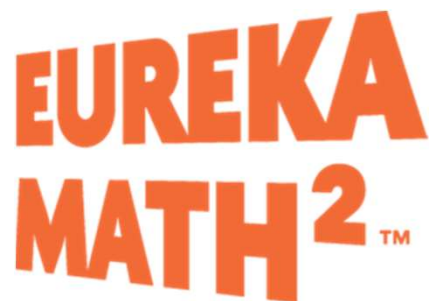




Module 4 - Lesson 5:

Multiply and divide decimal numbers by powers of 10.

CCSS Standard – 5.NBT.A.2

FLUENCY (10-min)

Whiteboard Exchange: Multiply or Divide by Powers of 10



What is 10^3 in standard form?
Raise your hand when you know.

$$10^3 = 1,000$$

Rewrite the expressions below with the power of 10 in standard form to find the product:

$$50 \times 10^3$$

=

$$206 \times 10^1$$

=

$$70 \times 10^5$$

=

$$8,300 \div 10^2$$

=

$$4,000,000 \div 10^4$$

=

FLUENCY (10-min)

Whiteboard Exchange: Place Value Relationships



Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

What is the **value** of the **green** underline digit?

What is the **value** of the **red** underline digit?

Write a **multiplication equation** to show the relationship between the values of the underlined digits.

Write a **division equation** to show the relationship between the values of the underlined digits.

2.237		
_____	= 10 ×	_____
_____	= $\frac{1}{10}$ ×	_____

FLUENCY (10-min)

Whiteboard Exchange: Place Value Relationships



Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

What is the **value** of the **green** underline digit?

What is the **value** of the **red** underline digit?

Write a **multiplication equation** to show the relationship between the values of the underlined digits.

Write a **division equation** to show the relationship between the values of the underlined digits.

$$\begin{array}{c} 3.\underline{6}\underline{6}1 \\ | \\ \underline{\hspace{2cm}} = 10 \times \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} = \frac{1}{10} \times \underline{\hspace{2cm}} \end{array}$$

FLUENCY (10-min)

Whiteboard Exchange: Place Value Relationships



Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

What is the **value** of the **green** underline digit?

What is the **value** of the **red** underline digit?

Write a **multiplication equation** to show the relationship between the values of the underlined digits.

Write a **division equation** to show the relationship between the values of the underlined digits.

79.902

_____ = 10 × _____

_____ = $\frac{1}{10}$ × _____

FLUENCY (10-min)

Whiteboard Exchange: Place Value Relationships



Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

What is the **value** of the **green** underline digit?

What is the **value** of the **red** underline digit?

Write a **multiplication equation** to show the relationship between the values of the underlined digits.

Write a **division equation** to show the relationship between the values of the underlined digits.

$$\begin{array}{c} 84.\underline{1}55 \\ \hline \end{array}$$
$$\underline{\hspace{2cm}} = 10 \times \underline{\hspace{2cm}}$$
$$\underline{\hspace{2cm}} = \frac{1}{10} \times \underline{\hspace{2cm}}$$

LAUNCH (10-min)

Order sets of unknown numbers that are related by powers of 10.



I'm going to read several problems, each with clues about three unknown numbers. Letters represent each unknown number. The numbers are NOT 0.

With a partner, determine the **ORDER** of the number from **LEAST** to **GREATEST**. Write the order of the numbers from **LEAST** to **GREATEST** on your whiteboard.

1. A is 10 times as much as B .
 C is 1,000 times as much as A .

B,A,C

2. D is 100 times as much as F .
 E is $\frac{1}{10}$ as much as F .

E,F,D

3. G is $\frac{1}{100}$ as much as H .
 H is 1,000 times as much as I .

I,G,H

4. J is 10^2 times as much as L .
 K is 10^3 times as much as J .

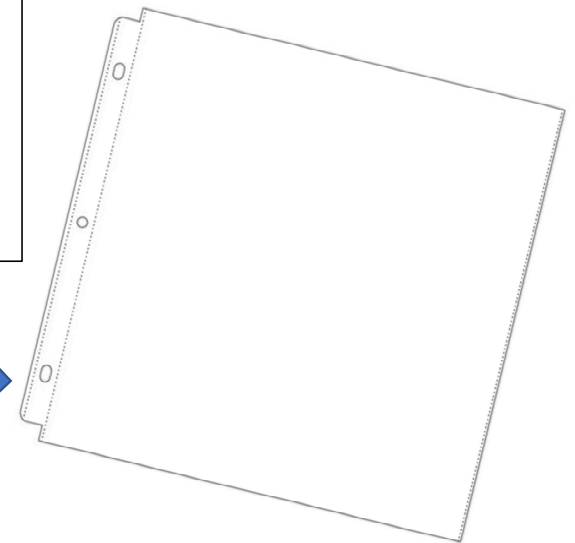
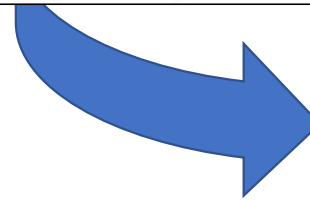
L,J,K

LEARN (30-min)

Multiplying Decimal Numbers by Powers of 10

Remove Place Value Chart on page 43 of LEARN book
and place it in the protective sleeve.

tens	ones	tenths	hundredths	thousandths



LEARN (30-min)

Multiplying Decimal Numbers by Powers of 10



What number is represented on the place value chart?

What number is **10 times as much as** 8 thousandths?

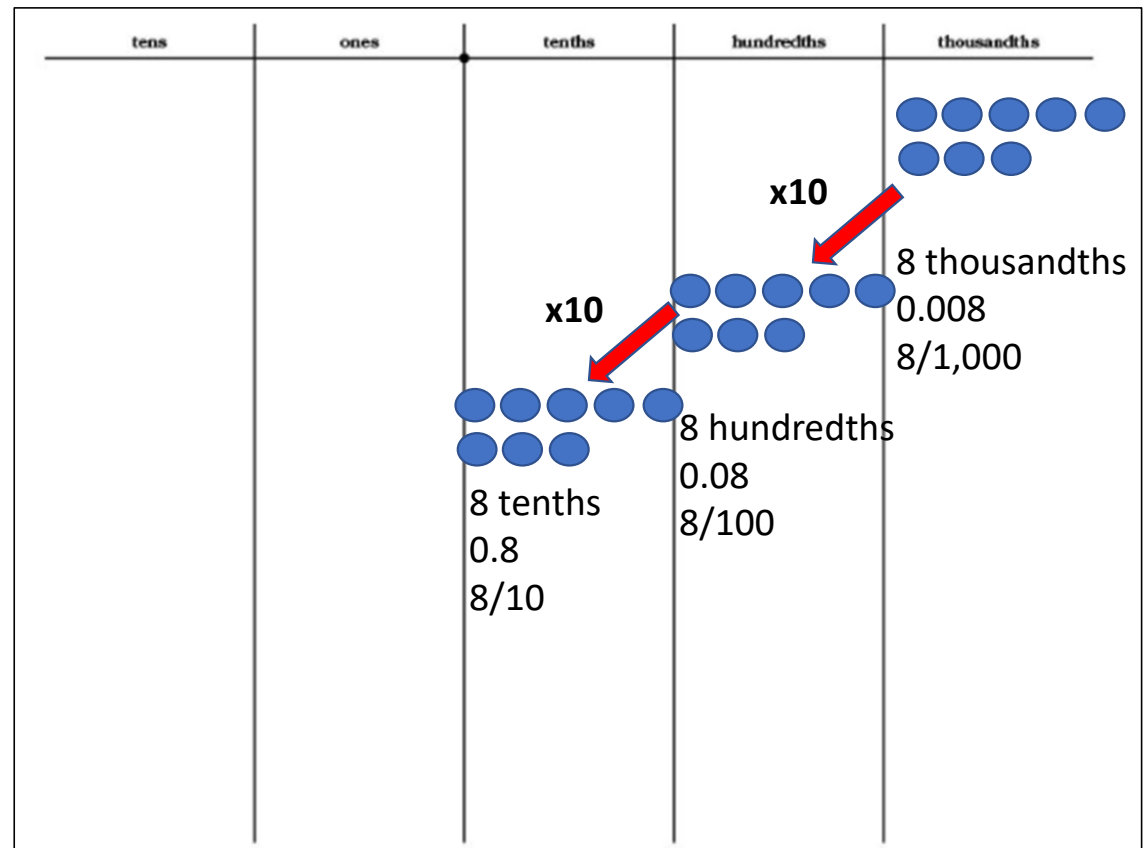
What **EQUATION** describes the statement that the place value chart represents?

$$0.008 \times 10 = 0.08$$

Now, on your place value chart, represent **100 times as much as** 8 thousandths.

What **EQUATION** describes the statement that the place value chart represents?

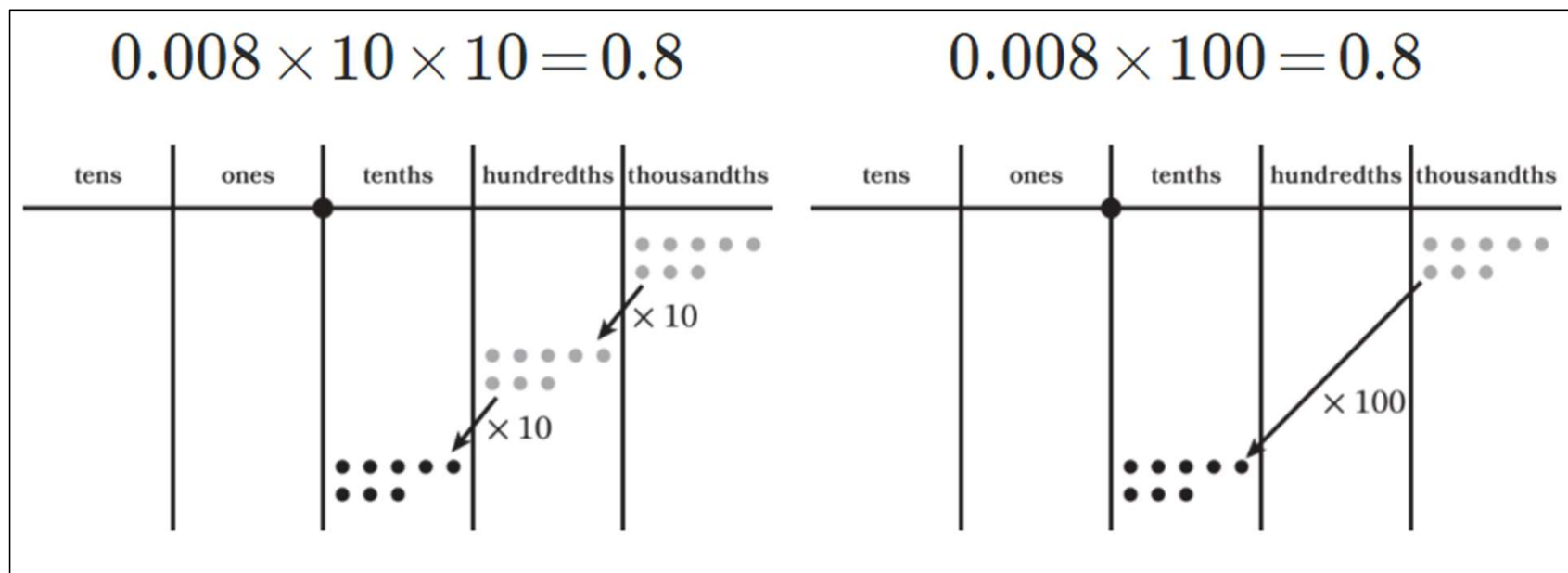
$$0.008 \times 100 = 0.8$$



LEARN (30-min)

Multiplying Decimal Numbers by Powers of 10

SUMMARY:



The 8 in 0.8 is 100 times **as much as** the 8 in 0.008.

Both representations show 100 times; either multiply by 100 or multiply twice by 10.

We could also write the equation using an exponent: $0.008 \times 10^2 = 0.8$

LEARN (30-min)

Multiplying Decimal Numbers by Powers of 10

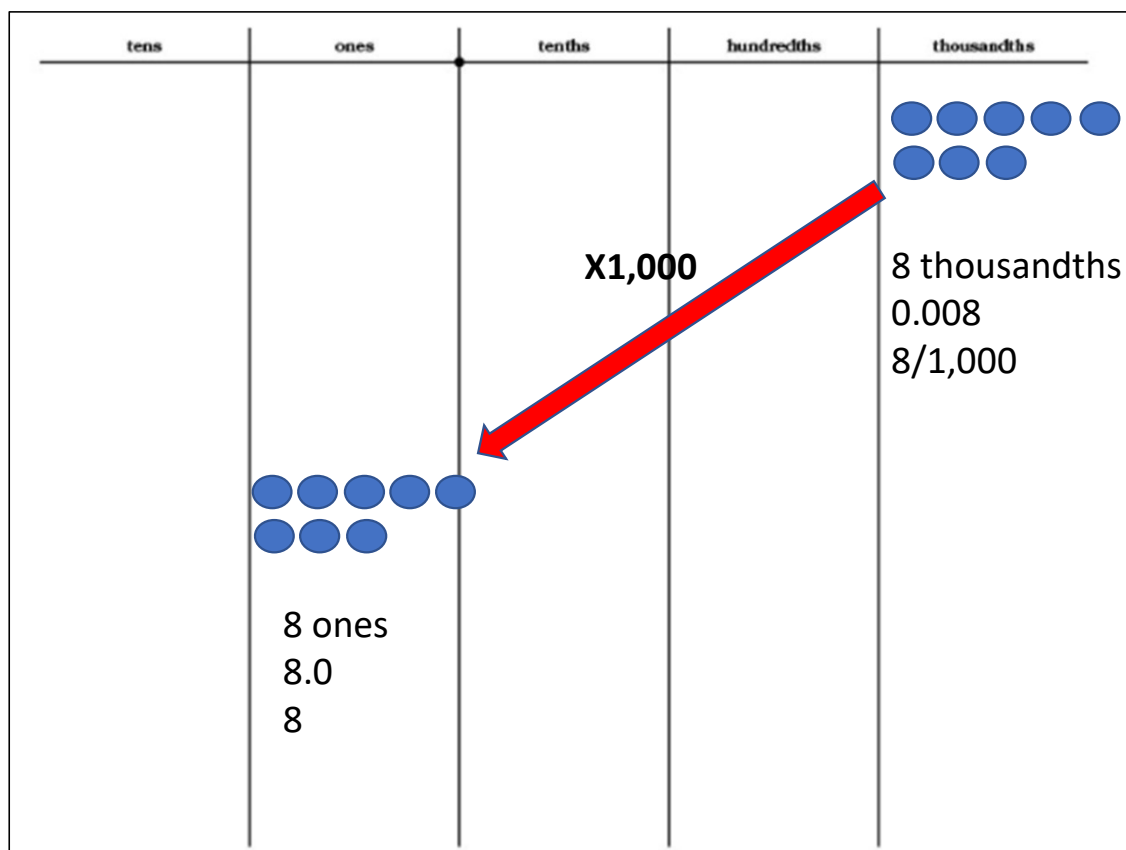
How would you represent **1,000 times as much as 8 thousandths** on the place value chart?

What different **EQUATIONS** can you use to represent 1,000 times as much as 0.008?

$$0.008 \times 1,000 = 8$$

$$0.008 \times 10^3 = 8$$

$$0.008 \times 10 \times 10 \times 10 = 8$$



LEARN (30-min)

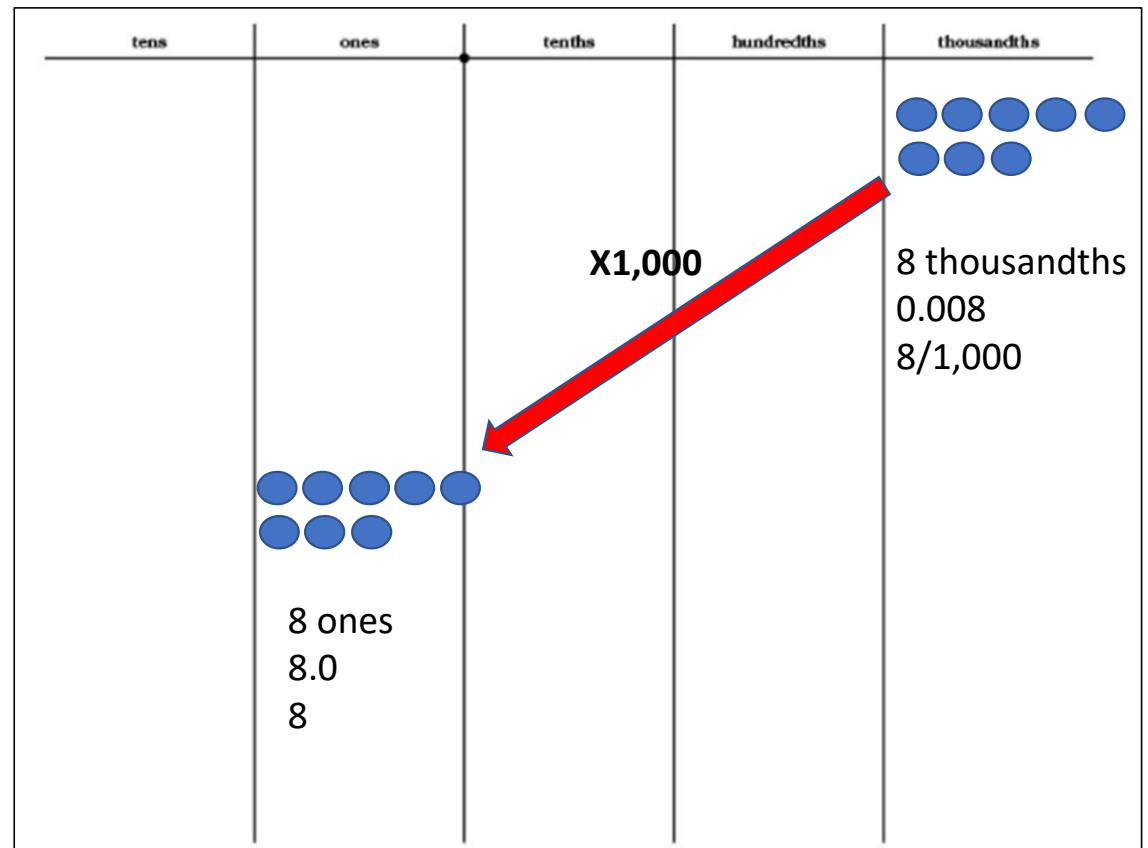
Multiplying Decimal Numbers by Powers of 10

We multiplied 0.008 by 1,000 to get 8.

What power of 10 would we need to multiply 0.008 to get to 80? 800?

$$0.008 \times 10^4 = 80$$

$$0.008 \times 10^5 = 800$$

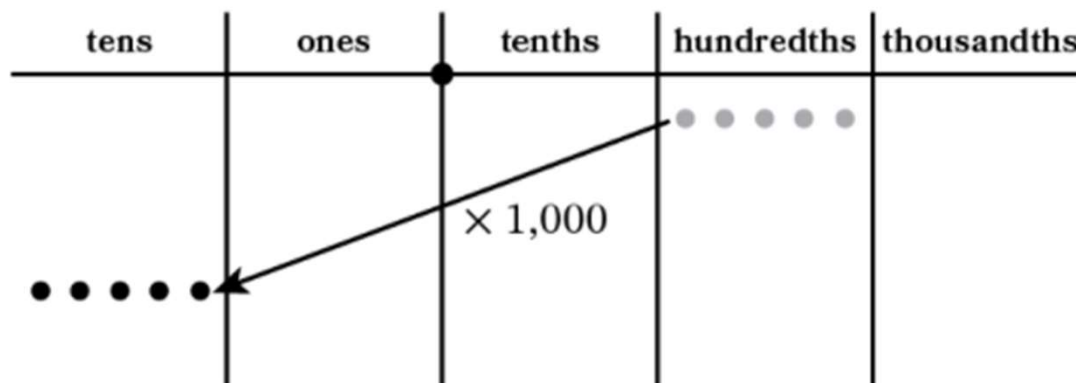


LEARN (30-min)

Multiplying Decimal Numbers by Powers of 10

LEARN book page 45.
Complete #1 - #5.

1. Use the place value chart to complete the equations.



$$0.05 \times \underline{1,000} = \underline{50}$$

$$0.05 \times \underline{10} \times \underline{10} \times \underline{10} = \underline{50}$$

$$0.05 \times 10^{\underline{3}} = \underline{50}$$

LEARN (30-min)

Multiplying Decimal Numbers by Powers of 10

LEARN book page 45.
Complete #1 - #5.

Find the product and write it in standard form.

2. $0.9 \times 10^2 = \underline{90}$

3. $0.001 \times 10^4 = \underline{10}$

4. $1.7 \times 10^3 = \underline{1,700}$

5. Determine the power of 10 that will make a true statement.

$4.06 \times \underline{10^3} = 4,060$

LEARN (30-min)

Dividing Decimal Numbers by Powers of 10



What number is represented on the place value chart?

What number is $\frac{1}{10}$ as much as 6 tenths?

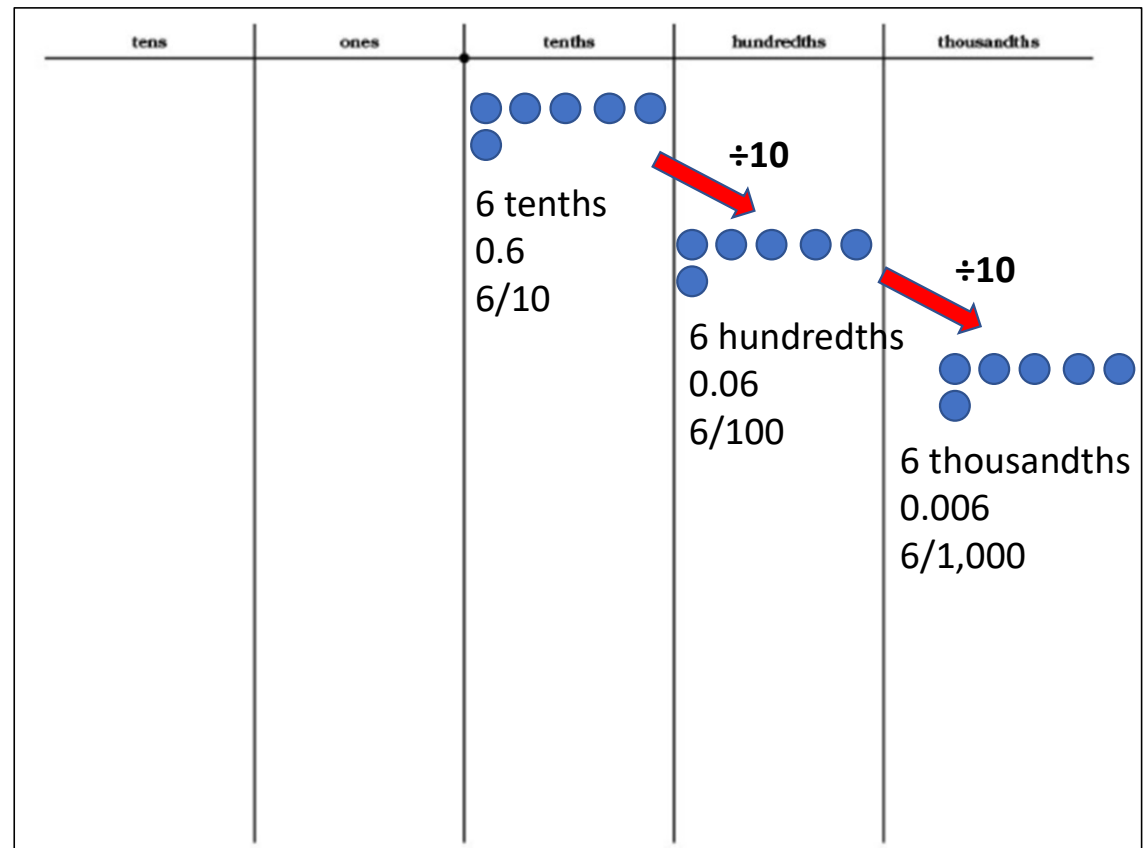
What EQUATION describes the statement that the place value chart represents?

$$0.6 \div 10 = 0.06$$

What number is $\frac{1}{100}$ as much as 6 tenths?

What EQUATION describes the statement that the place value chart represents?

$$0.6 \div 100 = 0.006$$



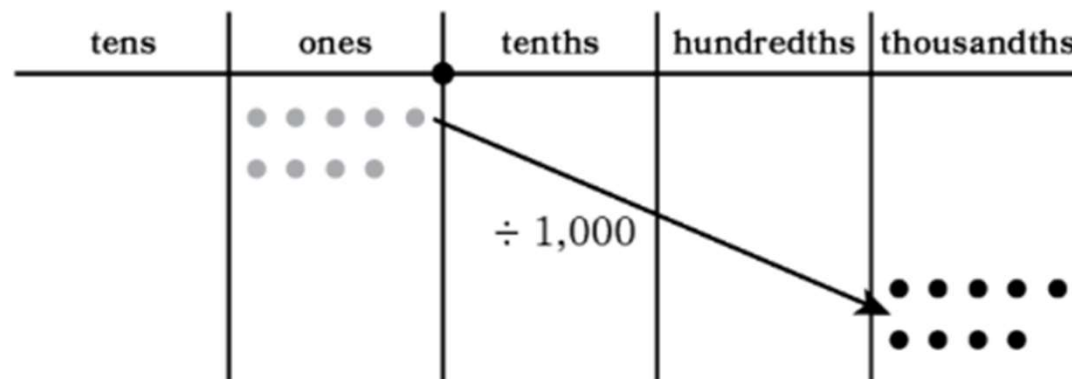
LEARN (30-min)

Multiplying Decimal Numbers by Powers of 10

LEARN book page 46.

Complete #6 - #10.

6. Use the place value chart to complete the equations.



$$9 \div \underline{1,000} = \underline{0.009}$$

$$9 \div \underline{10} \div \underline{10} \div \underline{10} = \underline{0.009}$$

$$9 \div 10^{\underline{3}} = \underline{0.009}$$

LEARN (30-min)**Multiplying Decimal Numbers by Powers of 10**

LEARN book page 46.
Complete #6 - #10.

TAKE-AWAY:

Dividing by 10 is the same
as multiplying by $\frac{1}{10}$.

Dividing by 100 is the same
as multiplying by $\frac{1}{100}$.

Dividing by 1,000 is the
same as multiplying by
 $\frac{1}{1,000}$.

Find the quotient and write it in standard form. Then write a related multiplication equation with the power of 10 expressed as a fraction.

7. $4 \div 10 = \underline{0.4}$

$$4 \times \frac{1}{10} = 0.4$$

8. $0.3 \div 10^2 = \underline{0.003}$

$$0.3 \times \frac{1}{100} = 0.003$$

9. $72.6 \div 10^3 = \underline{0.0726}$

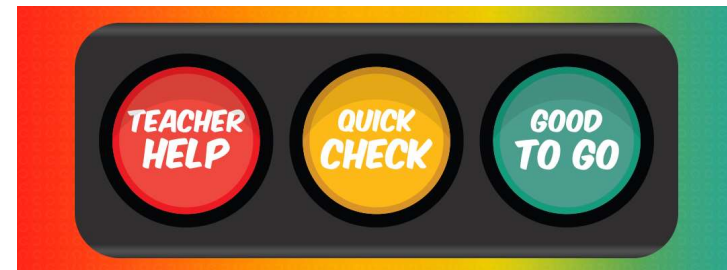
$$72.6 \times \frac{1}{1,000} = 0.0726$$

10. Determine the power of 10 that makes a true statement.

$$43.2 \div \underline{10^2} = 0.432$$

LAND (10-min)

Exit Ticket



Name

Date



5

1. Find the product and write it in standard form.

$$5.31 \times 10^3 = \underline{\hspace{2cm}}$$

2. Find the quotient and write it in standard form.

$$0.7 \div 10^2 = \underline{\hspace{2cm}}$$

Exit Ticket – PAGE 51

Small Group Time:

Problem Set Pages 47 – 49

Homework:

Page 33 APPLY BOOK