledge of proportional relationships to extend into non-proportional linear functions. The teacher anchors the lesson in a real-world scenario (a savings account with a starting balance) to distinguish the y-intercept from the slope. Students use the Desmos 'Slope Slider' activity to manipulate m and b values and observe the effect on the graph. They then work through a 4-representation graphic organizer connecting a table, graph, equation, and real-world story. The lesson ends with an exit ticket and targeted iReady practice.

Pacing

Activity	Description	Length
Warm-Up	The teacher displays two graphs on a card: one passes through the origin ($y = 3x$), one does not ($y = 3x + 2$). 'What's the same? What's different?' Students discuss with a partner and write observations on mini whiteboards. Goal: surface the concept of starting value (y-intercept).	5 min
Mini Lesson	The teacher introduces a savings account scenario: 'Jordan starts with \$20 and saves \$10 per week.' The teacher builds the table with students, then graphs on Desmos (projected). Teacher points to the y-intercept: 'Where does the line start? That's our b , the initial value, \$20.' The teacher shows slope = rise/run on the graph, connecting to the \$10 per week rate. Students write the equation $y = 10x + 20$ and label m and b in the graphic organizer.	8 min
Desmos Slope Slider	Students open the pre-loaded Desmos activity on their devices. They move the m slider (slope) and the b slider (y-intercept) and record: What happens to the line when m increases? When b is negative? Students complete a 3-row observation table in their graphic organizer. Teacher prompts: 'Can you make a line that starts at 5 and goes up 2 each step? What's the equation?'	10 min

Graphic Organizer: Real-World Scenario	Each student receives a scenario card at their readiness level (see Differentiated Materials). They complete all four boxes: Table, Graph (on Desmos or paper), Equation, and one-sentence Story description. Small group shares and compares equations.	10 min
iReady Practice	Students log in to iReady and complete 3–5 assigned problems on Slope and Linear Equations. Teacher checks live dashboard, noting students ready for the next lesson and those needing additional support.	8 min
Exit Ticket	Given a table of values, students: (1) calculate slope, (2) identify y-intercept, (3) write the equation. Teacher collects to re-group for the next intervention session if needed.	4 min
Reflection	Group share: 'What does the slope tell you in real life? What does the y-intercept tell you?' Students connect to their scenario card. Preview: next session will practice writing equations from two points only.	3 min

Appendix: Standards & Grant Alignment

NY Next Generation Learning Standards Alignment

Grade	Standard	Lesson Focus
6	6.R.P.A.2 – Understand unit rate a/b associated with ratio $a:b$; use rate language in context.	Ratios & Unit Rates
7	7.R.P.A.2 – Recognize and represent proportional relationships; identify constant of proportionality in tables, graphs, and equations.	Proportional Relationships
8	8.F.B.4 – Construct a function to model a linear relationship; determine rate of change and initial value.	Slope & Linear Equations ($y=mx+b$)

LTG Grant Year 2 Alignment

These lessons address Year 2 objectives of the Accelerate A.H.E.A.D! LTG Grant (Objective 2.3) by:

- Testing and implementing technology-infused lessons (Desmos, iReady) in 6th–8th grade classrooms
- Supporting 4–6 teachers in differentiating instruction through data-driven small group structures
- Providing culturally relevant, real-world contexts for mathematical problem solving
- Aligning to NY State Next Generation Learning Standards and ISTE Standards for student technology use
- Building teacher capacity to use digital graphing and visualization tools as core instructional resources

Small Group Intervention Components (Walk-Through Rubric)

Each lesson is designed to meet the 'Proficient' to 'Advanced' levels of all three walk-through components:

- Data-Driven Grouping: Groups are formed using iReady diagnostics and unit assessment results; designed to be flexible and updated each session based on exit ticket and iReady dashboard data.
- Differentiated Materials & Activities: Three differentiation levels are provided for each lesson (below, on, and above level), with multiple representations (concrete, visual, abstract) and real-world contexts.
- Management Systems & Engagement: Each lesson includes a posted pacing structure, clear transitions between tasks, and structured routines (mini whiteboards, partner work, digital tools) that support student independence.