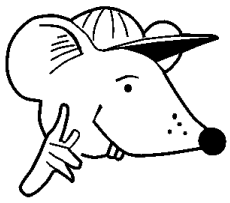
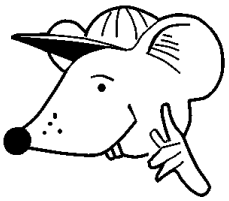


MATHEMATICS



Y6 Multiplication and Division
6312

Use known facts to multiply mentally

Equipment

Paper, pencil, ruler

MathSphere

Concepts

The mental calculation strategies for year 6 are very similar to earlier years, but the numbers do get very challenging, and many of the pages of this module are really for the most able of pupils.

It is recommended that tables in the teens e.g. 16 times table, can be worked out by adding the 6 times table to the ten times table.

Multiplying by 49 and 51 is introduced, again by multiplying by 50 and then adding or subtracting the number.

Multiplying two digits by one, mentally, is developed further by introducing decimals, with the emphasis on multiplying by the units first.

Decimal fractions are also used when recognising three other statements when given one

e.g. if $1.2 \times 6 = 7.2$ then

$6 \times 1.2 = 7.2$ and $7.2 \div 6 = 1.2$ and $7.2 \div 1.2 = 6$

15 times table

It's not too difficult to multiply by 15 in your head.
First multiply by 10 and then by 5.
(To multiply by 5 you can just halve the answer you got when multiplying by 10).
Then add your two answers together.

e.g. 7 x 15 = (7 x 10) + (7 x 5) = 70 + 35 = 105

Try these:

1. 4 x 15 = ☐ + ☐ = ☐

2. 10 x 15 = ☐ + ☐ = ☐

3. 5 x 15 = ☐ + ☐ = ☐

4. 3 x 15 = ☐ + ☐ = ☐

5. 6 x 15 = ☐ + ☐ = ☐

6. 11 x 15 = ☐ + ☐ = ☐

7. 9 x 15 = ☐ + ☐ = ☐

8. 8 x 15 = ☐ + ☐ = ☐

Multiply by 17

It's not too difficult to multiply by 17 in your head.
First multiply by 10 and then by 7.
Then add your two answers together.

e.g. 3 x 17 = (3 x 10) + (3 x 7) = 30 + 21 = 51

Try these:

1. 5 x 17 = ☐ + ☐ = ☐

2. 9 x 17 = ☐ + ☐ = ☐

3. 4 x 17 = ☐ + ☐ = ☐

4. 8 x 17 = ☐ + ☐ = ☐

5. 7 x 17 = ☐ + ☐ = ☐

6. 6 x 17 = ☐ + ☐ = ☐

7. 11 x 17 = ☐ + ☐ = ☐

8. 12 x 17 = ☐ + ☐ = ☐

Multiply by 14

How about trying to multiply by 14 in your head?
First multiply by 10 and then by 4.
(To multiply by 4 you can just double and double again).
Then add your two answers together.

e.g. 3 x 14 = (3 x 10) + (3 x 4) = 30 + 12 = 42

Try these:

1. 6 x 14 = ☐ + ☐ = ☐

2. 9 x 14 = ☐ + ☐ = ☐

3. 5 x 14 = ☐ + ☐ = ☐

4. 7 x 14 = ☐ + ☐ = ☐

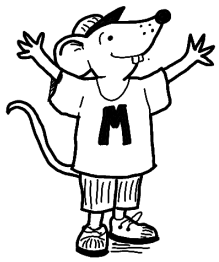
5. 12 x 14 = ☐ + ☐ = ☐

6. 8 x 14 = ☐ + ☐ = ☐

7. 4 x 14 = ☐ + ☐ = ☐

8. 11 x 14 = ☐ + ☐ = ☐

Multiply by 16



How about trying to multiply by 16 in your head?
First multiply by 10 and then by 6.

Then add your two answers together.

e.g. 3 x 16 = (3 x 10) + (3 x 6) = 30 + 18 = 48

Try these:

1. 4 x 16 = ☐ + ☐ = ☐

2. 7 x 16 = ☐ + ☐ = ☐

3. 5 x 16 = ☐ + ☐ = ☐

4. 11 x 16 = ☐ + ☐ = ☐

5. 8 x 16 = ☐ + ☐ = ☐

6. 12 x 16 = ☐ + ☐ = ☐

7. 9 x 16 = ☐ + ☐ = ☐

8. 6 x 16 = ☐ + ☐ = ☐

Multiply mentally

1. 7 x 12 =

2. 8 x 13 =

3. 9 x 14 =

4. 4 x 15 =

5. 6 x 16 =

6. 5 x 17 =

7. 9 x 18 =

8. 8 x 19 =

9. 6 x 21 =

10. 8 x 31 =

11. 7 x 41 =

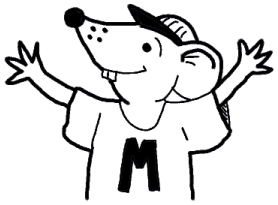
12. 9 x 51 =

13. 40 x 61 =

14. 30 x 71 =

Multiply by 101

Sounds difficult, but you can do it by multiplying a number by 100 and then adding on the number.



e.g. 43 x 101 = (43 x 100) + 43 = 4300 + 43 = 4343

Try these:

1. 14 x 101 = (14 x 100) + 14 = ☐ + 14 = ☐

2. 23 x 101 = (23 x 100) + 23 = ☐ + 23 = ☐

3. 35 x 101 = (35 x 100) + 35 = ☐ + 35 = ☐

4. 42 x 101 = (42 x 100) + 42 = ☐ + 42 = ☐

5. 53 x 101 = (53 x 100) + 53 = ☐ + 53 = ☐

6. 64 x 101 = (64 x 100) + 64 = ☐ + 64 = ☐

7. 72 x 101 = (72 x 100) + 72 = ☐ + 72 = ☐

8. 84 x 101 = (84 x 100) + 84 = ☐ + 84 = ☐

Multiply by 99

How about an ice-cream?
Multiply by 100 and then subtract the number.

e.g. 15 x 99 = (15 x 100) – 15 = 1500 – 15 = 1485

Try these:

1. 25 x 99 = (25 x 100) – 25 = ☐ – 25 = ☐

2. 23 x 99 = (23 x 100) – 23 = ☐ – 23 = ☐

3. 35 x 99 = (35 x 100) – 35 = ☐ – 35 = ☐

4. 46 x 99 = (46 x 100) – 46 = ☐ – 46 = ☐

5. 56 x 99 = (56 x 100) – 56 = ☐ – 56 = ☐

6. 28 x 99 = (28 x 100) – 28 = ☐ – 28 = ☐

7. 39 x 99 = (39 x 100) – 39 = ☐ – 39 = ☐

8. 45 x 99 = (45 x 100) – 45 = ☐ – 45 = ☐

Multiply two digits by one

Time yourself on these, working mentally.
Remember, the quickest way is usually to multiply the tens digit first.

e.g. 35 x 6 = (30 x 6) + (5 x 6) = 180 + 30 = 210

1. 23 x 9 = ☐ **2.** 34 x 8 = ☐ **3.** 42 x 7 = ☐

4. 56 x 5 = ☐ **5.** 64 x 4 = ☐ **6.** 72 x 3 = ☐

7. 86 x 2 = ☐ **8.** 91 x 9 = ☐ **9.** 27 x 5 = ☐

10. 36 x 6 = ☐ **11.** 45 x 7 = ☐ **12.** 37 x 8 = ☐

13. 19 x 9 = ☐ **14.** 23 x 8 = ☐ **15.** 31 x 7 = ☐

16. 48 x 8 = ☐ **17.** 56 x 9 = ☐ **18.** 67 x 2 = ☐

19. 77 x 3 = ☐ **20.** 88 x 4 = ☐

How long did you take?

Multiply whole number and tenths by a single digit

When multiplying numbers like these it is a good idea to start with the whole number or units.

e.g. 2.5 x 5 = (2 x 5) + (0.5 x 5) = 10 + 2.5 = 12.5

1. 2.4 x 3 = ☐ **2.** 3.3 x 4 = ☐ **3.** 4.6 x 5 = ☐

4. 5.3 x 6 = ☐ **5.** 6.1 x 7 = ☐ **6.** 7.5 x 8 = ☐

7. 8.2 x 9 = ☐ **8.** 9.2 x 2 = ☐ **9.** 8.4 x 3 = ☐

10. 7.7 x 4 = ☐ **11.** 6.4 x 5 = ☐ **12.** 5.8 x 6 = ☐

13. 4.4 x 7 = ☐ **14.** 3.8 x 8 = ☐ **15.** 2.7 x 9 = ☐

16. 1.6 x 8 = ☐ **17.** 2.9 x 7 = ☐ **18.** 3.4 x 6 = ☐

19. 4.3 x 5 = ☐ **20.** 2.9 x 4 = ☐

Quite quick, I hope!

Multiply whole number and tenths by a single digit

Start with the whole number or units and don't forget the decimal point in the answer!

e.g. 3.6 x 5 = (3 x 5) + (0.6 x 5) = 15 + 3 = 18

1. 2.8 x 2 = ☐ **2.** 3.4 x 5 = ☐ **3.** 4.7 x 3 = ☐

4. 5.4 x 5 = ☐ **5.** 6.2 x 6 = ☐ **6.** 7.4 x 7 = ☐

7. 8.3 x 8 = ☐ **8.** 9.4 x 9 = ☐ **9.** 8.7 x 2 = ☐

10. 7.8 x 3 = ☐ **11.** 6.5 x 4 = ☐ **12.** 5.9 x 5 = ☐

13. 4.5 x 6 = ☐ **14.** 3.9 x 7 = ☐ **15.** 2.5 x 8 = ☐

16. 1.7 x 9 = ☐ **17.** 3.3 x 8 = ☐ **18.** 9.1 x 7 = ☐

19. 5.3 x 5 = ☐ **20.** 1.9 x 6 = ☐

Quite quick, I hope!

Relationship between multiplication and division

Knowing one thing means that you actually know 4.
Have a look: if 0.65 x 5 = 3.25 then:
5 x 0.65 = 3.25
3.25 ÷ 0.65 = 5 and
3.25 ÷ 5 = 0.65

Make up three other sums from each of these:

1. 0.25 x 7 = 1.75

2. 0.55 x 6 = 3.3

3. 0.47 x 4 = 1.88

4. 0.85 x 5 = 4.25

5. 0.9 x 1.9 = 1.71

6. 0.95 x 9 = 8.55

Relationship between multiplication and division

Knowing one thing means that you actually know 4.
Have a look: if 0.65 x 5 = 3.25 then:
5 x 0.65 = 3.25
3.25 ÷ 0.65 = 5 and
3.25 ÷ 5 = 0.65

Make up three other sums from each of these:

1. 0.35 x 6 = 2.1

2. 0.45 x 7 = 3.15

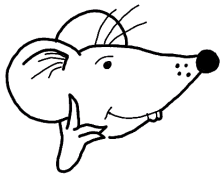
3. 0.52 x 4 = 2.08

4. 0.4 x 6 = 2.4

5. 0.7 x 6 = 4.2

6. 0.99 x 2 = 1.98

Knowing one thing means you know another



One thing just leads to three others.
Take a look:

If 30 x 5 = 150 then $^1/_{30}$ of 150 is 5 and $^1/_5$ of 150 is 30

Try filling the gaps in these statements

1. If 6 x 40 = 240 then ___ of 240 is ☐ and ___ of 240 is ☐

2. If 7 x 50 = 350 then ___ of 350 is ☐ and ___ of 350 is ☐

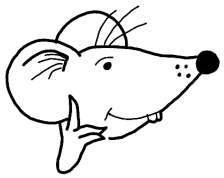
3. If 8 x 60 = 480 then ___ of 480 is ☐ and ___ of 480 is ☐

4. If 9 x 60 = 540 then ___ of 540 is ☐ and ___ of 540 is ☐

5. If 7 x 70 = 490 then ___ of 490 is ☐ and ___ of 490 is ☐

6. If 6 x 30 = 180 then ___ of 180 is ☐ and ___ of 180 is ☐

Knowing one thing means you know another



One thing just leads to three others.
Take a look:

If 25 x 5 = 125 then $^1/_{25}$ of 125 is 5 and $^1/_5$ of 125 is 25

Try filling the gaps in these statements

1. If 4 x 75 = 300 then ___ of 300 is ___ and ___ of 300 is ___

2. If 5 x 65 = 325 then ___ of 325 is ___ and ___ of 325 is ___

3. If 6 x 55 = 330 then ___ of 330 is ___ and ___ of 330 is ___

4. If 7 x 45 = 315 then ___ of 315 is ___ and ___ of 315 is ___

5. If 8 x 35 = 280 then ___ of 280 is ___ and ___ of 280 is ___

6. If 9 x 25 = 225 then ___ of 225 is ___ and ___ of 225 is ___

Relationship between multiplication and division

Think carefully about these and you will find them quite easy.
If 1.3 x 1.4 = 1.82
Then:
1.4 x 1.3 = 1.82
1.82 ÷ 1.3 = 1.4 and
1.82 ÷ 1.4 = 1.3

Make up three other sums from each of these:

1. 1.4 x 1.6 = 2.24

2. 1.5 x 1.8 = 2.7

3. 2.08 ÷1.3 = 1.6

4. 2.3 x 2.4 = 5.52

5. 12 ÷ 2.5 = 4.8

6. 2.16 ÷ 1.2 = 1.8

Answers

Page 3

1. 40 + 20 = 60 **2.** 100 + 50 = 150 **3.** 50 + 25 = 75 **4.** 30 + 15 = 45
5. 60 + 30 = 90 **6.** 110 + 55 = 165 **7.** 90 + 45 = 135 **8.** 80 + 40 = 120

Page 4

1. 50 + 35 = 85 **2.** 90 + 63 = 153 **3.** 40 + 28 = 68 **4.** 80 + 56 = 136
5. 70 + 49 = 119 **6.** 60 + 42 = 102 **7.** 110 + 77 = 187 **8.** 120 + 84 = 204

Page 5

1. 60 + 24 = 84 **2.** 90 + 36 = 126 **3.** 50 + 20 = 70 **4.** 70 + 28 = 98
5. 120 + 48 = 168 **6.** 80 + 32 = 112 **7.** 40 + 16 = 56 **8.** 110 + 44 = 154

Page 6

1. 40 + 24 = 64 **2.** 70 + 42 = 112 **3.** 50 + 30 = 80 **4.** 110 + 66 = 176
5. 80 + 48 = 128 **6.** 120 + 72 = 192 **7.** 90 + 54 = 144 **8.** 60 + 36 = 96

Page 7

1. 84 **2.** 104 **3.** 126 **4.** 60 **5.** 96 **6.** 85 **7.** 162
8. 152 **9.** 126 **10.** 248 **11.** 287 **12.** 459 **13.** 2440 **14.** 2130

Page 8

1. 1400 + 14 = 1414 **2.** 2300 + 23 = 2323 **3.** 3500 + 35 = 3535 **4.** 4200 + 42 = 4242
5. 5300 + 53 = 5353 **6.** 6400 + 64 = 6464 **7.** 7200 + 72 = 7272 **8.** 8400 + 84 = 8484

Page 9

1. 2500 – 25 = 2475 **2.** 2300 – 23 = 2277 **3.** 3500 – 35 = 3465 **4.** 4600 – 46 = 4554
5. 5600 – 56 = 5544 **6.** 2800 – 28 = 2772 **7.** 3900 – 39 = 3861 **8.** 4500 – 45 = 4455

Page 10

1. 207 **2.** 272 **3.** 294 **4.** 280 **5.** 256 **6.** 216 **7.** 172 **8.** 819
9. 135 **10.** 216 **11.** 315 **12.** 296 **13.** 171 **14.** 184 **15.** 217 **16.** 384
17. 504 **18.** 134 **19.** 231 **20.** 352

Page 11

1. 7.2 **2.** 13.2 **3.** 23 **4.** 31.8 **5.** 42.7 **6.** 60 **7.** 73.8
8. 18.4 **9.** 25.2 **10.** 30.8 **11.** 32 **12.** 34.8 **13.** 30.8 **14.** 30.4
15. 24.3 **16.** 12.8 **17.** 20.3 **18.** 20.4 **19.** 21.5 **20.** 11.6

Answers

Page 12

1. 5.6	**2.** 17	**3.** 14.1	**4.** 27	**5.** 37.2	**6.** 51.8	**7.** 66.4
8. 84.6	**9.** 17.4	**10.** 23.4	**11.** 26	**12.** 29.5	**13.** 27	**14.** 27.3
15. 20	**16.** 15.3	**17.** 26.4	**18.** 63.7	**19.** 26.5	**20.** 11.4	

Page 13

1. 7 x 0.25 = 1.75,	1.75 ÷ 7 = 0.25,	1.75 ÷ 0.25 = 7
2. 6 x 0.55 = 3.3,	3.3 ÷ 6 = 0.55,	3.3 ÷ 0.55 = 6,
3. 4 x 0.47 = 1.88,	1.88 ÷ 4 = 0.47	1.88 ÷ 0.47 = 4,
4. 5 x 0.85 = 4.25,	4.25 ÷ 5 = 0.85,	4.25 ÷ 0.85 = 5
5. 1.9 x 0.9 = 1.71,	1.71 ÷ 1.9 = 0.9,	1.71 ÷ 0.9 = 1.9
6. 9 x 0.95 = 8.55,	8.55 ÷ 9 = 0.95	8.55 ÷ 0.95 = 9

Page 14

1. 6 x 0.35 = 2.1,	2.1 ÷ 6 = 0.35,	2.1 ÷ 0.35 = 6
2. 7 x 0.45 = 3.15,	3.15 ÷ 7 = 0.45,	3.15 ÷ 0.45 = 7,
3. 4 x 0.52 = 2.08,	2.08 ÷ 4 = 0.52	2.08 ÷ 0.52 = 4,
4. 6 x 0.4 = 2.4,	2.4 ÷ 6 = 0.4,	2.4 ÷ 0.4 = 6
5. 6 x 0.7 = 4.2,	4.2 ÷ 6 = 0.7,	4.2 ÷ 0.7 = 6
6. 2 x 0.99 = 1.98,	1.98 ÷ 2 = 0.99	1.98 ÷ 0.99 = 2

Page 15

1. 1/6 of 240 is 40 and 1/40 of 240 is 6
2. 1/7 of 350 is 50 and 1/50 of 350 is 7
3. 1/8 of 480 is 60 and 1/60 of 480 is 8
4. 1/9 of 540 is 60 and 1/60 of 540 is 9
5. 1/7 of 490 is 70 and 1/70 of 490 is 7
6. 1/6 of 180 is 30 and 1/30 of 180 is 6

Page 16

1. 1/4 of 300 is 75 and 1/75 of 300 is 4
2. 1/5 of 325 is 65 and 1/65 of 325 is 5
3. 1/6 of 330 is 55 and 1/55 of 330 is 6
4. 1/7 of 315 is 45 and 1/45 of 315 is 7
5. 1/8 of 280 is 35 and 1/35 of 280 is 8
6. 1/9 of 225 is 25 and 1/25 of 225 is 9

Page 17

1. 1.6 x 1.4 = 2.24,	2.24 ÷ 1.6 = 1.4,	2.24 ÷ 1.4 = 1.6
2. 1.8 x 1.5 = 2.7,	2.7 ÷ 1.8 = 1.5,	2.7 ÷ 1.5 = 1.8
3. 1.6 x 1.3 = 2.08,	1.3 x 1.6 = 2.08	2.08 ÷ 1.6 = 1.3
4. 2.4 x 2.3 = 5.52,	5.52 ÷ 2.4 = 2.3,	5.52 ÷ 2.3 = 2.4
5. 4.8 x 2.5 = 12,	2.5 x 4.8 = 12	12 ÷ 4.8 = 2.5
6. 1.8 x 1.2 = 2.16,	1.2 x 1.8 = 2.16	2.16 ÷ 1.8 = 1.2