Prime Numbers Investigation

You will need: ❍ counters or ☐ cubes
a pencil

Prime numbers are numbers that only have two factors: 1 and itself, e.g. 5 is a prime number as its only factors are 1 and 5.

Remember: 1 is **not** a prime number as it only has one factor (1).

What to do:

1. Take a pile of counters and count them.
2. Record the total number of counters on your sheet in the first column.
3. Arrange your counters into an array and draw it on your sheet in column two.
4. How many different arrays for that number can you find? Record them all.
5. Which numbers can be arranged into only one array? These ones are prime numbers.
6. Put a tick or a cross in the final column to show whether that number is a prime number or not.
7. Repeat with different numbers of counters.

Think About It

How many prime numbers did you identify?

How could you check if you are correct?

Example:

Number of Counters	Arrays	Prime Number (×/✓)
13	○○○○○○○○○○○○○	✓
16	○○○○○○○○ ○○○○○○○○ ○○○○ ○○○○ ○○○○ ○○○○	×

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Number of Counters	Arrays	Prime Number (×/✓)

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Answers

Number of Counters	Arrays	Prime Number (×/✓)
Prime numbers up to 100 include: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97		✓

Arrays for prime numbers can only be shown as one complete row of counters. Any array that is incomplete means that that number is a prime number.

For example, 11 is a prime number as it can be represented with this single row of 11 counters.

This incomplete array also shows that 11 is a prime number.