About Prime Numbers...

What is a prime number?

A prime number is an integer number that is divisible as an integer number only by the number 1 and by itself.

How do you find prime numbers?

There is no single method for finding prime numbers. Mathematicians use computers to search for new prime numbers. There is no known pattern or algorithm for finding prime numbers. An algorithm is like a mathematical recipe or procedure.

Some prime numbers do follow patterns. The following "recipe" can used to find some prime numbers.

$$N \times N + N + 17$$

Let the N in the above pattern be 0. Then the prime number is 17. Let the N be 1, then the prime number is 19. What number is N to give the prime numbers 23, 29, 37, 47, or 59. Can you find more prime numbers with this pattern?

Why are prime numbers important?

Knowing prime numbers helps finding the least common denominators when solving elementary math problems and factoring algebra problems.

Mathematicians use prime numbers for generating codes for encryption and security.

Solutions…

There are 25 prime numbers between 1 and 100. These are:

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

You don't need to go farther than multiples of seven because

About Eratosthenes...

Eratosthenes (pronounced "Air-Ah-Toss-The-Knees") was a Greek philosopher, scientist and geographer who lived in 200 B.C. He is best known for having measured the circumference of the Earth. He wrote one of the first geography books. He maintained a library of scientific references. He was an astronomer.

References

"How Math Works: 100 Ways Parents and Kids can share the wonders of mathematics," By Carol Vorderman, Reader's Digest, 1996.

"Math Wizardry for Kids," By Margaret Kenda and Phyllis S. Williams, Barron's, 1995.

"The VNR Encyclopedia of Mathematics," by W. Gellert, H. Kustner, M. Hellwich, and H. Kastner, 1975.

Lunchbox Math Bytes

easy to digest mathematics for your lunchbox

Eratosthenes' Sieve

You will need to pack:

One pack of M&M's ™ or some other small colored candies to use as counters.

Eratosthenes' Sieve

To find the prime numbers between 1 and 100:

Number the squares from 1 to 100 starting at the upper left and going across rows from 1 to 10, the second row from 11 to 20, etc.

Place a blue M&M candy on the number 1.

Place a dark brown M&M on every number that is a multiple of 2, except for 2. (for example, 4, 6, 8,…)

Place a yellow M&M on every empty number that is a multiple of 3, but not on 3 itself (for example, 9, 15, 21, …)

Place a green M&M on every empty number that is a multiple of 5, but not on 5 itself (for example, 5, 35, …)

Place an orange M&M on every empty number that is a multiple of 7 but not on 7 itself.

(If you run out of any color, substitute with another color. The colors are only for making patterns.)

Do you need to explore any more numbers? Why not?

The numbers that do not have M&Ms covering them are called prime numbers. Prime numbers are numbers that are divisible as integers only by the number 1 and the number itself.

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