Unit 5 Home Resources

Illustrative Mathematics

Family Support Materials

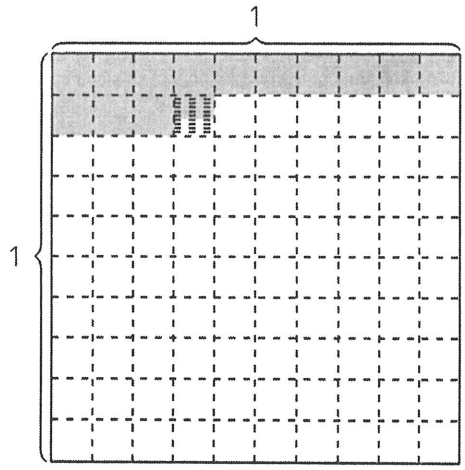
Place Value Patterns and Decimal Operations

In this unit, students use place value understanding to round, compare, order, add, subtract, multiply, and divide decimals.

Section A: Numbers to Thousandths

In this section, students are introduced to the thousandths place. They represent decimals on gridded area diagrams where the large square has a value of 1, and each small square within represents $\frac{1}{100}$.

Students learn that if they partition each small square into ten equal parts, each of those parts represents 1 thousandth of the large square.



Students write decimals in expanded form using sums of multiplication expressions. For example, 0.124 in expanded form can be written as $\left(1 \times \frac{1}{10}\right) + \left(2 \times \frac{1}{100}\right) + \left(4 \times \frac{1}{1{,}000}\right)$.

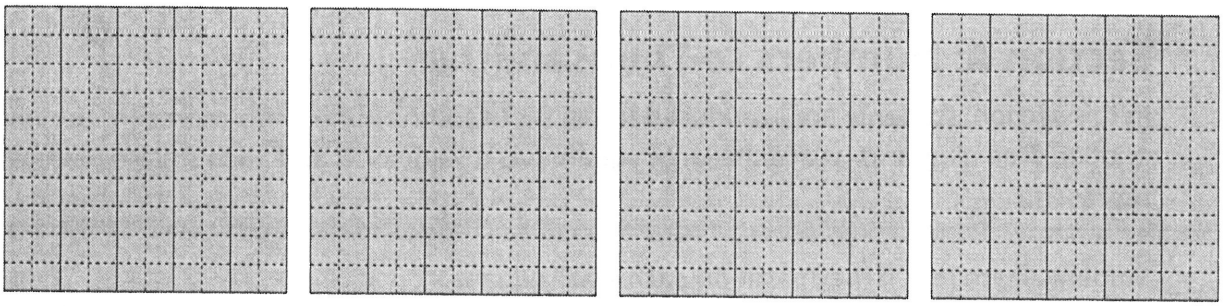
Students use this developing understanding of place value to the thousandths to locate decimals on a number line. They then use the number line to round, compare, and order decimals.

Section B: Add and Subtract Decimals

In this section, students add and subtract decimals to the hundredths. Initially, students add and subtract in ways that make sense to them. This allows students to relate addition and subtraction of decimals to operations with whole numbers. Students also use place value reasoning to estimate the value of sums and differences.

The example shows how students can divide 4 into groups of 2 tenths. There are 20 groups of 2 tenths in 4 wholes.

$$4 \div 0.2 = 20$$



Try it at home!

Near the end of the unit, ask your student to solve the following problems:

- 1.8×0.2
- $12.1 \div 1.1$

Questions that may be helpful as they work:

- Can you draw a diagram to help you solve the problem? How does your diagram show the solution?
- Can you explain the steps of your algorithm?

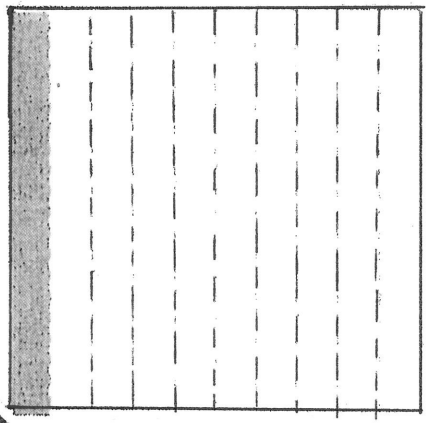
(2)

xiǎo shù shù wèi

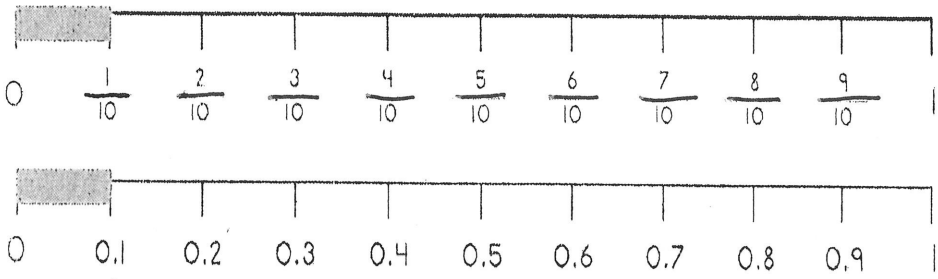
小数数位

shí fēn wèi

十分位

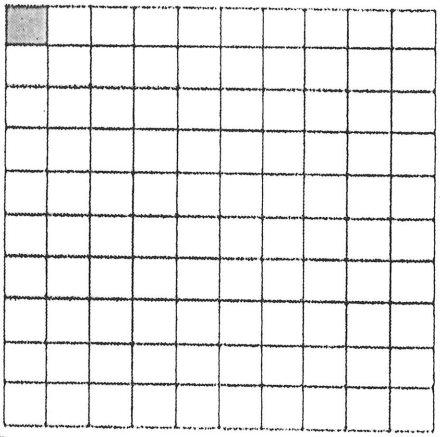


1 tenth = $\frac{1}{10}$ = 0.1 = $\frac{1}{10}$ of 1 = 1 dime

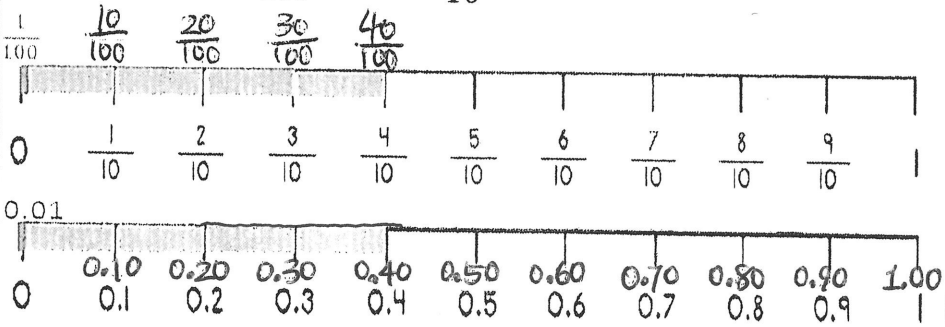


bǎi fēn wèi

百分位



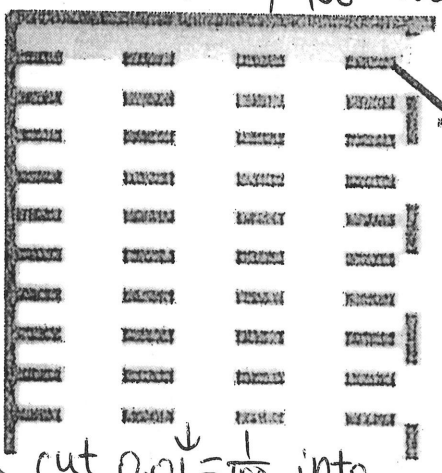
1 hundredth = $\frac{1}{100}$ = 0.01 = $\frac{1}{10}$ of 1 tenth = 1 penny = 1 cent



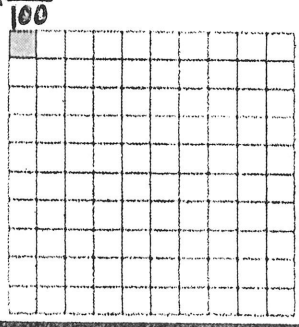
Zoom in View of $\frac{1}{100}$ = 0.01

qiān fēn wèi

千分位

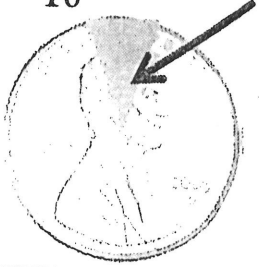


cut 0.01 = $\frac{1}{100}$ into



1 thousandth = $\frac{1}{1000}$ = 0.001 = $\frac{1}{10}$ of 1 hundredth

= $\frac{1}{10}$ of 1 penny



10 super tiny equal pieces/parts. Each super tiny shade part is $\frac{1}{1,000}$ = 0.001.

Name: _____ Number: _____ Decimal Anchor Chart

Name: _____

Practice Memorizing the Spelling of Numbers

Numbers in English

0	Zero	10	Ten	20	Twenty	30	Thirty
1	One	11	Eleven	21	Twenty-one	31	Thirty-one
2	Two	12	Twelve	22	Twenty-two	32	Thirty-two
3	Three	13	Thirteen	23	Twenty-three	33	Thirty-three
4	Four	14	Fourteen	24	Twenty-four	34	Thirty-four
5	Five	15	Fifteen	25	Twenty-five	35	Thirty-five
6	Six	16	Sixteen	26	Twenty-six	36	Thirty-six
7	Seven	17	Seventeen	27	Twenty-seven	37	Thirty-seven
8	Eight	18	Eighteen	28	Twenty-eight	38	Thirty-eight
9	Nine	19	Nineteen	29	Twenty-nine	39	Thirty-nine

40	Forty	50	Fifty	60	Sixty	70	Seventy
41	Forty-one	51	Fifty-one	61	Sixty-one	71	Seventy-one
42	Forty-two	52	Fifty-two	62	Sixty-two	72	Seventy-two
43	Forty-three	53	Fifty-three	63	Sixty-three	73	Seventy-three
44	Forty-four	54	Fifty-four	64	Sixty-four	74	Seventy-four
45	Forty-five	55	Fifty-five	65	Sixty-five	75	Seventy-five
46	Forty-six	56	Fifty-six	66	Sixty-six	76	Seventy-six
47	Forty-seven	57	Fifty-seven	67	Sixty-seven	77	Seventy-seven
48	Forty-eight	58	Fifty-eight	68	Sixty-eight	78	Seventy-eight
49	Forty-nine	59	Fifty-nine	69	Sixty-nine	79	Seventy-nine

80	Eighty	90	Ninety	100	One hundred
81	Eighty-one	91	Ninety-one	101	One hundred and one
82	Eighty-two	92	Ninety-two	200	Two hundred
83	Eighty-three	93	Ninety-three	300	Three hundred
84	Eighty-four	94	Ninety-four	400	Four hundred
85	Eighty-five	95	Ninety-five	500	Five hundred
86	Eighty-six	96	Ninety-six	600	Six hundred
87	Eighty-seven	97	Ninety-seven	700	Seven hundred
88	Eighty-eight	98	Ninety-eight	800	Eight hundred
89	Eighty-nine	99	Ninety-nine	900	Nine hundred

1000	One thousand
10,000	Ten thousand
100,000	One hundred Thousand
1,000,000	One million
10,000,000	Ten million
189,325,476	One hundred and eighty-nine million, three hundred and twenty-five thousand, four hundred seventy-six

Name: _____

Practice Memorizing the Spelling of Decimal Places

thousandths

tenths

hundredths

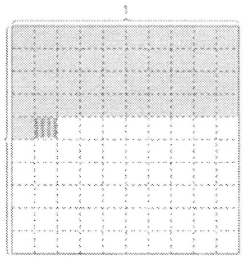
Thousands	Hundreds	Tens	ONES	Tenths	Hundredths	Thousandths
1,000	100	10	1	0.1	0.01	0.001
$\frac{1000}{1}$	$\frac{100}{1}$	$\frac{10}{1}$	$\frac{1}{1}$	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$

Showing/Representing Decimal Numbers in Different Ways/Forms

Standard Form	$43,035.272$ (do not forget "-" dash)
Word Form	Forty-three thousand, thirty-five and two hundred seventy-two thousandths
Expanded Form	$40,000 + 3,000 + 30 + 5 + 0.2 + 0.07 + 0.002$
Expanded Form Fraction	$(4 \times \frac{10,000}{1}) + (3 \times \frac{1,000}{1}) + (3 \times \frac{10}{1}) + (5 \times 1) + (2 \times \frac{1}{10}) + (7 \times \frac{1}{100}) + (2 \times \frac{1}{1,000})$
Expanded Form Unit → Decimal	$(4 \times 10,000) + (3 \times 1,000) + (3 \times 10) + (5 \times 1) + (2 \times 0.1) + (7 \times 0.01) + (2 \times 0.001)$

IM Fifth Grade Unit 5 Sample Questions

1. The shade region in the following grid represents ____



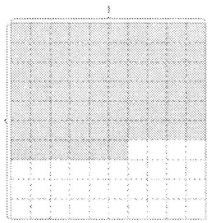
Answers （practice writing all three answers below):

$(4 \times 0.1) + (1 \times 0.01) + (9 \times 0.001)$

0. 419

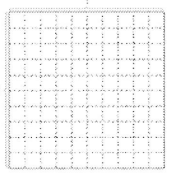
Four hundred nineteen thousandths

2. Write a decimal number to represent how much of the square is shaded.

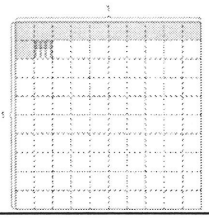


Answers : 0.66

3. Shade one hundred fifteen thousandths of the square.



Answers : See below.
You need to know how to write one hundred fifteen thousandths as a decimal number. It is 0.115. This helps you to prepare shading.



IM Fifth Grade Unit 5 Sample Questions

4. Write the decimal 0.418 as a fraction, in words, and in expanded form.

Answers （practice writing all three answers below):

Fraction Form: $\frac{418}{1,000}$

Word Form: four hundred eighteen thousandths

Expanded Form (Base Ten Form): $\left(4 \times \frac{1}{10}\right) + \left(1 \times \frac{1}{100}\right) + \left(8 \times \frac{1}{1,000}\right)$

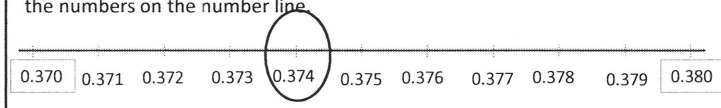
5. Order the numbers from least to greatest.

a) 13.8 b) 13.88 c) 13.78 d) 13.90

Answers : Since four choices all have 13, start to compare the digit on the tenth place of each answer choice. C has 7 tenths which means it is the least (smallest). Both A and B have 8 tenths, but A only have 8 tenths, B has 8 tenths and also 8 hundredths. Therefore, the second least (smallest) will be A. Then, it will B. The greatest (largest) will be D since it has 9 tenths. Answer is C, A, B, D

6. What is 0.374 rounded to the nearest hundredth? Explain or show your reasoning. Use the number line.

Answers : Make sure you underline the digit that is on the hundredth place first. 0. 3 7 4. Once you underline, you know the number 0.374 is between 0.370 and 0.380. You need to be able to locate the two numbers and label all the numbers on the number line.

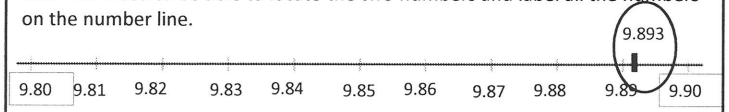


The left start number is 0.370, the right end number is 0.380. When rounding, you need to look if the number you need to round (0.374) is close to the left start number or right end number. For this question, 0.374 is definitely closer to the left start number, therefore, the answer is 0.370 or 0.37 when rounding to the nearest hundredth.

IM Fifth Grade Unit 5 Sample Questions

7. What is 9.893 rounded to the nearest tenth? What about to the nearest hundredth? Draw a number line if it is helpful.

Answers : Make sure you underline the digit that is on the tenth place first. 9. 8 9 3. Once you underline, you know the number 9.893 is between 9.80 and 9.90. You need to be able to locate the two numbers and label all the numbers on the number line.



The left start number is 9.80, the right end number is 9.90. When rounding, you need to look if the number you need to round (9.893) is close to the left start number or right end number. For this question, 9.893 is definitely closer to the right end number, therefore, the answer is 9.90 or 9.9 when rounding to the nearest tenth.

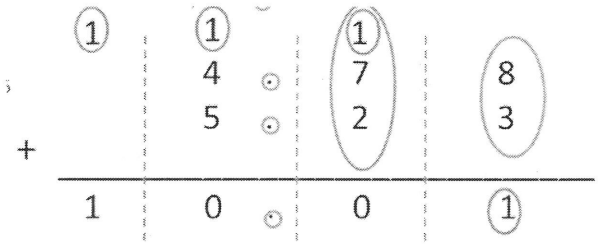
8. Practice adding decimal numbers by **following the things listed below**.

4. 78 + 5. 23 = _____

Answer:

What to follow in **Addition** with Decimals

- Check if you line up the decimal points, so like places can be added.
- It can be helpful if you draw lines to separate each place when adding.



IM Fifth Grade Unit 5 Sample Questions

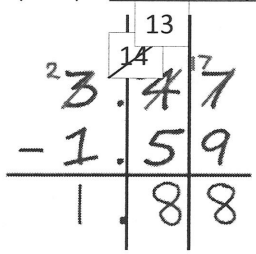
9. Practice subtracting decimal numbers by **following the things listed below**.

3. 4 7 - 1. 59 = _____

Answer:

What to follow in **Subtraction** with Decimals

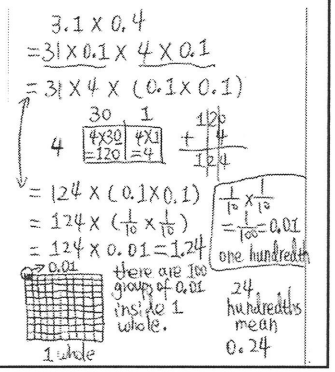
- Check if you line up the decimal points, so like places can be added.
- It can be helpful if you draw lines to separate each place when adding.



10. Practice multiplying a decimal number with another decimal number (contains a whole number part, for example, the number 3.1 has the whole number 3 on the ones place) by **following the example on the right side below.**

3. 1 x 0. 4 = _____

Answer: →



IM Fifth Grade Unit 5 Sample Questions

11. Practice multiplying a whole number with a decimal number by **following the example on the right side below.**

35 x 0. 34 = _____

Answer: ⟶

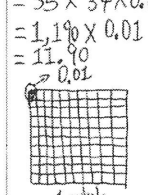
Example ②: 35 x 0.34 = 11.90

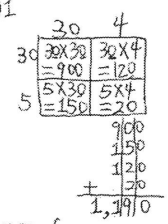
35 × 0.34 (34 hundredths)

= 35 × 34 × 0.01

= 1,190 × 0.01

= 11.90





There are 100 groups of 0.01 inside 1 whole, so there are 1,000 groups of 0.01 inside 10 wholes because 100 × 10 = 1,000 groups.

190 hundredths = 1.90 10 + 1.90 = 11.90

12. Practice multiplying decimal numbers by **following the example on the right side below.**

0. 5 x 0. 9 = _____

Answer: ⟶

Example ③: 0.5 x 0.9 = 0.45

method 1:

0.5 × 0.9

$= \frac{5}{10} \times \frac{9}{10}$

$= \frac{45}{100}$ = 45 hundredths

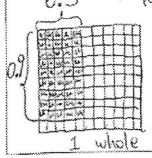
= 0.45

method 2: 0.5 × 0.9

= 5 (tenths) × 9 (tenths)

$= \frac{5}{10} \times \frac{9}{10} = \frac{45}{100}$

= 45 hundredths



length: 0.5 or $\frac{5}{10}$

width: 0.9 or $\frac{9}{10}$

IM Fifth Grade Unit 5 Sample Questions

13. Practice dividing a whole number by a decimal number by **following the example on the right side below.**

2 ÷ 0. 02 = _____

Answer: ⟶

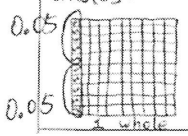
Example ①: 3 ÷ 0.05 = 60

how many groups of 0.05 inside 3 wholes?

There are 20 groups of 0.05 inside one whole.

3 (wholes) x 20.

= 60 groups of 0.05



14. Practice dividing a decimal number by a whole number by **following the example on the right side below.**

0. 54 ÷ 3 = _____

Answer: ⟶

Example ②: 0.72 ÷ 9 = 0.08

0.72 = 72 hundredths

72 (hundredths) ÷ 9

= 8 hundredths

= 0.08