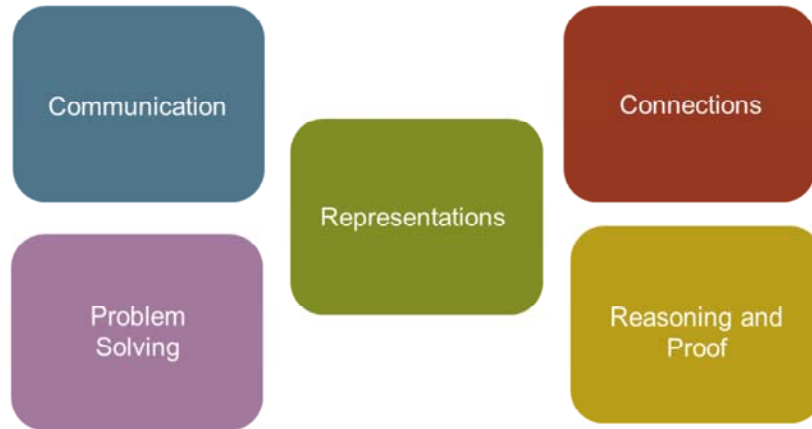


Quality Math Instruction: Five Process Areas



1

Equals

Communication: Language precedes thinking . We begin to learn language by naming things. This is why it is important for students to know the names of math tools, actions, and vocabulary. Eventually, students combine these names to think more deeply about strategies and concepts. This is why it is important for students to have a way to communicate about math. It is also important for students to communicate and interact in a community of learners.

Connections: In the structure of a lesson, students activate and build background knowledge for the purpose of connecting it to new knowledge within and between all content areas. That is how we all learn math. There are multiple connections beyond background knowledge that are found in the lesson, when learning about the math tools , actions, and strategies when problem solving and with practice and application activities that connect to the students world.

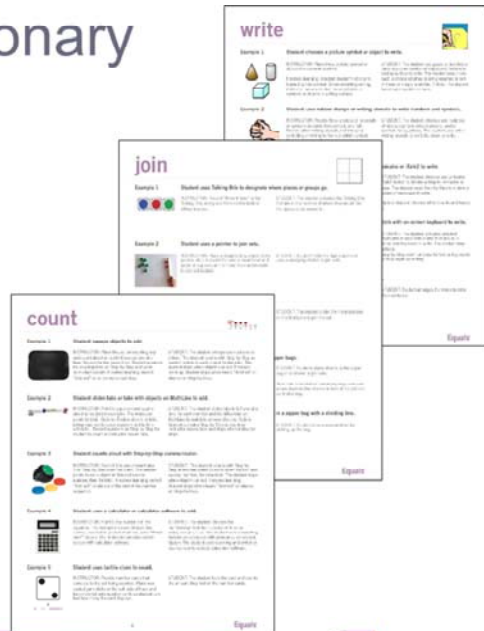
Representations maximize student understanding of math concepts. The CSA approach is a highly respected methodology for teaching all students math and this has been proven to benefit students from Kindergarten all the way to high school. No matter the ability level of each student, they view three representations of the math objective. This is present in every lesson.

Problem Solving is a culmination of communication, representations and connections. Good instruction, will provide a way for students to solve a problem with the amount of support that allows them to think as independently as possible. Differentiation makes this happen.

Reasoning and Proof begins with identifying how a problem was solved or not solved. Showing which tools were used and how the strategy was applied is the proof of a correct solution. When a correct solution isn't reached, it's time for discourse to determine what happened and try something else. In this part of the lesson, the safe classroom environment is important, so everyone knows it is ok to try and to learn from a mistake.

Action Dictionary

- Organized by purple words in lessons
- Purple words indicate a student action
- Suggested adaptations
- Action words cross-referenced
- Supports access
- Active learners



Action Dictionary location: **Members Only**→**Resources** →**Action Dictionary**

Provides differentiation for actions that students are asked to perform in the lesson.

Organized alphabetically.

Action words are found in purple print in all Equals math lessons.

Words are cross referenced with alternative action words.

Can be a springboard of ideas for you to support your students' needs.

Instructional Level	Instructional Minutes / Day	Time Spent / Lesson
Level 1: significant disabilities, highest level of support	30 minutes	2 weeks
Level 2: moderate disabilities, mid-level environmental supports	40 - 45 minutes	1½ weeks
Level 3: mild disabilities, minimal supports	60 minutes	4 days - 1 week

Math Focal Point review should be planned for the first 5 - 7 instructional minutes at all levels.

Note: see Getting Started section for specific information on implementing Equals Math curriculum.

OVERVIEW

Pacing Guide

Example of Equals Daily-Weekly Lesson Pacing
This guide is based off the Equals pacing guide for students at Level 1, 2, and 3. Always use the pacing appropriate to the needs of your students. This resource is meant to be a general resource for teachers to use while planning their math lessons. Math Focal Point review should be included as a daily opening activity.

Level 1	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Vocabulary Review	Math Dash	Math Tools	Vocabulary New	Solve It Together
	Game	Protest / Cards	Show & Tell	Think About It	
Week 2	C-S-A	Solve It	Discuss	Math Dash Revisited	Follow-Up Page
	Skill Worksheet	Problem Solving Worksheet	Group Problem Challenge	What Did We Learn?	Follow-Up Page

Level 2	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Vocabulary Review	Protest / Cards	Vocabulary New	C-S-A	Solve It
	Game	Math Tools	Think About It	Skill Worksheet	Problem Solving Worksheet
	Math Dash	Show & Tell	Solve It Together		
Week 2	Discuss	What Did We Learn?			
	Group Problem Challenge	Follow-Up			
	Math Dash Revisited	Follow-Up			

Level 3	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Vocabulary Review	Math Tools	C-S-A	Discuss	Follow-Up
	Game	Show & Tell	Skill Worksheet	Group Problem Challenge	Follow-Up
	Math Dash	Vocabulary New	Solve It	Math Dash Revisited	
	Protest / Cards	Solve It Together	Problem Solving Worksheet	What Did We Learn?	

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Overview Manual: Pacing Guide

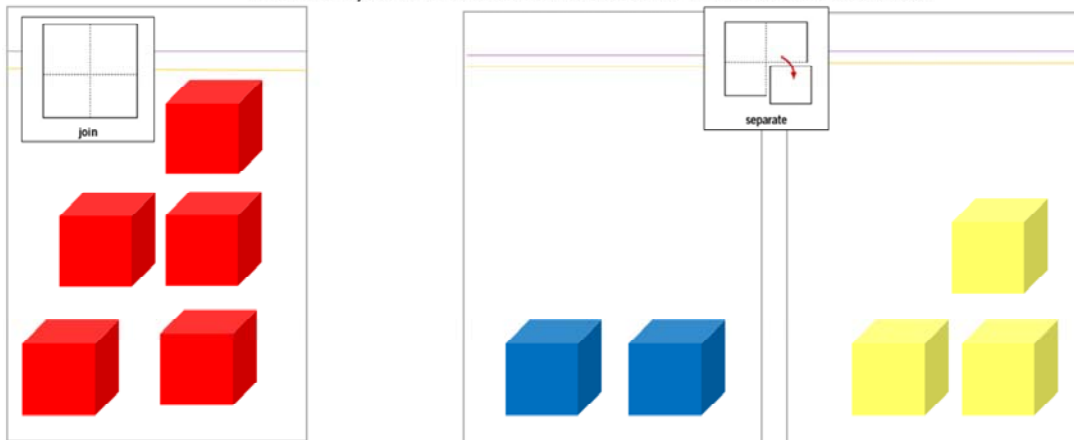
Pacing Guide, Overview Manual, page 5:
Members Only → Resources tab → Overview Manual

- 4-page lesson takes 4-10 days to complete, including review
- Include review opportunities within their daily lesson plan, during the first 5 or 10 min before the start of each lesson and/or a lesson wrap up at the end
- Consider building review or ongoing skill practice within the Math Focal Point
- Spend maximum 2 to 2-1/2 weeks on a lesson, then move on to the next lesson.
- Review any lesson or portion of a lesson that supports the next lesson if needed, then go back to where you left off and continue
- Use the Student Tracker Form on Members Only to keep track of lessons you would like to review:

Members Only → Assessment → Informal Assessments → Student Tracker Form

Concrete Connections

“What can you tell me about what we did with the sets of cubes?”



Activities in lesson: Vocabulary Review (page 1) & Vocabulary (page 2)

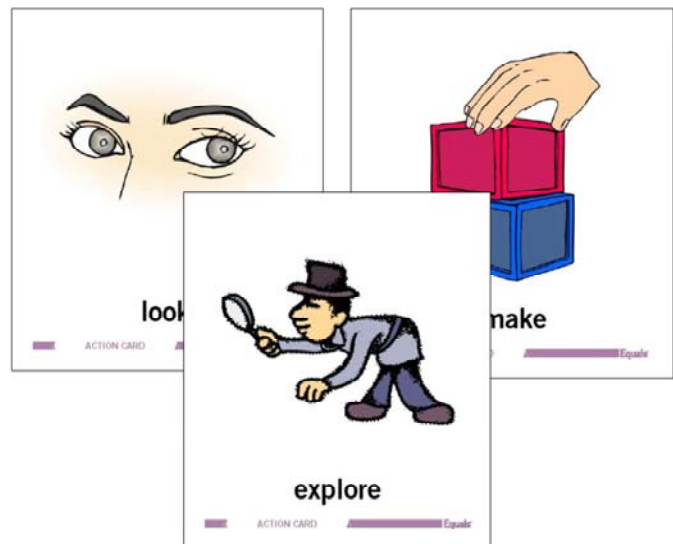
4

Equals

- Concrete Connections are visual representations of vocabulary words
- Students and teachers build a Concrete Connection together as written in lesson.
- Lessons list questions to support students when reviewing vocabulary words.
- Concrete Connections appear twice within a lesson: on page 1 for review word(s) and on page 2 for new word(s)
- After making Concrete Connections, consider placing them in your Math Focal Point to refer to them when the word is used, to connect to other content, or for use during problem solving.

Action Cards

- found on the first 3 pages of lesson
- typical student actions when problem solving
- each card is supported with 2 cards
- supports problem solving strategies taught in lesson
- teacher models Action cards



5

Equals

Action Cards are organized alphabetically in the card box.
For more information on organization see Overview Manual, page 8:
Members Only →Resources tab →Overview Manual

- Three Action Cards for each lesson.
- Action Cards visually support students in choosing an action when problem solving.
- Action Cards represent a first thought when students are thinking about solving a problem.
- Same three Action Cards are used throughout one lesson to provide multiple opportunities to view them as demonstrated with math tools.
- Actions modeled by the teacher whenever the word(s) usage occurs naturally in the lesson. Students can benefit from seeing a model, then apply it when it is their turn during problem solving.

Action cards + Action Dictionary

- Model within a natural setting
- Support student accessibility with Action Dictionary



Lesson 2-A-1 OBJECTIVE: Student will compose and decompose sets of 2-5 and describe the parts and whole.

Warm Up

<ul style="list-style-type: none"> • Vocabulary cards (see resources) • Sticky notes • Counting cubes • Counting cubes (see 1.3) • Sticky notes 	<ul style="list-style-type: none"> • Math Tools • Math Tools • Math Tools • Math Tools • Math Tools
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Warm Up

A. Vocabulary Review: join, separate

Show students how to use the action cards. Say, "Join means to put together. Separate means to take apart." Make Concrete Connections with students: place five red cubes in a bag. Place three yellow cubes in a bag and two blue in a bag. While making, receive joining and separating the cubes in the bags. Ask, "What can you tell me about what we did with the bags of cubes?" Students answer: Label bag of red cubes join, and bags of yellow and blue cubes separate. Find examples in classroom or poster. Show meaning with counters. Ask, "How can you show me what join and separate mean?" Students take turns showing the meaning.

B. Game: join and separate

Prep: Place blocks on table. Find Vocabulary cards join, separate on All Turn-It-around.

Directions: Player spins. If number spins join player takes three blocks, join them to existing sets and says if has more or less. If zero spins separate player separates one set of blocks, does not to place on the left and says if has more or less. After five spins, compare sets of blocks to determine which has more, less, or equal amount of blocks.

C. Math Tools: Connect Action cards to actions as they occur (identify, join, separate)

Show red with five connecting cubes. Say, "I have five connecting cubes." Separate and place under bowl. Put remaining two on top. Ask, "How many are hidden under the bowl?" Reveal amount. Re-connect red and count. Say, "The total is five." Show Subitizing card with five. Cover three dots with sticky note. Ask, "I only see two dots. How many dots are under the sticky note?" Students answer and explain. Lift sticky note to show the part covered (three dots) and two total. Repeat with 2-4.

Explore & Connect

A. Poster/Cards: Working at a Pet Store - Connect Action cards to actions as they occur (identify, join, separate). Show poster/cards. Discuss what you see on the poster/cards and personal experience, look at object to picture from school, internet, book, etc. Locate sets that can be joined and separated on poster/cards. Show how sets were joined or separated.

B. Math Tools: Connect Action cards to actions as they occur (identify, join, separate)

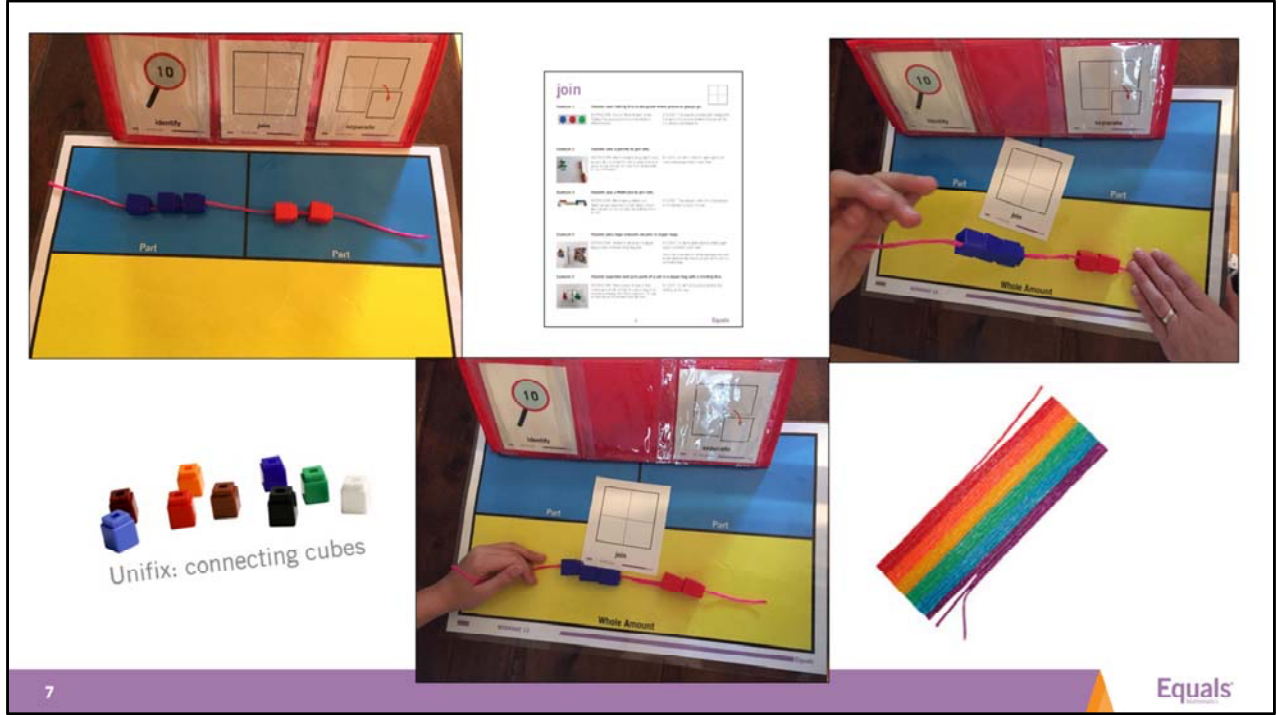
Say, "Let's explore joining and separating sets into parts and whole amount." Model meaning sets with turtles. Count ten turtles. Say, "Ten turtles in the whole set." Separate turtles. Ask, "What happens when I separate the turtles into parts?" Show turtles into parts on Worksheet 1.3. Students answer and explain. Say, "I separate the whole set of turtles into a part of one turtle and a part of two turtles." Repeat with multiple ways to separate three, four, and five, e.g., separate three into sets of two & one, then one & two etc.

C. Show & Tell: Number Notes poster - Connect Action cards to actions as they occur (identify, join, separate). Display cards. Talk about what you know about finding parts and the whole amount. Modeling aloud. Say, "I know I can find the parts and whole set of baseballs on Worksheet 1.3. I can join and separate on the worksheet this way." Show how to join and separate a set of four baseballs into parts and the whole amount. Write what you know on poster with words, pictures, and drawings to model. Use new vocabulary (part and whole).

Ask, "What do you know about parts and whole amount?" Students list and show what they see and know about parts and whole amount. Write all responses on poster with words, sentences, pictures, and drawings. Student to poster with hand.

Ask, "What do I want to know about parts and whole amount? I want to know about joining and separating sets into parts and the whole amount." Write on poster. Ask, "What do you want to know about parts and whole amount?" Students answer. Share responses.

- Some students may benefit from more support when completing actions on the Action Cards or any other action in the lesson.
- For students who benefit from additional support, locate Action Dictionary: **Members Only** → **Resources** → **Action Dictionary**
- Identify any action word(s) for student(s) who need support to perform them. Locate example adaptations within the Action Dictionary for each word. Decide which example(s) to model and provide the needed materials.



Adaptation example: wax-coated yarn sticks and connecting cubes to *join* a set.

Explore & Connect:

A. Poster/Cards

- theme
- activate background knowledge

Lesson 3-A-1 OBJECTIVE: Student will compare and decompose sets of 2, 3 and classified the parts and whole.

Warm up	<ul style="list-style-type: none"> • 100 objects • 100 objects • 100 objects • 100 objects • 100 objects • 100 objects 	Explore	<ul style="list-style-type: none"> • 100 objects • 100 objects • 100 objects • 100 objects • 100 objects • 100 objects
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Warm Up

A. Vocabulary Review: join, separate

B. Game: Join and Separate

C. Math Dash: Connect Action cards to actions as they occur (identify, join, separate).

Explore & Connect

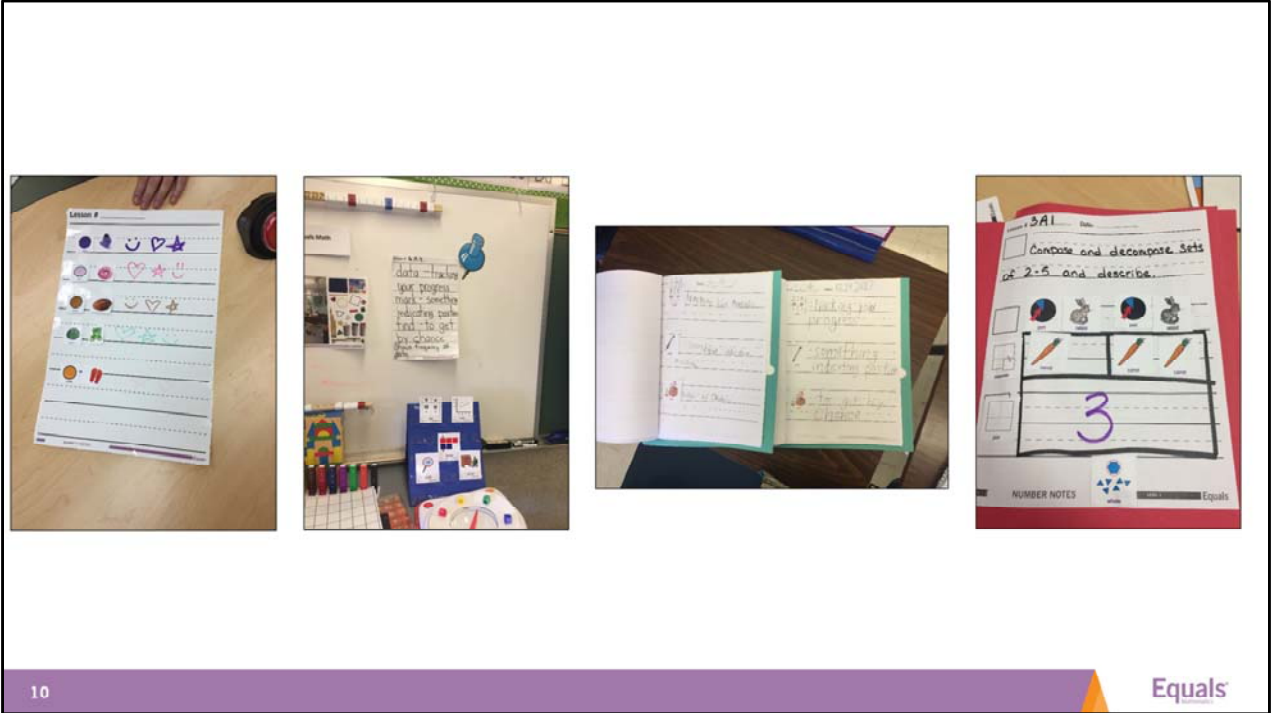
A. Poster/Cards: Working at a Pet Store

B. Math Tools: Connect Action cards to actions as they occur (identify, join, separate).

C. Show & Tell: Number Notes poster

Theme Posters are found within the poster set in your Content kit box.
 Poster Cards are found within the Card box.
 For more information on organization, Overview Manual, page 8:
Members Only → Resources tab → Overview Manual

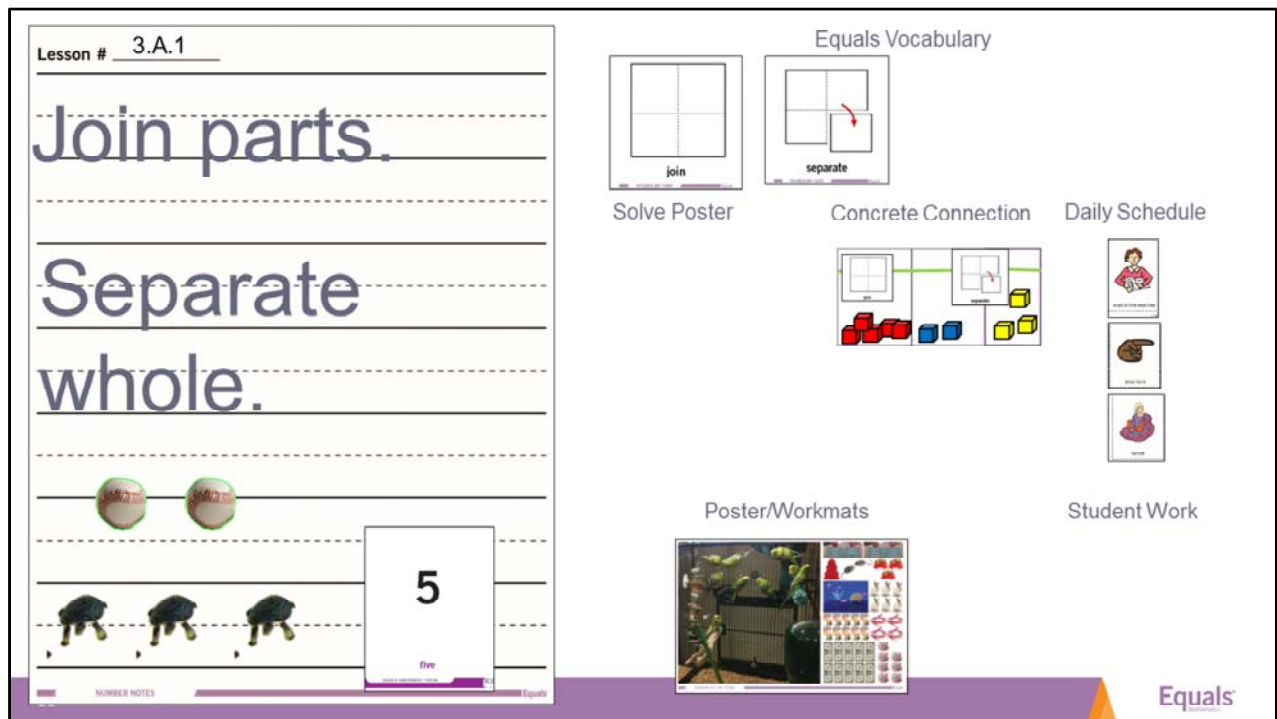
- Theme Poster and Cards promote discussion about the theme and lesson related concepts.
- The theme provides a context to problem solving in the lesson.
- Each theme poster is supported with 6 poster cards.
- Poster cards provide larger images from the poster for student to see up close, participate in the discussion, or for matching.



Examples of completed Number Notes from the field.

- First picture shows a combination of pic-symbols and drawn images.
- Second picture shows Vocabulary taught in lesson.
- The last two photos show student Number Notes journals. At the end of the lesson, students demonstrate their learning on their own Number Notes page. The pages can be combined into a student Number Notes journal.

Members Only → Lesson Prep tab → Number Notes



Example of Math Focal Point after completing the first page of the lesson.

- Concrete Connections posted after the Vocabulary review.
- Theme poster is posted after the Poster and Cards activity.
- Number Notes poster updated with student and teacher responses and manipulatives used during the Math Tools activity.
- Pic-Symbol Schedule provides a visual for each planned lesson activity during the day's math instructional time. Students read schedule with teacher, then remove pic-symbol and review remaining schedule after each activity.
Members Only →Resources →Pic-Symbol Schedule
- Start small with the Math Focal Point and make sure that it is reasonable and effective for your students to review and anchor their learning.

Solve Poster

- numbered steps support answering the Solve Poster questions
- supports visible and verbal thinking while problem solving
- all forms of communication used
 - Pic-symbols, drawings, Action cards, Action Dictionary



Solve Poster is found in the poster set in your Equals Content kit. There are two copies of this poster. One for teacher demonstration, and one for group problem solving on page 2. Provide it as a guide for Problem Solving on page 3 of lesson.

- Solve Poster is rooted into problem solving steps throughout second page of lesson.
- Solve Poster displays the 5 problem solving steps taught in the lesson.
- Each step within problem solving on page 2 matches the Solve Poster.
- The steps are supported with guiding questions on the poster and in the lesson.
 1. Facts – *What do I know about the problem?*
 2. Action – *What can I do to solve it?*
 3. Estimate/Predict – *What might the solution look like?*
 4. Tools/Strategy – *What tool or strategy can I use?*
 5. Solution – *How did I solve it?*
- Show visible thinking on the Solve Poster with pic-symbols, drawings, real life pictures, and Action Cards. Think outloud while reading and considering each step.
- Use Action Dictionary to support students in completing the action words while problem solving.

Joe works in the Dog Training section of the Pet Store. He has a set of three baseballs to put into two bags. Identify different ways Joe could separate the set of baseballs into two bags.

1. Facts: What do I know about the problem?
Joe has a set of dog toys. Set of three baseballs to put in two bags. Joe can separate the set.

2. Action: What can I do to solve it?
Separate the set.

3. Estimate/Predict: What might the solution look like?
I estimate 2 baseballs in one bag and 1 baseball in a second bag.

4. Tools/Strategy: What tool or strategy can I use?
separate set on Workmat 13, then join and separate another way.

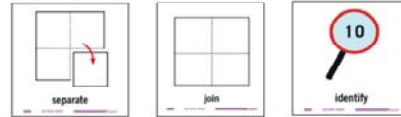
5. Solution: How did I solve it?
I separated into parts of 2 baseballs and 1 baseball.

Example of completed Solve Poster within lesson.

- Support language on poster by using lesson materials to show the facts, estimation/prediction, strategies and solution as possible.
- Use Action Cards to visually support the action choices and their use.
- If needed, condense language into meaningful phrases with visual supports, always maintaining use of math vocabulary.

Introduce and Connect:

B. Think About It Solve It Together:



Strategies

- 2 strategies / lesson
 - Underlined
- Action cards connected to strategies
- same Action card choices and
- two strategies throughout lesson

B. Think About It: Action cards: (identify, join, separate)
Three baseballs, Workmat 13, and connecting cubes on base. Demonstrate solving problem, thinking aloud. As each question is asked, answer on poster with underlining as indicated. Think aloud what you know and want to know about details of the problem while you solve it. Emphasize facts and the question / direction.

Write and read problem: Joe works in the Dog Training section of the Pet Store. He has a set of three baseballs to put into two bags. Identify different ways Joe could separate the set of baseballs into two bags.

1. **Fact:** Say, "I know Joe has a set of dog toys. The problem shows he has a whole set of three baseballs and two bags. I know Joe can separate the set in different ways into the two bags."
2. **Action:** Show Action card choices, modeling each. Say, "I will count the whole set, then separate the set into parts. I want to know how to separate the set into two parts in different ways." Place matching Action card (separate) near students for support.
3. **Estimate/Predict:** Show workmat and toys. Say, "I estimate two baseballs in one bag and one baseball in another bag."
4. **Tools/Strategy:** Show chosen Action cards. Choose an action strategy: separate set on Workmat 13, then join and separate another way. Say, "I used the workmat to separate whole set into parts of two baseballs and one baseball. I can identify two different solutions, e.g., parts of two & one and parts of one & two. Check with estimate."
5. Ask, "How did I get the solution?" Demonstrate and explain that you separated the whole set into parts. Check by showing three connecting cubes. Break into parts of two and one. Match to baseballs on Workmat 13. Join and repeat to separate with different parts. Write solution on poster.
6. Review Solve poster. Repeat 4 & 5 with other strategy: separate connecting cubes first, then join and separate another. Check solution.

- Each lesson shows two strategies that were modeled on the first page.
- Strategies include action words supported by Action Cards.
- Strategy ideas may come from the students. Allow them to try even if you think they might not work. Assist students in trying out their ideas as needed.
- The two strategies are underlined within the lesson.
- Action words that require a student action in the lesson are purple as an indicator to reference the Action Dictionary as needed.
- B. Think About It: the teacher demonstrates the first strategy listed in step 4, then repeats steps 4 and 5 by demonstrating the second strategy.
- C. Solve It Together: the group chooses from the two suggested strategies to complete step 4, then repeats steps 4 and 5 by solving with the second strategy. The teacher supports and assists with this process as needed.

Teach: CSA every student, every time

C
Concrete

S
Semi-Concrete

A
Abstract

15 Equals

Example of Concrete, Semi-Concrete, Abstract representational sequence in a lesson.

Concrete: objects are used to demonstrate the lesson concept.

Semi-Concrete: pic-symbols, Content cards, drawings, pictures, and math tools are used to show the lesson concept. This representation provides the bridge between the Concrete and Abstract sequence.

Abstract: math tools, numerals, symbols and operational symbols are used to show the lesson concept.

Give students a chance to try each representation.

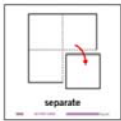
A Skill Worksheet is provided after this activity for students to complete with the manipulatives used during this activity.

*Worksheets: **Members Only** →Lesson Prep tab →Worksheets menu→Chapter/Level*


L1 Show facts in problem using manipulatives. Show Action cards. Student chooses action(s). Choose strategy for student and review (*separate* set on Workmat 13, then *join* and *separate* another way or *separate* connecting cube rod, then *join* and *separate* another way). Student describes *parts* and *whole* amount. Show and read question on Problem Solving worksheet. Student records.

L2 Student marks facts in problem. Show Action cards choices and review tools/strategies for student to choose (*separate* set on Workmat 13, then *join* and *separate* another way or *separate* connecting cube rod, then *join* and *separate* another way). Student chooses. Student describes parts and *whole* amount. Student records solution on Problem Solving worksheet and checks it.


L3 Provide coaching as needed. Student marks facts in problem. Student chooses an action, using Action cards as needed. Student chooses a tool/strategy and solves problem. Student records solution on Problem Solving worksheet and checks it.




separate

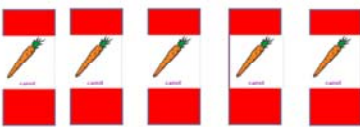


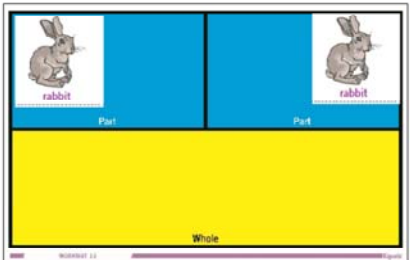
join




identify







16


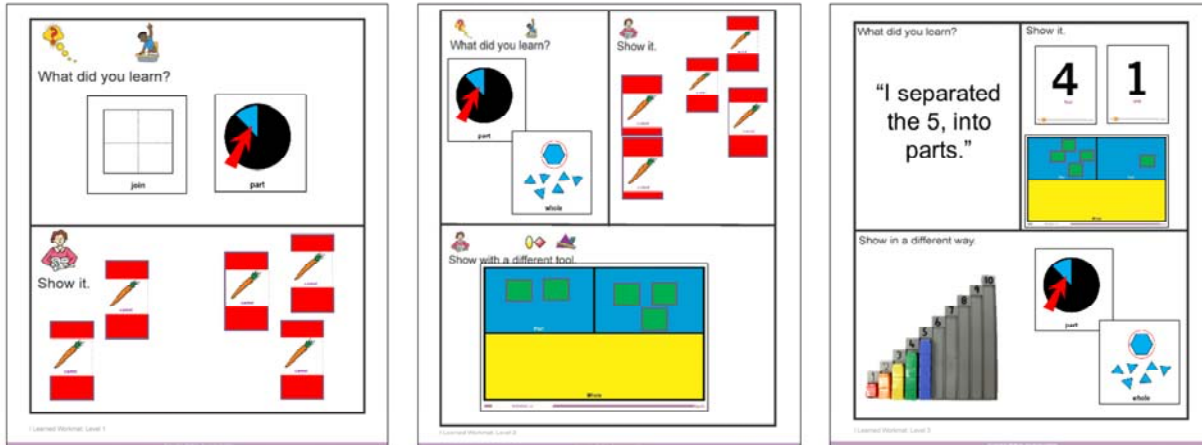
Supporting students during independent problem solving on page 3: Solve It.

Read each level to decide which level will best support each student.

Students solve the problem with the chosen action words, strategy, and provided materials. The problem solving worksheet is for recording their solution.

Worksheets: Members Only → Lesson Prep tab → Worksheets menu → Chapter/Level

I Learned Workmats



17

Equals

Example of completed I Learned workmats.

I Learned Workmats:

Members Only → **Lesson Prep tab** → **Number Notes – I Learned Workmats**

- Provide lesson materials used.
- Students demonstrate what they have learned in the lesson by choosing manipulatives, pic-symbols, and/or written words to complete workmat.
- Supportive to provide a structured workspace for students at 3 levels. Choose appropriate level for each student.

Level 1: two boxes for students to show their learning; pic-symbol supported.

Level 2: three boxes for students to show their learning; pic-symbol supported.

Level 3: three boxes for students to show their learning; not pic-symbol supported.

Students show what they learned by placing, drawing, or writing about tools, strategies, vocabulary, lesson objective or concept. They can show mistakes that were made, their own strategies they used, or simply how they learned to use a tool. All are acceptable.