

DR BAKER'S YEAR 5 MATHS
TUESDAY 24TH MARCH



WELCOME TO DAY 2

“Morning. I hope you all got on OK yesterday and I didn’t set too much work for you. Did you get the answer to the starter problem? The number I was thinking of was 19. Today we are going to start with some time tables. Answers tomorrow.”

1. $5 \times 9 =$

2. $2 \times 8 =$

3. $10 \times 11 =$

4. $6 \times 3 =$

5. $4 \times 8 =$

6. $3 \times 7 =$

7. $7 \times 8 =$

8. $4 \times 7 =$

9. $12 \times 6 =$

10. $9 \times 3 =$

11. $7 \times 11 =$

12. $12 \times 12 =$

13. $8 \times 6 =$

14. $10 \times 12 =$

15. $3 \times 3 =$

TASKS FOR TODAY

L.O. To recognise and use square numbers

First watch this video on square and cubed numbers

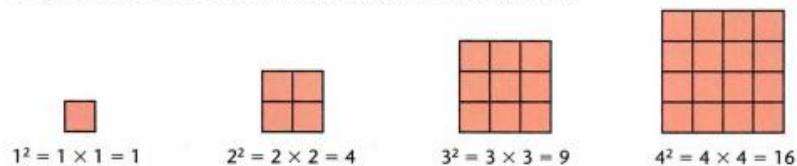
<https://www.bbc.co.uk/bitesize/topics/zyhs7p3/articles/z2ndsrd>

Have a go at the questions underneath.

Then have a go at the questions on the following slide. Work for the remainder of the hour. Pick level A, B or C and mark as you go, moving between levels as usual if you are getting them right or wrong. The answers are at the end of the slides. On B and C the last section of questions are meant to be challenging and make you think. Just try numbers out until you spot a pattern or come up with the answer. It might also be useful to write out all you square numbers if you haven't done so.

TARGET To recognise and use square numbers.

When a number is multiplied by itself you get a square number. They are called square numbers because they make square patterns.



A

1 Complete this table up to 12^2 .

$1^2 = 1 \times 1 = 1$
 $2^2 = 2 \times 2 = 4$
 $3^2 = 3 \times 3 = 9$

Work out the area of each square.

- | | | | |
|---|----------------|----|----------------|
| 2 | Sides
5 cm | 7 | Sides
11 cm |
| 3 | Sides
9 cm | 8 | Sides
7 cm |
| 4 | Sides
10 cm | 9 | Sides
4 cm |
| 5 | Sides
6 cm | 10 | Sides
12 cm |
| 6 | Sides
3 cm | 11 | Sides
8 cm |

B

Work out

- | | | | |
|---|--------------|----|--------------|
| 1 | $5^2 + 2^2$ | 7 | $10^2 + 6^2$ |
| 2 | $11^2 + 4^2$ | 8 | $7^2 + 3^2$ |
| 3 | $6^2 + 3^2$ | 9 | $12^2 + 1^2$ |
| 4 | $7^2 - 4^2$ | 10 | $10^2 - 5^2$ |
| 5 | $9^2 - 5^2$ | 11 | $11^2 - 9^2$ |
| 6 | $8^2 - 2^2$ | 12 | $8^2 - 4^2$ |

Work out

- | | | | |
|----|---------|----|---------|
| 13 | 10^2 | 19 | 70^2 |
| 14 | 20^2 | 20 | 50^2 |
| 15 | 60^2 | 21 | 40^2 |
| 16 | 80^2 | 22 | 90^2 |
| 17 | 30^2 | 23 | 120^2 |
| 18 | 110^2 | 24 | 100^2 |

Find a pair of square numbers which give a total of:

- | | | | |
|----|-----|----|--------|
| 25 | 20 | 31 | 2000 |
| 26 | 85 | 32 | 6500 |
| 27 | 37 | 33 | 9000 |
| 28 | 89 | 34 | 14 900 |
| 29 | 153 | 35 | 6100 |
| 30 | 170 | 36 | 7200 |

C

Work out

- | | | | |
|---|----------|----|----------------|
| 1 | 100^2 | 7 | $100^2 - 70^2$ |
| 2 | 200^2 | 8 | $40^2 + 20^2$ |
| 3 | 500^2 | 9 | $70^2 - 30^2$ |
| 4 | 800^2 | 10 | $60^2 + 50^2$ |
| 5 | 600^2 | 11 | $90^2 - 30^2$ |
| 6 | 1000^2 | 12 | $80^2 + 40^2$ |

Lagrange's Theorem

Every whole number can be written as the sum of four or fewer square numbers.

Examples

$19 = 16 + 1 + 1 + 1$
 $35 = 25 + 9 + 1$

Make the following numbers from four or fewer square numbers.

- | | | | |
|----|----|----|------|
| 13 | 23 | 19 | 123 |
| 14 | 31 | 20 | 142 |
| 15 | 48 | 21 | 483 |
| 16 | 63 | 22 | 933 |
| 17 | 79 | 23 | 3485 |
| 18 | 96 | 24 | 8058 |

ANSWERS

A 1. $1 \times 1 = 1$

12. $12 \times 12 = 144$

2. $2 \times 2 = 4$

2. 25

3. $3 \times 3 = 9$

3. 81

4. $4 \times 4 = 16$

4. 100

5. $5 \times 5 = 25$

5. 36

6. $6 \times 6 = 36$

6. 9

7. $7 \times 7 = 49$

7. 121

8. $8 \times 8 = 64$

8. 49

9. $9 \times 9 = 81$

9. 16

10. $10 \times 10 = 100$

10. 144

11. $11 \times 11 = 121$

11. 64

B

1. 29

2. 137

3. 45

4. 33

5. 56

6. 60

7. 136

8. 58

9. 145

10. 75

11. 40

12. 48

13. 100

14. 400

15. 3600

16. 6400

17. 900

18. 12100

19. 4900

20. 2500

21. 1600

22. 8100

23. 14400

24. 10000

25. 2 and 4

26. 2 and 9

27. 6 and 1

28. 8 and 5

29. 12 and 3

30. 7 and 11

31. 40 and 20

32. 80 and 10

33. 90 and 30

34. 100 and 70

35. 60 and 50

36. 60 and 60

C

1. 10000

2. 40000

3. 250000

4. 640000

5. 360000

6. 1000000

7. 5100

8. 2000

9. 4000

10. 6100

11. 7200

12. 8000

13. Onwards –
your answers