LESSON MAKER PRO

Prime Power Pack

Break composite numbers into prime factors.

GRADE 6 · MA.6.NSO.3.4

MA.6.NSO.3.4 "Express composite whole numbers as a product of prime factors with natural number exponents."

NAME _____ DATE _____

BUILD PRIME PRODUCTS

A prime factorization writes a composite number as a product of prime numbers. Keep dividing or breaking apart factors until every factor is prime. Use an exponent to show a prime factor that repeats.

WORKED EXAMPLE

Express 72 as a product of prime factors with exponents.

1. $72 = 2 * 36$
2. $72 = 2 * 2 * 18$
3. $72 = 2 * 2 * 2 * 9$
4. $72 = 2 * 2 * 2 * 3 * 3$

Answer: $72 = 2^3 * 3^2$

PRACTICE 6 problems

1 Express 24 as a product of prime factors with exponents.

ANSWER _____

2 Express 45 as a product of prime factors with exponents.

ANSWER _____

3 Express 56 as a product of prime factors with exponents.

ANSWER _____

4 Express 75 as a product of prime factors with exponents.

ANSWER _____

5 Express 84 as a product of prime factors with exponents.

ANSWER _____

6 Express 100 as a product of prime factors with exponents.

ANSWER _____

APPLY IT Show your work

1 The art club orders 96 sticker sheets for a school event. Express 96 as a product of prime factors with exponents.

WORK SPACE

ANSWER _____

2 A gaming club has 180 players signed up for a tournament. Express 180 as a product of prime factors with exponents.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Express 1,512 as a product of prime factors with exponents.

WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Express 24 as a product of prime factors with exponents.	**$24 = 2^3 * 3$**
2	Express 45 as a product of prime factors with exponents.	**$45 = 3^2 * 5$**
3	Express 56 as a product of prime factors with exponents.	**$56 = 2^3 * 7$**
4	Express 75 as a product of prime factors with exponents.	**$75 = 3 * 5^2$**
5	Express 84 as a product of prime factors with exponents.	**$84 = 2^2 * 3 * 7$**
6	Express 100 as a product of prime factors with exponents.	**$100 = 2^2 * 5^2$**

PART 2 · APPLY IT

1. **$96 = 2^5 * 3$** Break 96 into prime factors: 96 = 2 * 2 * 2 * 2 * 2 * 3. Write the five factors of 2 as 2^5.
2. **$180 = 2^2 * 3^2 * 5$** Break 180 into prime factors: 180 = 2 * 2 * 3 * 3 * 5. Use exponents for the repeated 2s and 3s.

CHALLENGE

$1{,}512 = 2^3 * 3^3 * 7$

Accept prime factors written in any order, as long as the factors and exponents are correct. Do not accept a factorization that includes a composite factor.