

Exponent Activity: Simplify $2^7 \times 3^4 \div 2^2$

Recall exponents are defined as repeated multiplication so

$$2^7 \times 3^4 \div 2^2 = (2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3) \div 2^2$$

The order of operations indicates exp _____
before division _____

so we can simplify a bit to get:

$$(2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3) \div 4$$

* Lets use the sharing model & think about how to divide * into 4 buckets.

Note (by associativity)

$$* = (2 \times 2) \times (2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3) \text{ or} \\ 4 \times (2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3)$$

That is we have 4 copies of * that we could put in each of our 4 buckets? ☺

$$\text{So our answer is } 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \\ \text{or } 2^5 \times 3^4$$