

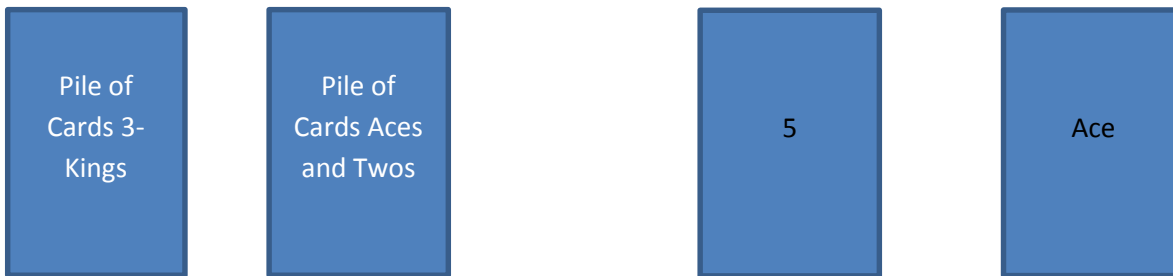
Reasoning Strategies for Addition Facts

More Than One and Two More Than

There are 36 addition facts on the chart that have at least one addend (number being added to another) of 1 or 2. Being able to *count on* is a necessary prerequisite to being able to apply this strategy.

Story problems in which one of the addends is a 1 or a 2 are easy to make up. For example, *Seven children were waiting for the slide. Then 2 more children got in line. How many children were waiting for the slide?* Some students will count on from 7. “Seven. Eight, Nine.” Others will say they knew that 2 more than 7 is 9. Some may still need to count 7 and 2 and then all. “One, two, three, four, five, six, seven, eight, nine.” This is less efficient. Helping students see the connection between **counting on** and **adding two** will help students move from counting strategies to reasoning strategies.

Activity: Grab a deck of cards. Remove the Aces and twos from the deck and place in a separate pile. Select a card from each pile. Students should say the complete fact: “Four and two more is six.” Jacks, Kings, and Queens can be wild cards and you can let your child pick their own number to add 1 or 2 to.



“5 and 1 more is 6.”

Adding Zero

Nineteen addition facts have zero as one of the addends (number being added to another). Though such problems are generally easy, some children think the sum (answer) has to be larger than the numbers being added. Word problems involving zero will be especially helpful. In the discussion, use drawings or actions to model one part being empty. When making equations with a zero make sure that sometimes the zero comes first and sometimes the zero comes second.

Seven students were waiting for the slide. No more students wanted to use the slide that day. How many students were waiting for the slide? 7 and 0 more is 7

There were no students waiting for the slide. Seven students rushed to get in the line for the slide. How many students were waiting for the slide? 0 and 7 more is 7

Make 10

Perhaps the most important strategy for students to know is the Make 10 strategy, or combinations that make 10. Story problems using two numbers that make 10 or that ask how many are needed to make 10 can assist this process.

I had four toy cars at my house. For my birthday my parents gave me 6 more cars. How many cars do I have now?

I have 10 toy cars. Some of those cars are red and some of the cars are yellow. How many could be red and how many could be yellow?

The **ten-frame** is a very useful tool for creating a visual image for students. Place counters in the ten frame and ask, “How many more to make 10?” This activity can be done over and over until students have mastered all the combinations to make 10. Later, display a blank ten-frame and say a number less than 10. Students start with that number and complete the “10 fact.” If you say, “four,” they say, “four plus six is ten.”

Knowing number combinations that make 10 not only helps with basic fact mastery but builds foundations for working on addition with higher numbers and understanding place-value concepts. Consider, for example, $28+7$. Using the Make 10 strategy, students can add 2 up to 30 and then 5 more (Van De Walle, 2013).

Ten –frames can be made at home by cutting two sections from one end of an egg carton. There should be 5 spots on the top row and 5 on the bottom. Any household items small enough to fit in the spaces can be used for the above activities. (candies, marshmallows, toys, legos, cereal squares)



Activity – Bowling for 10s – Another fun way for students to practice the Make 10 Strategy is by Bowling for 10s. After your child has rolled their bowling ball and knocked down pins, you count how many pins are left standing and say that number. The student needs to use the Make 10 strategy to tell you how many pins they knocked down.



Doubles

There are ten doubles facts from $0+0$ to $9+9$. Children often know doubles because of their rhythmic nature. These facts can be anchors for other facts. Story problems can focus on pairs of like addends (numbers being added to another). *Alex and Zach each found 7 seashells at the beach? How many did they find together?* Children just starting with the idea of doubling or if they are having difficulty memorizing these facts, may benefit from real world examples of doubles

Eyes - $1+1=2$

Egg Carton - $6+6=12$

Animal Legs - $2+2=4$

Two Weeks - $7+7=14$

6 pack of Pop - $3+3=6$

Crayons - $8+8=16$

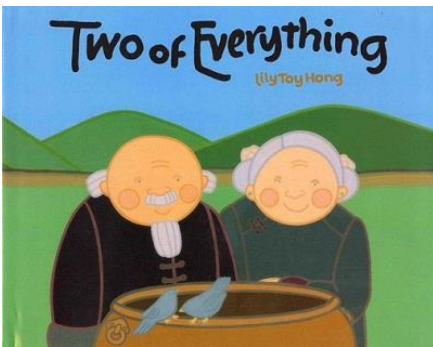
Spider legs - $4+4=8$

2 Tic-Tac-Toe boards - $9+9=18$

2 Hands - $5+5=10$

2 Hands and 2 Feet - $10+10=20$

Activity: A great literacy connection for doubling is *Two of Everything* by Lily Toy Hong. The story is a Chinese Folktale in which a couple find a magic pot that doubles everything that goes into it. Children love to imagine things they would want to place in a doubling pot. Using the idea of the double pot, students can practice their **double** facts. *"If I drop 5 dogs into my doubling pot, how many dogs will I pull out?"* $5+5=10$



Near Doubles

Near-doubles are also called “doubles-plus-one” or “doubles-minus-one” facts and include all combinations where one addend (the number being added to another) is one more or less than the other. This is a strategy that uses a known fact to solve an unknown fact. The strategy is to double the smaller number and add one or to double the larger and subtract 1. **Be sure children know the doubles before you focus on this strategy.**

Activity: Create a bingo board that illustrates the doubles. Prepare cards (on notecards or paper) with near doubles (4+5). Ask your child to find the fact that could help them solve the fact they have on the card and place it on that spot. Ask if there are other doubles that could help.

$6+6=$	$3+3=$	$4+4=$
$8+8=$	$1+1=$	$9+9=$
$2+2=$	$7+7=$	$5+5=$

$7+6=$

$5+4=$

$9+8=$

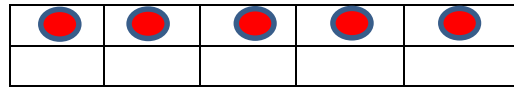
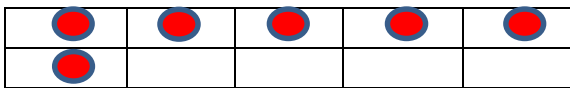
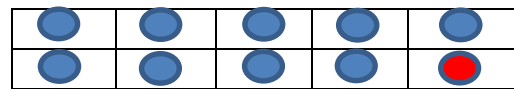
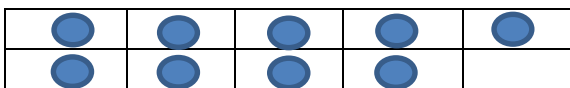
$7+8=$

$3+4=$

Up Over 10

Many facts have sums greater than 10, and all of those facts can be solved by using the **Up Over 10** strategy. That makes this the most useful strategy, especially considering that the “toughies” for students tend to be those sums over 10. Students use their **known** facts that equal 10 and then add the rest of the number onto 10. For example, students solving $6+8$ might start with the larger number and see that 8 is 2 away from 10; therefore, they take 2 from 6 to get 10 and then add on the remaining 4 to get 14. This process is also called **Break Apart to Make Ten**.

Activity – Move it, Move it – Give students two ten-frames (egg carton or drawn). Flash cards are placed next to the ten-frames, or a fact can be given orally. The students cover each frame with counters to represent the problem ($9+6$ would mean covering nine places on one frame and six on the other). Ask student to “move it” –to decide a way to move the counters so that they can find the total without counting. Get students to explain what they did and connect to the new equation. For example, $9+6$ many have become $10+5$ by moving one counter to the first ten-frame. Emphasize strategies that are working for that student (Make 10 and/or Up Over 10).



$$9+6=$$

“Move it, Move it”

$$10+5=15$$

Reinforcing Reasoning Strategies

The big idea of developing reasoning strategies is helping children move away from counting to becoming more efficient in recalling facts quickly and correctly. Also, it is very important to note that while the strategies above are explained individually, there is no one “best” strategy for any fact. For example, $7+8$ could be solved using Up Over 10 or near-doubles. The more you emphasize choice, the more students will be able to find strategies that work for them, and that will lead to their own fact fluency (Van De Walle, 2013). The activity below is good for helping children realize that if they don’t “just know” a fact, they can fall back on reasoning strategies to figure it out.

Activity: If You Didn’t Know

Pose the following task: If you did not know the answer to $8+5$ (or any fact that you want children to think about), how could you figure it out without counting? Encourage students to come up with more than one way (hopefully using the strategies suggested above).

Addition Facts by Strategy

+	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

Adding Zeros

One More Than and Two More Than

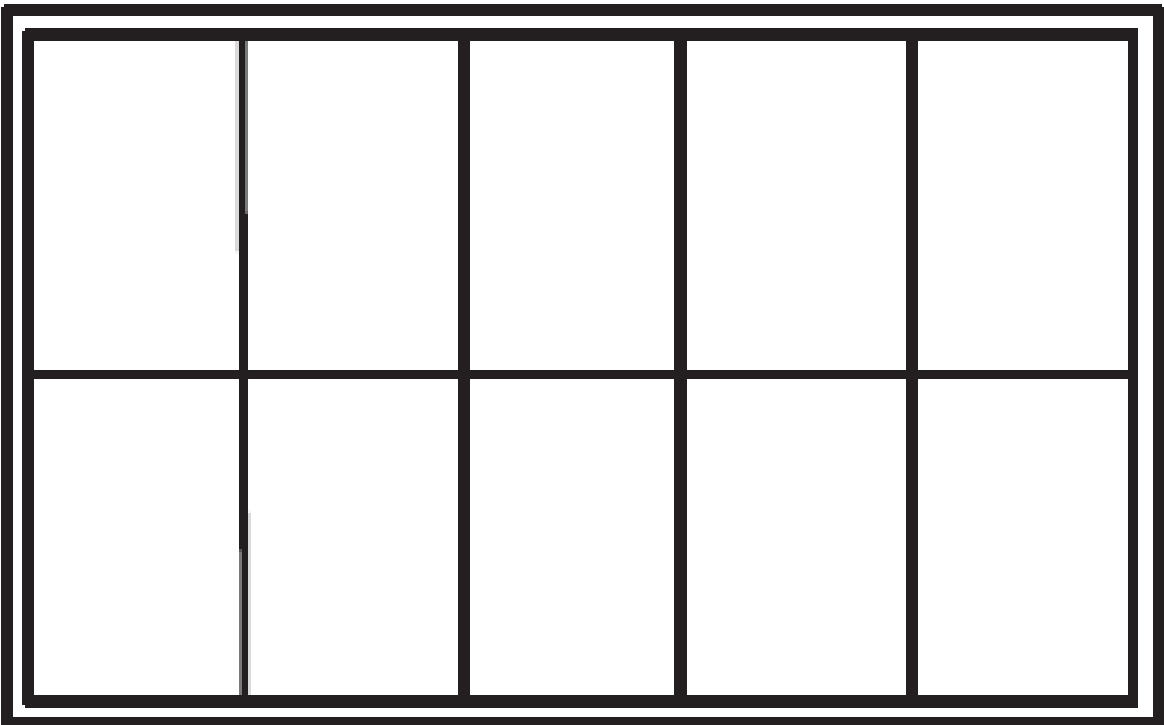
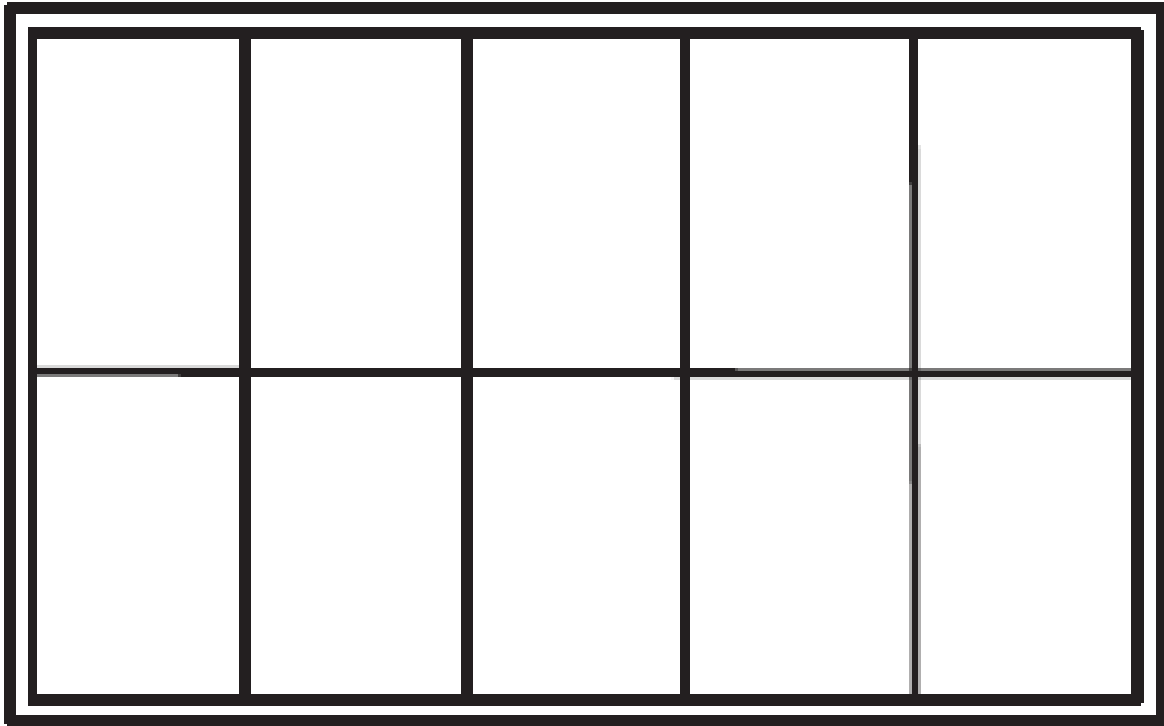
Doubles

Near Doubles

Make 10

Plus 10

Up and Over 10



Double ten-frame—11