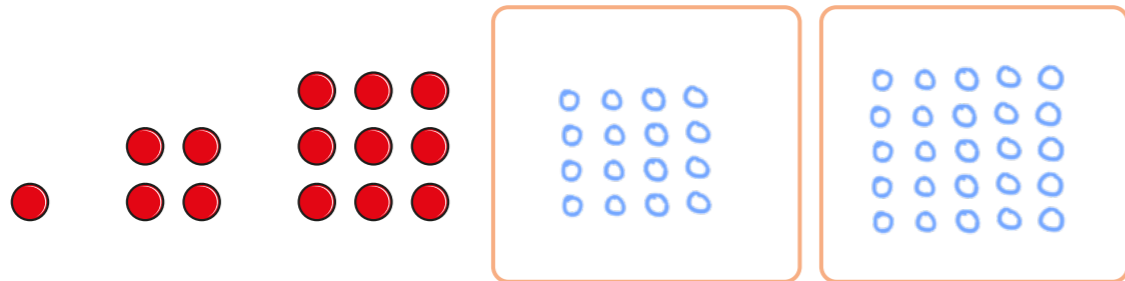


# Recognise square and triangular numbers

1 The pattern shows the first three square numbers.



a) What are the first three square numbers?

1 4 9

b) Draw the 4th and 5th square numbers.

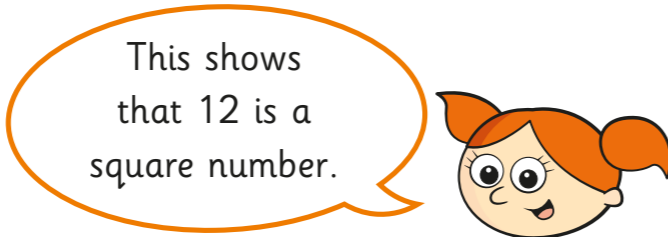
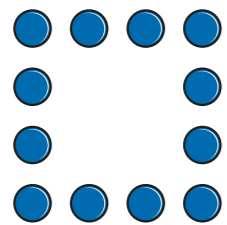
c) What are the 4th and 5th square numbers?

16 25

d) List the first ten square numbers.

1, 4, 9, 16, 25, 36, 49, 64, 81, 100

2 Alex uses counters to make a square.

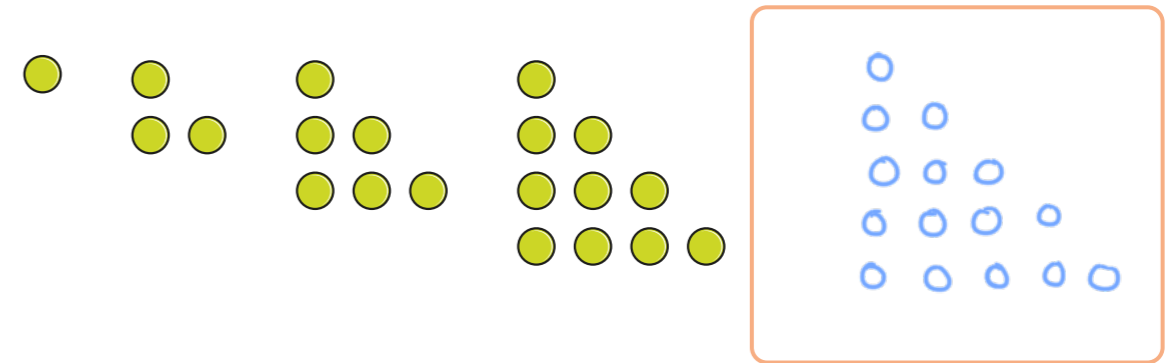


Do you agree with Alex? No

Explain your answer.

This isn't a complete square.

3 The pattern shows the first four triangular numbers.



a) What are the first four triangular numbers?

1 3 6 10

b) Draw the 5th triangular number.

c) What is the 5th triangular number?

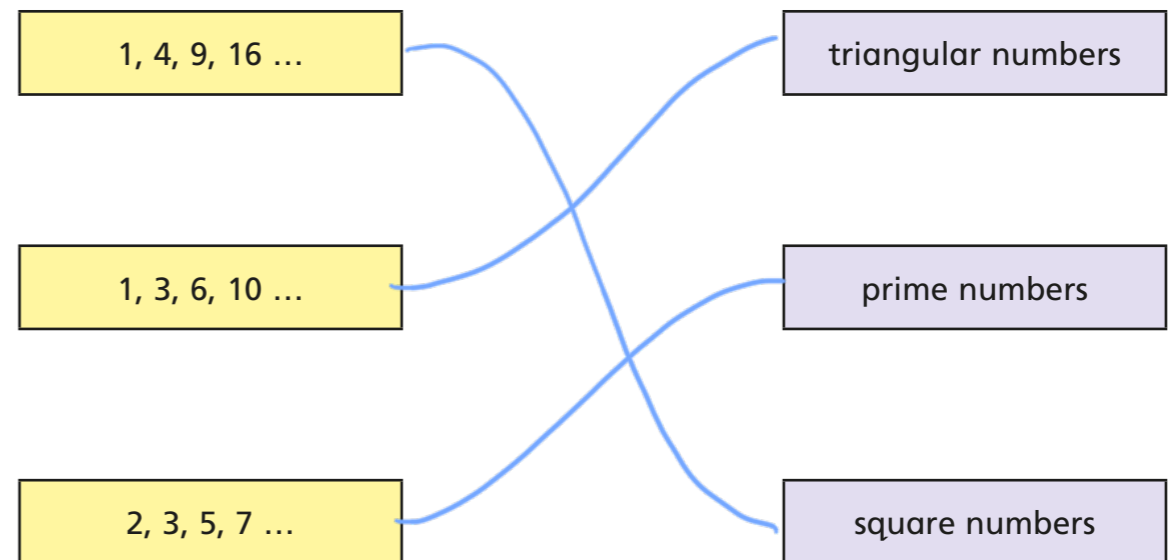
15

d) List the first ten triangular numbers.

1, 3, 6, 10, 15, 21, 28, 36, 45, 55

e) Explain to a partner how the pattern of triangular numbers is formed.

4 Match the sequences to the descriptions.



5 Work out the values.

a)  $11^2$  121

e)  $15^2$  225

b)  $12^2$  144

f)  $1.5^2$  2.25

c)  $13^2$  169

g)  $150^2$  22,500

d)  $14^2$  196

h)  $0.15^2$  0.0225

6



The 5th triangular number is 15, so the 10th triangular number must be double this, which is 30

Explain why Whitney is incorrect.

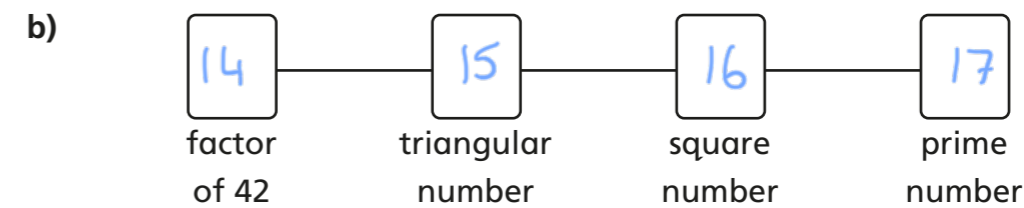
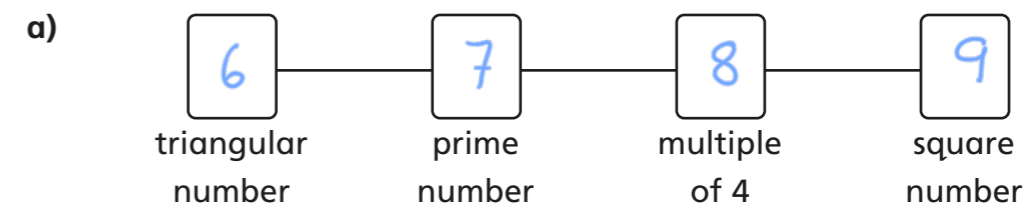
The 10<sup>th</sup> triangular number is 55

7 Is it possible for a number to be both square and prime? No

Explain your answer.

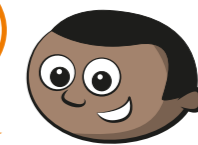
Square numbers have an odd number of factors and prime numbers have exactly 2 factors.

8 Use the clues to find four consecutive numbers that fit in the boxes.



9

If you square a number, the answer will always be bigger because you are multiplying.



Give two examples to show that Mo is incorrect.

$0.5^2 = 0.25$  and  $0.25 < 0.5$

10 Filip and Dani are investigating square numbers. They have found that 25 is a square number and can be written as the sum of two square numbers.

$9 + 16 = 25$  or  $3^2 + 4^2 = 5^2$

Find two more examples of square numbers that can be written as the sum of two square numbers.

e.g.  $6^2 + 8^2 = 10^2$        $5^2 + 12^2 = 13^2$

Compare answers with a partner.