LESSON MAKER PRO

Powers in Action

Calculate and compare numbers from tiny to enormous.

GRADE 7 · 7A.AF.B.16

7A.AF.B.16 "Express and compare very large or very small numbers in scientific notation. a. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used..."

NAME _____ DATE _____

THE BIG IDEA

To multiply numbers in scientific notation, multiply the first numbers and add the exponents. To add or subtract, first write the numbers with the same power of 10. Write each answer with a first number at least 1 but less than 10. On a calculator, E means "times 10 to the power of."

WORKED EXAMPLE

Multiply $(4.8 \times 10^6)(2.5 \times 10^3)$.

1. Multiply the first numbers: 4.8 × 2.5 = 12.
2. Add the exponents: 6 + 3 = 9, so the product is 12×10^9.
3. Rewrite 12×10^9 as 1.2×10^{10}.

Answer: 1.2×10^{10}

PRACTICE 6 problems

1 Multiply $(2 \times 10^5)(3 \times 10^4)$.

ANSWER _____

2 Divide $(8.4 \times 10^{-3}) / (2 \times 10^2)$.

ANSWER _____

3 Add $0.006 + 2 \times 10^{-3}$. Write your answer in scientific notation.

ANSWER _____

4 Subtract $(7.8 \times 10^6) - (1.3 \times 10^6)$.

ANSWER _____

5 A calculator displays 5.6E-7. Write this number in scientific notation and in decimal form.

ANSWER _____

_____

6 Which is greater, 9×10^{-5} or 1.1×10^{-4}? Explain using decimal form.

ANSWER _____

_____

APPLY IT Show your work

1 A gaming livestream gets 2.4×10^6 views each day for 5 days. How many views does it get in all? Write your answer in scientific notation.

WORK SPACE

ANSWER _____

2 Each of 25 photos uses 4×10^6 bytes of storage. For the total, choose the more useful unit, bytes or megabytes, and write your answer in scientific notation. Use 1 megabyte = 10^6 bytes.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A tablet has 1.5×10^8 bytes of free space. You download 3 video clips that each use 2×10^7 bytes and 6 images that each use 5×10^6 bytes. How much free space remains? Write your answer in megabytes in scientific notation. Use 1 megabyte = 10^6 bytes.

WORK SPACE AND ANSWER

Powers in Action

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Multiply $(2 \times 10^5)(3 \times 10^4)$.	**6×10^9**
2	Divide $(8.4 \times 10^{-3}) / (2 \times 10^2)$.	**4.2×10^{-5}**
3	Add $0.006 + 2 \times 10^{-3}$. Write your answer in scientific notation.	**8×10^{-3}**
4	Subtract $(7.8 \times 10^6) - (1.3 \times 10^6)$.	**6.5×10^6**
5	A calculator displays 5.6E-7. Write this number in scientific notation and in decimal form.	**5.6×10^{-7}; 0.00000056**
6	Which is greater, 9×10^{-5} or 1.1×10^{-4}? Explain using decimal form.	**1.1×10^{-4} is greater because 0.00011 > 0.00009.**

PART 2 · APPLY IT

1. **1.2×10^7 views** Multiply 2.4×10^6 by 5 to get 12×10^6, then rewrite it as 1.2×10^7.
2. **1×10^2 megabytes** The photos use $25(4 \times 10^6) = 1 \times 10^8$ bytes. Divide by 10^6 to get 1×10^2 megabytes, the more useful unit.

CHALLENGE

6×10^1 megabytes

Require scientific notation where requested. In problem 6, accept any explanation that correctly compares the two decimal values.