3. [× Whole Numbers to 12]

Skill 3.1 Multiplying whole numbers from 1 to 12 by 1 or 10.

Multiplication forms patterns.

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

Multiplication is the same as repeated additions.

Any number, multiplied by 1, equals the sum of 1 of the numbers.
Example: $6 \times 1 = 6$
Hint: The number stays the same.

Any number, multiplied by 10, equals the sum of 10 of the numbers.
Example:
$6 \times 10 = 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 = 60$
Hint: Add a zero to the number.

Multiplication is 'counting by' a number of times.

You can multiply by 1 by counting by that number, 1 time.
Example: 6
(1 time)

You can multiply by 10 by counting by that number, 10 times.
Example: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60
(10 times)

Multiplication is commutative.
Example: $10 \times 6 = 6 \times 10 = 60$

Q.

	6	7	4	8	1	11	3	10	2	9
× 10										

A.

	6	7	4	8	1	11	3	10	2	9
× 10	60	70	40	80	10	110	30	100	20	90

When you multiply a number by 10, add a zero to the end of the number.

a)

	3	8	10	4	1	6	2	9	11	7
× 1	3									

b)

	10	4	9	3	11	7	1	2	8	12
× 10	100									

Skill 3.2 Multiplying whole numbers from 1 to 12 by 5.

Multiplication forms patterns.

Multiplication is the same as repeated additions.
Any number, multiplied by 5, equals the sum of 5 of the numbers.
Example: $9 \times 5 = 9 + 9 + 9 + 9 + 9 = 45$

Multiplication is 'counting by' a number of times.

You can multiply by 5 by counting by that number, 5 times.
Example: 9, 18, 27, 36, 45
(5 times)

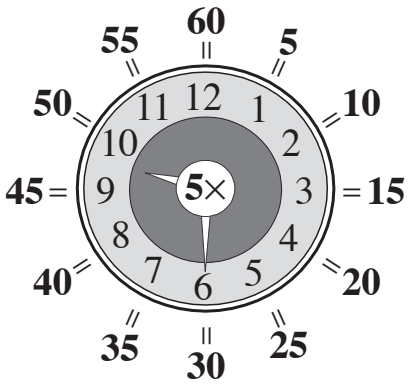
Multiplication is commutative.
Example: $9 \times 5 = 5 \times 9 = 45$

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

Hint: Multiplying by 5 produces a value that is half that of a multiplication by 10.
$9 \times 10 = 90$
$9 \times 5 = 90 \div 2 = 45$

Hint: Multiplying by 5 produces a value that always ends in 0 or 5.

Hint: Multiplying by 5 produces the same values as the minutes on a clock face.



Q.

	11	2	1	12	7	8	3	10	6	4
× 5										

A.

	11	2	1	12	7	8	3	10	6	4
× 5	55	10	5	60	35	40	15	50	30	20

a)

	5	12	3	6	7	4	11	8	9	10
× 5	25									

Skill 3.3 Multiplying whole numbers from 1 to 12 by 2 or 4.

Multiplication forms patterns.

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

Multiplication is the same as repeated additions.

Any number, multiplied by 2,
equals the sum of 2 of the numbers.
Example: $7 \times 2 = 7 + 7 = 14$

Any number, multiplied by 4,
equals the sum of 4 of the numbers
Example: $7 \times 4 = 7 + 7 + 7 + 7 = 28$

Multiplication is 'counting by' a number of times.

You can multiply by 4
by counting by that number, 4 times.
Example: 7, 14, 21, 28
(4 times)

Multiplication is commutative.
Example: $7 \times 2 = 2 \times 7 = 14$

Hint: Multiplying by 2 always produces an even number.

Hint: Multiplying by 2 is the same as doubling.
Double 7 is 14. OR $7 \times 2 = 14$

Hint: Multiplying by 4 is the same as doubling the number and then multiplying by 2.
$7 \times 4 = 14 \times 2 = 28$

Q.

	6	3	8	1	7	9	2	10	4	12
× 4										

A.

	6	3	8	1	7	9	2	10	4	12
× 4	24	12	32	4	28	36	8	40	16	48

a)

	5	7	2	9	3	12	6	10	4	8
× 2	10									

5×2
$= 5 + 5$ *Repeated additions*
$= \mathbf{10}$

b)

	3	9	5	2	10	7	4	6	11	8
× 4	12									

3×4
$= 6 \times 2$ *Double 3 and × by 2*
$= \mathbf{12}$

Skill 3.4 Multiplying whole numbers from 1 to 12 by 3.

Multiplication forms patterns.

Multiplication is the same as repeated additions.

Any number, multiplied by 3,
equals the sum of 3 of the numbers.
Example: $8 \times 3 = 8 + 8 + 8 = 24$

Multiplication is 'counting by' a number of times.

You can multiply by 3
by counting by that number, 3 times.
Example: 8, 16, 24
3 times

Multiplication is commutative.
Example: $8 \times 3 = 3 \times 8 = 24$

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

Q.

	8	1	6	9	7	3	12	4	5	10
× 3										

A.

	8	1	6	9	7	3	12	4	5	10
× 3	24	3	18	27	21	9	36	12	15	30

a)

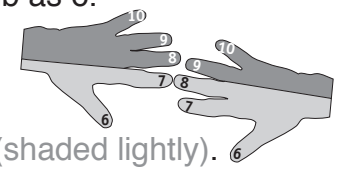
	6	4	10	1	5	8	7	9	3	2
× 3	18									

b)

	11	5	9	8	4	7	12	10	6	3
× 3	33									

Skill 3.5 Multiplying whole numbers from 1 to 12 by 6, 7, 8 or 9.

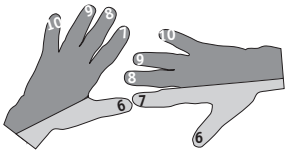
- Number the fingers on each hand from 6 to 10 starting with the thumb as 6.
- Touch the appropriate fingers together to match the table you are working on. Example: 7×8



- Count your thumbs, the touching fingers and any fingers inbetween (shaded lightly). This result makes up the tens.
  (2 fingers on left hand, 3 fingers on right hand) $\Rightarrow 2 + 3 = 5$
  5 tens = 50
- Count separately, the fingers on each hand that are beyond the touching fingers (shaded dark). Multiply the sums. This result makes up the units.
  (3 fingers on left hand, 2 fingers on right hand) $\Rightarrow 3 \times 2 = 6$
  6 units = 6
- Finally add the tens and units.
  $50 + 6 = 56$
  So, $7 \times 8 = 56$

Q.

	6	2	5	1	8	7	4	10	3	9
× 7										



A.

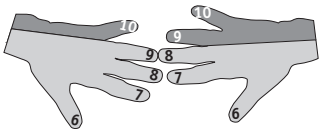
	6	2	5	1	8	7	4	10	3	9
× 7	42	14	35	7	56	49	28	70	21	63

$6 \times 7 = ?$

$1 + 2 = 3$ tens $= 30$
(light fingers)
$4 \times 3 = 12$ units $= 12$
(dark fingers)
$30 + 12 = 42$
So $6 \times 7 = 42$

a)

	9	4	7	2	5	6	10	3	1	8
× 8	72									



b)

	3	6	2	8	10	1	5	4	9	7
× 7	21									

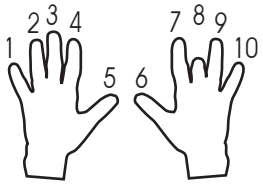
c)

	9	6	5	8	1	4	3	7	10	2
× 6										

d)

	4	2	9	1	7	3	8	5	6	10
× 9										

Skill 3.6 Multiplying whole numbers from 1 to 12 by 9.



- Number the fingers on both hands from 1 to 10.
- Bend the finger that matches the 9× table you are working on.
  Example: For 8×9, bend the 8th finger.
- Count the fingers before the bent finger. This result makes up the tens.
  7 fingers $\Rightarrow$ 7 tens = 70
- Count the fingers after the bent finger. This result makes up the units.
  2 fingers $\Rightarrow$ 2 units = 2
- Add the tens and units.
  $70 + 2 = 72$
  So, $8 \times 9 = 72$

Q.

	7	5	1	9	2	8	10	6	3	4
×9										

A.

	7	5	1	9	2	8	10	6	3	4
×9	63	45	9	81	18	72	90	54	27	36

$6+3=9$ $4+5=9$ $9+0=9$ $8+1=9$ $1+8=9$ $7+2=9$ $9+0=9$ $5+4=9$ $2+7=9$ $3+6=9$

Hint: When multiplying by 9, the digits in the answer always add to 9.

To find $7 \times 9 = ?$, bend the 7th finger.
6 fingers before the bent finger $\Rightarrow$ 6 tens = 60
3 fingers after the bent finger $\Rightarrow$ 3 units = 3
$60 + 3 = 63$
So $7 \times 9 = 63$

a)

	4	5	2	7	6	9	10	1	3	8
×9	36									

b)

	3	10	6	2	1	8	5	4	9	7
×9	27									

Skill 3.7 Multiplying whole numbers from 1 to 12 by 11.

Multiplication forms patterns.

Multiplication is the same as repeated additions.

Any number, multiplied by 11,
equals the sum of 11 of the numbers.
Example:
$4 \times 11 = 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 = 44$

Multiplication is 'counting by' a number of times.

You can multiply by 11
by counting by that number, 11 times.
Example: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44
(11 times)

Multiplication is commutative.
Example: $4 \times 11 = 11 \times 4 = 44$

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

Hint: Multiply any digit from 1 to 9 by 11 and the resulting number is two of that digit.

Q.

	6	8	11	9	7	3	12	4	10	5
× 11										

A.

	6	8	11	9	7	3	12	4	10	5
× 11	66	88	121	99	77	33	132	44	110	55

a)

	4	7	2	8	3	11	5	10	9	6
× 11	44									

$4 \times 11 =$ ***44***
two of the digit 4

b)

	5	10	4	9	3	8	12	7	11	6
× 11	55									

$5 \times 11 =$ ***55***
two of the digit 5

Skill 3.8 Multiplying whole numbers from 1 to 12 by 12.

Multiplication forms patterns.

Multiplication is the same as repeated additions.

Any number, multiplied by 12,
equals the sum of 12 of the numbers.
Example:
$5 \times 12 = 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 60$

Multiplication is 'counting by' a number of times.

You can multiply by 12
by counting by that number, 12 times.
Example: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60
(12 times)

Multiplication is commutative.
Example: $5 \times 12 = 12 \times 5 = 60$

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

Q.

	5	9	6	3	7	12	8	4	11	10
× 12										

A.

	5	9	6	3	7	12	8	4	11	10
× 12	60	108	72	36	84	144	96	48	132	120

a)

	6	4	10	11	5	8	7	9	3	12
× 12	72									

b)

	9	1	6	12	7	2	8	5	10	11
× 12	108									