LESSON MAKER PRO

Tiny Power Moves

Write negative powers of 10 in fraction and decimal form.

GRADE 7 · 7.NS.1.b

7.NS.1.b "Represent a power of 10 with a negative exponent in fraction and decimal form."

NAME _____ DATE _____

NEGATIVE POWERS OF 10

For 10 raised to a negative exponent, write 1 over a power of 10. The exponent tells how many places to move the decimal point left from 1.

WORKED EXAMPLE

Write 10^{-6} as a fraction and a decimal.

1. $10^{-6} = 1/10^{6}$.
2. $10^{6} = 1{,}000{,}000$.
3. So $10^{-6} = 1/1{,}000{,}000 = 0.000001$.

Answer: 1/1,000,000 and 0.000001

PRACTICE 6 problems

1 Write 10^{-1} as a fraction and a decimal.

ANSWER _____

2 Write 10^{-2} as a fraction and a decimal.

ANSWER _____

3 Write 10^{-3} as a fraction and a decimal.

ANSWER _____

4 Write 10^{-4} as a fraction and a decimal.

ANSWER _____

5 Write 10^{-5} as a fraction and a decimal.

ANSWER _____

6 Write 10^{-7} as a fraction and a decimal.

ANSWER _____

APPLY IT Show your work

1 In a coding game, the chance of finding a rare item is 10^{-8}. Write this chance as a fraction and a decimal.

WORK SPACE

ANSWER _____

2 A music app measures a tiny sound level as 10^{-9} of a reference level. Write 10^{-9} as a fraction and a decimal.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Write 10^{-12} as a fraction and a decimal. Then explain how the exponent helped you place the decimal point.

WORK SPACE AND ANSWER

ANSWER KEY

Tiny Power Moves

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write 10^{-1} as a fraction and a decimal.	**1/10 and 0.1**
2	Write 10^{-2} as a fraction and a decimal.	**1/100 and 0.01**
3	Write 10^{-3} as a fraction and a decimal.	**1/1,000 and 0.001**
4	Write 10^{-4} as a fraction and a decimal.	**1/10,000 and 0.0001**
5	Write 10^{-5} as a fraction and a decimal.	**1/100,000 and 0.00001**
6	Write 10^{-7} as a fraction and a decimal.	**1/10,000,000 and 0.0000001**

PART 2 · APPLY IT

1. **1/100,000,000 and 0.00000001** Use $10^{-8} = 1/10^{8}$. Since 10^{8} is 100,000,000, the decimal has seven zeros between the decimal point and the 1.
2. **1/1,000,000,000 and 0.000000001** Write the negative power as $1/10^{9}$. Then write 1 divided by 1,000,000,000 in decimal form.

CHALLENGE

1/1,000,000,000,000 and 0.000000000001. The exponent 12 means the denominator is 10^{12}, so the decimal places the 1 twelve places to the right of the decimal point.

Accept equivalent fraction forms with a denominator of 10, 100, 1,000, and so on. Decimal answers must have the correct number of zeros before the 1.