LESSON MAKER PRO

Exponent Power Moves

Use scientific notation to solve real-world quantities.

GRADE 8 · MA.8.NSO.1.6

MA.8.NSO.1.6 "Solve real-world problems involving operations with numbers expressed in scientific notation."

NAME _____ DATE _____

OPERATE WITH POWERS OF TEN

When you multiply scientific notation, multiply the coefficients and add the exponents. When you divide, divide the coefficients and subtract the exponents. To add or subtract, first rewrite the numbers so they have the same exponent.

WORKED EXAMPLE

$(3 \times 10^5) \times (4 \times 10^{-2})$

1. Multiply the coefficients: 3 x 4 = 12.
2. Add the exponents: 5 + (-2) = 3.
3. Write 12×10^3 as 1.2×10^4.

Answer: 1.2×10^4

PRACTICE 6 problems

1 $(5 \times 10^7) \times (6 \times 10^1)$

ANSWER _____

2 $(7 \times 10^9) / (5 \times 10^1)$

ANSWER _____

3 $2.6 \times 10^6 + 7.1 \times 10^6$

ANSWER _____

4 $6.4 \times 10^8 - 1.9 \times 10^7$

ANSWER _____

5 $(7.5 \times 10^{-1}) \times (8 \times 10^{-6})$

ANSWER _____

6 $(8.4 \times 10^{-7}) / (2.1 \times 10^{-1})$

ANSWER _____

APPLY IT Show your work

1 A student video team saves 6.2×10^7 bytes of raw footage for each clip. The team records 7×10^2 clips. How many bytes of raw footage does the team save?

WORK SPACE

ANSWER _____

2 A music app stores 8.4×10^8 bytes for a playlist collection. Each song file uses 2.1×10^6 bytes. How many song files are in the collection?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A school media club has 6×10^8 bytes of video and 2.5×10^7 bytes of audio. It saves the combined files equally in 5×10^2 storage folders. How many bytes are saved in each folder?

WORK SPACE AND ANSWER

ANSWER KEY

Exponent Power Moves

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	$(5 \times 10^{7}) \times (6 \times 10^{1})$	**3×10^{9}**
2	$(7 \times 10^{9}) / (5 \times 10^{1})$	**1.4×10^{8}**
3	$2.6 \times 10^{6} + 7.1 \times 10^{6}$	**9.7×10^{6}**
4	$6.4 \times 10^{8} - 1.9 \times 10^{7}$	**6.21×10^{8}**
5	$(7.5 \times 10^{-1}) \times (8 \times 10^{-6})$	**6×10^{-6}**
6	$(8.4 \times 10^{-7}) / (2.1 \times 10^{-1})$	**4×10^{-6}**

PART 2 · APPLY IT

1. **4.34×10^{10} bytes** Multiply 6.2 by 7 to get 43.4, and add the exponents, 7 + 2 = 9. Rewrite 43.4×10^{9} in scientific notation.
2. **4×10^{2} song files** Divide the coefficients, 8.4 / 2.1 = 4. Subtract the exponents, 8 - 6 = 2.

CHALLENGE

1.25×10^{6} bytes

Accept equivalent values when the arithmetic is correct. Require final answers in scientific notation with a coefficient that is at least 1 and less than 10.