LESSON 6

Objective

Explore the Commutative Property of Addition.

Common Core State Standards

- **1.OA.3** Apply properties of operations as strategies to add and subtract. *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)*

Commutative Property II

The Commutative Property of Addition states that addends added in any order will still have the same sum. For any two values, *a* and *b*, $a + b = b + a$. The Commutative Property of Addition is important for numeric values, but it also sets the stage for working with equations in algebra adeptly and flexibly.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Say:** *Look at your first pair of number sentences.* **Ask:** *How are the numbers being added in each number sentence similar? How are they different?*
- **Ask:** *What did you notice about the sum when you add numbers in a different order?* Elicit from children that the sum is the same regardless of the order of the numbers being added. Discuss as necessary.

Solve It

With children, reread the problem. Ask children to explain in writing the Commutative Property of Addition. Tell children to use this property to explain how Teams A and B got the same answer to the problems.

More Ideas

For other ways to teach about the Commutative Property of Addition—

- Have children create number sentences with three addends. Then have them use one size of Three Bear Family® Counters to model the number sentences and reorder the addends.
- Have pairs of children use a Bucket Balance and Color Tiles to create equalities in which the addends are on the left side of the balance and the sum is on the right side of the balance. For example, have children put 8 tiles on the right side. Have them add 5 tiles to the left side, then 3 tiles to make both sides even. Children should remove tiles from the left side, then add tiles in reverse order, first 3, then 5.

Formative Assessment

Have children try the following problem.

Which of the following means the same as 2 + 3 = 5?

A. 3 + 2 = 5 **B.** 5 – 2 = 3 **C.** 2 + 3 + 2 = 7 **D.** 3 – 2 = 5

Try It! 20 minutes | Groups of 3

Here is a problem about the Commutative Property of Addition.

Mr. Samuel divided his class into two teams to practice addition problems. He asked Team A to solve 7 + 2. He asked Team B to solve 2 + 7. What answers did the two teams get?

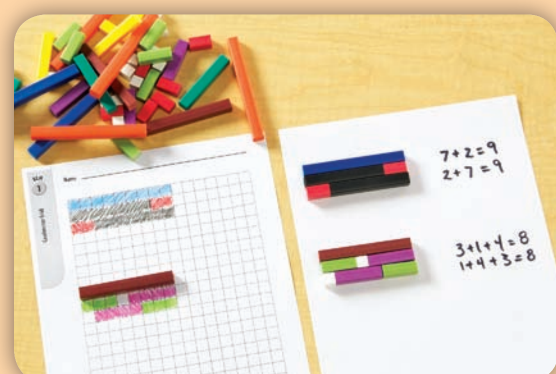
Introduce the problem. Then have children do the activity to solve the problem. Distribute Cuisenaire® Rods, Centimeter Grid (BLM 1), and paper to groups of children.

Materials

- Cuisenaire® Rods (half a set per group)
- Centimeter Grid (BLM 1; 1 per group)
- paper (1 sheet per group)
- crayons

1. Ask children to find the rod that is equal to 7. Children should use the white rods to measure, if necessary. Then have children find the rod equal to 2. **Say:** *Now find the rod that is equal to 7 plus 2.* Have children write an addition sentence to show their model.

2. Have children reverse the order of the black and red rods to show 2 + 7. **Say:** *Now build a train to show 2 + 7.* Have children write an addition sentence to show their model. Have children compare the answers of the two addition sentences.



3. Ask: *What if we added three numbers together? Does the order of the three numbers change the answer we get?* Have students model 3 + 1 + 4 with rods, then 1 + 4 + 3. They should reach the conclusion that the numbers can be added in any order.

⚠ Look Out!

Students may mistakenly think that they can use the Commutative Property of Addition to switch any two numbers in an addition problem. Reaffirm that only the addends can shift places without changing the problem. Demonstrate by showing students that only the numbers to the left of the equal sign may be switched. Also, some students may overgeneralize, thinking that the property can also be applied to subtraction. Demonstrate with rods that changing the number order in a subtraction problem will change the outcome.

Use Cuisenaire Rods to build the model. Write the two addition sentences the model shows.

(Check students' work.)

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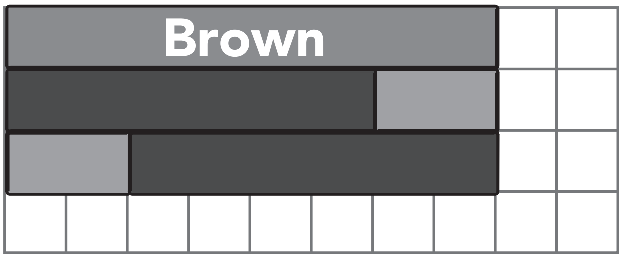
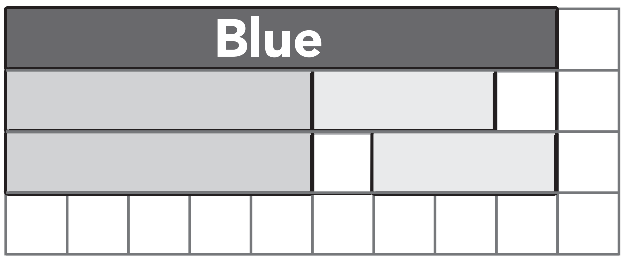


6 + 2 = 8

2 + 6 = 8

2.



5 + 3 + 1 = 9

5 + 1 + 3 = 9

Use Cuisenaire Rods to model the number sentence. Sketch a model that shows the numbers added differently. Write the addition sentence.

3. 3 + 2 = 5

2 + 3 = 5

4. 4 + 5 + 1 = 10

5 + 4 + 1 = 10 or 4 + 1 + 5 = 10

Write an addition sentence that shows the numbers added differently.

5. 8 + 3 = 11

3 + 8 = 11

6. 5 + 4 + 7 = 16

4 + 5 + 7 = 16 or 5 + 7 + 4 = 16

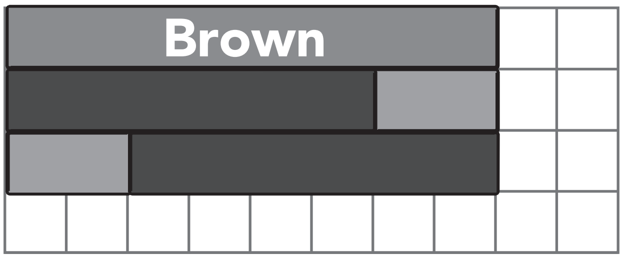
Answer Key

Challenge! Write a different sentence for Question 2 that changes the order of the added numbers. Sketch a model to help.

Challenge: (Sample) 1 + 5 + 3 = 9

Name ______________________________

Use Cuisenaire Rods to build the model. Write the two addition sentences the model shows.

1. 

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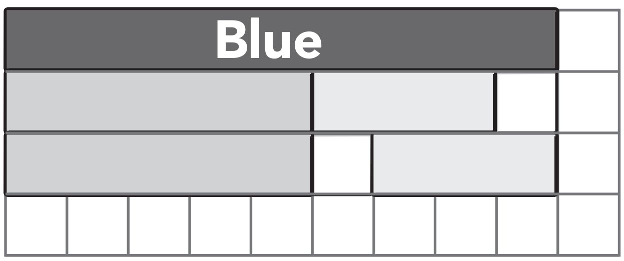
2. 

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Use Cuisenaire Rods to model the number sentence. Sketch a model that shows the numbers added differently. Write the addition sentence.

3. 3 + 2 = 5

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4. 4 + 5 + 1 = 10

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Write an addition sentence that shows the numbers added differently.

5. 8 + 3 = 11

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6. 5 + 4 + 7 = 16

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Name ________________________________

Challenge! Write a different sentence for Question 2 that changes the order of the added numbers. Sketch a model to help.

BLM 1

Centimeter Grid

Name ____________________