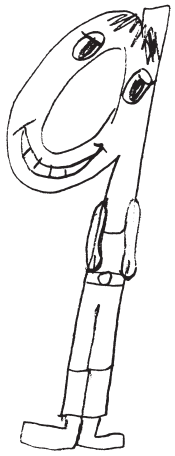


Chapter Nine

The 9-times table

Show the 9-times table on the chart.

	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

There are many ways to work with the number 9 and the 9-times table. Choose the one that makes the most sense to you; then you can expand your understanding with the others.

Visual

Use the paper strips from the back of the book. You'll need 1s, 10s and 9s for this, because 9 is 1 less than 10.

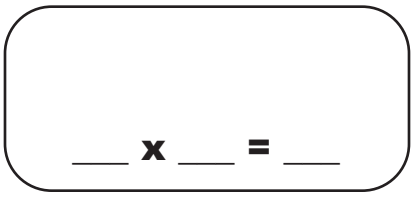
Put down 1 of the 10 strips (they look like this):

What is the equation for this? (How many times did you put down a strip?)

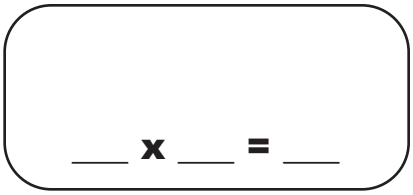
___ x ___ = ___

Under the 10 strip, put a 9 strip and a 1 strip.

What would the equation be for putting down the 9 strip?



The 1 strip?



The math symbol for putting down one thing and then another thing is +. So, 10 is 9 + 1 can also be written as:

10 x 1 = (9 x 1) + (1 x 1)

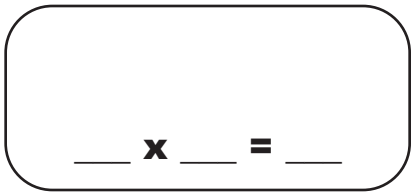
You could also say this about the 9: 9 is 10 minus 1

9 = 10 - 1

9 x 1 = (10 x 1) - (1 x 1)

Now, let's find out what 9 x 2 is by making the line of strips longer.

Add a second 10 strip to the first one. How would you write that as an equation?



Add a second 9 strip to the 9 line, and another 1 strip to make it even with the 10s.

You can see that 2 x 9 is going to be 2 pieces less than 2 x 10, or 18.

You can move the pieces around — because of the commutative property, it's the same amount — and see that your 9 x 2 line is 2 less than the 10 x 2 line.

Now, make the line longer to see how to figure out 9 x 3.

These are a bit harder — spend some more time practicing them.

Mental math trick!

To add 10 to a big number, keep the number in the 1s place the same and add 1 to the number in the 10s place. Here are some examples:

54 + 10 = 64 328 + 10 = 338

4,924 + 10 = 4934

Try these in your head:

18 + 10 63 +10 29 + 10

Now, try these:

9 + 10 2 + 10 125 + 10 99 + 10 296 + 10

When this gets easy, try this:

To add 9 to anything, add 10 and "back up" 1:

49 + 9 is . . . hmmm . . . 49 plus 10 equals 59 . . . back up 1 . . . 58.

So: 49 + 9 = 58

Try these in your head.

9 + 9 18 + 9 27 +9 45 +9 63+9

There are two ways to figure this out faster. Do the 10-times table for your number, then take your number away from that (either count backwards that many times, or subtract it).

For example, to figure out what 6 x 9 equals, multiply 6 x 10:

6 x 10 = _____

Subtract 6:

6 x 10 = _____ - 6 = _____

You also can use this piece of trivia: *If you add up the digits for a number in the 9-times table, the answer will always be 9.* Here are the 9-times tables numbers, and how this mental math trick works!

18: 1 + 8 is 9

27: 2 + 7 is 9

36: 3 + 6 is 9

Now, you do it:

45: __ + __ is 9

54: __ + __ is 9

63: __ + __ is 9

72: __ + __ is 9

81: __ + __ is 9

90: __ + __ is 9

Here's another way to get a 9-times answer, step by step:

7 x 9

1. "Back up" 1 from 7. That's 6.
2. Subtract 6 from 9. That's 3.
3. Put the two numbers together in order. That's 63.

Check your work:

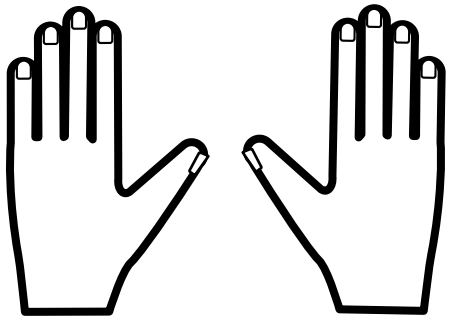
7 x 9 = 63

6 + 3 = 9

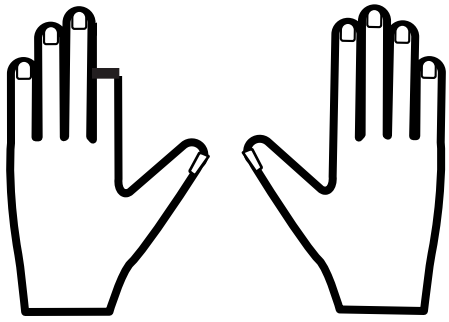
Still another way to get the answers to the 9s uses your hands — it's called the finger method, and it turns your thumbs into fingers! Here's how it works:

4 x 9 = ___

Place all 10 fingers (remember, your thumbs count as fingers) on a table edge.

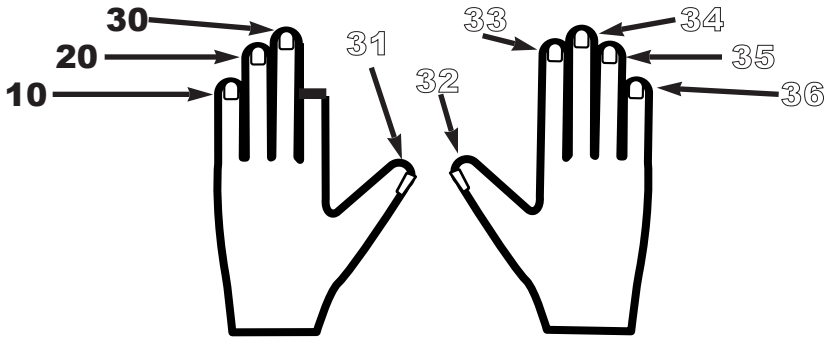


Tuck the fourth finger No. 4) under the table.



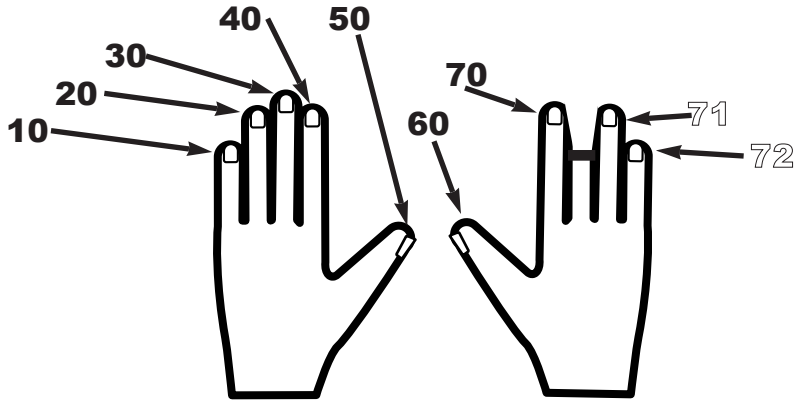
To the left of this tucked-away finger are 3 fingers, and to the right of it are 6 fingers (including your two thumbs).

Starting from the left, count up by 10s until you reach the finger you tucked under, then take that number and count to the right by 1s:



4 x 9 = 36

Here's another example of using your fingers to compute a 9-times equation.



8 x 9 = 72

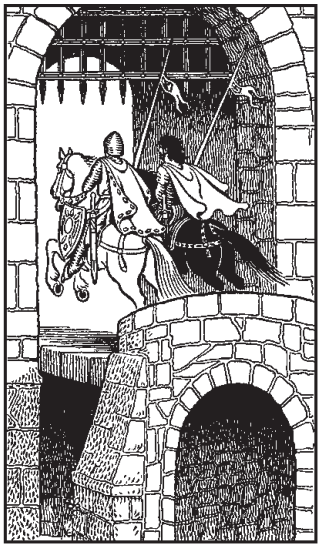
What you want to be able to do is "see" 5 fingers if they're there, so if you're computing 8 x 9, you count by 10s to 8.

And remember that a whole hand is 50!

You've been shown several ways to compute equations in the 9-times table. The important thing to do now is this:

Pick the way to do the 9-times table that works for *you*.

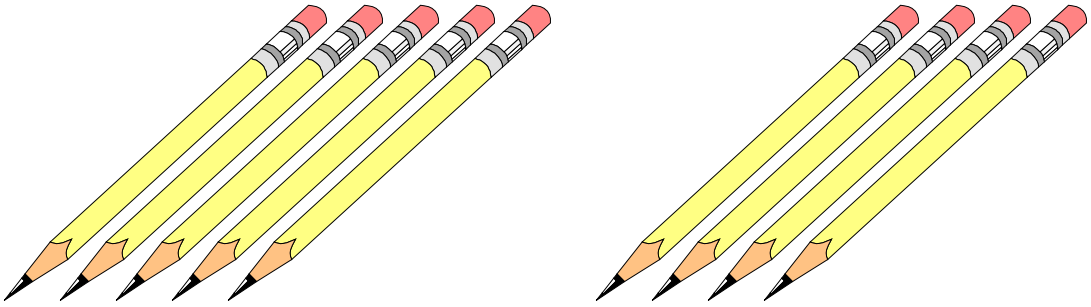
GATEWAY TO ALGEBRA



Math features something called the *distributive property*.

The "distributive" might remind you of the words "distribution" or "distributing."

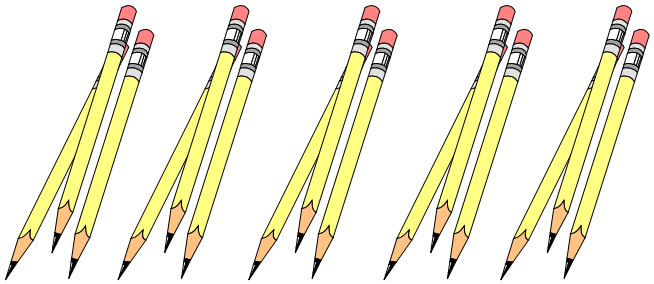
When you talk about distributing things, you're using one word to say "spread them out" into groups. For example, you can distribute 9 pencils into two groups, one with 5 pencils and the other with 4 pencils:



In the language of math, this concept is written as:

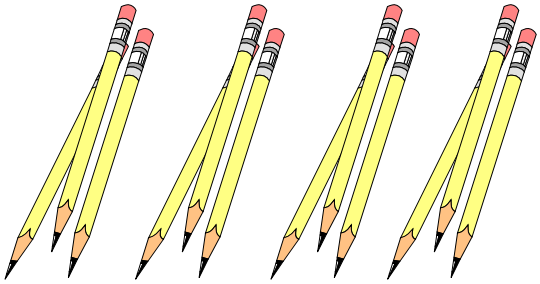
5 + 4 = 9

You could also distribute 9 groups of pencils the same way:



Here are 5 groups of 3 . . .

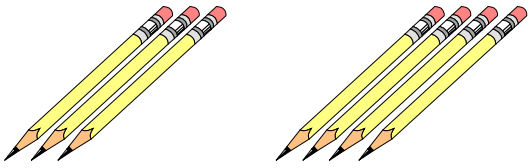
. . . and here are 4 groups of 3.



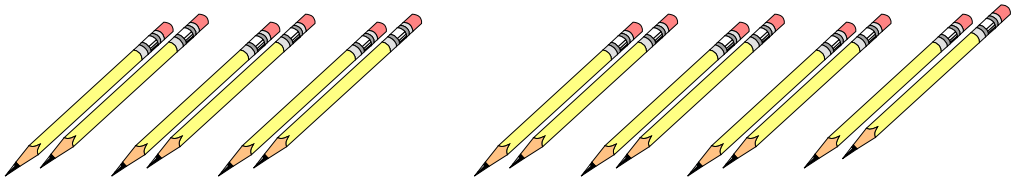
In the language of math, this is:

(5 x 3) + (4 x 3) = 9 x 3

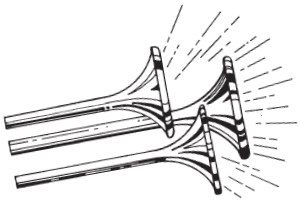
Now, let's take a different number of pencils and group them a new way. You write the equation they represent:



___ + ___ = ____



(__ x __) + (__ x __) = __ x __



Show what you know!

If you can explain what the *distributive property* is, then you'd know something that 9 out of 10 eighth graders in a survey (and the editor of this workbook) did not know.

Here's your chance to show that you know something many pupils in middle school don't know. Describe or draw the *distributive property* in the space below: