

Lesson: Math, Grades K-3
Topic: Addition



River Boat Taxi

Overview

Students will use boats and passengers to experience the commutative property of addition to complete open-ended sentences using numbers up to ten.

Learning Outcomes

Ohio Standard – Measurement Standard

Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools and technologies.

Ohio Outcomes

Solve open sentences by representing an expression in more than one way using the commutative property.

Materials

- Colored paper (for boats)
- Small objects for passengers
- Pencil
- Blue paper for a river

Vocabulary

- Addition
- Addend
- Sum

Lesson

Learning Activity

1. Each student or group of students should place one boat on the side of the paper that represents the river.
2. Place ten passengers in the boat. Ask students how many passengers are in the boat before it crosses the river (10).
3. Tell the students to cross the river with the boat. Now that the boat is on the other side of the river, ask how many passengers are in the boat (10).
4. Ask students to cross the river and bring the boat back to the original side of the river. Ask students how many passengers have traveled back to that side of the river (10).
5. Ask students to empty the boat and place a second boat on that starting side of the river.
6. In one boat, students should place 5 passengers and in the other boat place the 5 remaining passengers. Ask students how many total passengers are in the two boats (10).

7. Ask students to cross the river with one boat. Ask how many passengers crossed the river (5).
8. Now have students cross the river with the second boat. Ask how many total students crossed the river (10).
9. Repeat the process crossing back to the original side of the river.
10. Ask students to empty the boats and place both boats on that starting side of the river.
11. In one boat, students should place 7 passengers and in the other boat place the 3 remaining passengers. Ask students how many total passengers are in the two boats (10).
12. Ask students to cross the river with the boat that has 7 passengers. Ask how many passengers crossed the river (7).
13. Now have students cross the river with the boat that has 3 passengers. Ask how many **total** students crossed the river (10).
14. Repeat the process crossing back to the original side of the river. Make sure that when you return to the starting side of the river the boat with 3 passengers goes first.
15. Discuss the idea that there were 10 passengers before the river was crossed, after the river was crossed and when the boats returned to the starting side of the river. Emphasize the concept that the first trip across the river started with 7 passengers and was followed by 3 passengers and the return trip started with 3 and ended with 7. However, the end result was the same.

Extensions

- To reinforce the concept, use 2 boats and change the number of passengers in each boat (1,9 or 2,8 or 4,6)
- Use three boats and try the following number combinations: 1,2,7 1,3,6 1,4,5 2,3,5 2,4,4
2,5,3 2,6,2
- Find small toy boats and use real water
- Use total numbers other than 10
- Use the above activity but group the children into pretend boats and have the students actually move across the room (river)

Technology

Logical Journey of the Zoombinis is an educational software game that takes creatures called Zoombinis on a journey through a land where many puzzles must be solved before they may move on to the end of their journey. By the time the Zoombinis reach their destination the number in the small group of Zoombinis can often be different, but for the game to be over a certain number of Zoombinis must arrive at the final destination. Therefore, different numbers of Zoombinis in groups

will add up to the total number needed to end the game each time. Also, one of the puzzles in the game is arranging the Zoombinis on a raft so that they may cross a river.

Handouts

Students may benefit from writing number sentences that describe how the boats traveled across the river and recording the results. Depending on the ability level of the students, it may be possible to start them off with a blank sheet of paper. However, it may be necessary to create a data sheet that leads the students to use the numbers that you wish to use during the activity.

Evaluation

Students will be given a number and must create 2-3 pairs of number sentences using addition to show the commutative property of addition. Example: Students are given the number 12. A student response might include:

$$8 + 4 = 12 \text{ and } 4 + 8 = 12$$

$$5 + 7 = 12 \text{ and } 7 + 5 = 12$$

$$2 + 10 = 12 \text{ and } 10 + 2 = 12$$