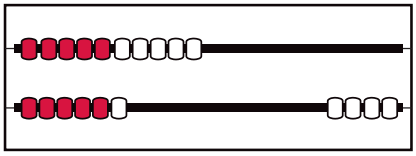
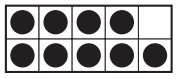
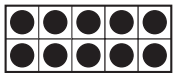
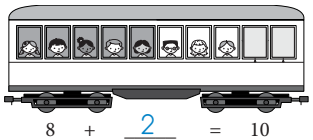
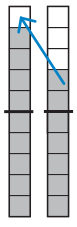
Bridges in Mathematics Grade 2

Unit 1: Figure the Facts

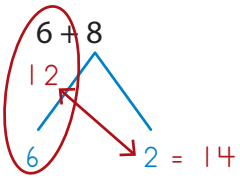
In this unit your child will:

- Practice efficient math strategies to add and subtract within 20
- Explore even and odd numbers
- Solve addition and subtraction story problems
- Count by 2s, 5s, and 10s to solve problems

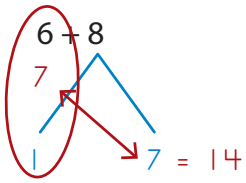
Your child will learn and practice these skills by solving problems like those shown below. Keep this sheet for reference when you're helping with homework.

PROBLEM	COMMENTS
Show 16 on the number rack.  *"I pushed over the 10 beads on the top row and used the 5 red and 1 white on the bottom row to make 16."*	The ***number rack*** is used to help students visualize number combinations and solve story problems within 20. This math tool is made up of 2 strings of 10 beads; each string is strategically broken into a group of 5 red beads and a group of 5 white beads. The colors encourage students to think in groups of 2, 5, and 10. Over time, students will construct a mental model for number combinations.
Solve the problems. 4 + 5  5 + 5  Ten-frames and the number rack are used to see Doubles facts and Doubles Plus and Minus One facts.	**Doubles facts** (such as 7 + 7) are those where a number is added to itself. Students will use doubles to solve larger combinations such as 70 + 70 or 700 + 700. **Doubles Plus or Minus One facts** (such as 6 + 7) may also be solved by thinking about doubles. For example, a combination like 6 + 7 can be thought of as 6 + 6 + 1.
How many children pulled down the shade to take a nap?  8 + 2 = 10 children awake / children napping / children on the train *"The train car looks like a row on the number rack! I know 8 and 2 more is 10. Two children are napping."*	**Make Ten facts** are pairs of numbers that equal 10. Being able to instantly recognize combinations that make 10—for example, 3 + 7 = 10—helps when adding 30 + 70 = 100 or 43 + 7 = 50. **Add Ten facts** (10 + 3, 7 + 10) apply when 10 is added to a single-digit number. This strategy helps students work flexibly with tens and ones. **Add Nine facts** are fast when you know how to make 10. If the fact is 9 + 7, as in the example, make 10 (9+1=10), then add 6 more. Students use this strategy to see that 9+7 is the same as 10+6.
 9 + 7 = 16 *"I took one from the 7 to make 10."*	***Ten-strips*** are another model to help students see number facts.

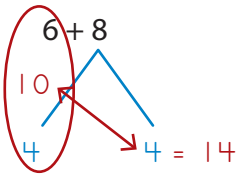
Leftover facts (7 + 4, 7 + 5, 8 + 4, 8 + 5, and 8 + 6) can be solved in a variety of ways:



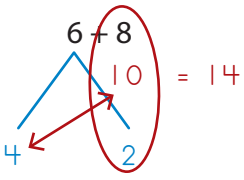
"I know that 6 + 6 is 12, so I took 6 from the 8 and that left 2. 6 + 6 is 12 and 2 more is 14."



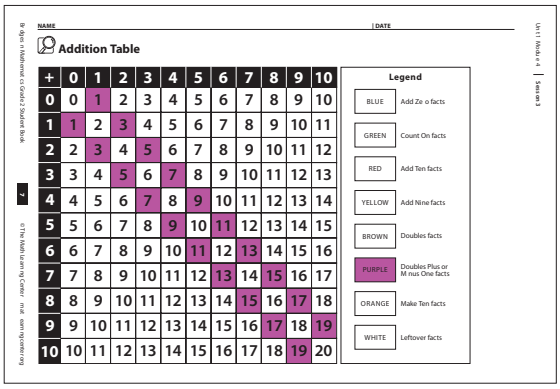
"I used doubles also, but I made 7 + 7 by taking 1 from the 8 and giving it to the 6. 6 + 1 is 7 and 8 – 1 is 7."



"I broke the 8 into 4 and 4, because I know that 6 and 4 make 10. Then I added the 4 to the 10 and got 14."



"You can make 10 another way by taking 2 from the 6 and adding it to the 8. Then you have 8 + 2 = 10, and 10 + 4 = 14."



NAME | DATE

Addition Table

+	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14
5	5	6	7	8	9	10	11	12	13	14	15
6	6	7	8	9	10	11	12	13	14	15	16
7	7	8	9	10	11	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

Legend

BLUE — Add Ze o facts
GREEN — Count On facts
RED — Add Ten facts
YELLOW — Add Nine facts
BROWN — Doubles facts
PURPLE — Doubles Plus or M nus One facts
ORANGE — Make Ten facts
WHITE — Leftover facts

The Addition Table shows all the facts from 0 + 0 to 10 + 10. Students color in the eight fact strategies they have discovered. They also explore patterns and relationships among these facts, to commit them to memory.

At left, the Doubles Plus or Minus One facts have been colored in.

"I added 2 + 2 + 2 + 2 = 8."

Counting patterns help students see relationships and structure among numbers, calculate fluently, and instantly recall number facts. Second graders use these patterns to skip-count and get ready to multiply. To solve the frog eyes problem shown, some students may double the eyes (2 + 2 + 2 + 2 = 8 or 4 x 2 =8) while others count the 4 groups of 2 eyes by 2s (2, 4, 6, 8).

FREQUENTLY ASKED QUESTIONS ABOUT UNIT 1

Q: Why do some of these activities look like what my child did in first grade?

A: This unit reviews mathematical concepts while introducing and establishing routines that will be used during second grade. This review helps teachers assess students' skill level and plan future lessons in the days and months to come. Time spent on learning expectations and procedures is essential to ensuring a cooperative community of learners where students work together to build mathematical concepts.

Q: Why are students spending time learning strategies? Why not just memorize addition and subtraction facts?

A: Second grade students are expected to use strategies to fluently add and subtract within 20. Bridges develops fluency with strategies to assure a solid understanding of addition and subtraction and provides multiple opportunities to practice basic facts. Visual models like the number rack allow your child to recall a visual picture of the quantity when needed. Students who recall facts from memory are, in many cases, performing calculations based on the strategies explained above. These strategies enhance number sense and carry over to working with larger numbers, so your child can work flexibly and accurately as a problem solver.

Q: How can I help my child and make homework a successful experience?

A: Homework assignments are sent home 2–3 times a week during the school year. Plan on your child spending 15–20 minutes on each. When an assignment is challenging, consider doing it in parts with a break in between. Even though your child is doing similar activities in class, she may need your help at home. Take time to ask her to explain the assignment to you. If your child can describe the task clearly and confidently, she can probably complete the assignment independently. Make yourself available, but assist only when necessary. Review the completed assignment. Ask your child to explain her thinking about some of the problems, give encouragement, and show interest in the work to build her confidence as a mathematician.