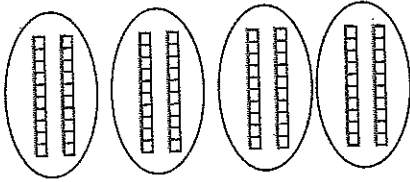


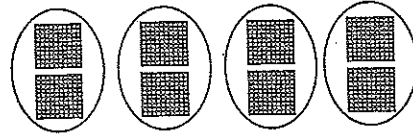
S5-21: Multiples of 10

To multiply 4×20 , Allen makes 4 groups containing 2 tens blocks ($20 = 2$ tens):



$$4 \times 20 = 4 \times 2 \text{ tens} = 8 \text{ tens} = 80$$

To multiply 4×200 , Allen makes 4 groups containing 2 hundreds blocks ($200 = 2$ hundreds):

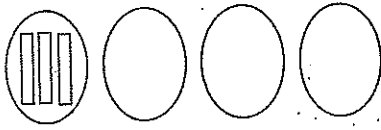


$$4 \times 200 = 4 \times 2 \text{ hundreds} = 8 \text{ hundreds} = 800$$

Allen notices a pattern: $4 \times 2 = 8$ $4 \times 20 = 80$ $4 \times 200 = 800$

Draw a model for each multiplication statement, then calculate the answer. The first one is started:

a) 4×30



$$4 \times 30 = 4 \times \underline{\quad} \text{ tens} = \underline{\quad} \text{ tens} = \underline{\quad}$$

b) 2×20

$$2 \times 20 = 2 \times \underline{\quad} \text{ tens} = \underline{\quad} \text{ tens} = \underline{\quad}$$

2. Regroup to find the answer. The first one is done for you:

a) $3 \times 70 = 3 \times \underline{7} \text{ tens} = \underline{21} \text{ tens} = \underline{210}$

b) $4 \times 50 = 4 \times \underline{\quad} \text{ tens} = \underline{\quad} \text{ tens} = \underline{\quad}$

c) $3 \times 40 = 3 \times \underline{\quad} \text{ tens} = \underline{\quad} \text{ tens} = \underline{\quad}$

d) $6 \times 30 = 6 \times \underline{\quad} \text{ tens} = \underline{\quad} \text{ tens} = \underline{\quad}$

3. Complete the pattern by multiplying:

a) $2 \times 3 = \underline{\quad}$	b) $5 \times 1 = \underline{\quad}$	c) $5 \times 4 = \underline{\quad}$	d) $4 \times 2 = \underline{\quad}$
$2 \times 30 = \underline{\quad}$	$5 \times 10 = \underline{\quad}$	$5 \times 40 = \underline{\quad}$	$4 \times 20 = \underline{\quad}$
$2 \times 300 = \underline{\quad}$	$5 \times 100 = \underline{\quad}$	$5 \times 400 = \underline{\quad}$	$4 \times 200 = \underline{\quad}$

4. Multiply:

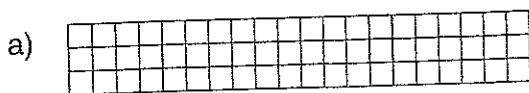
a) $5 \times 30 = \underline{\quad}$	b) $30 \times 4 = \underline{\quad}$	c) $4 \times 40 = \underline{\quad}$	d) $50 \times 3 = \underline{\quad}$
e) $3 \times 500 = \underline{\quad}$	f) $500 \times 6 = \underline{\quad}$	g) $3 \times 80 = \underline{\quad}$	h) $500 \times 5 = \underline{\quad}$
i) $2 \times 900 = \underline{\quad}$	j) $70 \times 6 = \underline{\quad}$	k) $8 \times 40 = \underline{\quad}$	l) $900 \times 3 = \underline{\quad}$

5. Draw a base ten model (using cubes to represent thousands) to show: $6 \times 1\,000 = 6\,000$.

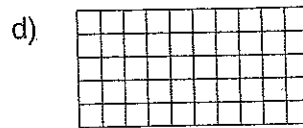
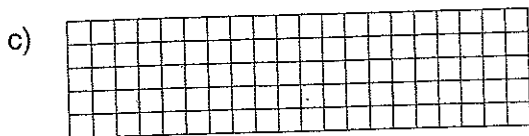
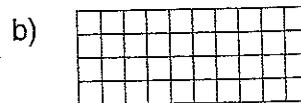
6. Knowing that $4 \times 2 = 8$, how can you use this fact to multiply $4 \times 2\,000$? Explain.

NS5-22: Advanced Arrays

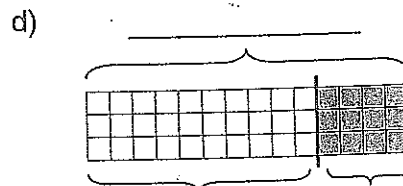
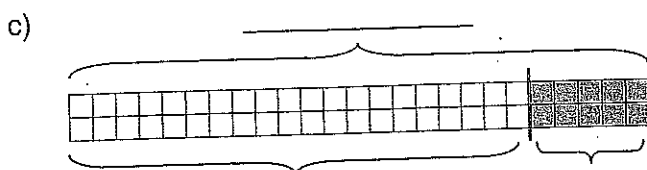
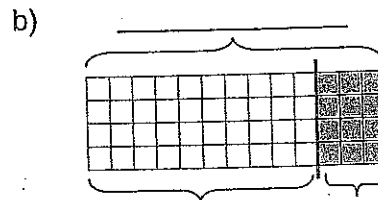
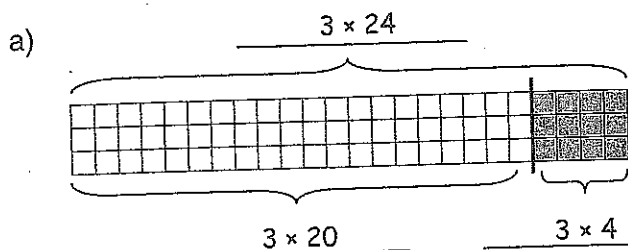
1. Write a multiplication statement for each array.



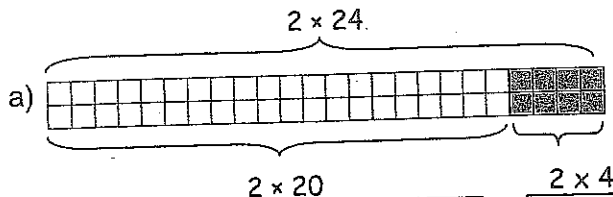
3×20



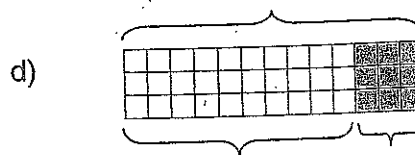
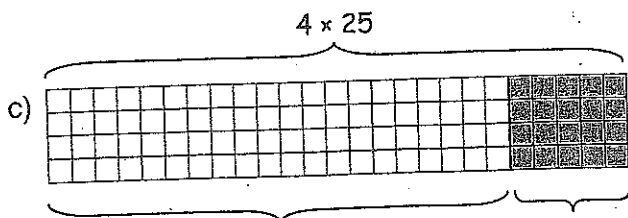
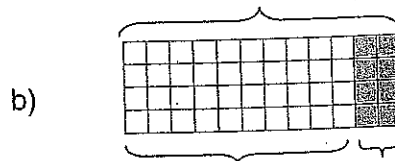
2. Write a multiplication statement for the whole array and each part of the array (as shown in a).



3. Fill in the blanks (as shown in a).



2×20 2×4
 $2 \times 20 + 2 \times 4 = 2 \times 24$



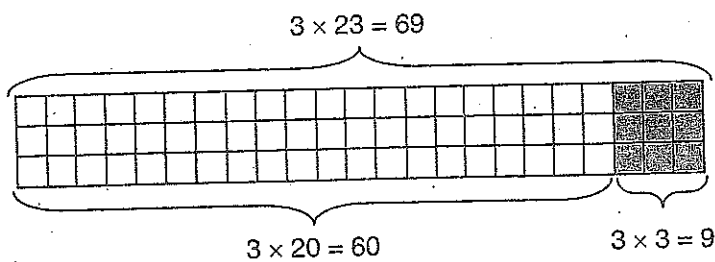
o multiply 3×23 , Rosa rewrites 23 as a sum:

$$23 = 20 + 3$$

he multiplies 20 by 3: $3 \times 20 = 60$

hen she multiplies 3×3 : $3 \times 3 = 9$

inally she adds the result: $60 + 9 = 69$



he picture shows why Rosa's method works:

$$3 \times 23 = 3 \times 20 + 3 \times 3 = 60 + 9 = 69$$

Rewrite each multiplication statement as a sum.

a) $2 \times 24 = \underline{2 \times 20} + \underline{2 \times 4}$

b) $2 \times 23 = \underline{\quad} + \underline{\quad}$

c) $3 \times 32 = \underline{\quad} + \underline{\quad}$

d) $4 \times 12 = \underline{\quad} + \underline{\quad}$

2. Multiply using Rosa's method. The first one has been done for you.

a) $3 \times 13 = \underline{3 \times 10} + \underline{3 \times 3} = \underline{30 + 9} = \underline{39}$

b) $3 \times 21 = \underline{\quad} + \underline{\quad} = \underline{\quad} = \underline{\quad}$

c) $2 \times 14 = \underline{\quad} + \underline{\quad} = \underline{\quad} = \underline{\quad}$

d) $3 \times 213 = \underline{3 \times 200} + \underline{3 \times 10} + \underline{3 \times 3} = \underline{600 + 30 + 9} = \underline{639}$

e) $2 \times 231 = \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad} = \underline{\quad}$

f) $2 \times 342 = \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad} = \underline{\quad}$

3. Multiply in your head by multiplying the digits separately.

a) $3 \times 12 = \underline{\quad}$ b) $2 \times 31 = \underline{\quad}$ c) $4 \times 12 = \underline{\quad}$ d) $5 \times 11 = \underline{\quad}$

e) $4 \times 21 = \underline{\quad}$ f) $2 \times 43 = \underline{\quad}$ g) $2 \times 32 = \underline{\quad}$ h) $3 \times 33 = \underline{\quad}$

i) $4 \times 12 = \underline{\quad}$ j) $2 \times 234 = \underline{\quad}$ k) $3 \times 233 = \underline{\quad}$ l) $5 \times 111 = \underline{\quad}$

m) $3 \times 132 = \underline{\quad}$ n) $2 \times 422 = \underline{\quad}$ o) $4 \times 212 = \underline{\quad}$ p) $3 \times 333 = \underline{\quad}$

4. Yén planted 223 trees in each of 3 rows.
How many trees did she plant altogether?



5. Paul put 240 marbles in each of 2 bags.
How many marbles did he put in the bags?

to multiply 4×23 , Anya rewrites 23 as a sum:

$23 = 20 + 3$

then she multiplies 20 by 4:

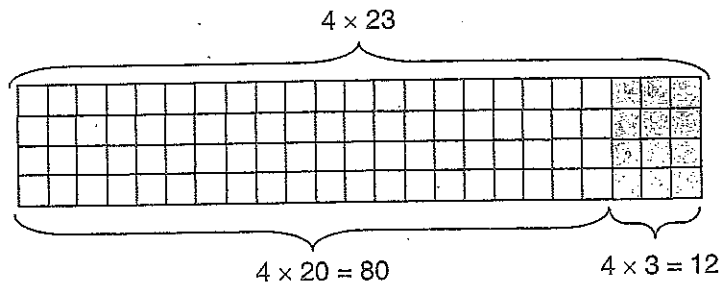
$4 \times 20 = 80$

then she multiplies 4×3 :

$4 \times 3 = 12$

finally she adds the result:

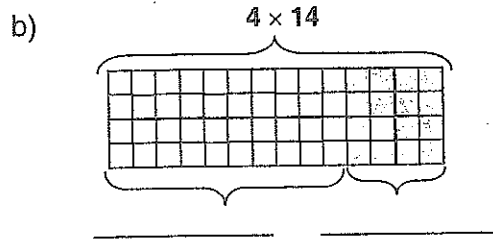
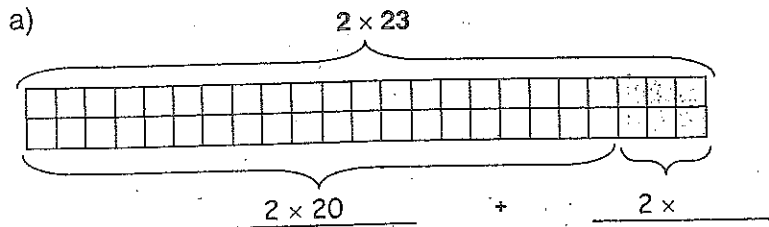
$80 + 12 = 92$



The picture shows why Anya's method works:

$4 \times 23 = 4 \times 20 + 4 \times 3 = 80 + 12 = 92$

Use the picture to write the multiplication statement as a sum. The first one is started for you:



Multiply using Anya's method. The first one has been done for you:

a) $4 \times 12 = 4 \times 10 + 4 \times 2 = 40 + 8 = 48$

b) $3 \times 43 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

c) $4 \times 22 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

d) $3 \times 231 = 3 \times 200 + 3 \times 30 + 3 \times 1 = 600 + 90 + 3 = 693$

e) $2 \times 443 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

f) $3 \times 313 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Multiply in your head by multiplying the digits separately.

a) $2 \times 12 = \underline{\hspace{2cm}}$ b) $2 \times 42 = \underline{\hspace{2cm}}$ c) $3 \times 12 = \underline{\hspace{2cm}}$ d) $4 \times 11 = \underline{\hspace{2cm}}$

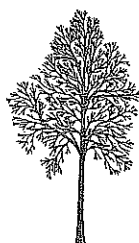
e) $4 \times 21 = \underline{\hspace{2cm}}$ f) $3 \times 41 = \underline{\hspace{2cm}}$ g) $2 \times 32 = \underline{\hspace{2cm}}$ h) $3 \times 23 = \underline{\hspace{2cm}}$

i) $3 \times 112 = \underline{\hspace{2cm}}$ j) $2 \times 233 = \underline{\hspace{2cm}}$ k) $3 \times 232 = \underline{\hspace{2cm}}$ l) $4 \times 222 = \underline{\hspace{2cm}}$

m) $3 \times 132 = \underline{\hspace{2cm}}$ n) $2 \times 442 = \underline{\hspace{2cm}}$ o) $4 \times 212 = \underline{\hspace{2cm}}$ p) $3 \times 333 = \underline{\hspace{2cm}}$

4. a) Atilla planted 332 trees in each of 3 rows. How many trees did he plant altogether?

b) Rema put 320 nails in each of 3 boxes. How many nails did she put in the boxes?



NS4-34: The Standard Algorithm for Multiplication

Clara uses a chart to multiply 3×42 :

Step 1

She multiplies the ones digit of 42 by 3. ($3 \times 2 = 6$)

	4	2
x		3
		6

Step 2

She multiplies the tens digit of 42 by 3 (3×4 tens = 12 tens).

She regroups 10 tens as 1 hundred.

	4	2
x		3
	1	2
		6

hundreds tens

1. Use Clara's method to find the products.

a)

	3	1
x		4

b)

	5	3
x		2

c)

	4	1
x		4

d)

	2	1
x		6

e)

	3	1
x		3

f)

	7	1
x		2

g)

	6	2
x		3

h)

	8	4
x		2

i)

	5	2
x		4

j)

	2	2
x		2

k)

	2	1
x		5

l)

	5	3
x		3

m)

	4	2
x		4

n)

	4	3
x		3

o)

	6	4
x		2

p)

	7	3
x		3

q)

	5	4
x		2

r)

	6	2
x		4

s)

	7	2
x		3

t)

	9	1
x		2

u)

	6	3
x		3

v)

	8	1
x		2

w)

	5	1
x		5

x)

	7	2
x		4

y)

	6	1
x		5

z)

	7	2
x		2

aa)

	8	3
x		3

bb)

	9	1
x		9

cc)

	4	1
x		6

dd)

	6	1
x		8

ee)

	9	2
x		4

ff)

	8	5
x		1

gg)

	4	3
x		2

hh)

	6	1
x		7

ii)

	7	1
x		8

2. Find the following products.

- a) 3×62 b) 2×74 c) 5×21 d) 4×62 e) 5×41 f) 7×21

Clara uses a chart to multiply 3×42 :

Step 1:

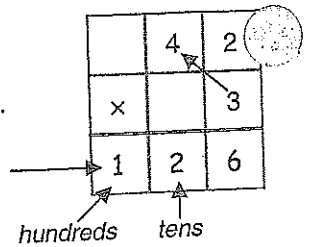
She multiplies the ones digit of 42 by 3 ($3 \times 2 = 6$).

	4	2
x		3
		6

Step 2:

She multiplies the tens digit of 42 by 3 (3×4 tens = 12 tens).

She regroups 10 tens as 1 hundred.



1. Use Clara's method to find the products:

a)

	5	1
x		4

b)

	6	3
x		2

c)

	7	1
x		4

d)

	2	1
x		6

e)

	9	1
x		3

f)

	8	1
x		2

g)

	7	2
x		3

h)

	9	4
x		2

i)

	4	2
x		4

j)

	9	2
x		2

k)

	8	1
x		5

l)

	7	3
x		2

m)

	2	2
x		3

n)

	7	3
x		3

o)

	7	4
x		2

p)

	8	3
x		3

q)

	6	4
x		2

r)

	3	2
x		4

s)

	4	1
x		9

t)

	9	1
x		5

u)

	6	3
x		3

v)

	8	1
x		9

w)

	7	1
x		5

x)

	7	2
x		2

y)

	8	1
x		8

z)

	7	2
x		4

aa)

	9	3
x		3

bb)

	7	1
x		9

cc)

	5	1
x		6

dd)

	6	1
x		8

ee)

	9	2
x		4

ff)

	6	5
x		1

gg)

	5	3
x		3

hh)

	8	1
x		7

ii)

	9	1
x		8



2. Find the following products.

a) 2×62

b) 2×64

c) 5×31

d) 4×62

e) 6×41

f) 7×21

NS4-33: Mental Math: Doubling

1. Count by 2s.

2, 4, 6, _____, _____, _____, _____, _____

2. Double each number mentally by doubling the ones digit and the tens digit separately.

	24	14	12	32	64	22	13
Double	48						

	82	51	34	54	92	74	71
Double							

3. Double the ones and tens separately and add the result: $2 \times 27 = 2 \times 20 + 2 \times 7 = 40 + 14 = 54$

	16	15	25	37	28	18	48
Double							

	17	45	66	35	46	29	55
Double							

4. Use doubles to find the missing products.

If	$2 \times 7 = 14$	$3 \times 7 = 21$	$4 \times 7 = 28$	$2 \times 6 = 12$
Then	$4 \times 7 =$	$6 \times 7 =$	$8 \times 7 =$	$4 \times 6 =$

	$3 \times 6 = 18$	$4 \times 6 = 24$	$2 \times 8 = 16$	$4 \times 8 = 32$
	$6 \times 6 =$	$8 \times 6 =$	$4 \times 8 =$	$8 \times 8 =$

	$2 \times 9 = 18$	$3 \times 9 = 27$	$4 \times 9 = 36$	$2 \times 12 = 24$
	$4 \times 9 =$	$6 \times 9 =$	$8 \times 9 =$	$4 \times 12 =$

5. Calculate the total cost of 2 items mentally.

a) 2 oranges for 42¢ each _____ b) 2 pencils for 37¢ each _____

c) 2 stamps for 48¢ each _____ d) 2 gold fish for 35¢ each _____

