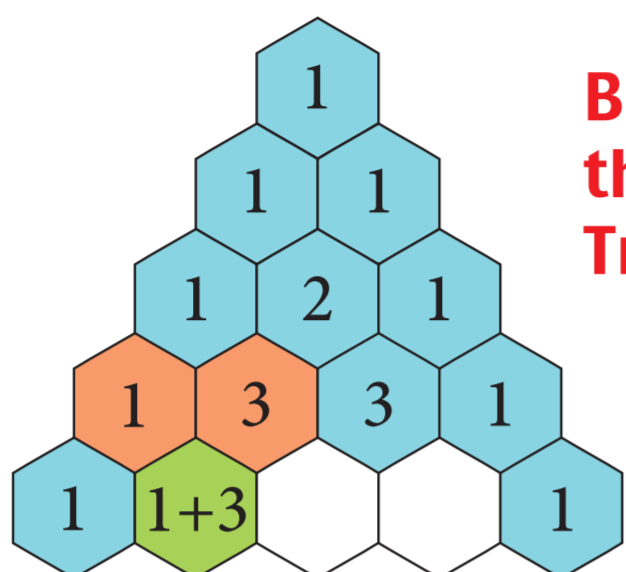


# PASCAL'S TRIANGLE

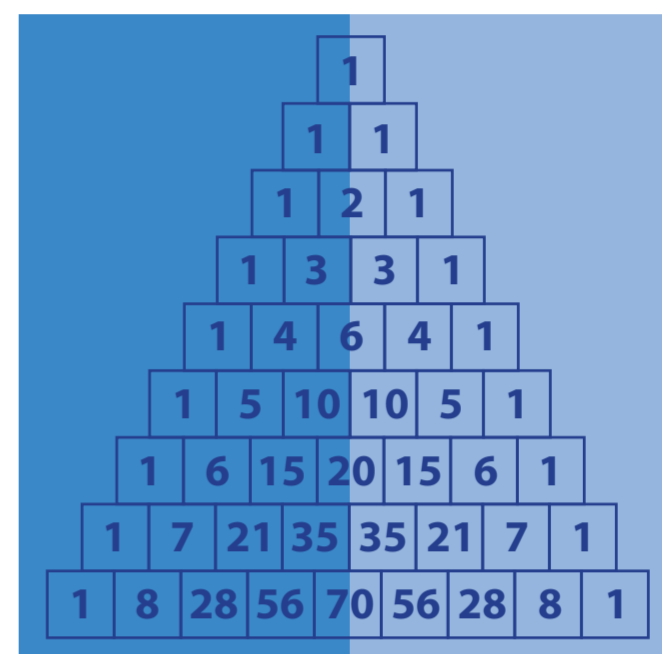
**Pascal's Triangle** is named after **Blaise Pascal** (1623 - 1662) a famous **French Mathematician and Philosopher**.



**Building the Triangle**

To build the triangle, start with "1" at the top, then continue placing numbers below it in a triangular pattern. Each number is the two numbers above it added together (except for the edges, which are all "1").

**The Triangle is Symmetrical**



**Binomial Expansion**

This construction of the triangle is related to the binomial coefficients by **Pascal's Rule**, which says that

$$(x + y)^n = \sum_{k=0}^n {}^n C_k x^{n-k} y^k$$

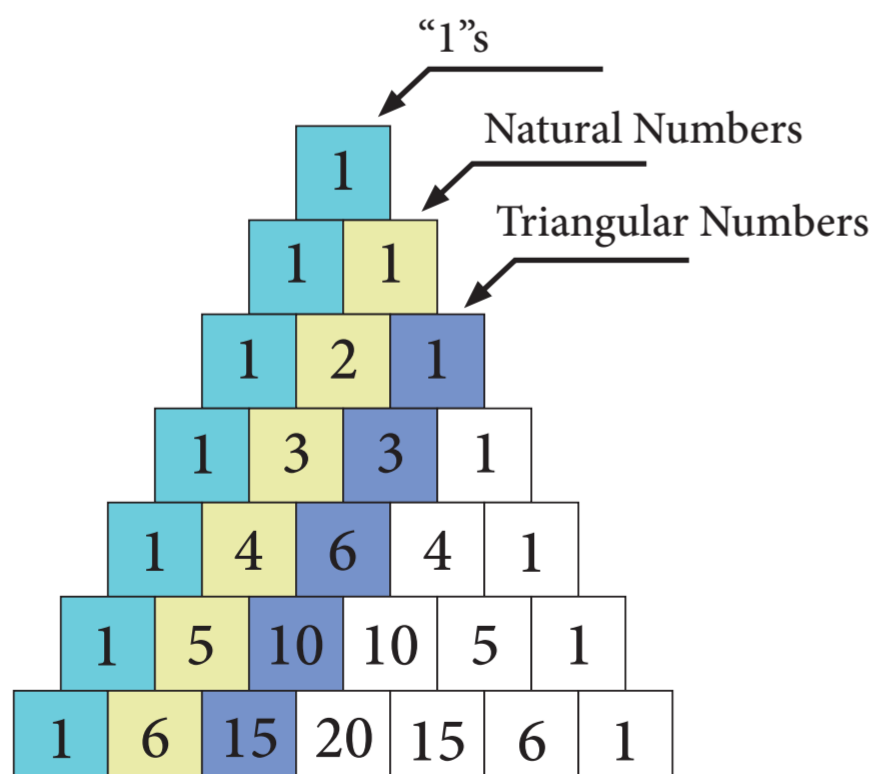
Row	Binomial expansion	Pascal's Triangle
0	$(x + y)^0 = 1$	1
1	$(x + y)^1 = x + y$	1, 1
2	$(x + y)^2 = 1x^2 + 2xy + 1y^2$	1, 2, 1
3	$(x + y)^3 = 1x^3 + 3x^2y + 3xy^2 + 1y^3$	1, 3, 3, 1
4	$(x + y)^4 = 1x^4 + 4x^3y + 6x^2y^2 + 4xy^3 + 1y^4$	1, 4, 6, 4, 1

**Prime Factors**

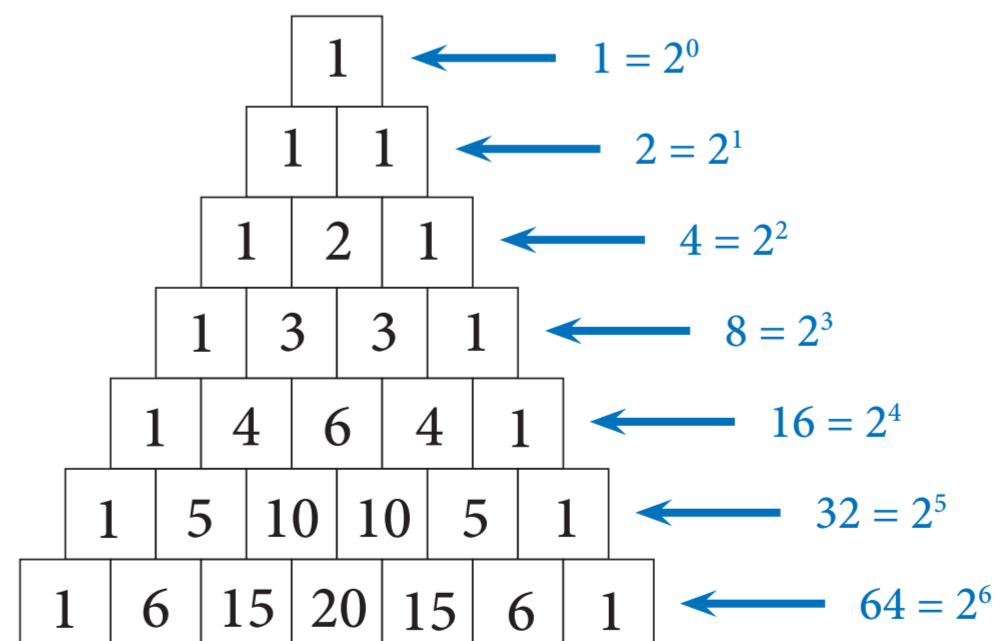
When the second number in any row is a prime number, all numbers apart from 1 in that row are divisible by that prime number.

e.g. In row 5, second number is 5 and 5 and 10 are factors of 5

**Patterns in the Diagonals of the Triangle**



**The Horizontal Rows Add to Powers of 2**



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