3. [× Whole Numbers to 10]

Multiplication forms patterns.

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.

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

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 reversable.
Example: $10 \times 6 = 6 \times 10$

Q.

6	7	4	8	1	5	3	10	2	9

×10										

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

A.

6	7	4	8	1	5	3	10	2	9

×10	60	70	40	80	10	50	30	100	20	90

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a)

3	8	10	4	1	6	2	9	5	7

×1	3									

b)

10	4	9	3	5	7	1	2	8	6

×10	100									

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 reversable.
Example: $9 \times 5 = 5 \times 9$

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

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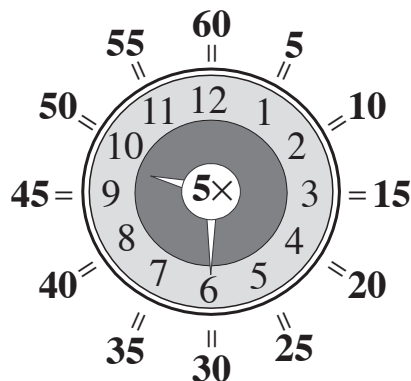
Q.

9	2	1	5	7	8	3	10	6	4
×5									

A.

9	2	1	5	7	8	3	10	6	4
×5	*45*	*10*	*5*	*25*	*35*	*40*	*15*	*50*	*30*	*20*

a)

5	1	6	2	7	4	9	3	10	8
×5	25								

Multiplication forms patterns.

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 reversable.
> Example: $7 \times 2 = 2 \times 7$

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.*
>   *$7 \times 4 = 14 \times 2 = 28$*

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

Q.

	6	3	8	1	7	9	2	10	4	5
×4										

A.

	6	3	8	1	7	9	2	10	4	5
×4	**24**	**12**	**32**	**4**	**28**	**36**	**8**	**40**	**16**	**20**

a)

	5	8	2	7	3	1	6	10	9	4
×2	10									

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

b)

	3	10	5	4	9	7	2	6	1	8
×4	12									

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

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 reversable.
Example: $8 \times 3 = 3 \times 8$

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

Q.

	8	1	6	9	7	3	2	4	5	10
×3										

A.

	8	1	6	9	7	3	2	4	5	10
×3	**24**	**3**	**18**	**27**	**21**	**9**	**6**	**12**	**15**	**30**

a)

	6	4	10	1	5	8	7	9	3	2
×3	18									

b)

	1	5	9	8	4	7	2	10	6	3
×3	3									

Skill 3.5   Multiplying whole numbers from 1 to 10 by 6, 7, 8 or 9.

MM3.2 1 1 2 2 3 3 4 4
MM4.1 1 1 2 2 3 3 4 4

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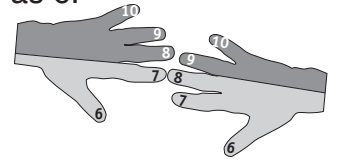
- Touch the appropriate fingers together to match the table you are working on. Example: 7×8

- Count your thumbs, the touching fingers and any fingers in between (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 $7 \times 8 = 56$
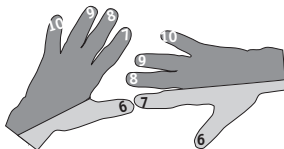
Q.

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								
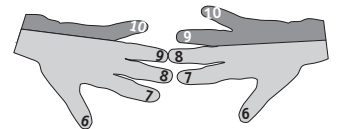
b)

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									

- Number the fingers on each hand 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
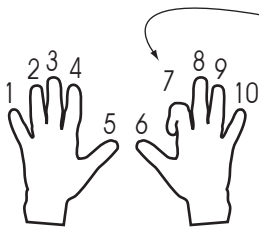- Add the tens and units.
  $70 + 2 = 72$
  So $8 \times 9 = 72$

Q.

×9	7	5	1	9	2	8	10	6	3	4

A.

×9	7	5	1	9	2	8	10	6	3	4
	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)

×9	4	5	2	7	6	9	10	1	3	8
	36									

b)

×9	3	10	6	2	1	8	5	4	9	7
	27									