**Two primes make one square**

* Can you make square numbers by adding 2 prime numbers together?
* Are there any that can not be made?
  + Eg. 2+2=4 2+7=9 5+11=16

Answers: 121 and 289 impossible

**Prime magic square**

* Place the numbers 1-9 in a 3 by 3 grid, so that all columns and rows add to a prime number.

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* How many solutions can you find?
* Extension: Show that it is impossible to do including diagonals.

Answers: Lots of various triplets see below for example

|  |  |  |
| --- | --- | --- |
| 2 | 8 | 3 |
| 6 | 4 | 9 |
| 5 | 7 | 1 |

**Primes**

* Cards numbered 0-9
* Rearrange them to make 5 prime numbers, can you find different ways of doing it?
* Can you do it with 5 2digit numbers?
* How about different digit numbers?

**Never prime**

* Take any 2 digit number, reverse its digits, and subtract the smaller number from the larger.
  + Eg. 42-24=18
* Do you ever end up with a prime number?
* Can you prove that you never get a prime?
* Extension: Try 3 or 4 digit numbers.

Answers: They end as multiples of 9, can be shown algebraically.

**Primes, squares, factors, multiples**

* Grid 1-100 on the board, or sheet in pairs.
* First person chooses a number to cross off, next person has to pick the next number with a link, either both are prime, one is a factor of the next etc.
* Extension: Could include working in pairs to find out what the longest sequence they could make is.
* Can be differentiated, using different options.