

Tools for Instruction

Number Pairs for Sums to 10

Objective Find different number pairs with the same sum for sums to 10.

Materials 20 connecting cubes (10 each of two colors)

Once students have counted and made sets of up to ten objects, they are ready to understand the connection between a set of objects and the symbols that represent it. Students are informally introduced to the “part-part-whole” relationship. They start by recognizing that the total number of objects in a set makes up the whole. Then they learn that the whole can be made up of two parts. Finally, students explore different combinations of two parts that can equal the whole. After stating each two-part relationship, students learn to record it in the form of a number sentence. Practice of this kind helps students to increase their numerical fluency, the basis for future mastery of all arithmetic operations.

Step by Step 10–15 minutes

1 Make a chain of same-color cubes.

- Choose a number between 2 and 10, inclusive. Provide the student with that number of connecting cubes of one color and the same number of a second color. For example, use six blue cubes and six green cubes.
- Have the student make a chain of same-color cubes of the first color. Then have the student tell how many cubes are in the set and how the set is composed. Guide the student to say that there are six blue cubes. Also encourage her to see that this is the same as six blue cubes and zero green cubes.

2 Trade one cube for a cube of a second color.

- Say: *Trade one cube for a cube of the other color.*
- When the student has completed her chain, ask: *How many cubes are in your chain? (6) What color are the cubes? (5 blue and 1 green)*

3 Trade a second cube for a cube of the second color.

- Have the student trade another cube of the original color for a cube of the second color.
- As in the previous step, ask her to tell how many cubes are in the set and how the set is composed. *(There are six cubes: four are blue and two are green.)*

4 Continue until all possible combinations of colors are obtained.

- Help the student continue through all possible combinations of both colors.
- Lead her to trade cubes to make additional sets of six cubes: three blue and three green, two blue and four green, one blue and five green, zero blue and six green.

5 Write all relevant addition facts for the color combinations.

- Help the student write all of the relevant addition facts. Since there are two colors, turn-around facts should be included in the list.
- Include facts with 0 depending on the student's level of instruction.

$6 + 0 = 6$

$5 + 1 = 6$

$4 + 2 = 6$

$3 + 3 = 6$

$3 + 3 = 6$

$2 + 4 = 6$

$1 + 5 = 6$

$0 + 6 = 6$

6 Repeat the activity with other values.

- Extend the activity by repeating with different numbers of cubes.
- For example, use eight cubes of each color. Have the student write the relevant addition facts. Guide her to see the pairs of addition facts, such as: $2 + 6 = 8$ and $6 + 2 = 8$.

Check for Understanding

Give the student a number from 2 to 10, inclusive. Provide space for the student to write all of the related addition facts, such as:

_____ + _____ = _____

_____ = _____ + _____

Depending on the ability of the student, have her write two (or more) ways to show the given number as the sum of two different parts. The student can also speak or write the addition in words, or make a drawing to show it.

For the student who struggles, use the chart below to help pinpoint where extra help may be needed.

If you observe...	the student may...	Then try...
the student struggles to write any facts using the given number	not understand how to decompose a number.	providing the student with a number of counters or connecting cubes equal to the given number. Have her remove one and count the number remaining, remove one more and count the number remaining, and so on. Help the student to write addition sentences using the whole (the given number) and the two parts (the number removed and the number remaining).
the student writes incorrect addition sentences using correct numbers	have correctly decomposed the given number but have swapped one of the parts with the whole.	encouraging the student to write the given number by itself on one side of the equal sign first, and then use the two groups as the numbers with the plus sign between them.