M aths is good for you!

History of mathematics for young mathematicians

Eratosthenes' Sieve – prime numbers up to 100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Sieve gives you a method for finding prime numbers.

1. Cross 1 out.
2. Then starting from 2, circle 2 but cross out every multiple of 2 from your sieve.
3. Starting with 3, circle 3, but cross out every multiple of 3 from your sieve.
4. Starting with 5, circle 5, but cross out every multiple of 5 from your sieve.
5. Starting with 7, circle 7 but cross out every multiple of it.
6. Do the same with all the primes that you know already. The numbers that are crossed are not primes, because they are multiples of other numbers. The numbers that are circled are primes. They should have no divisors apart from themselves and 1.
7. Make a list of your primes.

Investigation

How many prime numbers are less than 100?

Twin primes are two primes that differ by 2.   E.g. 3 and 5 are twin primes because they differ by 2. Clearly, 7 and 11 are not twin primes because they differ by 4. Can you find any other twin primes on your sieve?

Symmetrical primes are those where their digits are reversed. For example 17 and 71 are both primes.   However, 23 and 32 are not symmetrical primes. Can you tell why?

From your list of prime numbers (or the Sieve of Eratosthenes), find other pairs like 17 and 71.

Have a look at how many primes there are up to 10, 20, 30, 40 and so on until 100. Describe what you notice.