

Luna's Space Adventure

Name _____

Grade 5 · Powers of 10 · 5.NBT.A.2

Date _____



Astronaut Luna is exploring a far-off corner of space. Solve each problem to help Luna's mission go smoothly!

Powers of 10 10^3 means $10 \times 10 \times 10$.

$10^4 = \boxed{}$

$10^2 = \boxed{}$

$10^1 = \boxed{}$

$10^5 = \boxed{}$

Move the point Multiplying by 10 moves every digit one place left.

$93.3 \div 1000 = \boxed{}$

$1.02 \times 1000 = \boxed{}$

$81.9 \div 10 = \boxed{}$

$6.86 \times 100 = \boxed{}$

$6.8 \div 1000 = \boxed{}$

$1.74 \times 1000 = \boxed{}$

$71.7 \div 1000 = \boxed{}$

$5.55 \times 100 = \boxed{}$

$62.9 \div 1000 = \boxed{}$

With exponents The exponent tells you how many places the digits move.

$9.25 \times 10^2 = \boxed{}$

$6.12 \times 10^3 = \boxed{}$

$0.81 \times 10^3 = \boxed{}$

$2.43 \times 10^1 = \boxed{}$

$2.33 \times 10^1 = \boxed{}$

$1.63 \times 10^3 = \boxed{}$

Count the zeros Multiplying by 10^n adds n zeros to a whole number.

$7 \times 10^2 = \boxed{}$

$3 \times 10^2 = \boxed{}$

$67 \times 10^2 = \boxed{}$

$97 \times 10^3 = \boxed{}$

$42 \times 10^4 = \boxed{}$

$75 \times 10^4 = \boxed{}$

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ANSWER KEY



Astronaut Luna is exploring a far-off corner of space. Solve each problem to help Luna's mission go smoothly!

Powers of 10 10^3 means $10 \times 10 \times 10$.

$$10^4 = 10000$$

$$10^2 = 100$$

$$10^1 = 10$$

$$10^5 = 100000$$

Move the point Multiplying by 10 moves every digit one place left.

$$93.3 \div 1000 = 0.0933$$

$$1.02 \times 1000 = 1020$$

$$81.9 \div 10 = 8.19$$

$$6.86 \times 100 = 686$$

$$6.8 \div 1000 = 0.0068$$

$$1.74 \times 1000 = 1740$$

$$71.7 \div 1000 = 0.0717$$

$$5.55 \times 100 = 555$$

$$62.9 \div 1000 = 0.0629$$

With exponents The exponent tells you how many places the digits move.

$$9.25 \times 10^2 = 925$$

$$6.12 \times 10^3 = 6120$$

$$0.81 \times 10^3 = 810$$

$$2.43 \times 10^1 = 24.3$$

$$2.33 \times 10^1 = 23.3$$

$$1.63 \times 10^3 = 1630$$

Count the zeros Multiplying by 10^n adds n zeros to a whole number.

$$7 \times 10^2 = 700$$

$$3 \times 10^2 = 300$$

$$67 \times 10^2 = 6700$$

$$97 \times 10^3 = 97000$$

$$42 \times 10^4 = 420000$$

$$75 \times 10^4 = 750000$$

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GUIDE

① What this sheet practises

Multiplying and dividing by 10, 100 and 1,000, also written as powers like 10^3 , and seeing the pattern in how the digits move past the decimal point.

② A problem from the sheet, worked out

Move the point Multiplying by 10 moves every digit one place left.

$$93.3 \div 1000 = 0.0933$$

$$1.02 \times 1000 = 1020$$

$$81.9 \div 10 = 8.19$$

$$6.86 \times 100 = 686$$

$$6.8 \div 1000 = 0.0068$$

$$1.74 \times 1000 = 1740$$

$$71.7 \div 1000 = 0.0717$$

$$5.55 \times 100 = 555$$

$$62.9 \div 1000 = 0.0629$$

How: The number of zeros, or the exponent, tells how many places the digits move. Multiplying moves them left and dividing moves them right. Fill empty places with zeros.

③ Words to know

power of 10 10, 100, 1,000 and so on

exponent the small raised number: $10^3 = 10 \times 10 \times 10$

decimal point the dot between the ones and tenths

place a digit's spot: ones, tens, tenths...

④ Watch for

- Reading 10^3 as $10 \times 3 = 30$ instead of 1,000.
- Moving the digits the wrong way: $28.4 \div 100$ is 0.284, not 2,840.
- Adding zeros to the end of a decimal: 3.95×10 is 39.5, not 3.950.

⑤ Where it fits

BEFORE

5.NBT.A.1

Understand that each place is ten times the place to its right and a tenth of the one to its left.

THIS SHEET

5.NBT.A.2

Explain the patterns in zeros and decimal points when multiplying or dividing by powers of 10.

NEXT

5.MD.A.1

Convert between units in the same measurement system.

⑥ Helping at home

Say a number like 4.5 and a power of ten, and have your child give the answer. Check it on a calculator and look at where the digits moved.