

ADDITION STRIP BOARD

Material

- The addition strip board
- Strips
- Booklet of prepared equations
- First control chart

Presentation 1 (Booklet)

1. Refer to the first page of the booklet, which has the 1 + table.
2. Read the first equation: $1 + 1 =$
3. Place the blue one-strip on the first row of the board. Place the red one-strip on the first row of the board to the right of the blue strip. Read $1 + 1 = 2$, pointing to the answer above the end of the red strip.
4. Record the sum on the line provided in the booklet.
5. Replace the red strip. The blue stays stationary for it indicates that the table is being worked on.
6. Read the second equation: $1 + 2 =$
7. Place the red two on the first row of the board to the right of the blue strip. Read $1 + 2 = 3$, pointing to the answer above the end of the red strip.
8. Record the sum on the line provided in the booklet.
9. Replace the red strip.
10. Proceed with the following equations until the page is complete.
11. Then continue through several more pages.

12. Refer to the Addition Control Chart 1 to check accuracy.
13. Continue through the booklet.

Aim

Direct

To acquaint the child with the basic addition sums.

Age

5 to 6 years.

NOTE:

This activity will not hold the attention of the elementary age child for long.

Presentation 2 (Prepared Equation Slips, First Control Chart, and Paper for Recording)

1. The child selects an equation and records it in his math notebook.
2. The blue strip is selected for the first addend and placed on the board.
The red strip is selected for the second addend. Their sum is noted and recorded on the paper.
3. The equation slip is placed to the side.
4. The child continues in this manner.
5. Upon completion, the child refers to the Addition Control Chart to check the accuracy of the sums.

Aim

Direct

To aid the child in the memorization of the addition facts.

Age

5 to 6 years.

Presentation 3 (Combinations of Numbers: First and Second

Control Charts and Paper for Recording Work)

1. Say, "Let's see how many ways we can make ten."
2. Select the blue one-strip and the red nine and place them on the board.
3. Record the equation formed: $1 + 9 = 10$.
4. The strips remain on the board.
5. Select the blue two and the red eight and place them on the board directly under the $1 + 9$.
6. Record the equation formed: $2 + 8 = 10$.
7. The strips remain on the board.
8. Proceed in this manner to $9 + 1 = 10$.
9. Note the pattern established with the increase of the blue strip and the decrease of the red strip. (The child may remember parallel work in the number rods.)
10. Indicate the $1 + 9 = 10$ and $9 + 1 = 10$ equations. Say, "One plus nine equals ten; nine plus one equals ten. The numerals one and nine may be added either way and still equal ten. Therefore, it is only necessary to remember $1 + 9 = 10$." Then turn over the $9 + 1$ strips at the bottom (Beroni) or replace the strips above the board (Nienhuis). Draw a line through the written equation $9 + 1 = 10$.
11. Continue with $2 + 9$ and $8 + 2$, $3 + 7$ and $7 + 3$, and $4 + 6$ and $6 + 4$.

12. At $5 + 5$ indicate that there is not another equation that duplicates $5 + 5$. Therefore, nothing may be deleted.
13. Note that by this process of elimination only five equations need be memorized, not the nine originally laid on the board.
14. Analyze Control Chart 1 with the same sums running diagonally from bottom to top, left to right. Indicate the diagonal for sums of ten.
15. Then proceed to eliminate the duplicate equations, beginning at the top left of the chart. $1 + 1 = 2$ may not be eliminated, for there is not duplicate.
16. Then analyze the sum 3. It is found in two equations: $2 + 1 = 3$ and $1 + 2 = 3$. Therefore, one of the equations may be eliminated. Place a blank, rectangular paper over $2 + 1 = 3$.
17. Continue to analyze the sums to eighteen, eliminating duplicate equations.
18. An interesting pattern emerges as the number of equations for a particular sum increases to a peak at ten and then decreases at the same rate of increase to only one equation to analyze at sum 18, as there was only one equation to analyze for the sum of 1. Following this same pattern is the number of duplicate equations to be analyzed.
19. At the end of the analysis of Control Chart 1, the child sees that nearly half the chart has been covered, reducing the total number of equations to be memorized from 81 to 45.
20. Compare Control Chart 1 and Control Chart 2; it is apparent that Chart 2 contains only the equations needed. Chart 2 has been arranged to have equal sums fall on the same horizontal line.

Aim

Direct

Development of order, concentration, coordination, independence and exactness.

To bring to the child's consciousness the commutative law of addition.

Age

5 to 6 years.

NOTE:

Sums dealing with 1 - 9 are explored here. Sums 10 - 18 follow the same procedure.

Presentation 4 (Combinations of Numbers with Zero)

1. Say, "Let's see what happens when we add 0."
2. Record the equation $0 + 9 = \underline{\quad}$.
3. Place the red nine strip on the board. Say, "Zero plus nine equals nine."
Record the answer.
4. Continue with the equations that have 0 as an addend. $0 + 6$, $0 + 5$, $0 + 4$, $0 + 3$, $0 + 2$, $0 + 1$, $0 + 0$.
5. What happens when we add zero?

Aim

Direct

To aid the child in the memorization of the addition facts.

Age

5 to 6 years.

Presentation 5 (Doubles of Numbers: Control Chart 2)

1. Say, "Let's add the same number twice."
2. Select the blue one-strip and the red one-strip and place them on the board.
3. Note that $1 + 1 = 2$.
4. Record the equation.
5. Replace the blue one-strip and the red one strip.
6. Proceed with the doubles: $2 + 2 =$, $3 + 3 =$, $4 + 4 =$, $5 + 5 =$, $6 + 6 =$, $7 + 7 =$, $8 + 8 =$, $9 + 9 =$.
7. Refer to Control Chart 2 to check for accuracy. Note that the doubles lie on a diagonal that extends from top to bottom, left to right.

Aim

Direct

Development of order, concentration, coordination, independence and exactness.

To aid the child in memorizing the addition facts.

To explore the addition of two equal addends.

Age

6 years.

ADDITION CHART 3

Material

- Addition Chart 3
- Prepared equation slips
- Paper and Pencil
- Control Chart 1

Presentation 1

1. Select a prepared equation slip.
2. Record the equation.
3. The sum is found by placing the right index finger on the blue numeral of one addend and the left index finger on the red numeral of the other addend. Bring one finger down the column and bring the other finger across the row. At the square where they meet is the sum.
4. Record the sum.
5. Continue in this manner.
6. Upon completion, refer to Control Chart 1 to check accuracy.

Aim

Direct

Development of order, concentration, coordination, independence and exactness.

To aid the child in the memorization of the addition facts.

Age

6 years.

Presentation 2

1. Indicate that the sum of the doubles are found in the diagonal squares running from top to bottom, left to right. It divides the chart in half. There are the same number of sums above the diagonal as below the diagonal and in the same position.
2. Then analyze the sums for duplicate equations. There is only one sum 2. The equation for it cannot be eliminated.
3. The sum 3 is found twice: $2 + 1$, and $1 + 2$. They are duplicates so one may be covered with a blank square over the sum 3.
4. Continue to analyze the sums to eighteen, eliminating duplicate equations.
5. Upon completion, compare Chart 3 with Chart 4. They are the same, with Chart 4 containing only the unduplicated sums. The child has created it and understands its rationale. (The blue addends at the top are missing on Chart 4.)
6. Ask the child how many sums remain on Chart 3 after duplicates have been eliminated (45).

Aim

Direct

To reduce the number of equations to be memorized.

Age

6 years.

NOTE:

Chart 3 is similar to Control Chart 1 in information and organization. However, Chart 3 is more abstract because it contains the sum in each square, not the whole equation.

The addends are formed with the fingers. This process of elimination requires a higher level of abstraction than on Control Chart 1 because the child must begin with the sum and find the addends by moving fingers up and over.

Charts 3, 4, and 5 are sometimes referred to as “finger charts” for obvious reasons.