Finding prime numbers by sifting

A ***prime*** is a number greater than 1 that cannot be formed by multiplying two smaller whole numbers. In other words, a prime can be divided into whole numbers only by itself and the number 1. For example, 5 is a prime because no numbers can be divided into it except for itself and 1. However, 6 is not a prime since it can be divided by 2 and 3.

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

The ancient Greek mathematician Eratosthenes discovered a simple way to find all small primes using a “sieve” system. It does so by iteratively marking as composite (i.e., not prime) the multiples of each prime, starting with the first prime number 2. Try it by yourself on the table above.

- Cross out 1, which is not a prime.
- The next number is 2. Any number that can be produced by multiplying by 2 cannot be a prime. So, cross out all multiples of 2, except for 2 itself.
- The next is 3; cross out all multiples of 3, except for 3 itself.
- All multiples of 4 were already crossed out since they are also multiples of 2.
- Then cross out all multiples of 5 and 7, except for themselves.
- The remaining numbers not crossed out are all the primes below 100.