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Let's Learn Times Tables!

By Rachel DeMille

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You can't believe how quick and easy this is.

The first thing to note is that multiplication is just repeated addition. For example: "three times five" means adding three fives, like this: 5 + 5 + 5 = 15. It's easy to write the same thing using multiplication: 3 x 5 = 15.

So let's begin. First of all, we'll let's start with the basic graphic of the fact families 1 – 12:

X	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	88	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

I think it's likely that you already know some of these. Like 0's and 1's: duh, right? Do you know 2's, 10's and most of the 11's as well? We'll highlight those probable ones right now.

X	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	88	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

That's more than halfway there! But I think you know even more. Continue with me…

Do you know how to tell time? How many minutes have passed when the big hand goes from the top to the number 2? Ten, right? How many minutes are represented when the big hand is on the 9? Did you say 45? If you did, you know your 5 Times Tables. Get it? The number on the clock is equal to that number times five. There's another way to do 5's that works better for some people. To multiply a number by 5, just cut it in half and add a zero (multiply by 10). Let's use 5 x 6 for an example. Half of 6 is 3, and if we add a zero to it we get 30. 5 x 6 = 30. How simple is that? Are you done learning 5's ? I'm going to highlight those as well.

X	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	88	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

That's looking even better, isn't it? Now let's work a little magic. There's a thing with multiplication called, "The Commutative Property of Multiplication". It means that the numbers can "commute" or "travel" from one place to the other, and the answer stays just the same. It looks like this: 3 x 5 = 15 ***and*** 5 x 3 = 15. It doesn't matter which order you put the numbers when you multiply. The answer stays the same.

How does that help us here? Well, on our graphic there are quite a few remaining facts that are duplicated, if you take into account the Commutative Property of Multiplication. I'll highlight half of those in blue; let's see what we have left:

X	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	88	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

We started with a graphic of 169 multiplication facts. Turns out you only need to learn 31. And you're going to laugh at the simplicity of some of them. So let's get back to work…

Let's tackle the 3's now.

3's You know the following because they're simple and you work with them often:
3 x 3 = 9 and 4 x 3 = 12;

You know that the 3 on the clock represents 15 minutes, so 5 x 3 = 15.

If you memorize 3 x 8 = 24, you are pretty much done with 3's. How?

You know 1-5 x 3. Count up from 5 x 3 = 15 to get 6 x 3 = 18. Now you know 6 x 3.

Count down from your memorized fact 8 x 3 = 24 to get 7 x 3 = 21.

You know that 10 x 3 = 30; count down to get 9 x 3 = 27.

You know that 11 x 3 = 33; count up to get 12 x 3 = 36.

TA-DAH!!

Here's a little memory helper:
Song (to the tune of "Ten Little Indians", while indicating multiples with your fingers):

3, 6, 9, 12, 15, 18;
21, 24, 27, 30;
33, 36, Three Times Tables
Are so very simple.

Are you ready to fill those in? I'll use pink.

X	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	88	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Now we're down to 24 facts. And it's not hard yet. You're going to sail through the rest!

Moving on…

Let's have a look at 9's. Did you know that you have the nine times tables wrapped around your fingers? In the palm of your hands? Here's what I mean:

First, hold both your hands out in front of you, with palm open and facing you. Now, starting with your left thumb, number your fingers from left to right, ending on the right thumb. In this way, your left pinkie is 5 and your right pointer if 9, for example. Get it?

Okay. Now, if you want to do 1 x 9, you bend your #1 finger (left thumb) in toward your palm, like this:

See what's left? Nine little fingers still standing. That means 1(the left thumb) x 9 = 9 (fingers up). Easy, right? But you already knew that one.

Let's see if we can make it work for another one. Start again with all your fingers extended. Now bend your left middle finger (that's #3!) toward your palm, like this:

This means 3 x 9. And what are you left with? Two fingers standing on the left, and seven (count'em—the left ring and pinkie fingers and all the fingers on the right hand) standing in a row on the right. So on the left of the bent finger we have a 2, and on the right of the bent finger we have a 7. Put them together and you have your answer: 27. 3 x 9 = 27. Isn't that cool?

Let's try one more. Start again with all your fingers extended, palms facing you. Now bend your right pinkie down, like this:

That finger represents #6, remember? So this is the trick for 6 x 9 (or 9 x 6, same thing—remember the commutative property of multiplication). On the left of the bent finger are 5 fingers standing, and on the right of the bent fingers are 4 fingers standing. 5 and then 4—our answer is 54. 6 x 9 = 54.

This works for 1 x 9 through 9 x 9. But you know what? There's another really neat thing about 9's. It's a trick that you'll use for other things as well, called counting down.

Counting down works in this way: since you already know that ten times something is just to add a zero on the end, you have a really solid fact family to work from. Did you know that 9 times something is just ten times, minus that same number? Here's some examples:

10 x 3 = 30
9 x 3 = 10 x 3, minus 3, or: 27

10 x 6 = 60. If you take six away, you are left with 54, or 9 x 6 = 54. Do you see how that works?
It'll work no matter how small or large the number is.

Now you have two easy ways to remember 9's. I think it's a good time to do some shading on our graphic. Shall we do a purple this time?

X	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	88	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

There are only 18 facts left unshaded. There's a couple we can knock out right away.

Let's start with our remaining 11's facts. Eleven times one through nine are easy, because you just double the digit; you already knew that. Eleven times ten is easy because you just add a zero to the eleven, to make 110.

The funny thing is, even with much larger numbers, multiplying by eleven always has really elegant patterns.

When you multiply a two-digit number by 11, just add the digits together and put their sum between the digits. Like this:

11 x 12 . . .

1 + 2 = 3

1\ / 2
3

1 3 2

11 x 12 = 132

Let's try a bigger number:

11 x 27 . . .

2 + 7 = 9

2 \ / 7
9

2 9 7

11 x 27 = 297

Neat, right?
So, to help us finish highlighting our graphic, we need to do 11 x 11.

11 x 11 . . .

1 + 1 = 2

1 \ / 1
2

1 2 1

11 x 11 = 121

Now you know all your 11's! Let's fill it in with yellow:

0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	88	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Here's another cute little fact. How many hours in the day? 24. How many hours in half a day? 12. How many hours in two days? 48. That's four half-days, or four times twelve. 12 x 4 = 48. I'm filling it in!

0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	88	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

We're down to fifteen facts. Let's keep cruising.

There's a few ways to go from here, and it doesn't matter much which you do first. So I'm just going to pick one and go with it.

We mentioned "counting down" before—you take a known fact and count down to find the answer of a similar problem. It's not tough for most people to skip-count by fives; and if you remember the example of the clock face, you pretty much have your 5 times tables down cold right up through twelve. Fully half of the remaining facts to be learned are in the 4's and 6's—easy counting distance from a simple fact family.

So, if you know that 7 on the clock is 35 minutes, and that 5 x 7 = 35, you can count down seven to 28; this is 4 x 7.

5 x 7 = 35 35 – 7 = 28
4 x 7 = 28

If you know that 8 on the clock is 40 minutes, and that 8 x 5 = 40, you can count up eight to 48; this is 6 x 8.

8 x 5 = 40 40 + 8 = 48
8 x 6 = 48

This might take just a little practice to do quickly in your head. By all means, use your fingers, or tapping, or nodding, or whatever makes it work for you! You'll find this becomes a simple mental computation in no time.

Next, there's a little ditty to help you remember seven times eight: 5-6-7-8. Huh? Here's how it really works; you say those four counting numbers in order like this:
Five-six is seven times eight. Rewritten in numerals, it looks like this.

56 = 7 x 8

So seven times eight is 56. By the way, this also works with 1-2-3-4. One-two is three times four, or:

12 = 3 x 4

Let's shade in the remaining 4's and 6's and 7 x 8:

0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	88	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Only six left to go!

If you're pretty good at memorizing, and easy way is to just focus on memorizing the "doubles" early on. A "double" is a number multiplied by itself, like 4 x 4 or 9 x 9. That would take 7 x 7, 8 x 8 and 12 x 12 out of the picture by now.

If numbers don't stay in your head readily, here are a few little stories to help them along:

7 x 7:
You're in your brand new convertible driving down highway 49 to spend the week at an all-expense paid trip to a beach resort. You race the engine and feel it hum. You drive with the wind in your hair, anticipating the bliss of the week to come.

You're revvin' to heaven on forty-nine.
7 x 7 is 49.

8 x 8:
You're riding a skate board having a good time. All of the sudden the terrain gets shifty and you lose your balance. You land hard on your backside and boy, are you sore!

Skate x Slate = Shifty, sore
8 x 8 = 64.

12 x 12:
Two vertically challenged elves decide to build a house. They are disappointed at their house-warming party when none of their guests can get inside without crawling through the entrance!

Double elves = One shorty door
12 x 12 = 144

We might as well do stories for the remaining three facts.

12 x 7
A young army recruit by the name of Kevin was sent to gather military intelligence in the Caribbean country of Haiti. He was pretty sneaky, but not sneaky enough; he got caught! The resulting political problems turned into a war!

stealth x Kevin = Haiti war
12 x 7 = 84

12 x 8
There was an elf that was very lonely. Being short and having pointy ears, he found it hard to find a date. He decided that the only thing he could really change about his appearance was his physique, so he went to work. Lo and behold, after building up his muscles, he was able to attract the ladies.

elf x weight = findy chicks
12 x 8 = 96

12 x 9
A wealthy man loved to collect old wines. He had a cellar full and had to build a shelf in his pantry to accommodate his new finds. He new it would have to be sturdy—he wanted the shelf to hold up to 2,000 pounds of wine.

shelf x wine = ton o'weight
12 x 9 = 108

If this gimmick was helpful to you, I encourage you to use it on any of the facts that aren't sticking with you. But guess what—we should finish filling in our graphic!

0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	88	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

You did it! Now, here's a new challenge: memorize all the square roots to 200 and cube roots to 1000 . . . .

Post Script

Just for fun, I'll mention one last trick with multiplying numbers. If you know your Squares (doubles—multiplying a number by itself) you can use this one.

When the difference of two factors is 2, you can square the number between them and subtract one to get the answer. For example, let's use 6 and 8, which are two steps apart on the number line:

6 x 8 = ? (find the number between them: 4, 5, 6, **7**, 8, 9 . . .; then multiply it by itself)
7 x 7 = 49 (now subtract 1 from that answer)
49 – 1 = 48 (that's the product of 6 and 8—the numbers on either side of 7!)
6 x 8 = 48

Let's do another one.

4 x 2 = ? (the number between them is 3, so we square it)
3 x 3 = 9 (now subtract 1 from that answer)
9 – 1 = 8 (that's what we're looking for!)
4 x 2 = 8

Kind of interesting, isn't it? Here's how it can help with multiplication facts:

2 x 2 = 4	4 – 1 = 3	1 x 3 = 3
3 x 3 = 9	9 – 1 = 8	2 x 4 = 8
4 x 4 = 16	16 – 1 = 15	3 x 5 = 15
5 x 5 = 25	25 – 1 = 24	4 x 6 = 24
6 x 6 = 36	36 – 1 = 35	5 x 7 = 35
7 x 7 = 49	49 – 1 = 48	6 x 8 = 48
8 x 8 = 64	64 – 1 = 63	7 – 9 = 63
9 x 9 = 81	81 – 1 = 80	8 x 10 = 80

Of course, it works in reverse. If you know that 8 x 10 is 80, then you can add 1 to get 9 x 9 = 81. This is just the beginning! The whole universe of numbers is full of patterns and tricks that seem designed to delight us and evoke our curiosity. What patterns and tricks will you notice? Welcome to the journey!