

# Superscript and Subscript Demonstration

## Mathematical Expressions

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The Pythagorean theorem states that  $a^2 + b^2 = c^2$ , where  $c$  is the hypotenuse. Einstein's equation  $E = mc^2$  expresses the equivalence of mass and energy.

The area of a circle is  $A = \pi r^2$ , and the volume of a sphere is  $V = (4/3)\pi r^3$ . For compound interest:  $A = P(1 + r/n)^{nt}$ .

The  $n^{\text{th}}$  partial sum of a geometric series  $S_n = a(1 - r^n)/(1 - r)$ . Logarithm:  $\log_2(8) = 3$ .

## Chemical Formulae

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Water has the formula  $H_2O$ . Carbon dioxide is  $CO_2$ . Sulfuric acid is  $H_2SO_4$ , and glucose is  $C_6H_{12}O_6$ . Ethanol is  $C_2H_5OH$  and ammonia is  $NH_3$ .

Combustion of methane:  $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ . Photosynthesis:  $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$ .

## Ordinal Numbers

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She finished in 1<sup>st</sup> place. The 2<sup>nd</sup> runner-up received silver. By the 3<sup>rd</sup> quarter the team secured the championship. Our 100<sup>th</sup> customer received a special prize on the company's 21<sup>st</sup> anniversary.

## Footnote References

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The study found significant correlations between sleep deprivation and cognitive performance.<sup>[1]</sup> Participants sleeping fewer than six hours showed worse memory results.<sup>[2]</sup> These findings align with circadian rhythm research<sup>[3]</sup> and support the hypothesis that deep sleep consolidates memories.<sup>[4]</sup>

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1. Smith, J. et al. (2023). Sleep and cognition. *Journal of Neuroscience*, 45(2), 112–128. [1](#)

2. Jones, A. & Lee, B. (2022). Memory consolidation during sleep. *Sleep Research*, 18, 44–59. [↑](#)
3. Williams, C. (2021). Circadian rhythm disruption. *Nature Reviews*, 7, 203–215. [↑](#)
4. Brown, D. et al. (2024). REM sleep and declarative memory. *Brain*, 147(3), 891–905. [↑](#)