

6. [\times Whole Numbers]

Skill 6.1 Understanding different terms used for multiplication.

MM2.2 1 2 2 3 3 4 4
MM3.1 1 1 2 2 3 3 4 4

- Consider the words used with the numbers.
Multiplication is associated with words like: ***multiplied by, lots of, times, groups of, twice as much, product of.***

Q. 3 groups of 2 are

A. $3 \times 2 = 6$

groups of means multiplication

a) 8 multiplied by 5 is

40

b) 3 lots of 5 are

c) 6 times 10 is

d) 7 groups of 2 are

e) 5 times 2 is

f) 6 groups of 5 are

g) 2 lots of 9 are

h) 7 multiplied by 4 is

i) 4 groups of 3 are

j) 8 times 3 is

k) 6 multiplied by 3 is

l) 6 lots of 3 are

m) 4 multiplied by 5 is

n) 3 groups of 7 are

o) 10 times 9 is

p) 5 lots of 7 are

q) 2 groups of 6 are

r) 3 times 5 is

s) 10 multiplied by 6 is

t) 5 lots of 5 are

Multiplying a number by 2

- Add the number to itself. (Doubling)
Hint: Think of the counting pattern by 2.

$$\begin{array}{l} 1 \times 2 = 2 \\ 2 \times 2 = 4 \\ 3 \times 2 = 6 \\ 4 \times 2 = 8 \\ 5 \times 2 = 10 \\ 6 \times 2 = 12 \\ 7 \times 2 = 14 \\ 8 \times 2 = 16 \\ 9 \times 2 = 18 \\ 10 \times 2 = 20 \\ 11 \times 2 = 22 \\ 12 \times 2 = 24 \end{array}$$

Multiplying a number by 4

- Double the number. Double the result.
Hint: Think of the counting pattern by 4.

$$\begin{array}{l} 1 \times 4 = 4 \\ 2 \times 4 = 8 \\ 3 \times 4 = 12 \\ 4 \times 4 = 16 \\ 5 \times 4 = 20 \\ 6 \times 4 = 24 \\ 7 \times 4 = 28 \\ 8 \times 4 = 32 \\ 9 \times 4 = 36 \\ 10 \times 4 = 40 \\ 11 \times 4 = 44 \\ 12 \times 4 = 48 \end{array}$$

Q. $5 \times 4 = \square$

A. $5 \times 4 = 20$

Double 5 is 10.
Double 10 is 20.

a) $5 \times 2 = \square$

b) $3 \times 4 = \square$

c) $6 \times 4 = \square$

d) $8 \times 2 = \square$

e) $8 \times 4 = \square$

f) $4 \times 2 = \square$

g) $6 \times 2 = \square$

h) $2 \times 4 = \square$

i) $4 \times 4 = \square$

j) $7 \times 2 = \square$

k) $10 \times 2 = \square$

l) $7 \times 4 = \square$

m)

	3	6	5	8	4
$\times 2$					

n)

	6	2	3	5	4
$\times 4$					

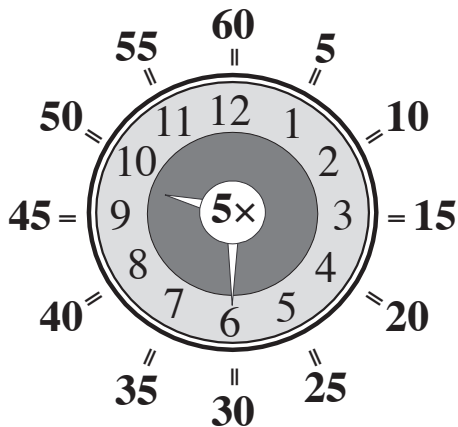
Skill 6.4 Multiplying the numbers from 1 to 10 by 5.

MM2.2 1 1 2 2 3 3 4 4
MM3.1 1 1 2 2 3 3 4 4

Hints: Think of the counting pattern by 5.

The last digits in the results are always a 0 or a 5.

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



- $1 \times 5 = 5$
- $2 \times 5 = 10$
- $3 \times 5 = 15$
- $4 \times 5 = 20$
- $5 \times 5 = 25$
- $6 \times 5 = 30$
- $7 \times 5 = 35$
- $8 \times 5 = 40$
- $9 \times 5 = 45$
- $10 \times 5 = 50$
- $11 \times 5 = 55$
- $12 \times 5 = 60$

q. $6 \times 5 =$

A. $6 \times 5 = 30$

a) $5 \times 5 =$

b) $4 \times 5 =$

c) $1 \times 5 =$

d) $6 \times 5 =$

e) $2 \times 5 =$

f) $8 \times 5 =$

g) $7 \times 5 =$

h) $3 \times 5 =$

i) $10 \times 5 =$

j) $9 \times 5 =$

k) $11 \times 5 =$

l) $12 \times 5 =$

m)

	5	4	1	7	9
$\times 5$	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

n)

	6	3	2	8	10
$\times 5$	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Skill 6.5 Multiplying the numbers from 1 to 10 by 6, 7 or 8.

MM2.2 1 1 2 2 3 3 4 4
MM3.1 1 1 2 2 3 3 4 4

Hint: Think of the counting pattern by 6.

- $1 \times 6 = 6$
- $2 \times 6 = 12$
- $3 \times 6 = 18$
- $4 \times 6 = 24$
- $5 \times 6 = 30$
- $6 \times 6 = 36$
- $7 \times 6 = 42$
- $8 \times 6 = 48$
- $9 \times 6 = 54$
- $10 \times 6 = 60$
- $11 \times 6 = 66$
- $12 \times 6 = 72$

Hint: Think of the counting pattern by 7.

- $1 \times 7 = 7$
- $2 \times 7 = 14$
- $3 \times 7 = 21$
- $4 \times 7 = 28$
- $5 \times 7 = 35$
- $6 \times 7 = 42$
- $7 \times 7 = 49$
- $8 \times 7 = 56$
- $9 \times 7 = 63$
- $10 \times 7 = 70$
- $11 \times 7 = 77$
- $12 \times 7 = 84$

Hint: Think of the counting pattern by 8.

- $1 \times 8 = 8$
- $2 \times 8 = 16$
- $3 \times 8 = 24$
- $4 \times 8 = 32$
- $5 \times 8 = 40$
- $6 \times 8 = 48$
- $7 \times 8 = 56$
- $8 \times 8 = 64$
- $9 \times 8 = 72$
- $10 \times 8 = 80$
- $11 \times 8 = 88$
- $12 \times 8 = 96$

Q. $6 \times 7 = \square$

A. $6 \times 7 = 42$

a) $3 \times 8 = \square$

b) $5 \times 7 = \square$

c) $8 \times 8 = \square$

d) $9 \times 6 = \square$

e) $4 \times 7 = \square$

f) $6 \times 8 = \square$

g) $4 \times 6 = \square$

h) $3 \times 7 = \square$

i) $2 \times 7 = \square$

j) $5 \times 8 = \square$

k)

	5	4	1	7	9
$\times 6$					

l)

	6	1	8	7	9
$\times 7$					

m)

	7	9	2	4	10
$\times 8$					

n)

	6	3	2	8	10
$\times 6$					

Skill 6.6 Multiplying the numbers from 1 to 10 by 9.

MM2.2 11 22 **33** 44
MM3.1 **11** 22 33 44

Hints: Think of the counting pattern by 9.

Apart from 11×9 , the digits in the results always add to 9.

Example: $2 \times 9 = 18 \Rightarrow 1 + 8 = 9$

$1 \times 9 =$	9
$2 \times 9 =$	18
$3 \times 9 =$	27
$4 \times 9 =$	36
$5 \times 9 =$	45
$6 \times 9 =$	54
$7 \times 9 =$	63
$8 \times 9 =$	72
$9 \times 9 =$	81
$10 \times 9 =$	90
$11 \times 9 =$	99
$12 \times 9 =$	108

q. $7 \times 9 =$

A. $7 \times 9 =$ **63**

a) $5 \times 9 =$

b) $4 \times 9 =$

c) $1 \times 9 =$

d) $6 \times 9 =$

e) $2 \times 9 =$

f) $8 \times 9 =$

g) $7 \times 9 =$

h) $3 \times 9 =$

i) $10 \times 9 =$

j) $9 \times 9 =$

k) $11 \times 9 =$

l) $12 \times 9 =$

m)

	2	3	7	10	9
$\times 9$	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

n)

	8	1	6	4	5
$\times 9$	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Multiplying by 10

- Add a zero to the end of the number.

Example: $6 \times 10 = 60$

- $1 \times 10 = 10$
- $2 \times 10 = 20$
- $3 \times 10 = 30$
- $4 \times 10 = 40$
- $5 \times 10 = 50$
- $6 \times 10 = 60$
- $7 \times 10 = 70$
- $8 \times 10 = 80$
- $9 \times 10 = 90$
- $10 \times 10 = 100$
- $11 \times 10 = 110$
- $12 \times 10 = 120$

Multiplying by a multiple of 10

- Multiply the two numbers, ignoring the zero.

- Add a zero to the end of the result.

Example: $7 \times 30 = 210$

Q. $4 \times 80 = \square$

A. $4 \times 80 = 320$
 $4 \times 8 = 32$

Add a zero after the 32.

a) $30 \times 6 = \square$

b) $50 \times 9 = \square$

c) $40 \times 5 = \square$

d) $7 \times 60 = \square$

e) $8 \times 70 = \square$

f) $3 \times 80 = \square$

g) $90 \times 2 = \square$

h) $20 \times 6 = \square$

i) $60 \times 4 = \square$

j) $6 \times 70 = \square$

k)

	2	10	4	6	5
$\times 10$	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

l)

	1	9	3	7	8
$\times 10$	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

- Write the result of the multiplication with the unit under the 1-digit numbers.

Q.

$$\begin{array}{r} 7 \\ \times 6 \\ \hline \square \end{array}$$

A.

$$\begin{array}{r} \text{tens} \\ \text{Units} \\ 7 \\ \times 6 \\ \hline 42 \end{array}$$

Unit under units!

Units:

$$7 \times 6 = 42$$

a)

$$\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$$

b)

$$\begin{array}{r} 3 \\ \times 4 \\ \hline \square \end{array}$$

c)

$$\begin{array}{r} 5 \\ \times 5 \\ \hline \square \end{array}$$

d)

$$\begin{array}{r} 6 \\ \times 9 \\ \hline \square \end{array}$$

e)

$$\begin{array}{r} 7 \\ \times 5 \\ \hline \square \end{array}$$

f)

$$\begin{array}{r} 9 \\ \times 8 \\ \hline \square \end{array}$$

g)

$$\begin{array}{r} 4 \\ \times 7 \\ \hline \square \end{array}$$

h)

$$\begin{array}{r} 9 \\ \times 3 \\ \hline \square \end{array}$$

i)

$$\begin{array}{r} 8 \\ \times 2 \\ \hline \square \end{array}$$

j)

$$\begin{array}{r} 8 \\ \times 8 \\ \hline \square \end{array}$$

k)

$$\begin{array}{r} 6 \\ \times 3 \\ \hline \square \end{array}$$

l)

$$\begin{array}{r} 3 \\ \times 8 \\ \hline \square \end{array}$$

m)

$$\begin{array}{r} 8 \\ \times 6 \\ \hline \square \end{array}$$

n)

$$\begin{array}{r} 7 \\ \times 7 \\ \hline \square \end{array}$$

o)

$$\begin{array}{r} 8 \\ \times 7 \\ \hline \square \end{array}$$

Skill 6.9 Multiplying a 2-digit number by a 1-digit number, by using the standard algorithm and showing the partial sums (1).

MM2.2 11 22 33 44
MM3.1 11 22 33 44

- Multiply the units by the single digit.
- Write the result with the unit under the 1-digit number.
- Multiply the tens by the single digit.
- Write the new result under the first result, with the unit under the 1-digit number.
- Add the two results from right to left to complete the multiplication.

Q.

$$\begin{array}{r}
 36 \\
 \times 8 \\
 \hline
 \boxed{} \leftarrow 8 \times 6 \text{ units} \\
 + \boxed{} \leftarrow 8 \times 3 \text{ tens} \\
 \hline
 \boxed{}
 \end{array}$$

A.

$$\begin{array}{r}
 \begin{array}{l} \text{hundreds} \\ \text{tens} \\ \text{units} \end{array} \\
 36 \\
 \times 8 \\
 \hline
 \boxed{48} \leftarrow 8 \times 6 \text{ units} \\
 \boxed{240} \leftarrow 8 \times 3 \text{ tens} \\
 \hline
 \boxed{288}
 \end{array}$$

Units:

$$8 \times 6 = 48 \Rightarrow 48 \text{ units}$$

Tens:

$$8 \times 3 = 24 \Rightarrow 24 \text{ tens}$$

$$48 + 240 = 288$$

a)

$$\begin{array}{r}
 25 \\
 \times 7 \\
 \hline
 35 \leftarrow 7 \times 5 \text{ units} \\
 + 140 \leftarrow 7 \times 2 \text{ tens} \\
 \hline
 \boxed{175}
 \end{array}$$

b)

$$\begin{array}{r}
 32 \\
 \times 8 \\
 \hline
 16 \leftarrow 8 \times 2 \text{ units} \\
 + 240 \leftarrow 8 \times 3 \text{ tens} \\
 \hline
 \boxed{}
 \end{array}$$

c)

$$\begin{array}{r}
 59 \\
 \times 4 \\
 \hline
 36 \leftarrow 4 \times 9 \text{ units} \\
 + 200 \leftarrow 4 \times 5 \text{ tens} \\
 \hline
 \boxed{}
 \end{array}$$

d)

$$\begin{array}{r}
 28 \\
 \times 5 \\
 \hline
 40 \leftarrow 5 \times 8 \text{ units} \\
 + 100 \leftarrow 5 \times 2 \text{ tens} \\
 \hline
 \boxed{}
 \end{array}$$

Skill 6.9 Multiplying a 2-digit number by a 1-digit number, by using the standard algorithm and showing the partial sums (2).

MM2.2 11 22 33 44
MM3.1 11 22 33 44

e)

$$\begin{array}{r} 53 \\ \times 5 \\ \hline \square \leftarrow 5 \times 3 \text{ units} \\ + \square \leftarrow 5 \times 5 \text{ tens} \\ \hline \square \end{array}$$

f)

$$\begin{array}{r} 72 \\ \times 9 \\ \hline \square \leftarrow 9 \times 2 \text{ units} \\ + \square \leftarrow 9 \times 7 \text{ tens} \\ \hline \square \end{array}$$

g)

$$\begin{array}{r} 44 \\ \times 6 \\ \hline \square \leftarrow 6 \times 4 \text{ units} \\ + \square \leftarrow 6 \times 4 \text{ tens} \\ \hline \square \end{array}$$

h)

$$\begin{array}{r} 46 \\ \times 3 \\ \hline \square \leftarrow 3 \times 6 \text{ units} \\ + \square \leftarrow 3 \times 4 \text{ tens} \\ \hline \square \end{array}$$

i)

$$\begin{array}{r} 62 \\ \times 8 \\ \hline \square \leftarrow 8 \times 2 \text{ units} \\ + \square \leftarrow 8 \times 6 \text{ tens} \\ \hline \square \end{array}$$

j)

$$\begin{array}{r} 37 \\ \times 4 \\ \hline \square \leftarrow 4 \times 7 \text{ units} \\ + \square \leftarrow 4 \times 3 \text{ tens} \\ \hline \square \end{array}$$

k)

$$\begin{array}{r} 49 \\ \times 7 \\ \hline \square \leftarrow 7 \times 9 \text{ units} \\ + \square \leftarrow 7 \times 4 \text{ tens} \\ \hline \square \end{array}$$

l)

$$\begin{array}{r} 78 \\ \times 3 \\ \hline \square \leftarrow 3 \times 8 \text{ units} \\ + \square \leftarrow 3 \times 7 \text{ tens} \\ \hline \square \end{array}$$

Multiply with no carry

- Multiply the units, tens and hundreds by the single digit.
- Multiply from right to left.

Multiply with carry

- Multiply the units, tens and hundreds by the single digit.
- Multiply from right to left.
- If there is a 'carry over':
First multiply.
Then add on the carry over.

Q.

$$\begin{array}{r} 438 \\ \times 2 \\ \hline \square \end{array}$$

A.

The diagram shows the multiplication 438×2 with vertical dashed lines separating the hundreds, tens, and units columns. A '1' is written above the tens column, with an arrow pointing to it from the units column. Below the multiplication, the result 876 is shown in a box, with a callout bubble saying "Units first!".

Units:

$$2 \times 8 = 16$$

$$16 \text{ units} = 1 \text{ ten and } 6 \text{ units} \Rightarrow 6 \text{ units}$$

Carry over the 1 ten to the tens column.

Tens:

$$2 \times 3 = 6$$

$$6 + 1 \text{ (carry over)} = 7 \Rightarrow 7 \text{ tens}$$

Hundreds:

$$2 \times 4 = 8$$

$$\Rightarrow 8 \text{ hundreds}$$

a)

$$\begin{array}{r} 31 \\ \times 3 \\ \hline \square \end{array}$$

Units first!

b)

$$\begin{array}{r} 22 \\ \times 2 \\ \hline \square \end{array}$$

c)

$$\begin{array}{r} 34 \\ \times 2 \\ \hline \square \end{array}$$

d)

$$\begin{array}{r} 32 \\ \times 3 \\ \hline \square \end{array}$$

e)

$$\begin{array}{r} 41 \\ \times 2 \\ \hline \square \end{array}$$

f)

$$\begin{array}{r} 12 \\ \times 4 \\ \hline \square \end{array}$$

g)

$$\begin{array}{r} 102 \\ \times 3 \\ \hline \square \end{array}$$

h)

$$\begin{array}{r} 121 \\ \times 2 \\ \hline \square \end{array}$$

i)

$$\begin{array}{r} 313 \\ \times 2 \\ \hline \square \end{array}$$

j)

$$\begin{array}{r} 434 \\ \times 2 \\ \hline \square \end{array}$$

k)

$$\begin{array}{r} 122 \\ \times 4 \\ \hline \square \end{array}$$

l)

$$\begin{array}{r} 103 \\ \times 3 \\ \hline \square \end{array}$$

Skill 6.10 Multiplying a 2-digit number by a 1-digit number, by using the standard algorithm (2).

MM2.2 11 22 33 44
MM3.1 11 22 33 44

m)
$$\begin{array}{r} \overset{1}{1}64 \\ \times \quad 2 \\ \hline \end{array}$$
Units first!

n)
$$\begin{array}{r} 3\overset{2}{2}7 \\ \times \quad 3 \\ \hline \end{array}$$

o)
$$\begin{array}{r} 151 \\ \times \quad 5 \\ \hline \end{array}$$

p)
$$\begin{array}{r} 104 \\ \times \quad 9 \\ \hline \end{array}$$

q)
$$\begin{array}{r} 218 \\ \times \quad 4 \\ \hline \end{array}$$

r)
$$\begin{array}{r} 140 \\ \times \quad 6 \\ \hline \end{array}$$

s)
$$\begin{array}{r} 346 \\ \times \quad 2 \\ \hline \end{array}$$

t)
$$\begin{array}{r} 109 \\ \times \quad 8 \\ \hline \end{array}$$

u)
$$\begin{array}{r} 125 \\ \times \quad 3 \\ \hline \end{array}$$

v)
$$\begin{array}{r} 215 \\ \times \quad 4 \\ \hline \end{array}$$

w)
$$\begin{array}{r} 326 \\ \times \quad 3 \\ \hline \end{array}$$

x)
$$\begin{array}{r} 102 \\ \times \quad 5 \\ \hline \end{array}$$

y)
$$\begin{array}{r} 192 \\ \times \quad 4 \\ \hline \end{array}$$

z)
$$\begin{array}{r} 173 \\ \times \quad 3 \\ \hline \end{array}$$

A)
$$\begin{array}{r} 133 \\ \times \quad 7 \\ \hline \end{array}$$

B)
$$\begin{array}{r} 236 \\ \times \quad 4 \\ \hline \end{array}$$

C)
$$\begin{array}{r} 119 \\ \times \quad 7 \\ \hline \end{array}$$

D)
$$\begin{array}{r} 116 \\ \times \quad 8 \\ \hline \end{array}$$

Skill 6.11 Multiplying three 1-digit numbers.

MM2.2 11 22 33 44
MM3.1 11 22 33 44

- Multiply two of the three numbers first, by choosing two that give a simple answer.
- Multiply the answer by the third number.

Hint: When multiplying 3 or more numbers, the order is not important (multiplication is associative).

Q. $3 \times 9 \times 2 =$

A. $3 \times 9 \times 2 =$
 $= 3 \times 2 \times 9$
 $= 6 \times 9$
 $= 54$

Choose 3 and 2 to multiply first.

Multiply 6 and 9.

a) $2 \times 6 \times 5 =$

$= 2 \times 5 \times 6$

$= 10 \times 6 =$

b) $2 \times 9 \times 4 =$

$= 2 \times 4 \times 9$

$= 8 \times 9 =$

c) $9 \times 5 \times 2 =$

$=$

$=$ $=$

d) $7 \times 4 \times 2 =$

$=$

$=$

e) $5 \times 8 \times 2 =$

$=$

$=$

f) $6 \times 3 \times 2 =$

$=$

$=$

g) $4 \times 6 \times 2 =$

$=$

$=$

h) $2 \times 3 \times 8 =$

$=$

$=$

i) $5 \times 6 \times 9 =$

$=$

$=$

j) $7 \times 5 \times 8 =$

$=$

$=$

k) $6 \times 2 \times 5 =$

$=$

$=$

l) $6 \times 4 \times 5 =$

$=$

$=$

m) $6 \times 8 \times 2 =$

$=$

$=$

n) $9 \times 8 \times 5 =$

$=$

$=$

o) $5 \times 6 \times 7 =$

$=$

$=$