Lesson 4: More Practice with Addition

Getting Started

Big Ideas

- How do we know when to add?
- What does it mean for numbers to be equal?
- How do we read and write in mathematical language?

Facts and Definitions

- **Commutative property of addition:** math law that states that the order of numbers does not matter when adding; also known as "turn-around facts"

Skills

- Use addition and subtraction within 20 to solve word problems
- Apply properties of operations as strategies to add and subtract
- Add and subtract within 20, demonstrating fluency with addition and subtraction within 10
- Determine if equations involving addition and subtraction are true or false
- Understand the meaning of the equal sign

Materials

- ✓ abacus (kit)
- ✓ crackers
- ✓ fine point dry-erase marker (kit)
- ✓ pennies, nickels, and dimes
- ✓ whiteboard (kit)
- ✓ apple slices
- ✓ deck of playing cards (kit)
- ✓ paper plates (kit)
- ✓ play dollar bills (kit)

Introduction

Explain that you and your child have 10 dollars between you. Count out ten play one dollar bills so that your child can see that there are 10. Ask: "If we both have the same amount of dollar bills, how many do we each have?" Allow your child to count out the bills as needed. She should find that you both have five dollars. Next, ask: "What if you have two more dollars than I have? How much would we each have then?" Again, allow her to count out the bills as needed until she finds that she would have six dollars and you would have four dollars. Now, ask: "How many dollars will you have if I have only one dollar?" (nine dollars).

Activities

Activity 1: Addition with Marbles

Give your child time to play the first two rounds of the Marble Math Addition game at the following web link. This game asks her to complete given number sentences by moving and counting marbles. The first two rounds go up to 10. When she's ready, she can play later rounds. The third and fourth rounds go up to 20, and the fifth round goes up to 25.

Marble Math Addition
www.movingbeyondthepage.com/link/5485/ Provide time for your child to play the first two rounds of Marble Math Addition, practicing adding to 10. When she's ready, she can play later rounds. The third and fourth rounds count up to 20 and the fifth round counts up to 25. NOTE: The games on this site are free to play on computers (PCs/Macs) but require a paid subscription to play on mobile devices.

Activity 2: Equal Amounts

Show your child one nickel and five pennies, and ask her how much money it is. As needed, remind her that a nickel is worth five cents and a penny is worth one cent. Show her how to begin with the nickel and count up from five to show that she has 10 cents. Touch the coins as you count.

Now, ask her if she'd rather have a nickel or four pennies. Again, remind her as needed about the value of a nickel and a penny. If needed, allow her to exchange the nickel for five pennies, and remind her that she can exchange these because a nickel is the same as five pennies. So would she rather have five pennies or four pennies? Tell her that it's important to know when amounts of things are equal and when they're not.

Using the abacus, ask your child to show the same number on the first two wires. For example, she might show eight on both wires by moving eight beads to the right on both of them. Now, ask her to show 10 on both wires, and remind her that there are many ways to make 10 on the abacus. Tell her to split each 10 into two groups, with those groups showing different numbers of beads. For example, she might show four and six making 10 and three and seven making 10. Model putting your finger between the groups of beads on each wire while you say the addition sentences that match her groups. For this example, you would say, "Four plus six equals ten and three plus seven equals ten." Point out that both wires are still equal because they're both still showing 10. Thus, 4+6 and 3+7 are equal.

Give your child the following addition sentences, and ask her to show that they are equal on the abacus: 3+2 and 1+4. She should move the beads to the right to model the sentences on the top two wires, and both wires should show five. Now, ask her if the following addition sentences are equal: 6+3 and 2+5. She should note that they are not equal because 6+3=9 and 2+5=7.

Give your child the "Are These Equal?" sheet, and allow her to use the abacus to identify when the addition sentences are equal and when they're not by coloring the pairs that are equal. She should color the following pairs on the sheet because they are equal:

3+5 and 4+4
1+3 and 2+2
3+3 and 5+1

Activity 3: Turn-Around Facts

This activity includes crackers and apples, but any dry foods that will fit on the plate will work. Ask your child to stand with her arms out to her sides and pretend that she is a balance. Place a small paper plate on each of her hands, and ask her to explain whether or not she's balanced. She should note that she's balanced because the plates are equal (one plate isn't bigger or doesn't weigh more than the other). Now, place five crackers on one of the plates. Ask: "Are you balanced now? Are the things on your hands equal?" (no, one hand has more on it)

Place four apple slices on the plate on her other hand, and ask your child whether or not she's balanced now. She should note that she's not because she doesn't have the same things or the same number of things on her plates. Ask: "How might

we make things equal on your plates without taking anything off of them?" Invite her to share possible solutions, but lead her to see that to make the plates equal you could add four apple slices to the plate of crackers and five crackers to the plate of apple slices. Thus, each plate would have the same items and the same numbers of items. Ask your child if it matters what you add to the plates first. She should note that it doesn't matter, but if needed, remove the items from the plates and add them back to the plates in different orders so that she sees that the end result is that the plates are equal no matter what's added first.

Using counters and small paper plates, tell your child that she's going to prove an important rule in math. First, tell her to show equal amounts on the plates using as many counters as she wants. She should place the same amount on each plate. Allow her to show other equal amounts using the counters.

Now, tell her that she's going to show 3+4 on one plate using two different colored counters. For example, she might place 3 red counters and 4 yellow counters on the plate. Ask her if she thinks 4+3 is the same as 3+4. Write 4+3 on the whiteboard next to 3+4, leaving a space between the two addition sentences. Now, ask her to show 4+3 on another plate by switching the colors of the counters. Using the example above, she should place 4 red counters and 3 yellow counters on another plate. Ask: "How many counters are on each plate?" and "What do you notice?" She should note that the two addition sentences, 3+4 and 4+3, are equal because they both equal 7. Write = between the two addition sentences on the whiteboard.

Ask your child to use the counters (two different colors) and plates to explore whether it's always true that the order of the numbers doesn't matter when we add two numbers together. Give her several minutes to work with different numbers and addition sentences, and observe to make sure that she's placing the counters on the plates correctly by placing the first number in each sentence on the plate first and by switching colors. If she's not able to come up with addition sentences on her own, give her the following ones to test:

1+7 and 7+1
5+4 and 4+5
3+6 and 6+3

Once she's had a chance to prove that the order of numbers doesn't matter when we add, tell her that we call these "turn-around facts," and ask her why she thinks that's a good name for these number sentences or math facts. Tell her that mathematicians call this the **commutative property of addition**. Say several addition number sentences and ask her to say the corresponding turn-around facts. For example, if you say "two plus five," she should say "five plus two."

Activity 4: Turn-Around Facts on the Abacus

Pose the following problem: "Ted has 5 cookies and gets 3 more. Shyan has 3 cookies and gets 5 more. Who has more cookies?" Whether she knows the answer or not, give your child the abacus, and ask her to use the top two wires on it to show the answer to the problem, letting one wire be for Ted and the other for Shyan. Let her work on her own, but if she needs a reminder, show her that she should move the beads from the left to the right and that she should move the first number of beads first. For example, to show how many cookies Ted has, she should move 5 beads first.

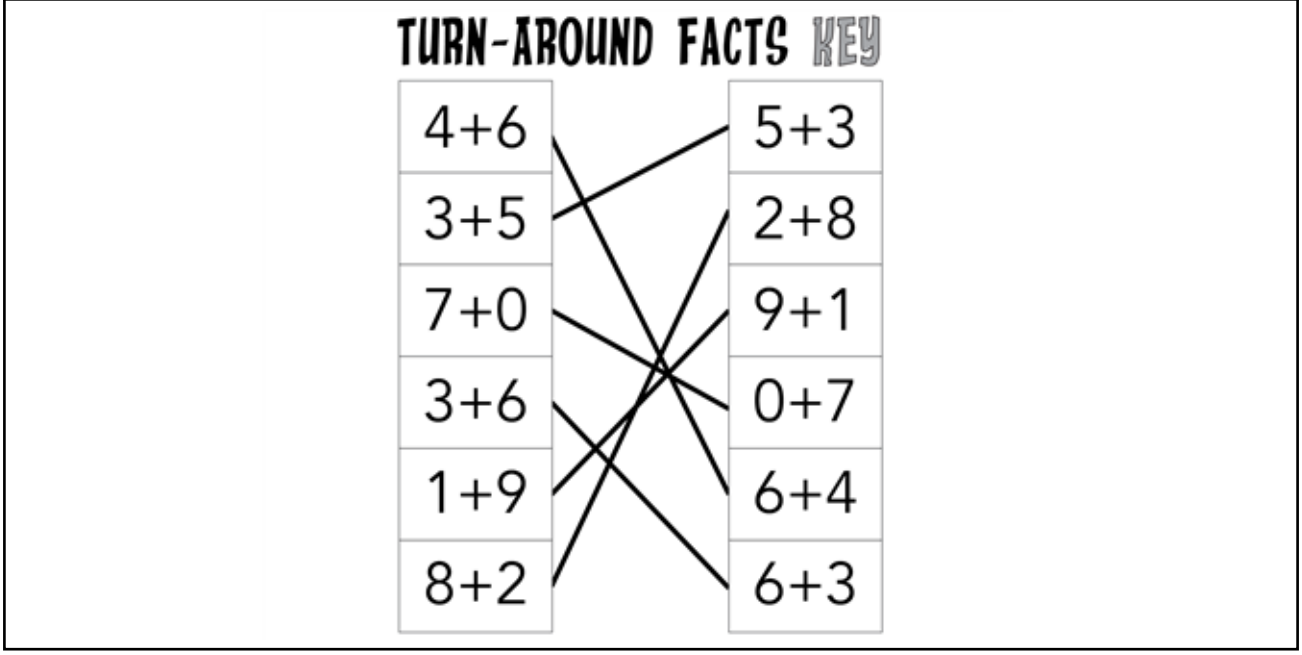
When she's finished, the abacus should show eight beads moved to the right on the top two wires, proving that Ted and Shyan have the same amount of cookies.

Pose another problem, and ask your child to use the abacus to show the answer: "Carter has 7 dollars and gets 3 more. Logan has 3 dollars and gets 7 more. Who has more dollars?" Again, encourage your child to work on her own as she's able. When she's finished moving and counting the beads, ask her to explain her answer. She should see that Carter and Logan both have 10 dollars.

Your child will complete the "Turn-Around Facts" sheet by drawing lines to match the turn-around facts with one another. Once she has connected the turn-around facts, she'll find the answers to the number sentences using the abacus. For

example, she should show 4+6 and 6+4 on the abacus. Ask: "What do you notice about each pair of turn-around facts?" She should note that they have the same answers.

"Turn-Around Facts" Answer Key



Wrapping Up

Play an addition card game (for 2-4 people). Ask your child to create a stack of numbers cards that includes only the numbers 0-5. There should be multiple copies of each number. The more cards, the longer the game. Shuffle the cards, and place the stack of cards face down in between the players. Each player takes two cards and adds the numbers on them together. The player with the highest resulting number wins all the cards in that round. In the case of a tie, the players each take two more cards and add them together, and the player with the highest resulting number wins all of the cards in that round. The game ends when there aren't enough cards to draw anymore. The winner is the player with the most cards.

This is a great game to play again later with higher numbers as your child is able.

Are These Equal?

Instructions: Color the boxes that show equal number sentences

3+5	4+4
2+6	5+2
1+3	2+2
3+3	5+1
4+2	3+5
7+1	5+2

Instructions: Draw lines to connect the pairs of turn-around facts.

4+6	5+3
3+5	2+8
7+0	9+1
3+6	0+7
1+9	6+4
8+2	6+3