

Building Numbers

Addition and Subtraction up to 10

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Grade Level	1st Grade	**Time Frame**	2-4 class period(s)
Subject	Mathematics	**Duration**	120 minutes

Essential Question

How are numbers composed and decomposed?

Summary

Students will solve addition problems up to 10 by creating true and false number sentences and using manipulatives. Students will understand how to use addition and subtraction to change number sentences and still arrive at their target number. Students will solve for a missing addend and demonstrate their knowledge of true and false number sentences.

Snapshot

Engage

Read or watch a video of the book "Animals on Board" to introduce composed numbers.

Explore

Students write true and false number number sentences for their target number.

Explain

Students draw explanations for all their true number sentences.

Extend

Students play the "Bears in the Cave" game to solve for a missing addend.

Evaluate

Students sort number sentence cards and show evidence of their reasoning.

Standards

Oklahoma Academic Standards for Mathematics (Grade 1)

1.N.2.3: Demonstrate fluency with basic addition facts and related subtraction facts up to 10.

Attachments

- Card-Sort-True-False-Mat.docx
- Card-Sort-True-False-Statements.docx
- Target-Number-Worksheet.docx

Materials

- 10 sticky notes
- “Animals on Board” book by Stuart J. Murphy, illustrated by R.W. Alley
- Jumbo wooden craft sticks (ten per student)
- Target number worksheet (attached)
- Counting bears manipulatives (ten for each partner group)
- Opaque plastic cups (one for each partner group)
- Butcher or copy paper for each partner group
- True and false cards for the card sort (attached)
- Card Sort true/false mat (attached)

Engage

Begin the lesson by adding the words "composed" and "decomposed" to the word wall. Explain that composed means put together, created, produced, or made whole as one piece.

Ask the students, “Can you think of something that is composed?"

Sample Answers

Examples of answers might include music, stories, recipes, and small parts added together to make a new set. Add that in math we also compose number sentences by putting numbers together to form true statements.

Read “Animals on Board,” written by Stuart J. Murphy, illustrated by R.W. Alley, or show students a video read-along of the book, found here.

Embedded video

https://www.youtube.com/watch?v=OxgTV9VAhV4

Tell the students, "Sometimes we do not have the things we want to count, so we use other items to help us. Today we will use sticky notes, because I do not have any animals with me."

Explore

Preparation

Give each student a bag of 10 jumbo craft sticks. Students will work at their desks to duplicate the work being done on the board.

Ask students to show the number seven using their craft sticks.

Have one student volunteer pull seven sticky notes and place them in a row on the board. Ask another student volunteer to show a different way to use the sticky notes to represent the number seven. If students aren't sure, prompt them by asking, “Could you separate these sticky notes into two groups and still have seven?” Then, have a student show seven sticky notes in two groups. Ask the class, “Do we still have seven sticky notes even though they are in two groups?”

Ask students if there are other ways to show seven. Students might group the stickies in sets of 6 and 1, 1 and 6, 2 and 5, 5 and 2, or others. Some students might even try to use more than two groups to come up with seven. Any combinations that add up to seven will work.

Responding To Students

Each time a student composes a group that equals seven, respond by saying, for example, “This is one way to make seven. A group of 3 combined with a group of 4 makes 7.” Write that group on the board to showcase the number sentence.

Pair students into partner groups. Tell students, “There are many ways to combine smaller numbers to make new whole numbers. In your partner groups, you will use craft sticks to discover new ways to make your target number.” Hand out a Target Number sheet to each student and assign a target number to each partner group. Use the numbers 5, 6, 8, and 9 as the target numbers for the partner groups.

Ask students to find number groups (addition problems) that equal the target number and number groups that do not equal the target number. For example, if the target number is 8, pose these number groups and ask the students to answer if they are true or false: "6+2=8", "8+1=8". Ask students, ”How do you know if a number sentence is true?” Practice some true/false number questions with students so they know how to check and validate an answer. Model checking numerals by using objects that can be counted and verified as true.

Developmental Consideration

Developmentally, true/false is a challenging concept for students. Discuss true and false with your students to be sure they are prepared for the questions above.

Students should work in pairs to write their answers on their individual Target Number worksheets.Challenge the students to write as many number sentences as they can under the True and False columns.

Explain

Students will work with their partners to create a small poster with all the true number sentences for their target number. Ask the groups to draw out their explanations using a graphic representation. Remind them of how they used craft sticks to represent numbers earlier. Now, encourage them to use another item of their choice to draw on their poster.

While working on sentences for their target numbers, some students might notice a pattern. When subtracting from one number group, they must add that number to the other number group to equal their target number.

For example: 3 + 3 = 6 and 2 + 4 = 6. Students might discover when comparing these sets of true number sentences that subtracting 1 from the first number and adding 1 to the second number will produce their target number. To demonstrate this idea, show how you can move a sticky note from one group of 3, making it 2, and add it to the other group of 3, making it 4. The total is still 6.

Extend

Working in pairs, students will now play “Bears In the Cave,” a math game. Each pair of students gets a total of ten counting bears. One partner looks away as the other partner hides some of the bears in the cave (an opaque cup). The partner that looked away looks back and has to figure out how many bears are in the cave by counting the remaining bears and knowing that there are 10 total bears. Play several rounds of the game with students each taking turns hiding the bears.

Differentiation

Pair up students who have mastered 1-10 and give them up to 20 bears. Or, have them write subtraction fact families for their Bears in the Cave problems.

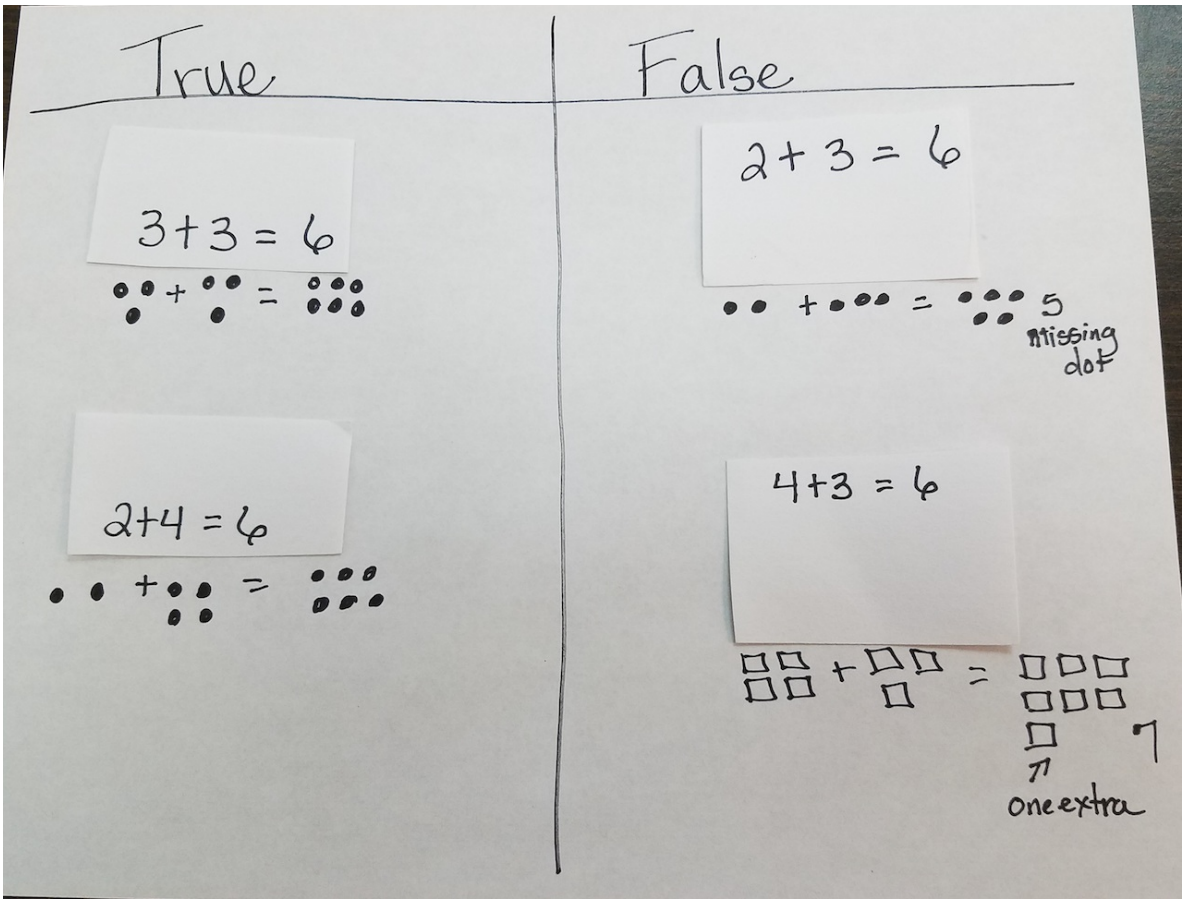
After a few rounds of the game, ask the students to think about their strategy for finding the missing number (the bears in the cave). Use the strategy below to guide the classroom conversation.

Examples: "2 + _ = 5" and "?? + _ = ?????"

Evaluate

Use a Card Sort activity to evaluate the students' learning. Pass out one Card Sort True/False Mat and four Card Sourt True/False Cards to each student.Ask students to sort the cards into true/false groups and then glue them on the paper, leaving some empty space below each card.

Have students draw a picture below their cards to show evidence for why they put the cards in the true or false group. See the image below for some example drawings.



True/False Card Sort Example

Resources

- Murphy, S. J. (2016). Animals on board. Vancouver: Provincial Resource Centre for the Visually Impaired.
- K20 Center. (n.d.). Card sort. Strategies. Retrieved from https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f506976b
- Toler, C.M. [Carrie M. Toler]. (2012, Nov. 17). Animals on Board. [Video file]. Retrieved from https://www.youtube.com/watch?v=OxgTV9VAhV4&feature=youtu.be