Decimal fractions (Tenths)

Multiplication Strategies with tenths

Exercise 1

We are using compensation to solve multiplication problems with whole numbers and decimals

Tan uses this strategy to work out 1 decimal place multiplication problems.

Since $3 \times 3 = 9$, $\quad 3 \times 2.9 \qquad = 3 \times 3 - 3 \times 0.1$

$\qquad\qquad\qquad\qquad\qquad\qquad = 9 - 0.3$

$\qquad\qquad\qquad\qquad\qquad\qquad = 8.7$

For each of the following multiplication 'facts' write down two decimal multiplication problems that can be worked out from this 'fact' using Tan's strategy. For each problem find the answer.

In your book write the problems and the answers. For question 1 you can write $3 \times 4.9 = 14.7$, $\ 3 \times 5.2 = 15.6$ etc

1)	3×5	(2)	5×7	(3)	7×6
4)	4×9	(5)	6×8	(6)	8×7
7)	3×9	(8)	2×8	(9)	5×6

Exercise 2

We are using compensation to solve multiplication problems with whole numbers and decimals

Now use this strategy to solve the following

1)	3×6.8	(2)	2×7.9	(3)	4×5.9
4)	6×5.9	(5)	8×3.8	(6)	7×6.2
7)	5×7.1	(8)	9×4.9	(9)	4×11.2
10)	3×10.1	(11)	5×4.9	(12)	6×10.2
13)	2×15.2	(14)	7×9.9	(15)	8×11.2

Exercise 3

We are using "Place Value" to solve multiplication problems with decimals and whole numbers.

Maia is using place value to solve multiplication problems
For 3 × 3.2 she says to herself that 3 × 3 is 9 and 3 × 2 tenths is 6 tenths, so
3 × 3.2 = 9.6

Use Maia's method to solve these problems.

1)   2 × 4.2   (2)   3 × 2.2   (3)   4 × 1.2   (4)   4 × 3.2

5)   6 × 5.1   (6)   8 × 7.1   (7)   2 × 8.4   (8)   3 × 6.3

9)   3 × 10.2   (10)   4 × 12.2   (11)   4 × 103.2   (12)   3 × 1123.3

13)   In what ways is the 'place value' strategy the same as the 'rounding and compensating' strategy?

14)   5 × 11.1   (15)   7 × 31.1   (16)   4 × 42.2   (17)   3 × 52.3

18)   What happens when you use the place value strategy on a problem like 2 × 1234.5? How do you make sure you get the right answer?

Exercise 4

Natasha uses place value to solve multiplication problems.
For 3 × 1.4 she says to herself that 3 × 1 is 3 and 3 × 4 tenths is 12 tenths which is 1.2, so
3 × 1.4 = 3 + 1.2
         = 4.2

Use Natasha's method to solve these problems.

1)   4 × 3.4   (2)   6 × 5.4   (3)   3 × 2.6   (4)   2 × 1.7

5)   7 × 1.3   (6)   5 × 3.2   (7)   8 × 1.4   (8)   3 × 3.4

9)   5 × 2.7   (10)   7 × 2.6   (11)   4 × 2.9   (12)   6 × 4.3

Exercise 5

Choose the best method to solve these multiplication problems. If possible work out the problems mentally.

1) 4×6.4 (2) 6×7.9 (3) 3×10.8 (4) 2×15.9

5) 7×8.9 (6) 5×7.6 (7) 8×9.8 (8) 8.7×3

9) 6.4×5 (10) 7.3×7 (11) 8.2×4 (12) 5.8×6

13) 9×8.8 (14) 8.8×2 (15) 6.3×9 (16) 5×7.9

17) 9×11.4 (18) 7.6×8 (19) 3×9.9 (20) 8×10.6

21) 2×15.3 (22) 7×9.5 (23) 4×5.9 (24) 6×8.4

Multiplication Strategies
Answers

Exercise 1

Your answers to this exercise will vary, depending on the numbers you have chosen. Here are some examples of problems that you may have written and answered.

1) $3 \times 4.9 = 14.7$ (2) $5 \times 6.9 = 34.5$ (3) $7 \times 5.9 = 41.3$
   $3 \times 4.8 = 14.4$ $5 \times 6.8 = 34$ $7 \times 5.8 = 40.6$
   $3 \times 5.1 = 15.3$ $5 \times 7.1 = 35 5$ $7 \times 6.1 = 42.7$
   $3 \times 5.2 = 15.6$ $5 \times 7.2 = 36$ $7 \times 6.2 = 43.4$

4) $4 \times 8.9 = 35.6$ (5) $6 \times 7.9 = 47.4$ (6) $8 \times 6.9 = 55.2$
   $4 \times 8.8 = 35.2$ $6 \times 7.8 = 46.8$ $8 \times 6.8 = 54.4$
   $4 \times 9.1 = 36.4$ $6 \times 8.1 = 48.6$ $8 \times 7.1 = 56.8$
   $4 \times 9.2 = 36.8$ $6 \times 8.2 = 49.2$ $8 \times 7.2 = 57.6$

7) $3 \times 8.9 = 26.7$ (8) $2 \times 7.9 = 15.8$ (9) $5 \times 5.9 = 29.5$
   $3 \times 8.8 = 26.4$ $2 \times 7.8 = 15.6$ $5 \times 5.8 = 29$
   $3 \times 9.1 = 27.3$ $2 \times 8.1 = 16.2$ $5 \times 6.1 = 30.5$
   $3 \times 9.2 = 27.6$ $2 \times 8.2 = 16.4$ $5 \times 6.2 = 31$

Exercise 2

1) 20.4   (2) 15.8   (3) 23.6
4) 35.4   (5) 30.4   (6) 43.4
7) 35.5   (8) 44.1   (9) 44.8
10) 30.3   (11) 24.5   (12) 61.2
13) 30.4   (14) 69.3   (15) 89.6

Exercise 3

1) 8.4   (2) 6.6   (3) 4.8
4) 12.8   (5) 30.6   (6) 56.8
7) 16.8   (8) 18.9   (9) 30.6
10) 48.8   (11) 412.8   (12) 3369.9
13) Place value is basically the same as rounding and compensating when an extra bit is added on, so $4 \times 6 = 24$, so 4×6.1 has $4 \times$ point 1 added on
14) 55.5   (15) 213.7   (16) 168.8
17) 156.9
18) $1234 \times 2 = 2468$, which is easy. The last poin$5 \times 2 = 1$ whole, so because it "overfills the column" we have to start carrying. In general, having to carry makes the place value strategy harder to use, so we don not use it much when there is a lot of this going on.

Exercise 4

1) 13.6   (2) 32.4   (3) 7.8
4) 3.4   (5) 9.1   (6) 16
(7) 11.2   (8) 10.2   (9) 13.5
(10) 18.2   (11) 11.6   (12) 25.8

Exercise 5

1)	25.6	(2)	47.4	(3)	32.4
4)	31.8	(5)	62.3	(6)	38
7)	78.4	(8)	26.1	(9)	32
10)	51.1	(11)	32.8	(12)	34.8
13)	79.2	(14)	17.6	(15)	56.7
16)	39.5	(17)	102.6	(18)	60.8
19)	29.7	(20)	84.8	(21)	30.6
22)	66.5	(23)	23.6	(24)	50.4