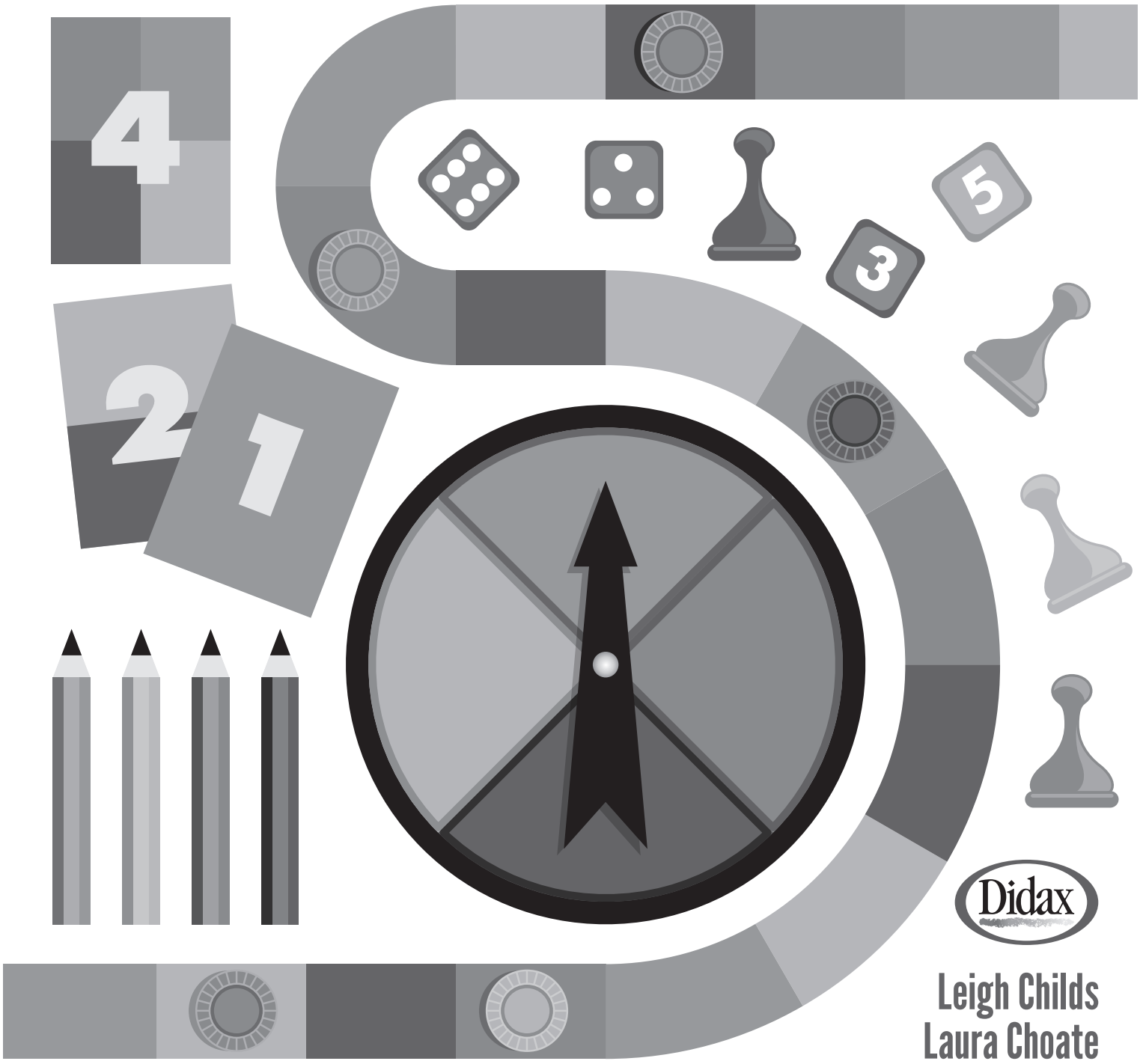
2nd Edition

Grade 2

Nimble *with* Numbers

Fluency Practice *for the* Math Standards



Didax

Leigh Childs
Laura Choate

Printed in the United States of America.

Order Number 211541
ISBN 978-1-58324-669-6

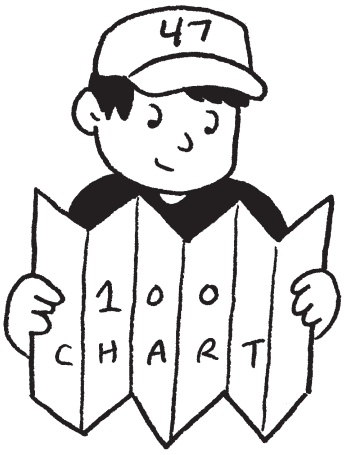
B C D E F 20 19 18 17 16

395 Main Street
Rowley, MA 01969
www.didax.com

Table of Contents – Grade 2

Introduction

Addition Facts



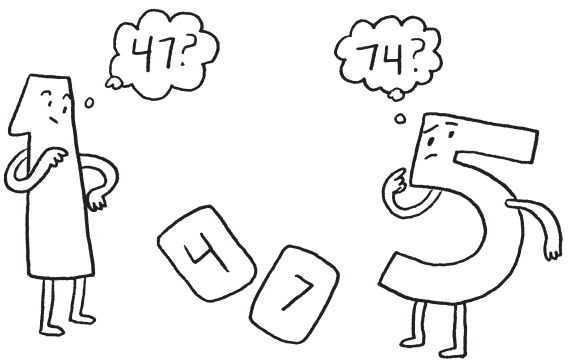
Subtraction Facts

Place Value

Table of Contents – Grade 2 (cont.)

Place Value (cont.)

Addition



Subtraction

Blackline Masters

Introduction

Welcome to the 2nd Edition!

Over the past ten years, thousands of teachers have enjoyed using *Nimble with Numbers* to provide engaging math experiences to their students. With this new edition, we bring you expanded content, explicit connections to current mathematics standards, and more carefully planned practice activities and assessments. This book is not intended to cover every standard, but rather to further the basic number and operation sense central to all the domains of mathematics.

The bulk of the work in this book is appropriate for second-graders, but many activities will be useful to first- and third-graders as well. Although we have linked the instruction to the content standards, we've elected to organize the book into units that provide a coherent approach to the instruction, rather than follow the sequence of the standards.

Students need a facility with number and operations to achieve success with today's mathematics programs. They are being asked to demonstrate proficiency not just in skills but in problem solving, critical thinking, conceptual understanding, and performance tasks. Consequently, the reduced time teachers devote to number must be thoughtful, selective, and efficient.

This book meets the need for high-quality, engaging math experiences that provide meaningful practice and further the development of number sense and operation sense. These activities are designed to help students practice number concepts previously taught for understanding in a variety of contexts. *Nimble with Numbers:*

- provides a variety of adaptable formats for essential practice;
- supplements and enhances homework assignments;
- encourages parent involvement in improving their children's proficiencies with basic facts and computation; and
- provides motivating and meaningful lessons for a substitute teacher or student teacher.

Introduction

Activities to Create Mathematically Proficient Students

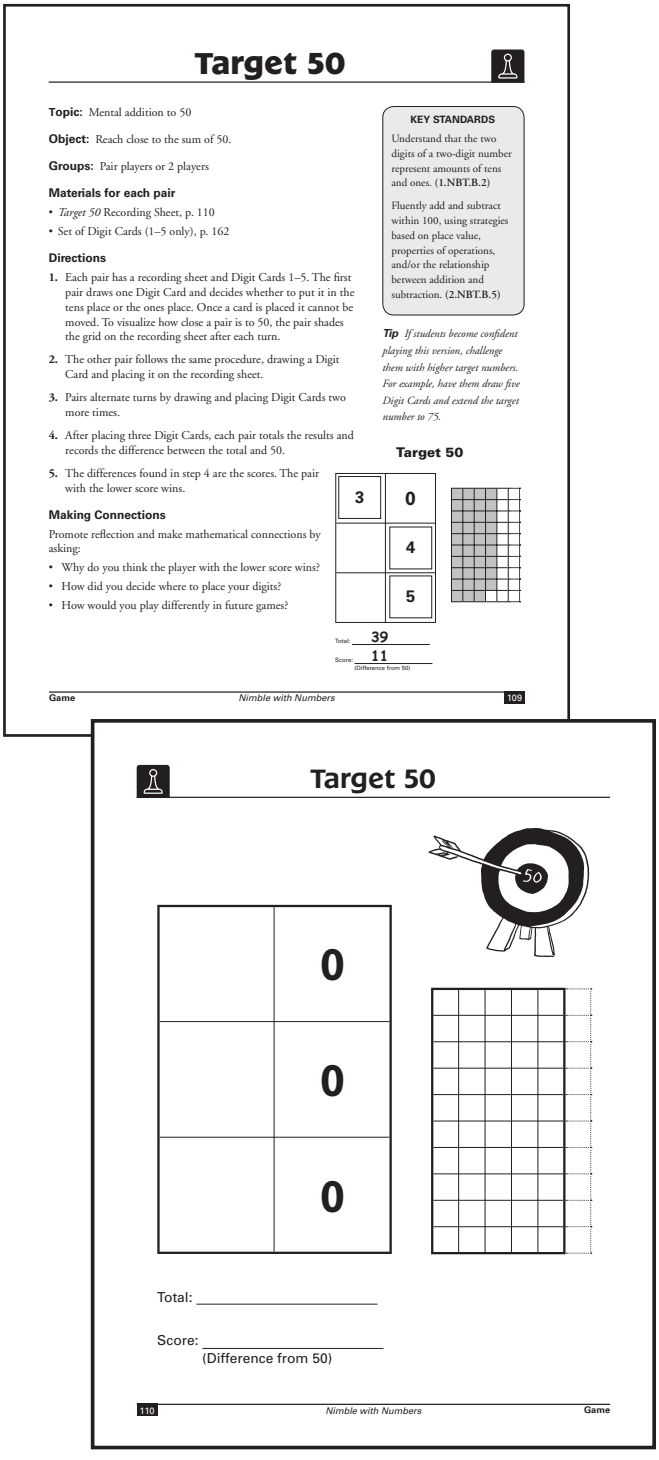
The activities in *Nimble with Numbers* are designed to use the amount of time dedicated to math efficiently. Current mathematics standards require greater focus on fewer topics, coherence from grade to grade, and rigor—that is, deep, authentic command of mathematical concepts, not making math harder or introducing topics at earlier grades. Accordingly, our criteria for selecting activities are that they be:

- Inviting (encourage participation)
- Engaging (maintain interest)
- Simple to learn
- Repeatable (able to be reused often, possibly throughout the school year)
- Open-ended, allowing multiple solutions
- Easy to prepare
- Easy to adapt for various levels
- Easy to vary for extended use

The basic design of the program is very much in keeping with current mathematical practice standards. The activities:

- Require a problem-solving approach
- Improve basic skills
- Enhance number sense and operation sense
- Encourage strategic thinking
- Promote mathematical communication
- Promote positive attitudes toward mathematics as mathematical abilities improve

Here's an interesting Game from the "Place Value" unit:



Target 50

Topic: Mental addition to 50

Object: Reach close to the sum of 50.

Groups: Pair players or 2 players

Materials for each pair

- *Target 50* Recording Sheet, p. 110
- Set of Digit Cards (1–5 only), p. 162

Directions

1. Each pair has a recording sheet and Digit Cards 1–5. The first pair draws one Digit Card and decides whether to put it in the tens place or the ones place. Once a card is placed it cannot be moved. To visualize how close a pair is to 50, the pair shades the grid on the recording sheet after each turn.
2. The other pair follows the same procedure, drawing a Digit Card and placing it on the recording sheet.
3. Pairs alternate turns by drawing and placing Digit Cards two more times.
4. After placing three Digit Cards, each pair totals the results and records the difference between the total and 50.
5. The differences found in step 4 are the scores. The pair with the lower score wins.

Making Connections

Promote reflection and make mathematical connections by asking:

- Why do you think the player with the lower score wins?
- How did you decide where to place your digits?
- How would you play differently in future games?

KEY STANDARDS

Understand that the two digits of a two-digit number represent amounts of tens and ones. (**1.NBT.B.2**)

Fluently add and subtract within 100, using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. (**2.NBT.B.5**)

Tip *If students become confident playing this version, challenge them with higher target numbers. For example, have them draw five Digit Cards and extend the target number to 75.*

Target 50

3	0
	4
	5

Total: 39

Score: 11 (Difference from 50)

Game — *Nimble with Numbers* — 109

Target 50

	0
	0
	0

Total: _____

Score: _____
(Difference from 50)

110 — *Nimble with Numbers* — Game

Introduction

Organization of the Book

This book has five units that cover the high-priority number topics for second-graders and many third-graders as well. In our teaching, we find some second- and third-graders who have yet to master the addition and subtraction facts. Consequently, the first section (Addition Facts) reviews those facts.

The book contains activities for whole groups, small groups, pairs, and individuals. Each unit begins with an overview and suggestions to highlight the activities and provide some time-saving advice. Throughout all units, we make an obvious attempt to promote mental computation. Each unit includes:

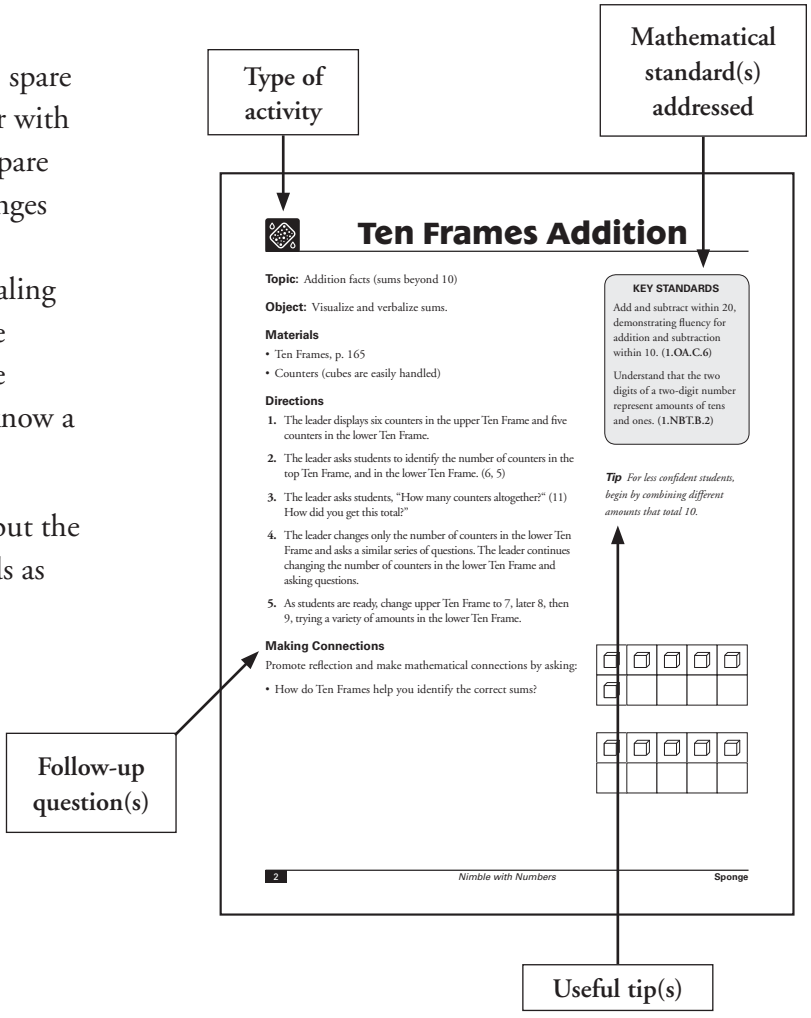
Sponges (S)
Games (G)
Mini-Assessments (A)
Independent Activities (I)

Sponges

Sponges are enriching activities for soaking up spare moments. Use Sponges with the whole class or with small groups as warm-up activities or during spare time to provide additional math practice. Sponges usually require little or no preparation and are short in duration (3–15 minutes). These appealing activities are repeatable, and once they become familiar, some can be student-led. Students are motivated to finish a task quickly when they know a favorite Sponge will follow.

Key content standards are listed for Sponges, but the instruction provided may cover other standards as well.

Sponges feature the following:



Introduction

Mini-Assessments

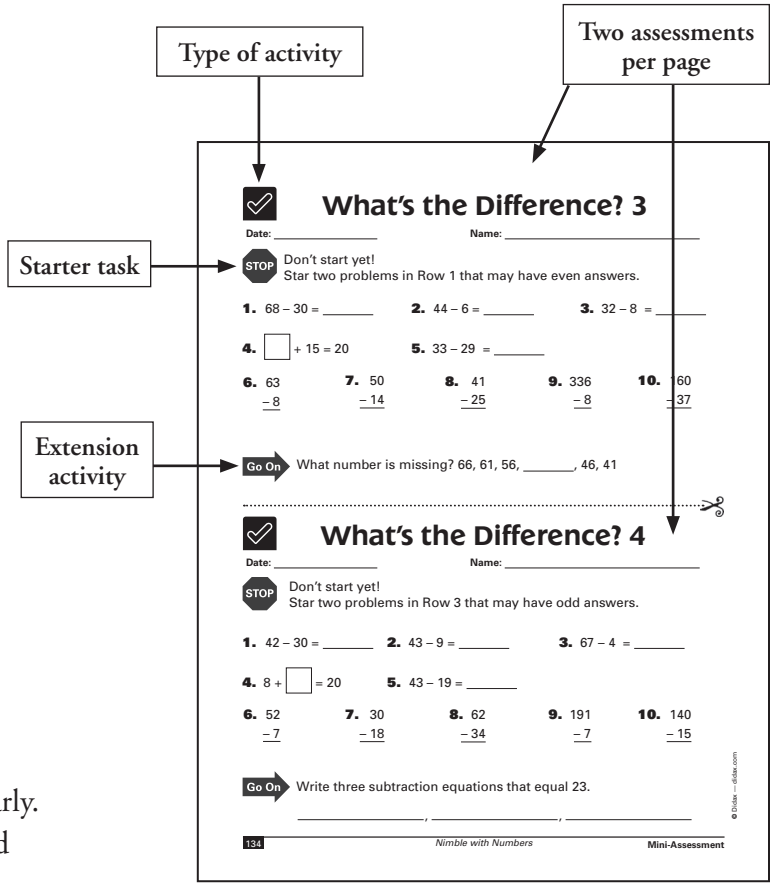
The six Mini-Assessments in each section provide a way to show students' improvement to parents, as well as to students. Each page is designed to be duplicated and cut in half, providing six comparative records for each student. Before answering the ten problems in each assessment, students should respond to the starter task following the STOP sign. These starter tasks are intended to promote mental computation and build number sense.

After students have responded to the STOP task, allow them to go ahead and answer the ten problems. Most students will complete an assessment in 10 to 15 minutes. Some teachers believe their students perform better on the assessments if the responses to the STOP task are shared and discussed first.

The concluding extension problem, labeled "Go On," accommodates those students who finish early. We recommend that early finishers be encouraged to create similar problems for others to solve. By having students share and discuss their approaches and responses to the STOP task and to some of the problems, teachers help students discover more efficient mental computation strategies.

These Mini-Assessments can help teachers determine whether further review of a concept is needed by the entire class or by an identified smaller group of students, determine which concepts are confusing to some students (e.g., identifying two less than a number), and identify which students require practicing the topic for a longer period of time.

Here is a sample page from the *What's the Difference?* Mini-Assessment in the Subtraction unit:



Games

Initially a new Game might be modeled with the entire class, even though Games are intended to be played by small groups or pair players after the rules are understood. ("Pair players" refers to a pair of students playing against another pair. This recommended arrangement promotes mathematical thinking and communication as students collaborate to develop and share successful strategies.) Some games include easy versions as well as more challenging versions.

Introduction

The CD that is included with this book will enable the teacher to present many of the games to the whole class on the interactive whiteboard or using a computer and projector. There are virtual manipulatives that can be dragged onto the gameboards to clearly illustrate game play.

An excellent option is to share the Game with a few students who then teach the Game to others. The teacher may provide some procedure for selecting the first player and may suggest that players take turns in a clockwise direction. Most Games require approximately 20 to 45 minutes of playing time. Games are ideal for home use because they provide students with additional practice and reassure parents that the number strand continues to be valued. When sending gameboards home, be sure to include the directions.

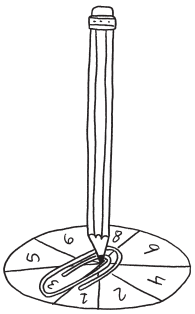
Independent Activities

Independent Activity sheets provide facts and computation practice for students. These sheets are designed to encourage practice of many more facts than would seem apparent at first glance. Some Independent Activity sheets allow multiple solutions. Most students will complete an Independent Activity sheet in 15 to 30 minutes. Independent Activity sheets can be completed in class or sent home as homework. At the end of some of the Independent Activity sheets, students are encouraged to create similar puzzles for classmates to solve. This provides additional practice and student recognition. When deemed helpful, an open-ended blackline master is included to facilitate this possibility.

Suggestions for Using *Nimble with Numbers*

Materials Tips

An effort has been made to minimize the materials needed. When appropriate, blackline masters are provided. The last section of the book contains more generic types of blackline masters, including patterns for number cubes and spinners. A six-sectioned spinner can substitute for a number cube or die. A simple spinner, like the one shown, can be assembled using one of the blackline master spinner bases, a paper clip, and a pencil. To reduce the noise and confine the area where cubes are rolled, use a small box with felt glued to its bottom or lid.



A number of activities require two sets of Digit Cards (blackline master, p. 162). Take time now to duplicate two sets on card stock (or substitute sets of 0–9 tiles). Cut the Digit Cards apart, place them in an appropriate container (plastic bag, coffee can, or margarine tub), and store in a handy place. Play money may be used for activities, although real coins may be more motivating.

Various materials work as markers on gameboards—different types of beans, multicolored cubes, buttons, counters, or transparent color counters (our preference due to the see-through feature). It is assumed that students have access to scratch paper and pencils, especially when a recording sheet is used. It is assumed that a document camera is available, although a whiteboard may be substituted.

Introduction

Recommended Uses

The repeatable nature of these activities makes them ideal for additional use at home. Encouraging children to use these activities at home serves a dual purpose: parents are able to assist their children in gaining competence with the facts and with mental computation, and parents are reassured as they see the familiar basics practiced. Students will become competent and confident as they experience these activities frequently and over time. To support your work in this area, we have included a family letter and a list of helpful open-ended questions.

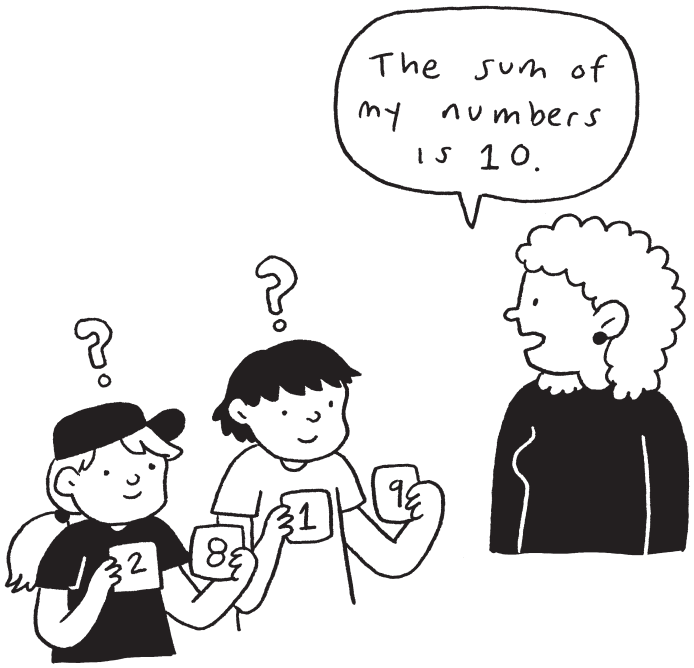
Besides being a source for more familiar homework, these activities offer a wide variety of classroom uses. The activities can be effectively used by substitute teachers, as rainy-day options, for a change of pace, or for "Family Math" events.

Many activities are short-term and require little or no preparation, making them ideal for soaking up spare moments at the end or beginning of a class period. They also work well as choices for center or menu activities. When students are absent from school, these activities can be sent home in independent work packets. You may package these activities in manila envelopes or self-closing transparent bags to facilitate frequent and easy checkout. Feel free to modify the activities and/or change the rules. To accommodate the needs of your students, you might change the numbers, operations, and/or directions.

Getting the Most from These Activities

It is important to focus on increasing students' awareness of the mathematics being learned. To do this, pose open-ended questions that promote reflection, communication, and mathematical connections. For example, after using *Who Buys?* (p. 139), one teacher asked her students, "What mathematics are you doing?" Her second-graders identified addition, subtraction, place value, and patterning.

Having students work together as pair players is of great value in increasing student confidence. While working this way, students have more opportunities to communicate strategies and to verbalize thinking. When asked to identify and to share their successful Game strategies verbally and in writing, students grow mathematically. It is worthwhile to ask students to improve these activities or to create new high-interest games.

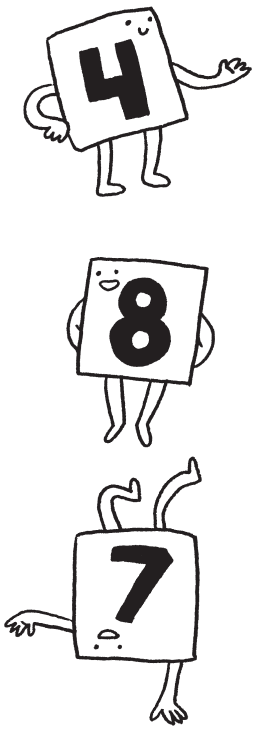


Parent Support

Good questions help children make sense of mathematics, build their confidence, and encourage mathematical thinking and communication. The sample questions we have included on page *xiii* are designed to help teachers and parents see where students are relative to key mathematical practice standards. Because the teacher's or parent's response impacts learning, we have included suggestions for responding. Share this list with parents for their use as they assist their children with these activities and with other unfamiliar homework tasks.

Concluding Thought

We hope that by using these materials, your students will develop more positive feelings toward mathematics as they become mathematically confident and numerically nimble.



Parent Support

Most parents place high priority on attention to the basic facts. Thus, parents will appreciate the inviting and repeatable activities in this book. Because most parents share the responsibility for short periods of practice, the following items are designed to promote parent involvement:

– **Addition Facts Made Easy** (p. *xiv*) is a simple but effective approach for parents to help their children;

– **Good Questions** (p. *xiii*) give parents a framework to interact with and guide their children in persevering in problem solving and thinking about math, while demonstrating their involvement and commitment;

– **The Family Letter** (p. *xii*) is a simple but effective device to help parents be actively involved in helping their children with math.

Over the course of the year, a number of packets may be sent home to parents. The first might include the *Family Letter, Good Questions, Addition Facts Made Easy,* and the *Seeking Sums* activity (pp. 11–12) with the appropriate materials. A future home packet might include *Uncover* (pp. 9–10) and *Making Equations* (pp. 35–36).

Sponge and Independent Activity sheets can be sent home as packets as well. Their advantage is that, unlike Games, they can be used while a monitoring family member prepares dinner, packs lunches, or attends to other household tasks.

Family Letter

Dear Family,

Today the working world requires an understanding of all areas of mathematics including statistics, logic, geometry, and probability. To be successful in these areas, students must know their basic facts and be able to compute. It is important that we be more efficient and effective in the time we devote to arithmetic. You can help your child in this area!

Throughout the school year, our mathematics program will focus on enhancing your child's understanding of number concepts. However, students must devote time at school and at home to practice and to improve these skills. Periodically, I will send home activities and related worksheets that will build number sense and provide much-needed practice. These games and activities have been carefully selected to engage your child in practicing more math facts than are usually answered on a typical page of drill or during a flash card session.

By using the enclosed *Good Questions* during homework sessions, you can help your child without revealing the answers. The questions are categorized to help you select the most appropriate questions for your situation. If your child is having difficulty getting started with a homework assignment, try one of the questions in the first section. If your child gets stuck while completing a task, ask one of the questions from the second section. Try asking one of the questions from the third and fourth sections to have your child clarify his or her mathematical thinking.

Good Questions will help your child make sense of the mathematics, build confidence, and improve mathematical thinking and communication. I recommend posting the Questions in a convenient place so you can refer to it often while helping your child with homework.

Your participation in this crucial area is most welcome!

Sincerely,

Good Questions

Getting Started

How might you begin?

What do you know now?

What do you need to find out?

While Working

How can you organize your information?

How can you make a drawing (model) to explain your thinking?

What approach (strategy) are you developing to solve this?

What other possibilities are there?

What would happen if . . . ?

What do you need to do next?

What assumptions are you making?

What patterns do you see? . . . What relationships?

What prediction can you make?

Why did you . . . ?

Checking Your Solutions

How did you arrive at your answer?

Why do you think your solution is reasonable?

What did you try that did not work?

How can you convince me your solution makes sense?

Expanding the Response

(To help clarify your child's thinking, avoid stopping when you hear the "right" answer and avoid correcting the "wrong" answer. Instead, respond with one of the following.)

Why do you think that?

Tell me more.

In what other way might you do that? What other possibilities are there?

How can you convince me?

Rhythm Addition

Topic: Addition facts

Object: Name sums while maintaining the rhythm.

Directions

1. The leader identifies a pathway around the classroom that includes all students.
2. The entire class practices a "2 slaps, 2 claps, 4 snaps" continuing rhythm.
3. When everyone seems to have the rhythmic pattern, the leader begins by stating an addition fact during the "snapping stage." Without interrupting the rhythmic activity, students respond with the sum coinciding with the next set of snaps. (All responses and naming of facts occur during the "snapping stage.")
4. The leader continues this warm-up with each student answering a stated fact. The goal is to go all around the classroom or group without breaking the rhythmic pattern and by responding in the expected timely manner.

KEY STANDARD

Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (K.OA.A.1)

Tips *Initially set a slow pace to allow for greater success, and begin with easier facts.*

Making Connections

Promote reflection and make mathematical connections by asking:

- What could we do to ensure success for the entire class?

Just the Facts 1

Date: _____ **Name:** _____

STOP Don't start yet! Star two problems that may have odd answers.

1. 3 + 4 **2.** 6 + 3 **3.** 7 + 5 **4.** 8 + 8

5. _____ = 2 + 5 **6.** 6 + 1 = _____ **7.** 8 + 3 = _____

8. _____ = 4 + 9 **9.** 7 + 9 = _____ **10.** 6 + 8 = _____

Go On What numbers come next? 4, 8, 12, _____, _____

Just the Facts 2

Date: _____ **Name:** _____

STOP Don't start yet! Star the problem in Row 1 that may have the largest answer.

1. 2 + 5 **2.** 5 + 5 **3.** 8 + 4 **4.** 9 + 8

5. _____ = 6 + 2 **6.** 4 + 5 = _____ **7.** 7 + 4 = _____

8. _____ = 8 + 5 **9.** 8 + 8 = _____ **10.** 9 + 7 = _____

Go On Write three facts that equal 11.

Just the Facts 3

Date: _____ **Name:** _____

STOP Don't start yet! Star two problems that may have even answers.

1. 3 + 5 **2.** 7 + 3 **3.** 6 + 5 **4.** 7 + 8

5. _____ = 4 + 4 **6.** 7 + 2 = _____ **7.** 6 + 4 = _____

8. _____ = 9 + 3 **9.** 6 + 7 = _____ **10.** 9 + 9 = _____

Go On What numbers come next? 5, 10, 15, _____, _____

Just the Facts 4

Date: _____ **Name:** _____

STOP Don't start yet! Star two problems that may have answers less than 10.

1. 4 + 2 **2.** 2 + 8 **3.** 6 + 6 **4.** 8 + 6

5. _____ = 3 + 3 **6.** 2 + 7 = _____ **7.** 5 + 7 = _____

8. _____ = 9 + 4 **9.** 6 + 9 = _____ **10.** 8 + 7 = _____

Go On Write three facts that equal 12.

Just the Facts 5

Date: _____ **Name:** _____

STOP Don't start yet! Star the problem that may have the smallest answers.

1. 2 + 2 **2.** 3 + 6 **3.** 9 + 3 **4.** 5 + 9

5. _____ = 7 + 2 **6.** 1 + 8 = _____ **7.** 6 + 5 = _____

8. _____ = 5 + 8 **9.** 7 + 7 = _____ **10.** 8 + 9 = _____

Go On What numbers come next? 3, 6, 9, _____, _____

Just the Facts 6

Date: _____ **Name:** _____

STOP Don't start yet! Star two problem that may have answers greater than 12.

1. 5 + 1 **2.** 4 + 6 **3.** 9 + 2 **4.** 4 + 9

5. _____ = 3 + 4 **6.** 3 + 7 = _____ **7.** 7 + 5 = _____

8. _____ = 4 + 8 **9.** 9 + 8 = _____ **10.** 8 + 7 = _____

Go On Write three facts that equal 13: _____, _____, _____

Uncover

Topic: Addition facts

Object: Uncover the most numbers.

Groups: Pair players or 2 players

Materials for each group

- *Uncover* Gameboard, p. 10
- 2 number cubes (1–6)
- 24 transparent markers

KEY STANDARD

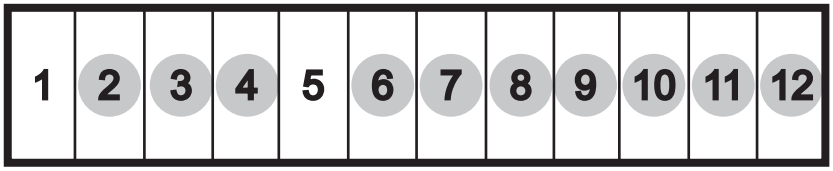
Fluently add and subtract within 20, using mental strategies. By the end of Grade 2, know from memory all sums of two one-digit numbers. **(2.OA.B.2)**

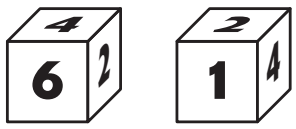
Directions

1. Using markers, pairs cover every numbered space along their number strips on the gameboard.
2. The first pair rolls the number cubes and adds the numbers on the cubes. The pair can uncover the sum or any combination of addends that equals the rolled sum.

   Example: If 2 and 4 are rolled, the pair can uncover 6 or any combination that makes 6 (1 + 5, 1 + 2 + 3, or 2 + 4).
3. Pairs alternate turns, rolling number cubes and uncovering sums or addends on their number strips.
4. When a pair is unable to use the covered numbers to make a sum or combination, the pair loses that turn. When both pairs are unable to uncover any more numbers, the game ends.
5. The pair who uncovers the most numbers wins.

Tip *When students seem ready, have them determine their scores by totaling the numerical values of the uncovered numbers. The pair with the lower score wins.*





Making Connections

Promote reflection and make mathematical connections by asking:

- Which sums did you prefer to roll? Why?
- What strategies helped you uncover more markers?

Uncover

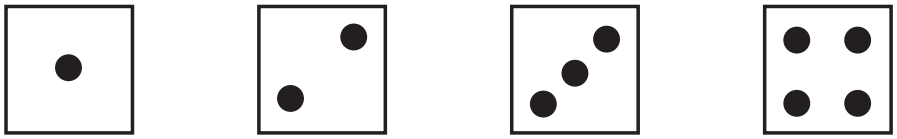
Gameboard

1
2
3
4
5
6
7
8
9
10
11
12

12
11
10
9
8
7
6
5
4
3
2
1

Seeking Sums Practice A

Date _____ **Name** _____



_____ _____ _____ _____

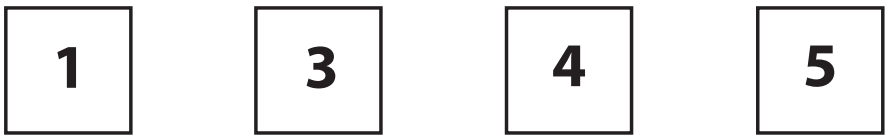
Look at the sums below. Which sums can be made with the dot cards above? If you find a way, write the addition fact. The first one is done for you.

Hint: Add 2, 3, or 4 of the dot cards. One sum is not possible.

3 = 1 + 2 6 = _____ 9 = _____

4 = _____ 7 = _____ 10 = _____

5 = _____ 8 = _____ 11 = _____



Look at the sums below. Which sums can be made with the Digit Cards above? If you find a way, write the addition fact. **Hint:** Add 2, 3, or 4 of the Digit Cards. One sum is not possible.

4 = _____ 9 = _____

6 = _____ 10 = _____

7 = _____ 11 = _____

8 = _____ 12 = _____

Seeking Sums Practice B

Date _____ **Name** _____

1	3	5	6

Which of the sums below can be made using the numbers above?
If you find a way, record your solution. (**Hint:** Only seven equations are possible.)

3 = _____ 6 = _____ 9 = _____

4 = _____ 7 = _____ 10 = _____

5 = _____ 8 = _____ 11 = _____

2	3	5	6

Which of the sums below can be made using the numbers above?
If you find a way, record your solution. Is it possible to make every equation?

5 = _____ 9 = _____

6 = _____ 10 = _____

7 = _____ 11 = _____

8 = _____ 12 = _____

Seeking Sums Practice C

Date _____ **Name** _____

1	3	6	7

Which of the sums below can be made with the numbers above? If you find a way, record your solution. One sum is not possible.

8 = _____ 11 = _____ 15 = _____

9 = _____ 13 = _____ 16 = _____

10 = _____ 14 = _____ 17 = _____

2	4	5	8

Which of the sums below can be made using the numbers above? If you find a way, record your solution. Is it possible to make every equation?

11 = _____ 15 = _____

12 = _____ 16 = _____

13 = _____ 17 = _____

14 = _____ 18 = _____

Seeking Sums Practice D

Date _____ **Name** _____

1	3	4	9

Look at the sums below. Which sums can be made with the numbers above? If you find a way, write the addition fact.

Hint: Add 2, 3, or 4 of the numbers. It is not possible to make every sum.

7 = _____ 12 = _____ 15 = _____

8 = _____ 13 = _____ 16 = _____

10 = _____ 14 = _____ 17 = _____

1	3	6	8

Look at the sums below. Which sums can be made with the numbers above? If you find a way, write the addition fact.

Hint: Add 2, 3, or 4 of the numbers. It is not possible to make every sum.

11 = _____ 15 = _____

12 = _____ 16 = _____

13 = _____ 17 = _____

14 = _____ 18 = _____