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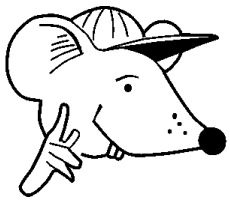
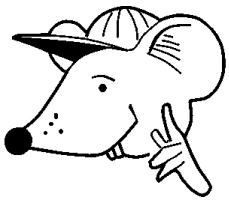


MATHEMATICS



N.S. Yr. 5 P.63

Use known facts to calculate mentally

Equipment

Paper, pencil, ruler

MathSphere

Concepts

In year 5 strategies to calculate from known facts are further developed.

The 12 times table has been popular with parents for many years, but lost a great deal of its importance when 12 pennies in a shilling disappeared! Whilst children are not expected to know off by heart their 12 times table they should be able to calculate it quickly by adding the 10 times table to the 2 times table.

Multiplying by 21 can be calculated mentally by multiplying by 20 and adding the number on to the answer. In a similar way, multiplying by 19 can be calculated mentally by multiplying by 20 and subtracting the number from the answer.

An especially useful part of this module is for children to recognise fractions from multiplication statements such as:

If 12 x 3 = 36 then $^{1}/_{12}$ of 36 is 3 and $^{1}/_{3}$ of 36 is 12

Whilst it might seem obvious that four different multiplication or division sums can be made from a set of three numbers such as 12, 10 and 120, it is vital that children recognise this relationship between multiplication and division.

Multiply by 12

Some people (especially those who still use feet and inches!!) think it is important to know how to multiply by 12.
It's easy – just add 10 times the number to 2 times the number.

eg 14 x 12 = (14 x 10) + (14 x 2) = 140 + 28 = 168

Try these:

1. 13 x 12 = ☐ + ☐ = ☐

2. 17 x 12 = ☐ + ☐ = ☐

3. 23 x 12 = ☐ + ☐ = ☐

4. 31 x 12 = ☐ + ☐ = ☐

5. 24 x 12 = ☐ + ☐ = ☐

6. 33 x 12 = ☐ + ☐ = ☐

7. 16 x 12 = ☐ + ☐ = ☐

8. 42 x 12 = ☐ + ☐ = ☐

Multiply by 12

Some people (especially those who still use feet and inches!!) think it is important to know how to multiply by 12.
It's easy – just add 10 times the number to 2 times the number. Reminds me of the stone age!

eg 14 x 12 = (14 x 10) + (14 x 2) = 140 + 28 = 168

Try these:

1. 15 x 12 = ☐ + ☐ = ☐

2. 12 x 12 = ☐ + ☐ = ☐

3. 25 x 12 = ☐ + ☐ = ☐

4. 32 x 12 = ☐ + ☐ = ☐

5. 26 x 12 = ☐ + ☐ = ☐

6. 34 x 12 = ☐ + ☐ = ☐

7. 18 x 12 = ☐ + ☐ = ☐

8. 44 x 12 = ☐ + ☐ = ☐

Multiply by 12

1. 23 x 12 =

2. 26 x 12 =

3. 35 x 12 =

4. 45 x 12 =

5. 51 x 12 =

6. 53 x 12 =

7. 18 x 12 =

8. 34 x 12 =

9. 43 x 12 =

10. 52 x 12 =

11. 25 x 12 =

12. 38 x 12 =

13. 44 x 12 =

14. 14 x 12 =

Multiply by 21

To multiply by 21, just multiply by 20 and then add the number on.
Easy!

eg 16 x 21 = (16 x 20) + 16 = 320 + 16 = 336

Try these:

1. 15 x 21 = (15 x 20) + 15 = ☐ + 15 = ☐

2. 12 x 21 = (12 x 20) + 12 = ☐ + 12 = ☐

3. 26 x 21 = (26 x 20) + 26 = ☐ + 26 = ☐

4. 31 x 21 = (31 x 20) + 31 = ☐ + 31 = ☐

5. 42 x 21 = (42 x 20) + 42 = ☐ + 42 = ☐

6. 24 x 21 = (24 x 20) + 24 = ☐ + 24 = ☐

7. 18 x 21 = (18 x 20) + 18 = ☐ + 18 = ☐

8. 44 x 21 = (44 x 20) + 44 = ☐ + 44 = ☐

Multiply by 21

To multiply by 21, just multiply by 20 and then add the number on.
Easy!

eg 24 x 21 = (24 x 20) + 24 = 480 + 24 = 504

Try these:

1. 14 x 21 = (14 x 20) + 14 = ☐ + 14 = ☐

2. 13 x 21 = (13 x 20) + 13 = ☐ + 13 = ☐

3. 25 x 21 = (25 x 20) + 25 = ☐ + 25 = ☐

4. 33 x 21 = (33 x 20) + 33 = ☐ + 33 = ☐

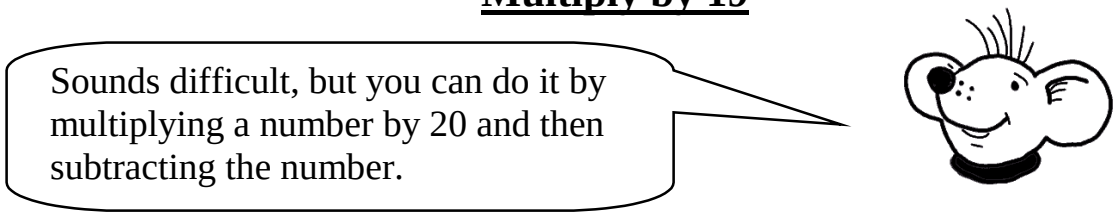
5. 43 x 21 = (43 x 20) + 43 = ☐ + 43 = ☐

6. 22 x 21 = (22 x 20) + 22 = ☐ + 22 = ☐

7. 19 x 21 = (19 x 20) + 19 = ☐ + 19 = ☐

8. 45 x 21 = (45 x 20) + 45 = ☐ + 45 = ☐

Multiply by 19



eg 13 x 19 = (13 x 20) – 13 = 260 – 13 = 247

Try these:

1. 12 x 19 = (12 x 20) – 12 = ☐ – 12 = ☐

2. 16 x 19 = (16 x 20) – 16 = ☐ – 16 = ☐

3. 22 x 19 = (22 x 20) – 22 = ☐ – 22 = ☐

4. 25 x 19 = (25 x 20) – 25 = ☐ – 25 = ☐

5. 32 x 19 = (32 x 20) – 32 = ☐ – 32 = ☐

6. 35 x 19 = (35 x 20) – 35 = ☐ – 35 = ☐

7. 41 x 19 = (41 x 20) – 41 = ☐ – 41 = ☐

8. 44 x 19 = (44 x 20) – 44 = ☐ – 44 = ☐

Multiply by 19

Remember, you can multiply by 19 by multiplying a number by 20 and then subtracting the number.

eg 12 x 19 = (12 x 20) – 12 = 240 – 12 = 228

Try these:

1. 14 x 19 = (14 x 20) – 14 = ☐ – 14 = ☐

2. 15 x 19 = (15 x 20) – 15 = ☐ – 15 = ☐

3. 23 x 19 = (23 x 20) – 23 = ☐ – 23 = ☐

4. 24 x 19 = (24 x 20) – 24 = ☐ – 24 = ☐

5. 31 x 19 = (31 x 20) – 31 = ☐ – 31 = ☐

6. 36 x 19 = (36 x 20) – 36 = ☐ – 36 = ☐

7. 42 x 19 = (42 x 20) – 42 = ☐ – 42 = ☐

8. 49 x 19 = (49 x 20) – 49 = ☐ – 49 = ☐

Multiply two digits by one

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

eg 23 x 3 = (20 x 3) + (3 x 3) = 60 + 9 = 69

1. 46 x 2 = ☐ **2.** 35 x 3 = ☐ **3.** 34 x 4 = ☐

4. 53 x 2 = ☐ **5.** 37 x 3 = ☐ **6.** 24 x 4 = ☐

7. 72 x 5 = ☐ **8.** 61 x 6 = ☐ **9.** 83 x 5 = ☐

10. 64 x 5 = ☐ **11.** 41 x 3 = ☐ **12.** 52 x 4 = ☐

13. 44 x 6 = ☐ **14.** 53 x 4 = ☐ **15.** 64 x 6 = ☐

16. 61 x 4 = ☐ **17.** 38 x 3 = ☐ **18.** 55 x 4 = ☐

19. 63 x 4 = ☐ **20.** 56 x 3 = ☐

How long did you take?

Multiply two digits by one

When doing these sums, multiply the tens digit first and then the units – all in your head!
Work as quickly as you can!

eg 21 x 3 = (20 x 3) + (1 x 3) = 60 + 3 = 63

1. 47 x 2 = ☐ **2.** 36 x 3 = ☐ **3.** 37 x 4 = ☐

4. 54 x 2 = ☐ **5.** 38 x 3 = ☐ **6.** 25 x 4 = ☐

7. 73 x 5 = ☐ **8.** 63 x 6 = ☐ **9.** 86 x 5 = ☐

10. 65 x 5 = ☐ **11.** 42 x 3 = ☐ **12.** 56 x 4 = ☐

13. 46 x 6 = ☐ **14.** 51 x 4 = ☐ **15.** 65 x 6 = ☐

16. 62 x 4 = ☐ **17.** 39 x 3 = ☐ **18.** 58 x 4 = ☐

19. 72 x 4 = ☐ **20.** 75 x 3 = ☐

How long did you take?

You know more than you think…

Knowing your tables helps you a lot with fractions.
Have a look below!

If 10 x 6 = 60 then $^{1}/_{10}$ of 60 is 6 and $^{1}/_{6}$ of 60 is 10

Try filling the gaps in these statements

1. If 3 x 10 = 30 then $\frac{\square}{\square}$ of 30 is $\square$ and $\frac{\square}{\square}$ of 30 is $\square$

2. If 6 x 9 = 54 then $\frac{\square}{\square}$ of 54 is $\square$ and $\frac{\square}{\square}$ of 54 is $\square$

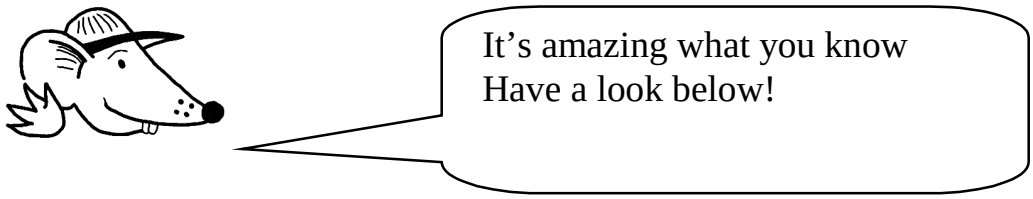
3. If 12 x 4 = 48 then $\frac{\square}{\square}$ of 48 is $\square$ and $\frac{\square}{\square}$ of 48 is $\square$

4. If 5 x 9 = 45 then $\frac{\square}{\square}$ of 45 is $\square$ and $\frac{\square}{\square}$ of 45 is $\square$

5. If 4 x 6 = 24 then $\frac{\square}{\square}$ of 24 is $\square$ and $\frac{\square}{\square}$ of 24 is $\square$

6. If 7 x 8 = 56 then $\frac{\square}{\square}$ of 56 is $\square$ and $\frac{\square}{\square}$ of 56 is $\square$

You know more than you think…



If 12 x 5 = 60 then $^{1}/_{12}$ of 60 is 5 and $^{1}/_{5}$ of 60 is 12

Try filling the gaps in these statements

1. If 6 x 10 = 60 then $\frac{\square}{\square}$ of 60 is $\square$ and $\frac{\square}{\square}$ of 60 is $\square$

2. If 5 x 8 = 40 then $\frac{\square}{\square}$ of 40 is $\square$ and $\frac{\square}{\square}$ of 40 is $\square$

3. If 11 x 3 = 33 then $\frac{\square}{\square}$ of 33 is $\square$ and $\frac{\square}{\square}$ of 33 is $\square$

4. If 7 x 4 = 28 then $\frac{\square}{\square}$ of 28 is $\square$ and $\frac{\square}{\square}$ of 28 is $\square$

5. If 6 x 7 = 42 then $\frac{\square}{\square}$ of 42 is $\square$ and $\frac{\square}{\square}$ of 42 is $\square$

6. If 9 x 5 = 45 then $\frac{\square}{\square}$ of 45 is $\square$ and $\frac{\square}{\square}$ of 45 is $\square$

Relationship between multiplication and division

Have a quick whizz through these.
If you know that 120 x 30 = 360 then you can make up three other sums:
30 x 120 = 360
360 ÷ 30 = 120 and
360 ÷ 120 = 30

Make up three other sums from each of these:

1. 27 x 13 = 351

2. 2640 ÷55 = 48

3. 5082 ÷66 = 77

4. 82 x 81 = 6642

5. 80 x 70 = 5600

6. 2430 ÷ 45 = 54

Make your own up!

Make up 2 multiplication and 2 division statements, (or sums) from the following sets of numbers:

1. **16, 61, 976**

2. **33, 44, 1452**

3. **50, 60, 3 000**

4. **77, 88, 6776**

5. **47, 74, 3478**

6. **22, 99, 2178**

Answers

Page 3

1. 130 + 26 = 156 **2.** 170 + 34 = 204 **3.** 230 + 46 = 276 **4.** 310 + 62 = 372
5. 240 + 48 = 288 **6.** 330 + 66 = 396 **7.** 160 + 32 = 192 **8.** 420 + 84 = 504

Page 4

1. 150 + 30 = 180 **2.** 120 + 24 = 144 **3.** 250 + 50 = 300 **4.** 320 + 64 = 384
5. 260 + 52 = 312 **6.** 340 + 68 = 408 **7.** 180 + 36 = 216 **8.** 440 + 88 = 528

Page 5

1. 276 **2.** 312 **3.** 420 **4.** 540 **5.** 612 **6.** 636 **7.** 216
8. 408 **9.** 516 **10.** 624 **11.** 300 **12.** 456 **13.** 528 **14.** 168

Page 6

1. 300 + 15 = 315 **2.** 240 + 12 = 252 **3.** 520 + 26 = 546 **4.** 620 + 31 = 651
5. 840 + 42 = 882 **6.** 480 + 24 = 504 **7.** 360 + 18 = 378 **8.** 880 + 44 = 924

Page 7

1. 280 + 14 = 294 **2.** 260 + 13 = 273 **3.** 500 + 25 = 525 **4.** 660 + 33 = 693
5. 860 + 43 = 903 **6.** 440 + 22 = 462 **7.** 380 + 19 = 399 **8.** 900 + 45 = 945

Page 8

1. 240 – 12 = 228 **2.** 320 – 16 = 304 **3.** 440 – 22 = 418 **4.** 500 – 25 = 475
5. 640 – 32 = 608 **6.** 700 – 35 = 665 **7.** 820 – 41 = 779 **8.** 880 – 44 = 836

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1. 280 – 14 = 266 **2.** 300 – 15 = 285 **3.** 460 – 23 = 437 **4.** 480 – 24 = 456
5. 620 – 31 = 589 **6.** 720 – 36 = 684 **7.** 840 – 42 = 798 **8.** 980 – 49 = 931

Page 10

1. 92 **2.** 105 **3.** 136 **4.** 106 **5.** 111 **6.** 96 **7.** 360 **8.** 366
9. 415 **10.** 320 **11.** 123 **12.** 208 **13.** 264 **14.** 212 **15.** 384 **16.** 244
17. 114 **18.** 220 **19.** 252 **20.** 168

Page 11

1. 94 **2.** 108 **3.** 148 **4.** 108 **5.** 114 **6.** 100 **7.** 365 **8.** 378
9. 430 **10.** 325 **11.** 126 **12.** 224 **13.** 276 **14.** 204 **15.** 390 **16.** 248
17. 117 **18.** 232 **19.** 288 **20.** 225

Answers

Page 12

1. 1/3 of 30 is 10 and 1/10 of 30 is 3
2. 1/6 of 54 is 9 and 1/9 of 54 is 6
3. 1/12 of 48 is 4 and 1/4 of 48 is12
4. 1/5 of 45 is 9 and 1/9 of 45 is 5
5. 1/4 of 24 is 6 and 1/6 of 24 is 4
6. 1/7 of 56 is 8 and 1/8 of 56 is 7

Page 13

1. 1/6 of 60 is 10 and 1/10 of 60 is 6
2. 1/5 of 40 is 8 and 1/8 of 40 is 5
3. 1/11 of 33 is 3 and 1/3 of 33 is11
4. 1/7 of 28 is 4 and 1/4 of 28 is 7
5. 1/6 of 42 is 7 and 1/7 of 42 is 6
6. 1/9 of 45 is 5 and 1/5 of 45 is 9

Page 14

1. 13 x 27 = 351, 351 ÷ 27 = 13, 351 ÷ 13 = 27
2. 55 x 48 = 2640, 48 x 55 = 2640, 2640 ÷ 48 = 55,
3. 66 x 77 = 5082, 77 x 66 = 5082 5082 ÷ 77 = 66,
4. 81 x 82 = 6642, 6642 ÷ 81 = 82, 6642 ÷ 82 = 81
5. 70 x 80 = 5600, 5600 ÷ 70 = 80, 5600 ÷ 80 = 70
6. 45 x 54 = 2430, 54 x 45 = 2430 2430 ÷ 54 = 45,

Page 15

1. 16 x 61 = 976, 61 x 16 = 976, 976 ÷ 16 = 61, 976 ÷ 61 = 16
2. 33 x 44 = 1452, 44 x 33 = 1452, 1452 ÷ 33 = 44, 1452 ÷ 44 = 33
3. 50 x 60 = 3000, 60 x 50 = 3000, 3000 ÷ 50 = 60, 3000 ÷ 60 = 50
4. 77 x 88 = 6776, 88 x 77 = 6776, 6776 ÷ 77 = 88, 6776 ÷ 88 = 77
5. 47 x 74 = 3478, 74 x 47 = 3478, 3478 ÷ 47 = 74, 3478 ÷ 74 = 47
6. 22 x 99 = 2178, 99 x 22 = 2178, 2178 ÷ 22 = 99, 2178 ÷ 99 = 22