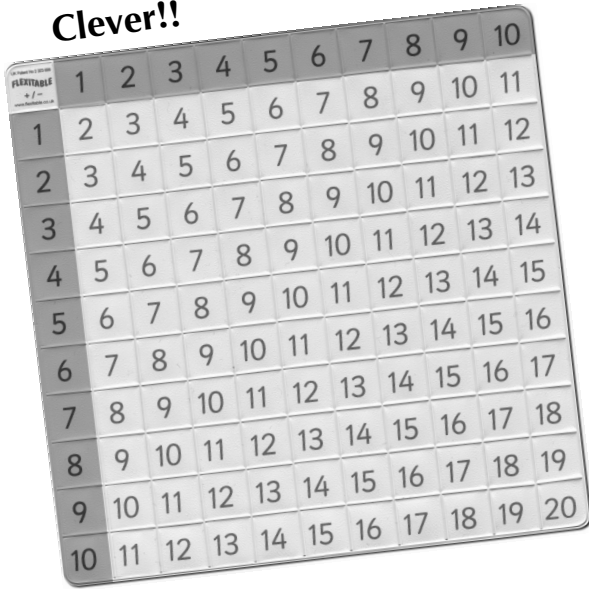


FLEXITABLE™

A Folding Addition Table

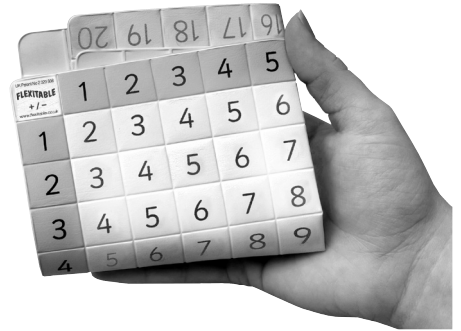
Clever!!



Introduction

Flexitable™ is an ingenious grid, 7-3/4" or 20cm square, has vertical and horizontal channels moulded into soft, pliable plastic. The material and design of this grid allow children to continually fold and unfold again and again to find the correct answers to their addition problems with sums to 20.

Flexible!!

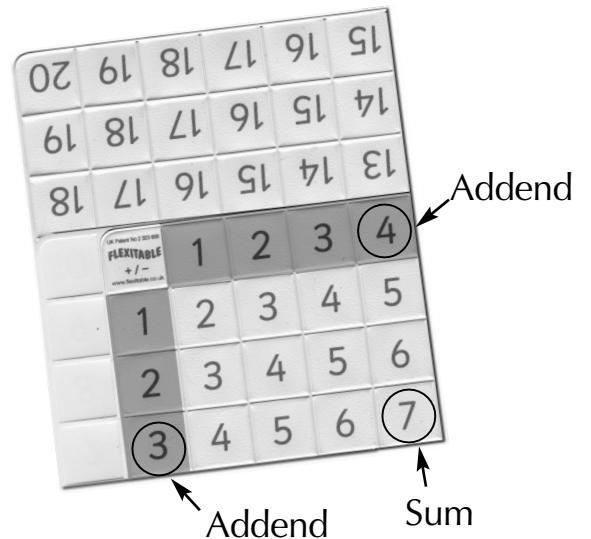


How to use?

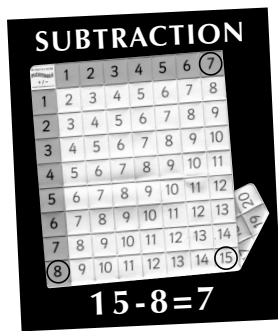
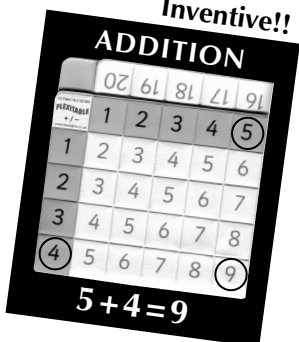
The numbers that run across the top of the grid are in orange as are the numbers that run down the far left-hand column.

These numbers act as the addends in addition. In subtraction, these orange numbers act as the subtrahends and differences.

1. Look along the top row and find the 4.
2. Fold the table from top to bottom, vertically, under the number 4.
3. Keep the table folded and look down the left-hand column until you find the number 3.
4. Fold the table up, horizontally, under this row.
5. In the right-hand corner, find the answer, 7!!



Inventive!!



Ingenious!!

Contents

1. Find the Sum/Difference
2. How many Addend Combinations?
3. Adding more than 2 Addends
4. Find the Difference
5. Find the Missing Subtrahend
6. Missing Addend
7. Find the Square Number
8. Skip Counting 2's
9. Number Patterns
10. The relationship between Multiplication and Addition
11. Further suggestions for Class Activities and Practice
12. Addend Roll

FLEXITABLE™

Phone: 0044-1604 648111 Web: www.flexitable.co.uk
 UK patent no. 2 323 698 US patent no. 5,997,305
 Made in England



More Activity Ideas Using Flexitable™:

1. Find the Sum/Difference

Materials: Flexitables and Addition Flash Cards/
Subtraction Flash Cards (optional)

Call out addition/subtraction problems or show flash cards and have students find the sum/difference. When a child has found the sum/difference have them hold their Flexitable up to prove their answer.

2. How Many Addend Combinations?

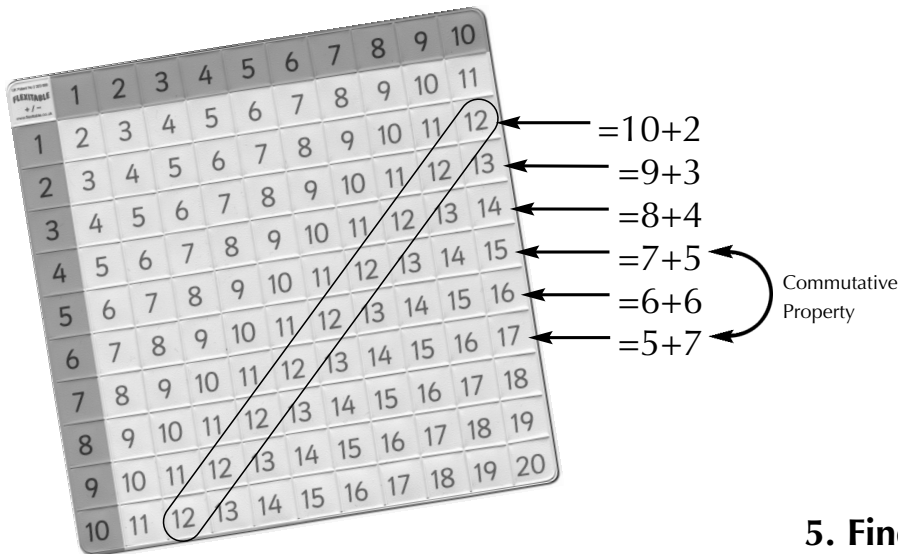
Call out a sum such as 12 and have the children find as many addend combinations for 12 as they can. Addend combinations for 12 are any two numbers that added together equal 12. Children will need to work backwards by finding the sum first and then identifying the addends. Make a list of all of the addend combinations the children find. Ask, "Do all sums have the same number of addend combinations?"

Hint: Note that the numeral 12 in the green area runs on a diagonal from the right hand side of the Table down to the lower left.

Example:

Some addend combinations are: 10+2, 9+3, 8+4, 7+5, 6+6, etc. When children reach the 6+6 addend

combination, the next child will provide the 5+7, 4+8, etc. Ask students if they note a pattern. This is called the **commutative property of addition**, the order in which two or more numbers are added will not change the answer (sum).



3. Adding More Than 2 Addends

$$7+5+3$$

Locate the orange 7 at the top of the Table, fold the Table vertically, find the orange 5 in the far left column and fold the Table horizontally. So far the answer is 12, now have students open their Tables along the horizontal line and count 3 more blocks, and they should arrive at the 15.

$$7+3+5= \quad 5+7+3= \quad 3+7+5= \quad 5+3+7= \text{ etc.}$$

Are all examples of the commutative property of addition.

The **associative property of addition** can also be demonstrated. When three or more numbers are added, changing the way in which they are grouped does not change the answer (sum).

$$=5+7+3$$

$$=(5+7) + 3 \quad \text{or} \quad =5 + (7+3)$$

$$= 12 + 3$$

$$= 5 + 10$$

$$= 15$$

$$= 15$$

4. Find the Difference

Call out a minuend and a subtrahend and have children determine the difference.

Example: The minuend is 9 and the subtrahend is 5, what is the difference?

The minuend is 14 and the subtrahend is 6, what is the difference?

(Shown in diagram below).

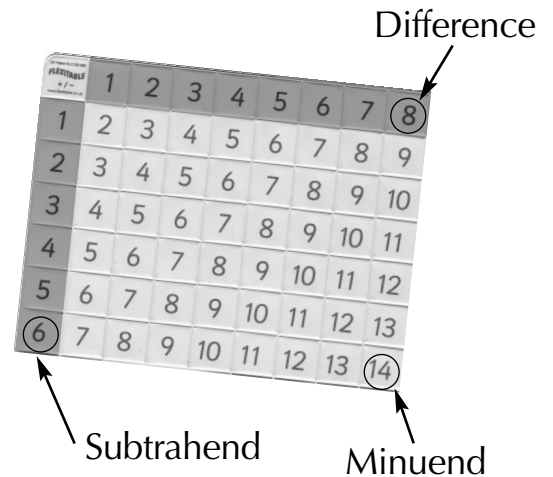
The minuend is 18 and the subtrahend is 10, what is the difference?

The minuend is 16 and the subtrahend is 7, what is the difference?

As you call out the problems, record the problem symbolically so that children connect the vocabulary to the symbolic representation.

Example: $9 - 5 = ?$ $18 - 10 = ?$

$14 - 6 = ?$ $16 - 7 = ?$



5. Find the Missing Subtrahend

Call out the minuend and the difference and have the children determine the subtrahend.

Example: The minuend is 10 and the difference is 6, what is the subtrahend?

The minuend is 9 and the difference is 2, what is the subtrahend?

As you call out the problems, record the problem symbolically so that children can connect the vocabulary to the symbolic representation.

Example: $10 - ? = 6$ $9 - ? = 2$

Note: Answers to addition problems (sums) will be found in the green section of the Flexitable.

Answers to subtraction problems (differences) will be found in the orange section of the Flexitable.

6. Missing Addend

Tell children that you are going to call out the one addend and the sum. Tell children to find the missing addend. Record the problem symbolically so that they connect the vocabulary to the symbols and the problem.

Example: One addend is 8, the sum is 16.
What is the missing addend?

$$8 + ? = 16$$

One addend is 7, the sum is 13.
What is the missing addend?

$$7 + ? = 13$$

One addend is 2, the sum is 12.
What is the missing addend?

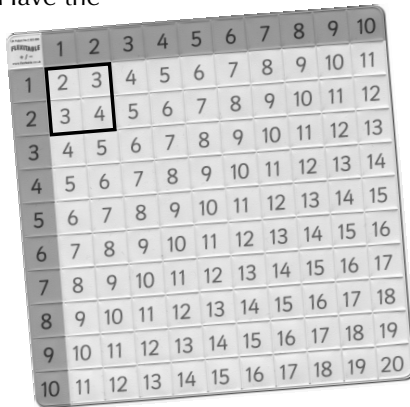
$$2 + ? = 12$$

7. Find the Square Number

Have the children explore square numbers by finding squares on the Flexitable. Show them the first square, 4. Elicit from the children that the square is made up of 4 squares on the Flexitable. Have the children record them.

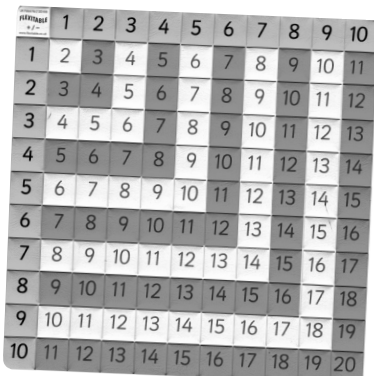
Children should then explore the Table to find other squares. They can experiment by folding the Flexitable. They need to make sure that the squares they find line up to the horizontal and vertical orange columns.

The other squares on the Flexitable are 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20.



1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18
10	11	12	13	14	15	16	17	18	19

Then have the children find the addends for the squares. Ask them what they notice about the placement of the squares on the Flexitable. (They are on a diagonal). Ask them what they notice about the addends of the squares. (They are all doubles.) Congratulate them on discovering the square numbers

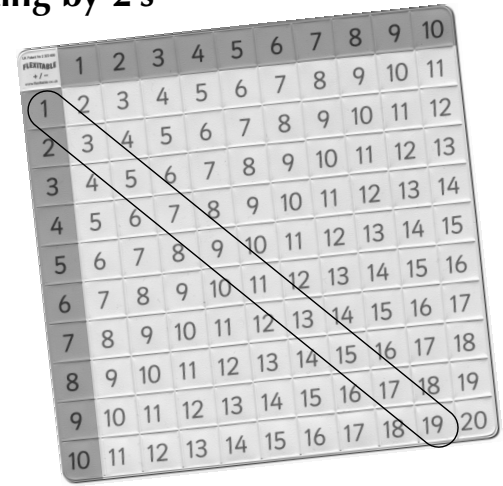


1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18
10	11	12	13	14	15	16	17	18	19

8. Skip Counting by 2's

The diagram in Activity 7 also pictures skip counting by 2's (even numbers).

Have children skip count by 2's, but now with odd numbers - 1, 3, 5, 7, 9, 11, 13, 15, 17, and 19.



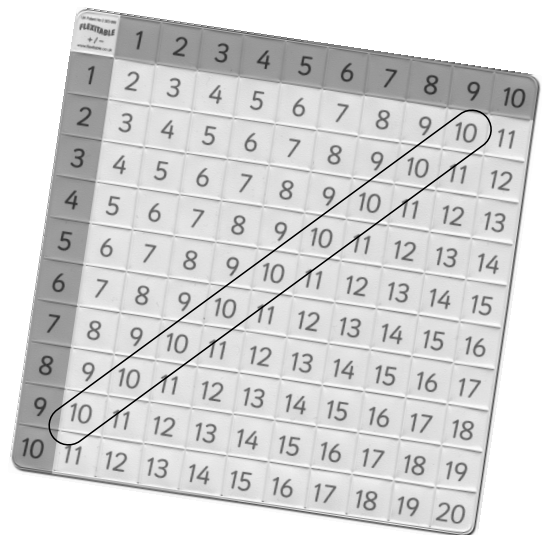
1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18
10	11	12	13	14	15	16	17	18	19

9. Number Patterns

Have children find and record all the patterns that they can find on the Flexitable. Encourage them to be creative as they look for patterns.

Example: The same number runs from one corner of the Flexitable to the opposite corner of the table on the diagonal.

Children can readily see all of addend combinations for the sum of 10. Starting in the lower left corner $1 + 9 = 10$, $2 + 8 = 10$, $3 + 7 = 10$, $4 + 6 = 10$, $5 + 5 = 10$, $6 + 4 = 10$, $7 + 3 = 10$, etc.



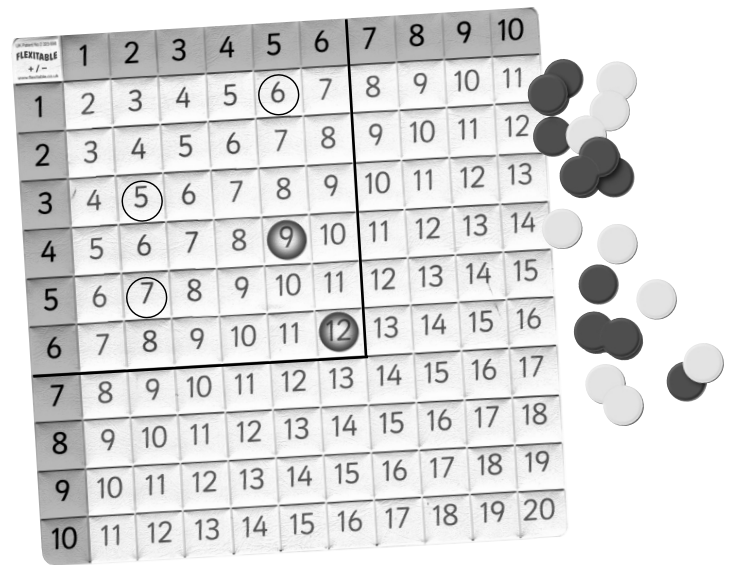
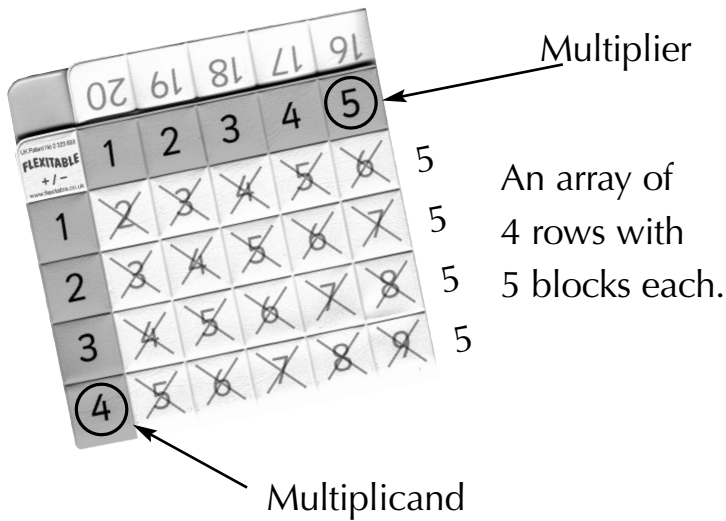
1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18
10	11	12	13	14	15	16	17	18	19

10. The Relationship Between Multiplication and Addition

Multiplication is nothing more than repeated or continuous addition. This fact is easily demonstrated on the Addition Flexitable. Children need to understand that if they are doing multiplication on the Addition Flexitable they find their multiplier and multiplicand using the orange numbers - example, 5×4 , they should fold their table vertically under the five. Keep the table folded and look down the left-hand column until they find the number 4.

Fold the table up, horizontally, under this row.

The number 9 appears in the lower right-hand corner, obviously this is not the answer to 5×4 ; however, children are ready to calculate or count out the answer. Children will realize that they have an array of 4 rows of 5 green blocks; $5 + 5 + 5 + 5$ or 1, 2, 3, 4, 5, 6, . . . 19, 20; if they prefer to count the total number of blocks.



Player one rolls the dice and a 2 and a 3 come up. Player one moves across the top orange row to the 2 and goes to the 3 in the orange left-hand column and marks the correct answer in the green area - 5, with their colour marker. Player 2 then takes their turn and will mark the answer to their addition combination with their colour marker.



11. Further Suggestions for Class Activities and Practice

Materials: Flexitables, write-on/wipe-off crayon or pen and clear plastic sheet.

Have children place a clear plastic sheet over their Flexitable and by using a write-on/wipe-off crayon or some type of non-permanent marker, children can trace patterns, mark answers, etc.



12. Addend Roll

Materials: Addition Flexitable, 2 dice and markers (centimeter cubes or discs 2 colours only)

Working with classic dot or numeral cubes to six, have children tell you that the largest addend combination will be $6 + 6$. Point out, above right, that this is the area in which they will be working and need to fill.

In the beginning, play will move back and forth regularly. As squares fill, however, a player's combination may have already been covered. Encourage children to recall the commutative property of addition. If $2 + 3$ has been covered, they should reverse the numbers and see if $3 + 2$ is covered. If it has not been covered, the player should cover the answer. If that combination has been covered, then the player will lose a turn. When all of the blocks have been covered, the player with the most counters is the winner.

If children need to still fold their Flexitables to get the correct answer, always have extras available to keep the game moving. A timer can be added to promote quick recall of facts. Set the timer and see how many squares can be filled within 5 minutes, 3 minutes, etc.

Keep decreasing the allotted time for each game. Player with the most markers on the Table in the allotted time is the winner even if the playing area is not fully covered.



Note: Two octahedron dice, 8 sides, will permit play to $8 + 8$; and decahedron dice, 10 sides, may permit play on the entire board if it uses numerals 1 to 10, some use 0 to 9.

FLEXITABLE™

Licensed from WCLM
© World Class Learning Materials
and Flexitable 2003

DISTRIBUTED BY

Power of 2 Publishing Ltd

26 Devonshire Avenue, Nottingham, NG9 1BS

Phone/Fax: 0115 919 3911

Email: info@powerof2.co.uk Web: www.powerof2.co.uk