

# Number Sense: Multiplying Whole Numbers – AP Book 5.1: Unit 3

## AP Book NS5-14

page 47

1. a)  $3 + 3 + 3 + 3 + 3$   
b)  $7 + 7 + 7 + 7 + 7 + 7$   
c)  $9 + 9 + 9 + 9$

### BONUS

- $748 + 748 + 748 + 748$
2. a)  $4 + 4 + 4 + 4 + 4 + 20$   
 $5 + 5 + 5 + 5 + 20$   
b)  $2 + 2 + 2 + 2 + 2 + 2 + 12$   
 $6 + 6 + 12$
3. b) 3, 5, 15  
c) 8, 4, 32  
d) 7, 6, 42
4. b)  $3 \times 5$   
c)  $5 \times 7$   
d)  $3 \times 5$

### BONUS

- $3 \times 11$
5. Teacher to check arrays.  
a) 5, 3, 15  
b) 6, 7, 7, 6, 42  
c) 9, 4, 4, 9, 36  
d) 8, 5, 5, 8, 40
6. b)  $6 \times 3$   
 $5 \times 3$   
3  
c)  $3 \times 6$   
 $2 \times 6$   
6  
d)  $5 \times 5$   
 $4 \times 5$   
5  
e)  $6 \times 4$   
 $5 \times 4$   
4  
f)  $3 \times 9$   
 $2 \times 9$   
9

### BONUS

- $13 \times 24$
- $12 \times 24$
- 24

7. b)  $6 \times 8$   
 $5 \times 8$   
8  
 $6 \times 8 = (5 \times 8) + 8$   
c)  $7 \times 7$   
 $6 \times 7$   
7  
 $7 \times 7 = (6 \times 7) + 7$   
d)  $5 \times 9$   
 $4 \times 9$   
9  
 $5 \times 9 = (4 \times 9) + 9$
8. b) 7, 7  
c) 27, 3, 3  
d) 42, 6, 6  
e) 16, 4, 4  
f) 18, 6, 6  
g)  $(34 \times 5) + 5$   
h)  $(57 \times 7) + 7$   
i)  $(46 \times 6) + 6$

### BONUS

- $(15 \times 14) + 14$
9. b)  $(6 \times 6) + 6$   
 $36 + 6$   
42  
c)  $(3 \times 8) + 8$   
 $24 + 8$   
32  
d)  $(2 \times 7) + 7$   
 $14 + 7$   
21  
e)  $(5 \times 6) + 6$   
 $30 + 6$   
36  
f)  $(3 \times 7) + 7$   
 $21 + 7$   
28  
g)  $(6 \times 5) + 5$   
 $30 + 5$   
35  
h)  $(5 \times 8) + 8$   
 $40 + 8$   
48

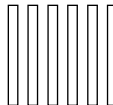
## AP Book NS5-15

page 51

1. b) Teacher to check model.  
5, 15, 150
2. b) 5, 20, 200  
c) 4, 24, 240  
d) 3, 24, 240
3. a) 8  
80  
800  
b) 9  
90  
900  
c) 16  
160  
1600  
d) 9  
90  
900
4. a) 80  
b) 150  
c) 180  
d) 200  
e) 800  
f) 1500  
g) 1200  
h) 1200  
i) 350  
j) 300  
k) 180  
l) 1600

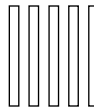
5. 

6.  $6 \times 300 = 6 \times 3 \text{ hundreds}$   
 $= 18 \text{ hundreds} = 1800$

7. b) 3000  
c) 

60

- d)  $10 \times \square \square \square \square$



50

- e) Teacher to check model.  
500

- f) Teacher to check model.  
5000

- g) Teacher to check model.  
50 000

8. a) 40  
b) 700  
c) 800  
d) 6000  
e) 80  
f) 9000

### BONUS

- g) 200 000  
h) 600 000
9. a) 140  
b) 1700  
c) 210  
d) 4200  
e) 8700  
f) 2800

### BONUS

- g) 43 000  
h) 135 000
10. b) 14, 100  
1400  
d) 16, 1000  
16 000
11. b) 12  
12 000  
c) 35  
35 000  
d) 12  
12 000  
e) 36  
36 000  
f) 40  
40 000

### BONUS

24 000 000

12.  $30 \times 20 = 600$   
There are 600 students competing at the provincial track meet.

## AP Book NS5-16

page 54

1. b) 82  
c) 42

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(continued)

<p>d) 46</p> <p>e) 102</p> <p>f) 68</p> <p>2. b) <math>40 + 14 = 54</math></p> <p>c) <math>60 + 16 = 76</math></p> <p>d) <math>40 + 10 = 50</math></p> <p>e) <math>60 + 10 = 70</math></p> <p>f) <math>100 + 10 = 110</math></p> <p>3. b) 32</p> <p>32, 64</p> <p>64</p> <p>c) <math>60 + 12 = 72</math></p> <p>72, <math>140 + 4 = 144</math></p> <p>144</p> <p>d) <math>80 + 16 = 96</math></p> <p>96, <math>180 + 12 = 192</math></p> <p>192</p> <p>e) <math>100 + 14 = 114</math></p> <p>114, <math>220 + 8 = 228</math></p> <p>228</p> <p>f) <math>140 + 12 = 152</math></p> <p>152, <math>300 + 4 = 304</math></p> <p>304</p> <p>4. a) 12</p> <p>24</p> <p>b) 21</p> <p>42</p> <p>c) 24</p> <p>48</p> <p>d) 18</p> <p>36</p> <p>e) 15</p> <p>30</p> <p>f) 27</p> <p>54</p> <p><b>BONUS</b></p> <p>g) 333</p> <p>666</p> <p>h) 3333</p> <p>6666</p> <p>i) 333 333</p> <p>666 666</p> <p>5. a) 12</p> <p>24</p> <p>48</p> <p>b) 16</p> <p>32</p> <p>64</p> <p>c) 14</p> <p>28</p> <p>56</p>	<p>d) 18</p> <p>36</p> <p>72</p> <p>e) 24</p> <p>48</p> <p>96</p> <p><b>BONUS</b></p> <p>240</p> <p>480</p> <p>960</p> <p>6. a) 21</p> <p>42</p> <p>84</p> <p>b) 15</p> <p>30</p> <p>60</p> <p><b>BONUS</b></p> <p>150</p> <p>300</p> <p>600</p> <p>7. b) <math>2 \times 9 = 18</math></p> <p><math>4 \times 9 = 36</math></p> <p><math>8 \times 9 = 72</math></p> <p><math>16 \times 9 = 144</math></p> <p>c) <math>2 \times 17 = 34</math></p> <p><math>4 \times 17 = 68</math></p> <p><math>8 \times 17 = 136</math></p> <p><math>16 \times 17 = 272</math></p> <p><b>BONUS</b></p> <p><math>32 \times 3 = 96</math></p> <p>8. a) <math>2 \times 42 = 84</math></p> <p><math>4 \times 42 = 168</math></p> <p>b) <math>2 \times 37 = 74</math></p> <p><math>4 \times 37 = 148</math></p> <p>c) <math>2 \times 7 = 14</math></p> <p><math>4 \times 7 = 28</math></p> <p><math>8 \times 7 = 56</math></p> <p>d) <math>2 \times 9 = 18</math></p> <p><math>4 \times 9 = 36</math></p> <p><math>8 \times 9 = 72</math></p> <p>e) <math>2 \times 11 = 22</math></p> <p><math>4 \times 11 = 44</math></p> <p><math>8 \times 11 = 88</math></p> <p><math>16 \times 11 = 176</math></p> <p>f) <math>2 \times 14 = 28</math></p> <p><math>4 \times 14 = 56</math></p> <p><math>8 \times 14 = 112</math></p> <p><math>16 \times 14 = 224</math></p>	<p><b>BONUS</b></p> <p><math>2 \times 13 = 26</math></p> <p><math>4 \times 13 = 52</math></p> <p><math>8 \times 13 = 104</math></p> <p><math>16 \times 13 = 208</math></p> <p><math>32 \times 13 = 416</math></p> <p><math>64 \times 13 = 832</math></p> <p><math>128 \times 13 = 1664</math></p> <p>9. b) 10, 34, 340</p> <p>c) 10, 241, 2410</p> <p>d) 10, 433, 4330</p> <p><b>BONUS</b></p> <p>e) 100, 24, 2400</p> <p>f) 1000, 43, 43 000</p> <p>10. b) <math>6 \times 5 \times 22</math></p> <p><math>30 \times 22</math></p> <p>660</p> <p>c) <math>2 \times 5 \times 39</math></p> <p><math>10 \times 39</math></p> <p>390</p> <p>d) <math>8 \times 5 \times 12</math></p> <p><math>40 \times 12</math></p> <p>480</p> <p><b>BONUS</b></p> <p>e) <math>20 \times 5 \times 39</math></p> <p><math>100 \times 39</math></p> <p>3900</p> <p>f) <math>2 \times 50 \times 39</math></p> <p><math>100 \times 39</math></p> <p>3900</p> <p><b>AP Book NS5-17</b></p> <p>page 57</p> <p>1. b) <math>4 \times 16</math></p> <p><math>4 \times 10, 4 \times 6</math></p> <p>c) <math>4 \times 22</math></p> <p><math>4 \times 20, 4 \times 2</math></p> <p>d) <math>3 \times 13</math></p> <p><math>3 \times 10, 3 \times 3</math></p> <p>2. b) <math>2 \times 15</math></p> <p><math>2 \times 10, 2 \times 5</math></p> <p><math>2 \times 15 = (2 \times 10)</math></p> <p><math>+ (2 \times 5)</math></p> <p>c) <math>3 \times 25</math></p> <p><math>3 \times 20, 3 \times 5</math></p> <p><math>3 \times 25 = (3 \times 20)</math></p> <p><math>+ (3 \times 5)</math></p>	<p>d) <math>2 \times 14</math></p> <p><math>2 \times 10, 2 \times 4</math></p> <p><math>2 \times 14 = (2 \times 10)</math></p> <p><math>+ (2 \times 4)</math></p> <p>3. b) 4, 30, 4, 6</p> <p>c) <math>3 \times 14 = (3 \times 10)</math></p> <p><math>+ (3 \times 4)</math></p> <p>d) <math>3 \times 34 = (3 \times 30)</math></p> <p><math>+ (3 \times 4)</math></p> <p>4. b) 70, 3</p> <p>c) 40, 1</p> <p>d) 30, 2</p> <p>e) 2, 80, 2, 4</p> <p>f) 5, 90, 5, 1</p> <p>g) <math>(3 \times 50) + (3 \times 2)</math></p> <p>h) <math>(2 \times 60) + (2 \times 4)</math></p> <p>5. b) <math>(4 \times 60) + (4 \times 2)</math></p> <p>240 + 8</p> <p>248</p> <p>c) <math>(3 \times 70) + (3 \times 2)</math></p> <p>210 + 6</p> <p>216</p> <p>d) <math>(9 \times 90) + (9 \times 1)</math></p> <p>810 + 9</p> <p>819</p> <p>e) <math>(7 \times 20) + (7 \times 6)</math></p> <p>140 + 42</p> <p>182</p> <p>f) <math>(5 \times 60) + (5 \times 7)</math></p> <p>300 + 35</p> <p>335</p> <p>g) <math>(8 \times 50) + (8 \times 2)</math></p> <p>400 + 16</p> <p>416</p> <p>h) <math>(9 \times 30) + (9 \times 3)</math></p> <p>270 + 27</p> <p>297</p> <p>6. <math>(8 \times 40) + (8 \times 7)</math></p> <p>320 + 56</p> <p>376</p> <p>7. <math>(9 \times 30) + (9 \times 4)</math></p> <p>270 + 36</p> <p>306</p> <p>8. <math>7 \times 56</math></p> <p><math>= (7 \times 50) + (7 \times 6)</math></p> <p><math>= 350 + 42</math></p> <p><math>= 392 \text{ m}^2</math></p>
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# Number Sense: Multiplying Whole Numbers – AP Book 5.1: Unit 3

(continued)

## AP Book NS5-18

page 60

1. a) 249  
b) 126  
c) 276  
d) 188  
e) 148
2. c) 1  
8  
d) 3  
6  
e) 4  
5  
f) 2  
4  
g) 4  
9  
h) 2  
1  
i) 3  
0  
j) 1  
6
3. b) 31  
c) 7  
d) 51  
e) 35
4. a) 4  
315  
b) 2  
180  
c) 2  
161  
d) 3  
156  
e) 1  
114
5. a) 2  
108  
b) 3  
180  
c) 3  
192  
d) 3  
270  
e) 1  
168
6. a) 3  
185

- b) 1  
75
- c) 108
- d) 3  
245
- e) 1  
172

7. 

	1	
	1	2
x		5
	6	0

  
Mary needs 60 flowers.

8. 

	2	
	1	5
x		4
	6	0

  
The total length of the sides is 60 m.

## AP Book NS5-19

page 62

1. a) 200, 10, 3  
600, 30, 9  
639  
b) 300, 40, 2  
600, 80, 4  
684
2. a) 268  
b) 936  
c) 848  
d) 699  
e) 628
3. b) 1  
975  
c) 2  
570  
d) 1  
672  
e) 2  
791
4. b) 3  
855  
c) 1  
528  
d) 1  
968

- e) 1  
759

5. a) 

	1	
4	3	7
x		2
8	7	4

- b) 

2	2	
1	5	6
x		4
6	2	4

- c) 

	2	
1	1	4
x		6
6	8	4

- d) 

1		
2	3	2
x		4
9	2	8

- e) 

2	2	
1	8	7
x		3
5	6	1

6. a) 

	8	3	4
x			2
1	6	6	8

- b) 

	2		
	2	9	1
x			3
	8	7	3

- c) 

	1		
	8	3	1
x			5
4	1	5	5

- d) 

		2	
	9	0	6
x			4
3	6	2	4

- e) 

	1	2	
	2	2	7
x			4
	9	0	8

7. b) 

	2		
	6	3	1
x			7
4	4	1	7

- c) 

	3	2	
	2	6	4
x			6
1	5	8	4

- d) 

	2	2	
	3	7	8
x			3
1	1	3	4

- e) 

	4	2	
	1	5	3
x			9
1	3	7	7

8. a) 

	2		
	6	8	1
x			3
2	0	4	3

- b) 

	4		
	2	7	0
x			6
1	6	2	0

- c) 

	4	3	
	9	6	5
x			7
6	7	5	5

# Number Sense: Multiplying Whole Numbers – AP Book 5.1: Unit 3

(continued)

d)

		4	
	8	0	5
×			8
6	4	4	0

e)

	1		
	9	6	1
×			3
2	8	8	3

f)

	5	1	
	9	7	2
×			8
7	7	7	6

## BONUS

Teacher to check algorithm.

40 907 315 176

## BONUS

		2		
	1	1	5	0
×				5
	5	7	5	0

She lays 5750 eggs.

## BONUS

	5			
	5	7	0	0
×				8
4	5	6	0	0

Sam can type  
45 600 words in 8 hours.

## AP Book NS5-20

page 64

- 60
  - 90
  - 30
  - 90
  - 60
  - 20
  - 20
- 300
  - 600
  - 800
  - 900

- 700
- 400
- 100

- $500 \times 500 = 250\,000$
  - $800 \times 200 = 160\,000$
  - $500 \times 800 = 400\,000$

- $50 \times 80 = 4000$   
4827 is much greater than 4000 so the product is not reasonable.

- $40 \times 90 = 3600$   
5108 is much greater than 3600 so the product is not reasonable.

- $200 \times 300 = 60\,000$   
69 984 is much greater than 60 000 so the product is not reasonable.

- D
  - C
  - E

- We round the minimum mass of each egg size to the nearest ten to estimate the total mass of six eggs:

Estimations:

Small:  $6 \times 40 = 240$  g

Medium:  $6 \times 50 = 300$  g

Large:  $6 \times 60 = 360$  g

Extra-large:  $6 \times 60 = 360$  g

Jumbo:  $6 \times 70 = 420$  g

Calculations:

Small:  $6 \times 42 = 252$  g

Medium:  $6 \times 49 = 294$  g

Large:  $6 \times 56 = 336$  g

Extra-large:  $6 \times 63 = 378$  g

Jumbo:  $6 \times 70 = 420$  g

The minimum mass of large and extra-large eggs both round to 60 g, so you cannot use estimation to distinguish between them.

- Estimations:  
 $8 \times 10 = 80$  inches  
 $7 \times 20 = 140$  cm

Calculations:

$8 \times 12 = 96$  inches

$7 \times 15 = 105$  cm

## BONUS

$$78 \times 6 = \$468$$

\$800 is much greater than \$468, so Hanna's estimate is not good.

- $20 \times 4 = 80$   
Jayden will take approximately 80 days to read 4 books.

Check estimate:  
 $17 \times 4 = 68$  days

- $50 \times 7 = 350$   
7 keyboards have approximately 350 number and letter keys.

Check estimate:  
 $46 \times 7 = 322$  keys

- $30 \times 5 = 150$   
5 pieces of paper have approximately 150 lines to write in.

Check estimate:  
 $27 \times 5 = 135$  lines

- Estimates:  
 $70 \times 6 = 420$   
 $420 \times 2 = 840$   
Each girl spent approximately \$420 or \$840 altogether.

Check estimate:  
 $73 \times 6 = \$438$   
 $438 \times 2 = \$876$

- Estimates:  
63 and 57 both round to 60.

$$60 \times 6 = 360$$

$$360 \times 2 = 720$$

Each girl spent approximately \$360 or \$720 altogether.

Check estimate:

$$63 \times 6 = \$378$$

$$57 \times 5 = \$342$$

$$378 + 342 = \$720$$

## BONUS

$$185 \times 9 = 1665$$

1800 is close to 1665, so Sharon's estimate is reasonable.

- Estimate:  
 $400 \times 5 = 2000$   
5 hours costs approximately \$2000.

Check estimate:

$$379 \times 5 = \$1895$$

- Estimate:  
 $500 \times 4 = 2000$   
4 passes cost approximately \$2000.  
Check estimate:  
 $489 \times 4 = 1956$

- Estimate:  
 $100 \times 7 = 700$   
7 armadillos in a line is approximately 700 mm.  
Check estimate:  
 $107 \times 7 = 749$

- Estimate:  
 $10 \times 354 = 3540$   
Approximately \$3540 would pay for lunches for 354 children for half a year.  
Check estimate:  
 $9 \times 354 = \$3186$

- Estimate:  
 $300 \times 5 = 1500$   
5 people use approximately 1500 L of water in one day.

Check estimate:  
 $329 \times 5 = 1645$  L

- Estimate:  
 $200 \times 5 = 1000$   
5 people use approximately 1000 bottles of water in one day.

Check estimate:  
 $168 \times 5 = 840$  bottles

- Estimate:  
 $2000 \times 3 = 6000$   
Approximately 6000 mm of precipitation falls in 3 years.

Check estimate:  
 $2477 \times 3 = 7431$  mm

- Estimate:  
 $2000 \times 4 = 8000$   
Approximately 8000 L of fuel is burned in 4 hours.  
Check estimate:  
 $2153 \times 4 = 8612$  L

- Estimate:  
 $3000 \times 5 = 15\,000$   
Ben takes approximately 15 000 steps in 5 days.  
Check estimate:  
 $3418 \times 5 = 17\,090$  steps

# Number Sense: Multiplying Whole Numbers – AP Book 5.1: Unit 3

(continued)

20. Estimate:  
 $2000 \times 5 = 10\,000$   
 5 friends will take  
 approximately 10 000 steps  
 to get to the main deck.  
 Check estimate:  
 $1776 \times 5 = 8880$  steps

## BONUS

Estimate:  
 $200 \times 4 = 800$   
 800 m is greater than  
 710 m, so she will not have  
 enough fencing.  
 $800 - 710 = 90$   
 She needs approximately  
 90 m more fencing.  
 Check estimate:  
 $193 \times 4 = 772$  m  
 $772 - 710 = 62$  m

## AP Book NS5-21

page 67

1. a) 258, 2580  
 b) 116, 1160  
 c) 224, 2240
2. a) 1360  
 b) 1100  
 c) 2150  
 d) 1750  
 e) 2080

3. a) 

	2		
		5	8
x		3	0
1	7	4	0

b) 

	1		
		6	3
x		5	0
3	1	5	0

c) 

	2		
		7	6
x		4	0
3	0	4	0

d) 

	1		
		8	9
x		2	0
1	7	8	0

4. a) 238  
 680  
 918
- b) 92  
 1380  
 1472
- c) 318  
 1060  
 1378
- d) 340  
 2720  
 3060
5. b) 2  
 140
- c) 208
- d) 3  
 80
6. b) 4  
 3450
- c) 1  
 1650
- d) 1  
 1340

7. b) 

		4	2
x		3	4
1	6	8	
1	2	6	0

c) 

	1	2	
		4	5
x		3	5
2	2	5	
1	3	5	0

d) 

	2	1	
		1	6
x		4	2
		3	2
	6	4	0

8. Teacher to check grids.  
 a) 925  
 b) 3657

- c) 3848  
 d) 1888

9. Teacher to check grids.

- a) 950  
 b) 874  
 c) 1404  
 d) 1904  
 e) 1273  
 f) 3431  
 g) 4760  
 h) 6016

10.

	2	3	
		1	4
x		5	8
1	1	2	
	7	0	0
	8	1	2

There are 812 seats in this section.

11.

	1	2	
		5	7
x		2	4
2	2	8	
1	1	4	0
1	3	6	8

1368 people can camp in the park at the same time.

## AP Book NS5-22

page 70

1. Teacher to check grids.

- a) 21 995  
 b) 16 701  
 c) 18 502
2. b) 1, 1  
 2932
- c) 3, 3  
 2835
- d) 3, 3  
 5915

3. b) 1, 1  
 36 650
- c) 2, 2  
 17 010
- d) 1, 2  
 33 800

- e) 3, 1  
 15 360
- f) 1, 4  
 31 620
- g) 1, 2  
 41 700
- h) 1  
 27 750

4. Teacher to check grids.

- b) 2680  
 16 080
- c) 2475  
 33 000
- d) 4044  
 33 700
- e) 5704  
 21 390
- f) 2460  
 29 520
- g) 1632  
 28 560
- h) 6552  
 18 720

5. Teacher to check grids.

- b) 10 948  
 c) 59 262  
 d) 38 702

## BONUS

- e) 93 758  
 f) 187 904  
 g) 364 820

# Number Sense: Multiplying Whole Numbers – AP Book 5.1: Unit 3

(continued)

6.

1	1		
1	6	4	
	1	7	5
×		2	8
1	4	0	0
3	5	0	0
4	9	0	0

175 wheels with  
28 spokes have  
4900 spokes in total.

2	1		
	1	1	
	1	7	5
×		3	2
	3	5	0
5	2	5	0
5	6	0	0

175 wheels with  
32 spokes have  
5600 spokes in total.

2	1		
	4	3	
	1	7	5
×		3	6
1	0	5	0
5	2	5	0
6	3	0	0

175 wheels with  
36 spokes have  
6300 spokes in total.