# Exponents

How do exponents work and what do they mean

# Why are exponents important

- All organisms regardless of how complicated they are begin with a single cell.

- This cell splits to form two new ones
-
- The two cells split and the process continues until the organism develops into an adult containing trillions of cells.

- the product 2 * 2 * 2 * 2 can be written as $2^4$ which is called a power of 2 it is read as 2 to the exponent 4 or two to the forth

- The exponent 4 is the number of times the base to is multiplied.

# Activity on Page 4

- Complete the activity on page 4

| Expression | Factored Form | Exponential Form |
|---|---|---|
| $2^3 \times 2^2$ | $(2 \times 2 \times 2) \times (2 \times 2)$ | $2^5$ |
| $3^2 \times 3^4$ | $(3 \times 3) \times (3 \times 3 \times 3 \times 3)$ | $3^6$ |
| $4^4 \times 4^3$ | $(4 \times 4 \times 4 \times 4) \times (4 \times 4 \times 4)$ | $4^7$ |
| $5^6 \times 5^1$ | $(5 \times 5 \times 5 \times 5 \times 5 \times 5) \times (5)$ | $5^7$ |
| $3^4 \times 3^4$ | $(3 \times 3 \times 3 \times 3) \times (3 \times 3 \times 3 \times 3)$ | $3^8$ |
| $2^5 \div 2^2$ | $\frac{2 \times 2 \times 2 \times 2 \times 2}{2 \times 2}$ | $2^3$ |
| $3^6 \div 3^3$ | $\frac{3 \times 3 \times 3 \times 3 \times 3 \times 3}{3 \times 3 \times 3}$ | $3^3$ |
| $5^3 \div 5^2$ | $\frac{5 \times 5 \times 5}{5 \times 5}$ | $5^1$ |
| $2^3 \div 2^1$ | $\frac{2 \times 2 \times 2}{2}$ | $2^2$ |
| $4^5 \div 4^3$ | $\frac{4 \times 4 \times 4 \times 4 \times 4}{4 \times 4 \times 4}$ | $4^2$ |

| Rules of Exponents or Laws of Exponents | |
|---|---|
| Multiplication Rule | $a^x \times a^y = a^{x+y}$ |
| Division Rule | $a^x \div a^y = a^{x-y}$ |
| Power of a Power Rule | $\left(a^x\right)^y = a^{xy}$ |
| Power of a Product Rule | $(ab)^x = a^x b^x$ |
| Power of a Fraction Rule | $\left(\frac{a}{b}\right)^x = \frac{a^x}{b^x}$ |
| Zero Exponent | $a^0 = 1$ |
| Negative Exponent | $a^{-x} = \frac{1}{a^x}$ |
| Fractional Exponent | $a^{\frac{x}{y}} = \sqrt[y]{a^x}$ |

# Assignment

- Inquiry on page 4 # 1 to 4
- Practice on Page 5 # 1 to 37