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Algorithms in Prime Time

A prime number is an integer greater than 1 — such as 2, 3, 5, 7, or 11 — that is divisible only by 1 and itself. Your goal in this activity is to identify all the prime numbers up to 100. Write the steps you used to accomplish this task before the "Goal," as well as your input and outputs!

Please note that the steps ask participants to circle prime numbers and cross out numbers that are not prime. To ensure that this educator's copy is legible, prime numbers are in red-colored text and numbers that are not prime are in gray-colored text.

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

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Algorithms in Prime Time

Goal: Identify all prime numbers up to 100.

Steps:

- Write down the integers from 1 to 100 in a 10 by 10 array in increasing order.
- Cross out 1 and then cross out all the numbers that are multiples of 2, except for 2 (e.g. 4, 6, 8, and so on). Then, circle 2.
- Take the next smallest number not circled — in this case, 3. Cross out all numbers that are multiples of 3, except for 3 (e.g. 6, 9, 12, and so on) and circle 3.
- Continue in this way until what remains are the circled numbers. These numbers are all of the primes up to 100.

Input: 100

Outputs: 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

This algorithm is known as the Sieve of Eratosthenes.

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