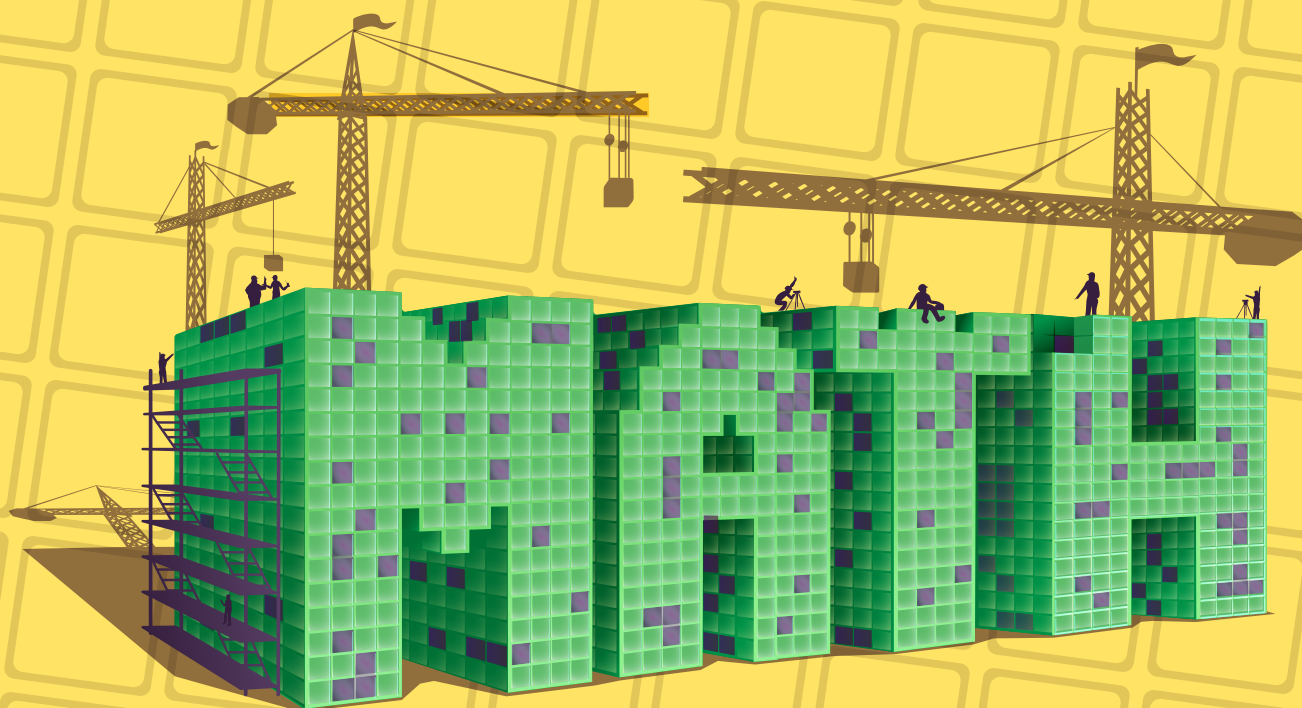


TEACHER'S GUIDE

UNITS **1-4**

ATTAINMENT'S
**MATH
SKILLS
BUILDER**



ALICIA SAUNDERS

JENNY ROOT

DIANE BROWDER

Math Skills Builder Flash Drive

The flash drive contains an Image Library and printable PDF files of teaching resources and the student workbook. PDF reader software is required to view the PDFs.



Math Skills Builder Teacher's Guide: Units 1-4

By Alicia Saunders, Jenny Root, Diane Browder

Editing: Linda Schreiber

Graphic design: Elizabeth Ragsdale

Cover design: Josh Eacret

Art direction: Beverly Sanders

An Attainment Company publication

© 2017 by the Attainment Company, Inc. All rights reserved.

Printed in the United States of America

ISBN: 978-1-57861-247-5



Attainment Company, Inc.

P.O. Box 930160

Verona, Wisconsin 53593-0160 USA

1-800-327-4269

www.AttainmentCompany.com

Contents

UNIT 1: Review of Early Numeracy Skills 1

Overview	3
Lesson 1	5
Lesson 2	17

UNIT 2: Group Problem-Solving Strategy 29

Overview	31
Lesson 1	34
Lesson 2	40
Lesson 3	55
Lesson 4	70
Lesson 5	73

UNIT 3: Compare Problem-Solving Strategy 81

Overview	83
Lesson 1	87
Lesson 2	94
Lesson 3	110
Lesson 4	125
Lesson 5	128

UNIT 4: Discrimination of Group and Compare Problem-Solving Strategies 135

Overview	137
Lesson 1	140
Lesson 2	146
Lesson 3	166
Lesson 4	181
Lesson 5	184

Unit

2

GROUP

Problem-Solving Strategy

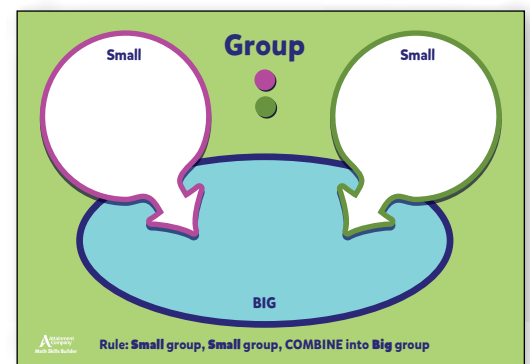
Overview

After completing Unit 1, students should be successful at creating sets. In Unit 2, students will begin exploring ways to compose numbers from two different parts (adding), based on a part-part-whole model, in which the two parts are combined into a whole. The Group Graphic Organizer will be used to teach this concept. The five lessons provided for teaching the Group Problem-Solving Strategy are summarized below.

Unit 2 Lesson Preview

Lesson 1: Preteaching and Reviewing Concepts

Use this lesson plan to solve mathematical problems involving grouping. A time-delay procedure is used to preteach/review key vocabulary and concepts. The process of using manipulatives with the Group Graphic Organizer (a) to create and combine sets, and (b) to represent a number sentence to solve a math story problem is modeled for the student. Once students have demonstrated an understanding of this process following your model, provide several opportunities for students to use graphic organizers and manipulatives on their own. Provide coaching and feedback, but fade your support to allow students to learn to use graphic organizers and manipulatives to help them solve math problems independently.



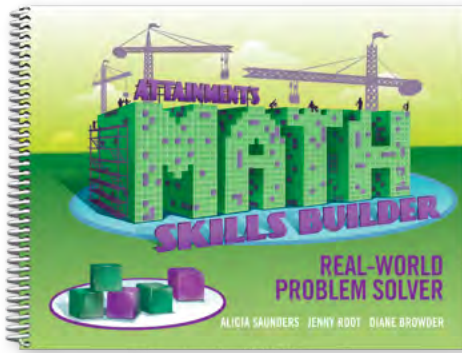
Lesson 2: Modeling the Compare Problem-Solving Strategy

Follow this lesson plan to introduce students to the Group Problem-Solving Strategy and to model how to perform each step of the Problem-Solving Checklist. This lesson also introduces students to the corresponding video of hand motions/signs, which you can review within the software/app, or on the DVD provided. Repeat this lesson as needed until students understand how to use each step in the Problem-Solving Checklist. As you model each step, give students a chance to perform each action. Provide coaching and feedback. Problems from the *Real-World Problem Solver* workbook are used for modeling in this lesson. (Data of the student's performance are not collected during lessons that model the procedure.)

Problem-Solving Checklist	
<input type="checkbox"/> 1	Listen to or read the problem.
<input type="checkbox"/> 2	Find the "whats."
<input type="checkbox"/> 3	Find and write the label.
<input type="checkbox"/> 4	More? Fewer? Different? Same?
<input type="checkbox"/> 5	Choose the graphic organizer.
<input type="checkbox"/> 6	Say and sign the rule.

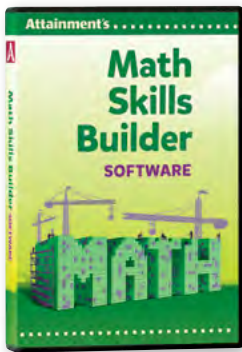
OVER →

<input type="checkbox"/> 7	Find the numbers.
<input type="checkbox"/> 8	Fill in the number sentence.
<input type="checkbox"/> 9	Write + or -.
<input type="checkbox"/> 10	Fill in the graphic organizer.
<input type="checkbox"/> 11	Make sets.
<input type="checkbox"/> 12	Solve the problem and write the answer.



Lesson 3: Providing Guided Practice

Once students have general knowledge of how to perform each step of the Problem-Solving Checklist, follow the Lesson 3 plan to give students practice using the Group Problem-Solving Strategy independently with planned prompting when needed. The *Real-World Problem Solver* workbook provides three story themes—six problems for each—for the student to practice using the Group Problem-Solving Strategy. Choose a theme and corresponding pages from the student workbook, provide the required materials, and follow this lesson plan to give students practice in independently solving Group math problems.



Lesson 4: Providing Independent Practice via Software

After students have used the Problem-Solving Checklist and have knowledge of how to perform each step, follow this lesson plan to give them additional independent practice. The app/software provides two additional themes and randomizes the numbers occurring within the story problems, giving students a multitude of math story problems to solve. Use this lesson plan to give students practice in independently solving Group math story problems using software.



Lesson 5: Generalizing Skills via Videos

When students have shown mastery of the Group Problem-Solving Strategy, follow this lesson plan. Lesson 5 is designed to provide real-world video simulations of math story problems. Videos are provided for six additional Group math story problems from two themes.

Using the Lesson Plans

For all lessons, the **green** script indicates what to say as you teach and the black text tells you what to do. Words in all caps (e.g., BIG) indicate to emphasize that word. Words [in brackets] indicate to substitute information as appropriate to the lesson or the math story problem you are focusing on.

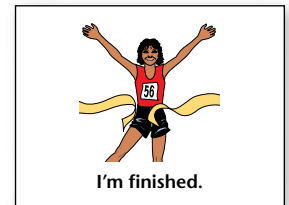
Providing Support for Different Types of Learners

Use these ideas for nonverbal students:

- The majority of time, nonverbal students can participate without any additional supports by pointing to their responses in the *Real-World Problem Solver* workbook.
- Response Cards are provided to request *Read, please;* *Help me;* and *I'm finished.*
- Response options can also be programmed into a student's AAC device (see the Materials list in each lesson).

Use these ideas for beginning writers or nonwriters, when required to write on the graphic organizer and Number Sentence Cards.

- Have students copy the words (or just the first letter of the words) from the story problem.
- Have students copy from your model.
- Create response options that students can select and place on their graphic organizers.
- Use a magnetic circle for students who struggle with drawing circles or draw the circle for them.
- Use plastic numerals for students who struggle with writing numbers.



Lesson

1

Preteaching and Reviewing Concepts

Objectives

- Identify the symbol for add: +
- Identify the vocabulary words: *add*, *group*, *same*, *different*
- Match *add* and *combine* to the plus sign (+)
- Create sets to represent a number sentence
- Solve addition problems with sums to 10 using number sentences

Materials

- Vocabulary and Symbol Cards: *add*, *combine*, *group*, *same*, *different*, plus sign (+); distractor cards: minus sign (–), *take away*
- 2-column T-chart
- Teaching (large) Group Graphic Organizer
- Number Sentence Card; 1 per student
- Student (small) Group Graphic Organizer; 1 per student
- Counting Cubes; 10 of each color per student
- Marking pen and eraser; 1 per student

Preparation

Write the symbol + at the top of one column of the T-chart and – at the top of the other column.

Notes

- The purpose of this lesson is to prepare students to solve mathematical problems involving grouping. Students first review the vocabulary words and symbols associated with Group problems. Then they become familiar with the Group Graphic Organizer without the context of a story problem. (That is, neither the Group Rule nor math story problems are used during this introductory lesson.) Students learn how to use manipulatives (i.e., Counting Cubes) with the Group Graphic Organizer.
- **Green text** indicates what to say to students; text in all CAPITAL letters indicates to emphasize the word. Substitute information [in brackets] as appropriate.

Vocabulary Words and Symbols

You'll begin the lesson by using a constant time-delay procedure to review the following vocabulary words and symbols: *add*, *combine*, *group*, and the plus (+) sign. Next, you'll check students' comprehension by having them match words to the corresponding symbol and/or indicate the word when you give its definition.

Review (Using the Constant Time-Delay Procedure)

Place 4 Vocabulary and/or Symbol Cards in front of the student (the target card and 3 distractor cards). Point to the cards and remind students of what each means: *add* means “to put together”; *same* means “alike or identical”; *different* means “not the same”; a *group* is “a number of things close together”; and the plus sign (+) means “to add.” Use the constant time-delay procedure to review the words and the plus sign (+).



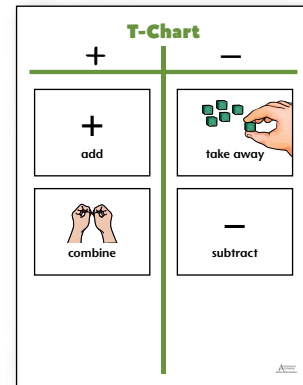
Round 1: 0-Second Time Delay	
Step 1	Present the target Vocabulary or Symbol Card and 3 distractor cards.
Step 2	Point to the target card and name it. While still pointing to the card, say, This is the word [add]. Touch [add] or This is [the plus sign]. Touch [the plus sign].
Step 3	Provide feedback. <ul style="list-style-type: none"> • Give specific praise for touching the correct word, Yes, [add]. Good job touching [add]. [Add] means [“to put together”]. • If the student does not touch the correct card, use a physical prompt to guide the student to locate the word and then give praise, Very good. You pointed to [add]. Good job touching [add]. [Add] means [“to put together”]. There should be no errors in this round.
Step 4	Shuffle the cards and repeat the process with each Vocabulary Card or Symbol Card (i.e., <i>same</i> , <i>different</i> , <i>group</i> , plus sign [+]).
Step 5	Repeat these steps with each student in the group; then proceed to Round 2.



Round 2: 4-Second Time Delay	
Step 1	Present the target Vocabulary Card or Symbol Card and 3 distractor cards.
Step 2	Say, Show me [add]. Wait up to 4 seconds for a response before prompting the student. (For students who can read, alternatively say, What word? OR What symbol? rather than “Show me.”)
Step 3	Provide feedback. <ul style="list-style-type: none"> • Give specific praise for pointing to the word or symbol, Yes, [add]. Good job touching [add]. [Add] means [“to put together”]. • If the student does not touch the correct card, use a physical prompt to guide the student to locate the correct word and then give praise, Very good. You pointed to [add]. [Add] means [“to put together”]. • If the student responds incorrectly, point to the correct word and say, This is [add]. Touch [add]. If possible, try to block errors and redirect the student to the correct response. If the student makes an error, do not attend to it (e.g., by saying, “No, that word is [subtract]”).
Step 4	Shuffle the cards and repeat the process with each Vocabulary Card (i.e., <i>same</i> , <i>different</i> , <i>group</i> , plus sign [+]).
Step 5	Repeat these steps with each student.

Comprehension

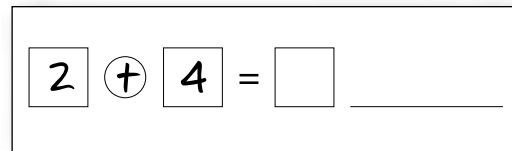
- 1 Display the T-chart. Point to the + and – symbols at the top of each column. Place Vocabulary Cards or Symbol Cards for *add*, *combine*, *subtract*, *take away*, the minus sign (–), and the plus sign (+) in front of the students. Review the definitions of the words. Then, have students sort the cards into the appropriate columns. Say, **Match [add] to the [plus] sign** or **Match this word to the correct math sign**.
- 2 Place the Vocabulary Cards for *group*, *add*, *combine*, *subtract*, and *take away* in front of the students. Ask students to indicate the card as you give the definition, **Find the word that means [“a number of things close together”]**.



Graphic Organizer

Introduce students to the Group Graphic Organizer and the Number Sentence Card.

- 1 Distribute 10 of each color of Counting Cubes, a Group Graphic Organizer, a marking pen and eraser, and a Number Sentence Card to each student. Say, **You already know how to make sets. Today we are going to learn how to COMBINE sets together.**
- 2 Write any numbers (1–9) in the first two boxes and + in the circle on each student’s Number Sentence Card. Point to the first number in the number sentence, and model making a set using the Counting Cubes. Say, **See the first number in this number sentence? I’ll make a set of [2] in the small purple circle on this graphic organizer. Now, you make a set of [2] in your small purple circle, too.** Wait for students to respond.



Praise independent correct response	Or, if needed, assist using least intrusive prompt		
	Verbal →	Specific verbal →	Model
Excellent job! You made a set of [2].	If no response, say, How many Counting Cubes go in the small purple circle? Wait for students to respond.	If still no response, say, Put [2] Counting Cubes in the small purple circle. Wait for students to respond.	If an incorrect response or still no response, say, Watch me. Make the set in the student’s small purple circle, then move the Counting Cubes away. Say, Your turn. Give the student a chance to retry. Use hand-over-hand prompting if the student makes a mistake on the retry.

- 3** Point to the second number you wrote on the Number Sentence Card and model making a corresponding set with the Counting Cubes. Say, **I'll make a set of [4] in the small green circle. Now you make a set of [4] in your small green circle, too.**

Praise independent correct response	Or, if needed, assist using least intrusive prompt		
	Verbal →	Specific verbal →	Model
Excellent job! You made a set of [4].	If no response, say, How many Counting Cubes go in the small green circle? Wait for the student to respond.	If still no response, say, Put [4] counters in the small green circle. Wait for the student to respond.	If an incorrect response or still no response, say, Watch me. Make the set in the student's small green circle, then move the Counting Cubes away. Say, Your turn. Give the student a chance to retry. Use hand-over-hand prompting if the student makes a mistake on the retry.

- 4** Model combining the two small sets to form one big set. Say, **I'll combine both small sets together and move them into the big blue circle to make one BIG set. Then, I will count them to add. Now you combine both small sets together to make one big set—a big GROUP.** Wait for the students to respond.

Praise independent correct response	Or, if needed, assist using least intrusive prompt		
	Verbal →	Specific verbal →	Model
Excellent job! You combined the two small sets together to make one BIG set: $[2 + 4 = 6]$.	If no response, say, Combine your sets together to add. Wait for the student to respond.	If still no response, say, Move your two small sets into the BIG circle and count them altogether. Wait for the student to respond.	If an incorrect response or still no response, say, Watch me. Move the two small sets to the big group circle in an organized array (e.g., a line) and count the cubes aloud. Move the Counting Cubes back to the original sets. Say, Your turn. Give the student a chance to retry. Use hand-over-hand prompting if the student makes a mistake on the retry.

- 5 Model systematically counting the cubes then writing the corresponding numeral as the sum in the box after the = sign in the number sentence. Say, **Now you count the cubes and write your total number in the empty box on your number sentence.**
- 6 Repeat these steps with two or three more examples, changing the addition number sentence and modeling the process of using the graphic organizer and manipulatives to solve other addition number sentences.

Independent Use

Encourage students to independently use the Group Graphic Organizer.

- 1 When students have begun to grasp the procedure, begin to fade your model. Provide students with an opportunity to independently solve a number sentence using the graphic organizer and the manipulatives.
- 2 Write a different number sentence (with a sum of 10 or less) on each student's Number Sentence Card. Say, **Show me how to solve your number sentence using your Group Graphic Organizer and your Counting Cubes.** Use the least intrusive prompt to assist them.
- 3 Make sure students write the final answer in the number sentence immediately after solving it.

Praise independent correct response	Or, if needed, assist using least intrusive prompt		
	Verbal →	Specific verbal →	Model
Excellent job! You combined the two small sets together to make one BIG set: $[2 + 3 = 5]$.	If no response, say, Make your sets. OR Combine your sets together to add. Wait for the student to respond.	If still no response, say, Move your two small sets into the BIG circle and count them altogether. Wait for the student to respond.	If an incorrect response or still no response, say, Watch me. Move the two small sets to the big group circle in an organized array (e.g., a line) and count the cubes aloud. Move the Counting Cubes back to the original sets. Say, Your turn. Give the student a chance to retry. Use hand-over-hand prompting if the student makes a mistake on the retry.



Troubleshooting Tips

If a student is having difficulty, collect data while the student solves the number sentence. Analyze the student's errors to determine where the difficulty lies.

- If a student continues to make errors when creating a set of 5 or more, return to Unit 1 and do more practice.
- If counting the cubes in the large set is challenging, have the student organize the Counting Cubes into a line, then touch and move each cube up while counting. If needed, draw a line above the Counting Cubes and have the student push each over the line when counting. Fade this support as soon as possible.



Repeat this lesson one or two more days or until students are fluently using the graphic organizer and manipulatives to make sets and group them together to add and solve addition number sentences with a sum of 10 or less. Then move on to Lesson 2.

