

Exponent Rules: Building Exponent Towers

Name: _____ Date: _____

LEARNING OBJECTIVE

Students will apply the product of powers and quotient of powers rules with positive integer exponents.

MATERIALS NEEDED

- 20+ same-size building blocks, Legos, stacked cups, or coins
- index cards
- marker

HANDS-ON ACTIVITY

1. Using blocks, build a stack showing 2 to the 3rd power ($2 \times 2 \times 2 = 8$ blocks) and label it with an index card.
2. Build a second stack showing 2 to the 2nd power (4 blocks) next to it.
3. Combine the two builds into one representing 2^3 times 2^2 ; count the total blocks, confirm it equals 2^5 (32 blocks), and write the equation and rule (add exponents when multiplying same base) on an index card.
4. Take your 32-block build and divide it back into groups of 2^2 to demonstrate 2^5 divided by 2^3 equals 2^2 ; write the quotient rule (subtract exponents when dividing same base).
5. Create one more original example of each rule using a different base, such as base 3, and label it.

QUESTIONS

1. **Simplify:** 3^4 times 3^2 .
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2. **Simplify:** 5^7 divided by 5^3 .
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3. **State the product of powers rule in your own words.**
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4. **Why does the quotient rule involve subtracting exponents rather than dividing them?**
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