

Integrate Language and Mathematics

To help students use academic language to learn, the Try–Discuss–Connect routine provides opportunities to incorporate language routines, teacher moves, and tips for engaging students in mathematical discourse.

To learn more about the Language Routines, visit: [i-Ready Classroom Mathematics Teacher Toolbox > Program Implementation > Try–Discuss–Connect Routine Resources.](#)

Supports for Academic Language within the Try–Discuss–Connect Routine

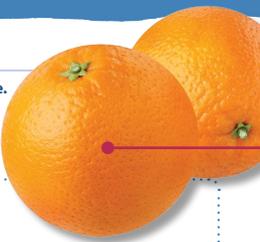
 <p>Try</p> <p>Language Routines</p> <ul style="list-style-type: none"> • Three Reads • Co-Craft Questions • Notice and Wonder • Say It Another Way <p>Teacher Moves</p> <ul style="list-style-type: none"> • Turn and Talk • Individual Think Time 	 <p>Discuss</p> <p>Language Routines</p> <ul style="list-style-type: none"> • Compare and Connect • Collect and Display <p>Teacher Moves</p> <ul style="list-style-type: none"> • Turn and Talk • Individual Think Time • Four Rs <p>Conversation Tips</p>	 <p>Connect</p> <p>Language Routines</p> <ul style="list-style-type: none"> • Collect and Display • Compare and Connect <p>Teacher Moves</p> <ul style="list-style-type: none"> • Turn and Talk • Individual Think Time • Four Rs <p>Conversation Tips</p>
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LESSON 23 SESSION 2 ● ● ● ● ●

Develop Finding Equivalent Fractions

Read and try to solve the problem below.

Carl eats $\frac{2}{8}$ of an orange. Trey's orange is the same size. He eats $\frac{1}{4}$ of it. Show that the two boys eat the same amount of an orange.



TRY IT

Math Toolkit

- fraction tiles
- fraction circles
- fraction models 
- number lines 
- grid paper

DISCUSS IT

Ask your partner: How did you choose that strategy?

Tell your partner: A model I used was ... It helped me ...

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Language Routines

To make sure students understand the problem, use a language routine like **Three Reads**. In this routine, students read a word problem three times, each time with a specific focus:

- Read 1: *What is the problem about?*
- Read 2: *What are we trying to find out?*
- Read 3: *What are the important quantities and relationships?*

Teacher Moves

Use effective teaching strategies like **Turn and Talk** and **Individual Think Time** to develop mathematical understanding and guide discussion.

Differentiated Instruction for English Learners

Every session includes differentiated support for various levels of English proficiency.

ELL English Language Learners: Differentiated Instruction **Prepare for Session 2** Use with *Apply It*.

Levels 1–3
Listening/Speaking Give pairs two **congruent** circles. Read aloud **Apply It** problem 8. Ask: *How many equal pieces are in Lina's pizza?* [4] *How do you know?* Provide the sentence frame:
The denominator is 4.
 Model how to fold one circle to create fourths. Ask: *How many slices did Lina eat?* [3] *Shade the circle to represent $\frac{3}{4}$.* Repeat the process with the second circle. Say: *Both pizzas show $\frac{3}{4}$. Discuss how the four slices of Adam's pizza can be made into eight equal pieces.* Validate suggestions. Model how to fold or draw lines to create eighths. Display and have students complete the sentence frame:
Adam ate 6 slices.

Levels 2–4
Listening/Speaking Give pairs two **congruent** circles. Read aloud **Apply It** problem 8. Ask: *How many equal pieces are in Lina's pizza?* [4] *How do you know?* [The denominator is 4.] *How many slices did Lina eat?* [3] *Discuss with your partner how you can use a circle to represent Lina's pizza.* Validate suggestions. Have them fold one circle to create fourths. Say: *Shade the circle to represent $\frac{3}{4}$.* Repeat the process with the second circle. Say: *With your partner, show eighths on the second circle to represent Adam's pizza. Decide how many eighths are equal to the three slices Lina ate.* Have students complete the sentence frame: *Adam ate 6 pizza slices.* Have students take turns reading the sentence to their partners.

Levels 3–5
Listening/Speaking Give pairs two **congruent** circles. Read aloud **Apply It** problem 8. Ask: *How many equal pieces are in Lina's pizza?* How do you know? How many slices did Lina eat? Encourage students to answer in complete sentences. Say: *Discuss with your partner how you can use a circle to represent Lina's pizza.* Validate suggestions. Have them fold one circle to create fourths. Say: *Shade the circle to represent $\frac{3}{4}$.* With your partner, show eighths on the second circle to represent Adam's pizza. Decide how many eighths are equal to the three slices Lina ate. Write a sentence that tells how many slices Adam ate. Select pairs to share their process.

Scaffolded language support

for a specific problem is identified. However, this differentiation can be applied to other problems as needed.

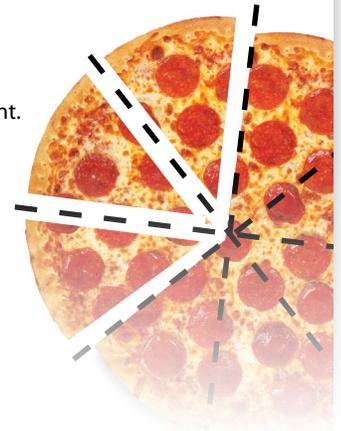
LESSON 23 DEVELOP

SESSION 2 ● ● ○ ○ ○

APPLY IT

Use what you just learned to solve these problems.

- 8 Lina and Adam each order a small pizza. They eat the same amount. Lina eats $\frac{3}{4}$ of her pizza. Adam's pizza is divided into 8 slices. How many slices of pizza did Adam eat? Show your work.



Professional Learning is available in every unit to support teachers with discourse and language development throughout the year.

Professional Learning

Supporting Math and Academic Vocabulary Development

Understanding mathematics and engaging in mathematical discussions requires students to communicate ideas using both academic and math-specific vocabulary and language.

Formal academic mathematical language can be challenging for many students. Exposure to and integrated practice with academic language is critical for all students' success.

Academic language falls into two categories:

- technical, discipline-specific words and phrases used in the area of mathematics (such as *hypotenuse*, *prime number*, *rational number*, *base-ten*, "per," *if and only if*)
- all-purpose academic words—such as *analyze* and *structure*—that transcend the discipline of mathematics (Council of the Great City Schools, 2016)

Build Your Vocabulary

At the beginning of each unit, the *Build Your Vocabulary* activities make math and academic vocabulary accessible to all learners:

- **Math Vocabulary** that students were exposed to in previous

Academic Vocabulary Routine

Use with *Build Your Vocabulary*.

1 Assess prior knowledge.

- Assess prior knowledge by asking students to place a checkmark next to any vocabulary words they know or are familiar with.
- Have students work in pairs to briefly discuss how and when they have used the words. Listen to assess if perceived knowledge is correct.
- If you have Spanish speakers or speakers of other Latin-based languages, use the *Cognate Support Routine*.

2 Pronounce the words.

- Review the *Academic Vocabulary*.
- Say each of the words aloud and then have students repeat to ensure correct pronunciation.

Support for Language, Discourse, Community, and Culture

See a few program highlights below and a complete list in the chart on the next page.

i-Ready Classroom Mathematics recognizes the linguistic and cultural assets that all students, especially English Learners, bring to the classroom. Leveraging students' background knowledge, experiences, and insights can enrich the classroom culture and be built upon for academic success.

Vocabulary Development

i-Ready Classroom Mathematics provides instruction and practice to help students communicate ideas using both academic and math-specific vocabulary and language.

Connect to Community and Cultural Responsiveness

Use these activities to connect with and leverage the diverse backgrounds and experiences of all students.

Session 1 Use with Try It.

- Ask students to tell their favorite snack. Suggest that many people like to snack on granola bars. Draw and label a model as you say: *When you eat a whole granola bar, the whole bar is represented as $\frac{1}{1}$. If you give your bar to two friends to share, the unit fraction they each get is $\frac{1}{2}$ (display). If you give your bar to three friends to share equally, the unit fraction they each get is $\frac{1}{3}$ (display). Turn to a partner and decide what unit fraction four friends receive if they share equally. Display $\frac{1}{4}$. Point to the models: What happens to the pieces of the granola bar as more friends share? (the pieces get smaller) Point to the fractions. Ask: What happens to the denominators as more friends share? (the number gets greater) Display and have students complete the sentence frame: The pieces get smaller as the denominators get greater.*

Session 2 Use throughout the session.

- Say: *We have focused on food parts. Display a dollar bill and dollar into equal parts not a quarter. Say: Are there things that cannot be divided into equal fractional pieces? Turn to a partner and think cannot or should not be divided.*

Be prepared to explain why you cannot or should not divide your item. Select pairs to share.

Session 3 Use with Try It.

- Ask students if they have or have seen a birdhouse, bird feeder, or bird bath. Ask students to explain the purpose of each. Point out that these objects are often made of wood. Ask: *What are some things that can be built with wood?* (for example, a fence, a bookcase, and a tree house) Display a list of items students suggest. Ask students to share any experiences they may have had building something out of wood.

Session 4 Use with Apply It problem 10.

- Explain that breads in different cultures can vary quite a bit by ingredients, size, and shape. Invite students to tell about different types of breads that they know or like. You may also ask: *What type of bread is most common in your home?*

Connect to Community and Cultural Responsiveness

Leverage students' backgrounds and experiences to enhance learning.

ELL Language Expectations

Learning Target Fluently add and subtract multi-digit whole numbers using the standard algorithm.

LANGUAGE DOMAINS	Beginning Level 1	Intermediate Level 2	Level 3	Advanced/Advanced High Level 4	Level 5
LISTENING	Follow the teacher's oral explanation of how she solved a four-digit addition or subtraction problem, using visuals.	Follow the oral explanation of how a partner solved a four-digit addition or subtraction problem, using visuals.	Follow the oral explanation of how a partner solved four- or five-digit addition or subtraction problems, using visuals.	Follow the oral explanation of how a partner solved an addition or subtraction problem involving greater numbers, using visuals and numbers.	Follow the oral explanation of how a partner solved an addition or subtraction problem involving greater numbers, using numbers.
SPEAKING	Point to and name the values of the digits in each number while solving an addition or subtraction problem using a visual model.	Explain the steps taken to solve an addition or subtraction problem using a visual model.	Explain where a student made a computation error while solving an addition or subtraction problem using an oral sentence frame.	Explain why a computation error occurred while solving an addition or subtraction problem using an oral sentence frame.	Generalize common mistakes made when solving addition and subtraction problems using oral sentence frames.
READING	Match the pictorial solution of an addition or subtraction problem with the numerical solution using a table.	Match solutions using the addition/subtraction algorithm to visual models with a partner.	Identify and sort word problems based on whether they would be solved most efficiently using the addition/subtraction algorithm or a visual model with a partner.	Sequence procedural steps used to solve an addition or subtraction problem using models, drawings, or numbers.	Find the mistake in a partner's addition or subtraction problem using models.
WRITING	List real-world professions that require solving problems involving addition or subtraction with a partner.	Describe real-world scenarios that require solving problems involving addition and subtraction with a partner.	Compose a real-world problem requiring the use of addition or subtraction using a sentence stem.	Explain the steps taken to solve an addition or subtraction problem using visuals and numbers.	Elaborate on the mistake made in a problem and why the student may have made that mistake using visuals and numbers.

ELL Language Expectations

Chart Examples of what students can do based on their English-language proficiency in connection with one of the standards addressed in the unit.

Mathematics Language and Discourse

Feature	How This Supports Language and Discourse	Where to Find It
Language Objectives	<i>Language Objectives</i> indicate the language students are expected to understand and produce as they work on <i>Lesson Objectives</i> .	<ul style="list-style-type: none"> Teacher's Guide
Build Your Vocabulary	<i>Build Your Vocabulary</i> provides the opportunity for students to use prior knowledge in reviewing previously taught math vocabulary and provides an early entry point to general, all-purpose academic words.	<ul style="list-style-type: none"> Student Worktext Teacher's Guide
Try–Discuss–Connect Routine	In <i>Discuss It</i> , students explain their ideas and begin to understand other students' ideas, first with partners and then with the class. Through discourse, students see how the same problem can be represented with different models or solved with different strategies.	<ul style="list-style-type: none"> Student Worktext Teacher's Guide
Develop Language	<i>Develop Language</i> provides targeted vocabulary and language support to ensure mathematics content is accessible to all students.	<ul style="list-style-type: none"> Teacher's Guide
Explore Session: Prepare for . . .	<i>Prepare for</i> pages use graphic organizers to help students access prior knowledge and vocabulary they will build on in the lesson.	<ul style="list-style-type: none"> Student Worktext Teacher's Guide
Discourse Cards and Discourse Cube	<i>Discourse Support</i> resources provide sentence starters and questions to help students initiate, deepen, and extend conversations with partners, small groups, or the whole class.	Teacher Digital Experience > Teacher Toolbox

English Learner Support

Feature	How This Supports Language and Discourse	Where to Find It
Language Expectations	<i>Language Expectations</i> chart provides examples of what English Learners can do based on their English-language proficiency levels in connection with a learning target. These examples help teachers differentiate instruction and meet the needs of English Learners.	<ul style="list-style-type: none"> Teacher's Guide
Build Your Vocabulary	A <i>Cognate Support</i> routine is provided in the Teacher's Guide for students who primarily speak Spanish or other Latin-based languages.	<ul style="list-style-type: none"> Student Worktext Teacher's Guide
ELL Differentiated Instruction	<i>ELL Differentiated Instruction</i> scaffolds the language so students can access the mathematics in one problem or part of each session. Instruction is differentiated for different levels of English proficiency and focuses on the language domains of listening, speaking, reading, and writing.	<ul style="list-style-type: none"> Teacher's Guide

Community and Culture

Feature	How This Supports Language and Discourse	Where to Find It
Connect to Community and Cultural Responsiveness	<i>Connect to Community and Cultural Responsiveness</i> provides teachers with ideas to increase engagement and connections with the diverse backgrounds and experiences of all students.	<ul style="list-style-type: none"> Teacher's Guide
Family Letters	<i>Family Letters</i> provide background information and include an activity. Letters are available for every lesson in English, Spanish, Russian, Tagalog, Arabic, Mandarin, Korean, and Vietnamese.	<ul style="list-style-type: none"> Student Worktext Teacher's Guide
Math in Action	<i>Math in Action</i> lessons include explanations of topics to build background and provide alternative suggested contexts to connect with all students.	<ul style="list-style-type: none"> Student Worktext Teacher's Guide