HOW TO USE THIS BOOK

THE INTENDED USE

Give ***all*** of your students the "gift" of math by copying Level One for each of them. Present these booklets as a fun challenge and watch your students blossom. Consider doing the first few pages all together as you model for the students. Then allow students to progress through the levels…each at his/her own pace. Below are some helpful hints for management of these booklets:

- After copying a booklet, save a "master" from which to make new copies.
- Staple each booklet down the left edge to open and close like a book.
- Have the booklets ready when you need them. Keep copies of each level in ready-to-use files.
- Send completed booklets home for students to "show off" to parents.

How do I fit these booklets into my already busy schedule?

Classroom teachers feel the time crunch every day. With so many objectives to cover, how is it possible to fit in this "extra" work? First of all, don't consider it "extra". These booklets allow valuable practice of skills and concepts that you will most likely cover in class as well as new concepts that will help your students to see the "big picture" in the world of math. The booklets also provide great practice of the basic facts in a fun, puzzle-like format. Additionally, there are ways to allow time for these booklets that you will not even notice.

Try these ideas:

- Have students use the booklets as a "warm up" for the first ten minutes of your math block.
- Use these booklets as the students arrive each day…a great way to settle in and get brains working.
- Encourage early finishers to work on the booklets in their free time.

What is important to know before beginning?

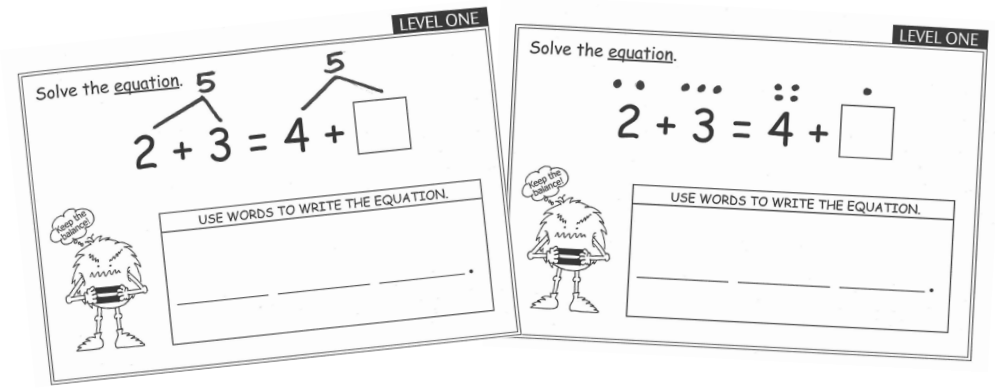
After years of using these booklets in my first- and second-grade classrooms, I have learned some secrets along the way. The booklets are very low maintenance for the teacher while being very meaningful for the students. Here are some ways to make a very user-friendly program even user-friendlier. ☺

DO:

- ✓ Expect students to write the equations/inequalities in the simplest terms possible. (Example: For "4 + 5 < 12 – 2", the students should write "nine is less than ten" and not "four plus five is less than twelve minus two".) In Level One (page 19), the first opportunity for this kind of thinking is modeled for the students. On this booklet page, the words "seven equals seven" are provided. Typically, students would write "four plus three equals seven" which is true and accurate. However, to promote the concept of a balanced equation, only three lines are given. In these booklets, students are challenged to write every number sentence in the simplest way possible. Consider discussing page 19 as a whole class.

- ✓ Check each completed page before allowing a student to progress to the next.

- ✓ Help students who need some assistance by drawing pictures, using counters, or diagramming the page (see below).



- ✓ Encourage and respect a student's own thinking if it is accurate and efficient. For example, in a problem such as "9 – 2 + 6 – 3" many students will follow the "Order of Operations" (introduced in level 5). The "Order of Operations" helps early learners manage a problem containing addition and subtraction. Here is an illustration of the thinking involved:

$$9 - 2 + 6 - 3$$

$$9 - 2 = 7,\ 7 + 6 = 13,\ 13 - 3 = \underline{10}$$

However, a student may stumble upon the fact that the numbers can be manipulated as long as their signs follow along. Here is an illustration of how that thinking may look:

$$9 - 2 + 6 - 3$$

$$9 + 6 = 15,\ 15 - 5 = \underline{10}$$

…two ways of thinking that result in the same answer!

- ✓ Give "mini lessons" to individuals or small groups as needed.

- ✓ "Show off" really interesting, clever and unique solutions to pages. Call the whole class together, write the solution on the board, and discuss why it is exciting. This rallies the class together and gets everybody excited and interested in math. Unfortunately, many kids need to be shown that math is fun and interesting…they seem to develop a fear or feeling of intimidation early in life. Our role as primary teachers is to shed some light.

- ✓ Celebrate as a class each student's completion of a level. Announce each student's "graduation" to a new level.

- ✓ Differentiate pages to meet student needs. Most pages are open-ended and can have many answers. For a page saying, "__ + __ = __ + __", it might be appropriate for one student to answer with "4 + 5 = 5 + 4" because he/she is still getting a grasp on the concept of a balanced equation or is learning the concept of the Commutative Property. For another student, you may have higher expectations such as "7 + 7 = 9 + 5" or even "20 + 20 = 35 + 5".

- ✓ Insist that all children challenge themselves. For instance, for a page saying, "__ + __ = __ + __", a student may answer "0 + 0 = 0 + 0". If you know that a child is capable of much more…insist on it. My students are used to getting a giggle from hearing "Remember this is your math *CHALLENGE* booklet… not your math *EASY* booklet." Be sure that each child is feeling challenged and successful.

- ✓ Help students to understand why answers don't "work". For example, when my students get to the point (in these booklets) where they are completing equations such as "___ + ___ = ___ – ___", they often put the smaller number first for subtraction and end up with something like, "5 + 3 = 2 – 10". Instead of saying, "you can't do that" or "the big number has to come first", which can cause students to form misconceptions, I use the number line to demonstrate how "2 – 10" results in a negative number. We then rearrange the equation by putting the larger number first as the "whole" and trying it again on the number line. It is amazing what this 2 minute conversation (which may need a few repeat performances) can do for a student's understanding.

DON'T:

- ✓ Don't allow students to work through the booklet without checking each page to see that it is properly completed.

- ✓ Don't forget to acknowledge each student's passing of levels. This keeps the booklets from being "forgotten" and shows students the value of good, old-fashioned hard work. ☺

- ✓ Don't allow a student to skip a booklet because he/she seems "proficient". Quite often, it is true that students fluent with the basic facts, and who easily navigate the curriculum, still experience confusion with the "balanced equation" concept. Many have made generalizations based on what they have been taught (at home or school) and have trouble with "out-of-the-box" thinking and activities. Having students complete every level can fill in holes in their understanding that we may not even know exist. If a student truly does not "need" a level, he/she will fly through it quickly and move on to a challenge as this program increases in difficulty. Remember, the open-endedness of many pages allows for students to self-challenge.

- ✓ Don't encourage the use of negative numbers ***unless*** a student is truly ready to dabble. It is important for early learners to know that negative numbers exist. However, adding and subtracting negative numbers is another story (and even many adults experience confusion with this unless they have a "refresher course"). A great "dabble" with negatives for most learners is in the scenario mentioned in the "Do" section. In equations such as "___ + ___ = ___ – ___", young students often put the smaller number first for subtraction and end up with something like, "5 + 3 = 2 – 10". This is because they are still developing the concept of part/part/whole relationships. In cases such as this, take the opportunity to show students where "2 – 10" really takes them on a number line. This is a fabulous, authentic way to strengthen understanding of part/part/whole concepts while dabbling with the concept of negative numbers.

  (Unsolicited Opinion: I believe all elementary number lines should have numbers extending in positive and negative directions… again, the big picture!)

  Note: You may wonder why I discuss negative numbers… when using the booklets with your whole class, the topic WILL come up. After years of using these booklets in class, I can say I've not had a year when negative numbers DIDN'T appear. I've also had many a student get excited by negatives and begin to dabble with solutions such as "5 – 7 = 2 – 4". If a student solidly understands what he is doing, allow it. ☺

OTHER WAYS TO USE THIS BOOK

There are many different ways to use this series of booklets. A suggestion is to read all of the possibilities and then choose those that best meet the needs of your classroom. If you are not interested in using the booklets with your whole class, some alternative uses follow:

A More Guided Approach – If you fear letting your students "loose" with these booklets, try this more guided approach. Copy the booklet for each student. Introduce the first few pages by completing them together. Then have small groups work daily on a page or two. Go over the solutions when all groups have completed the work. It is a worthwhile experience for students to share and discuss the many different answer possibilities for the open-ended pages.

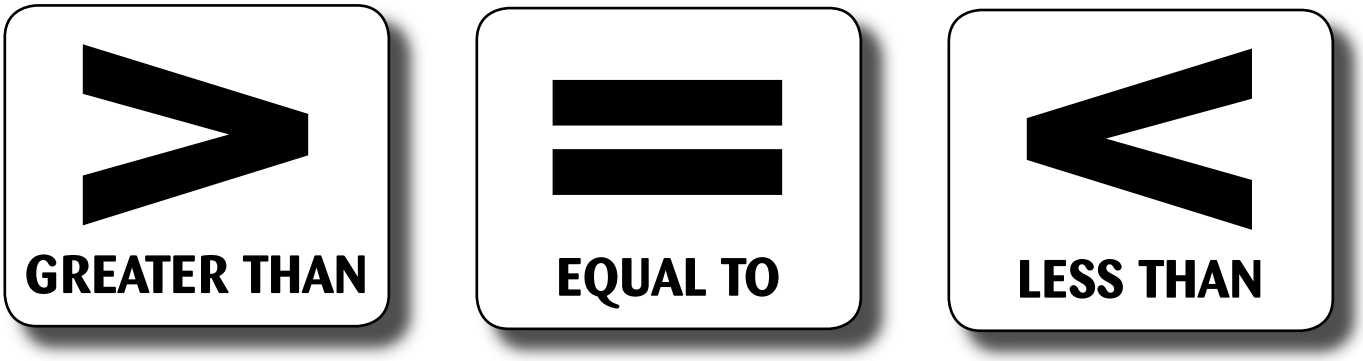
A Challenge – Give the booklets only to the students who need a challenge in math. Each year, these booklets keep my students happily challenged…even the students who really excel in math. Best of all, the parents really appreciate the challenge and the experience with the advanced concepts. Allow these students to work on the booklets in free moments after assignments are completed.

A Whole-Class Activity – Make an overhead copy of the first level. Do one page per day as a "warm up" for the whole class before your actual math lesson. Continue through the levels as the year progresses. What a great way to utilize all of the concepts you help your students to acquire… and to get math conversations started in class. Encourage students to share their thinking as they share their solutions.

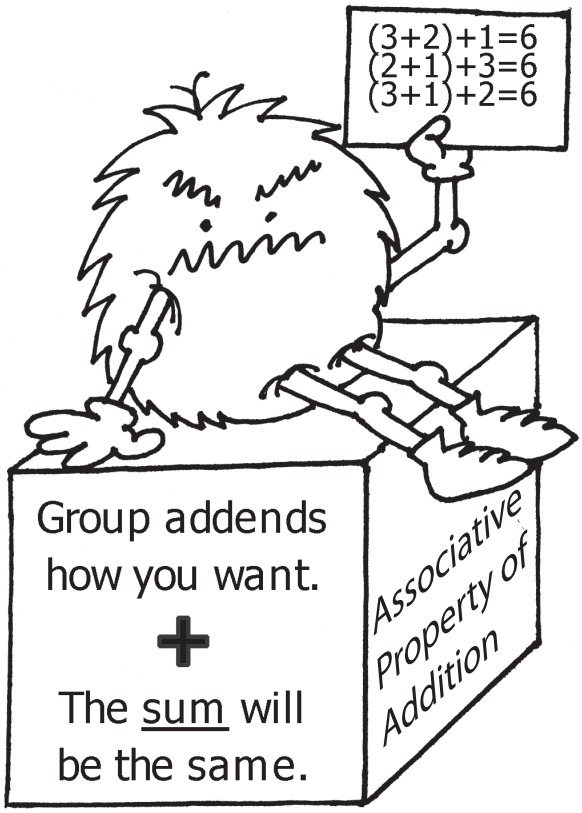
Selected Pages – Choose and use pages as they fit in with the concepts you are covering in class.

Whatever use you select for these booklets, they will help to lay a solid foundation for future years of math learning. Get started today…and help make these important math concepts **MONSTROUSLY MEANINGFUL** for your students.

EQUATIONS and INEQUALITIES: BOOK TWO



LEVEL SIX

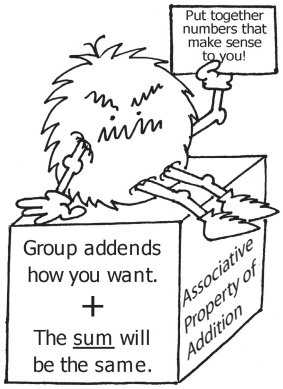


Completed By:

LEVEL SIX

Solve the equation.

$$8 + 5 + 1 + 2 = \square$$



USE WORDS TO WRITE THE EQUATION.

_____

_____ .

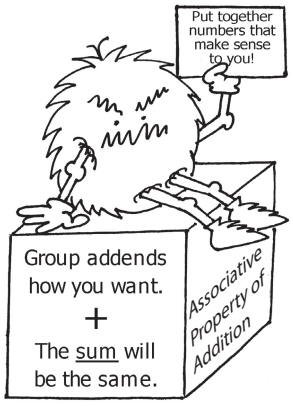
Solve the equation.

$$\square = 3 + 7 + 3 + 1$$

USE WORDS TO WRITE THE EQUATION.

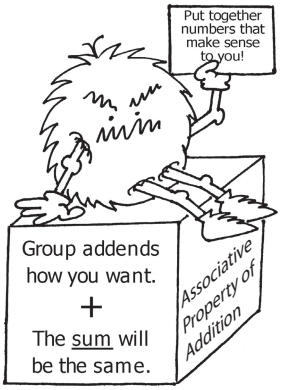
_____

_____ .



Solve the equation.

$$3 + 9 + 4 + 2 = \square$$



USE WORDS TO WRITE THE EQUATION.

_____

_____ .

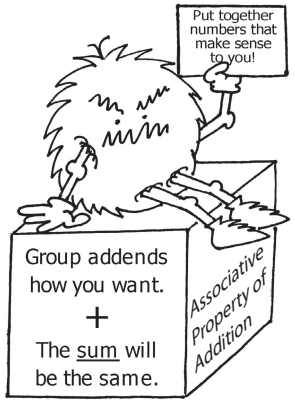
Solve the equation.

$$\square = 6 + 8 + 2 + 1$$

USE WORDS TO WRITE THE EQUATION.

_____

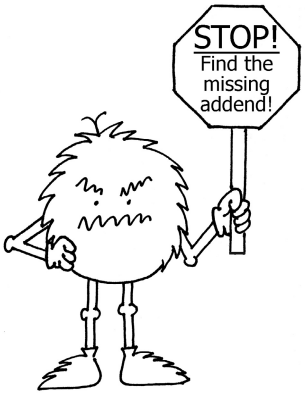
_____ .



LEVEL SIX

Find the missing addend.

$$5 + \square + 5 + 2 = 15$$



USE WORDS TO WRITE THE EQUATION.

_____

_____ .

Find the missing addend.

$$13 = \square + 2 + 3 + 2$$

USE WORDS TO WRITE THE EQUATION.

_____

_____ .