Understanding Place Value

Concepts & Practice

Name That Place & Value
Whole Numbers
Decimals
Standard Form
Whole Numbers
Decimals
Expanded Form
Whole Numbers
Decimals

Compare and Order
Whole Numbers
Decimals
Vocabulary
Word First
Definition First
Rounding
Whole Numbers
Decimals

Problem-Solving

Place & Value

Place Value means that the amount a digit is worth depends on its position in the number.

On a place-value chart, you can think of numbers in groups of three.

Organizing the digits of a number in a place-value chart helps you understand the number's value.

Let's Take a Look…

Millions	Thousands	Ones

Hundreds Tens Ones , Hundreds Tens Ones , Hundreds Tens Ones

By using the place value chart, we can determine the ***place*** and ***value*** of any digit within a number.

				8	9	2	4	0	9
H	T	O	,	H	T	O	,	H	T	O
Millions				Thousands				Ones		

So, in the number 892,409, the ***place*** of the digit 2 is “Thousands” and the ***value*** is 2,000.

Let’s try using the chart!

5 7 4 3 1 8 6

H T O , H T O , H T O

Millions | Thousands | Ones

What is the place of the digit 4?

Ten-Thousands

What is the value of the digit 4?

40,000

What is the place of the digit 5?

Millions

What is the value of the digit 5?

5,000,000

What is the value of the digit 6?

6

What is the place of the digit 7?

Hundred-Thousands

Let’s practice without the chart!

THINK…

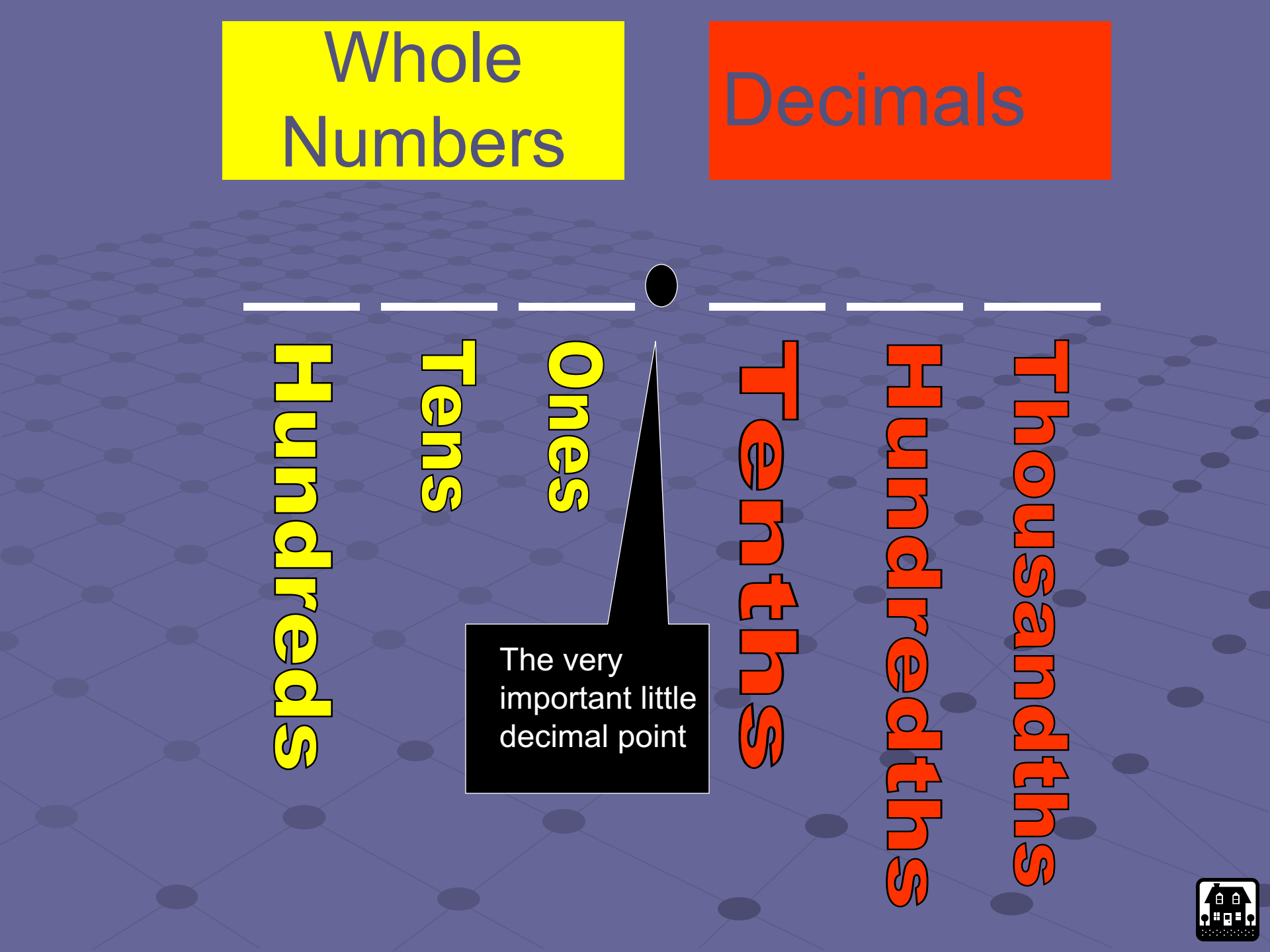
What can I do to be sure I don’t make a careless mistake when trying to figure out a digit’s place and value?

Place & Value - Decimals

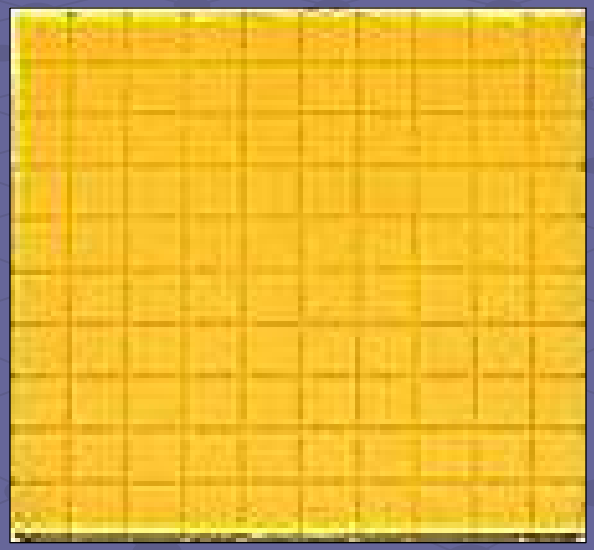
Place Value means that the amount a digit is worth depends on its position in the number.

This can be done with whole numbers and decimals. A **decimal** is a number expressed using a decimal point.

Let's Take a Look…


Whole Numbers
Decimals
Hundreds
Tens
Ones
Tenths
Hundredths
Thousandths
The very important little decimal point

Don’t forget those “th”s in your Dethimals!



If this represents a whole, or “one” then…

This shows a tenTH, because it takes 10 of them to make a whole

This shows a hundredTH, because it takes 100 of them to make a whole

Confused by decimals? Think of them like money…

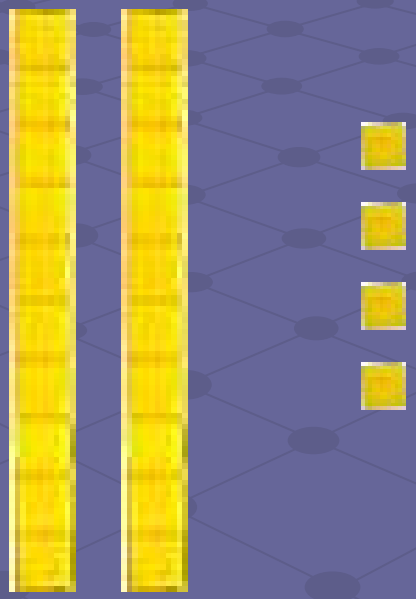
If this represents a whole, or “one” then…

This shows a tenTH, because it takes 10 of them to make a whole

This shows a hundredTH, because it takes 100 of them to make a whole

By using the place value chart, we can determine the ***place*** and ***value*** of any digit within a number.

Write a decimal for the model shown.

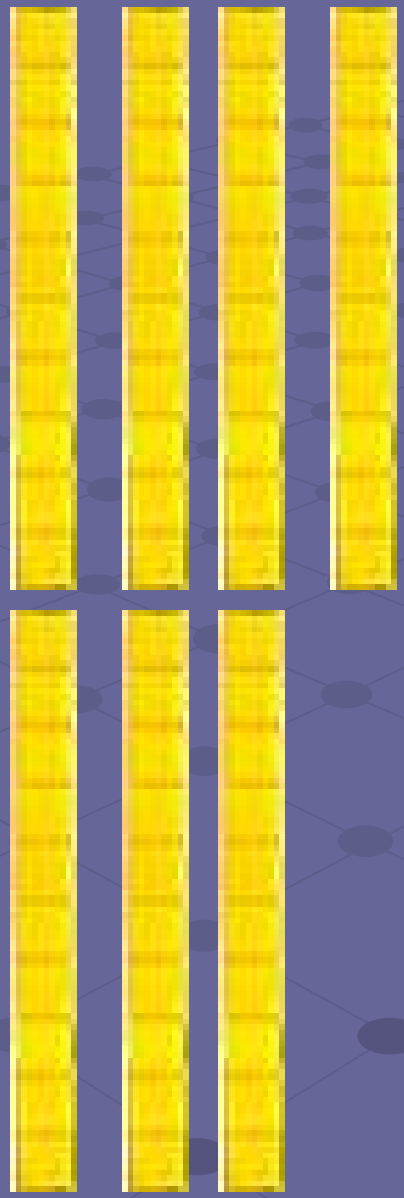


0 . 2 4

Ones Tenth Hundredth Thousandth

Decimals

Write a decimal for the model shown.

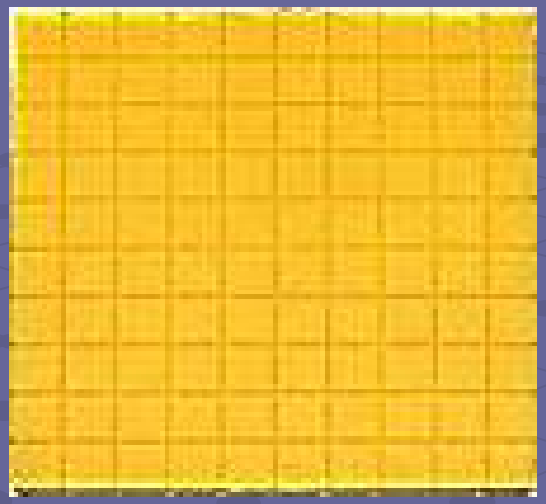


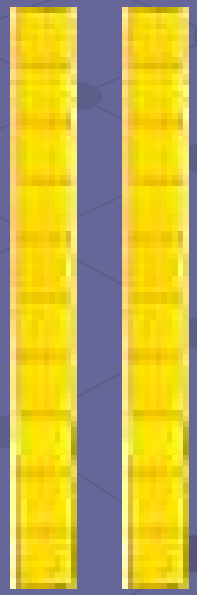
8 . ___ ___ ___

Ones Tenth Hundredth Thousandth

Decimals

Write a decimal for the model shown.





1 . 2

Ones Tenth Hundredth Thousandth

Decimals

Let's try using the chart!

8 . 3 7 2

Hundred	Tens	Ones	Tenth	Hundredth	Thousandth
		Ones		Decimals	

What is the value of the digit 8?

8

What is the place of the digit 7?

Hundredths

What is the place of the digit 2?

Thousandths

What is the value of the digit 7?

.07

Let’s practice without the chart!

8,[illegible]

THINK…

How can thinking of decimals in terms of money help me understand them better?

Standard Form

Standard Form simply means the number is shown in the usual way we write a number.

For example, “two thousand, eight hundred and sixty one” in standard form is 2,861! Simple enough! But beware of going to quickly and making a careless mistake!

Standard Form

When we read numbers, it helps to think of them in the groups of three (periods) we use in our place value chart.

The number “32,567,097” is read “thirty-two million, five hundred sixty seven thousand, and ninety seven”.

Try “reading” these numbers!

54,335,765

9,007,073

See if you can write these numbers in standard form!

Nineteen thousand, one hundred seventy two

Three million, sixty one thousand, three hundred two

Twenty million, thirteen thousand, eighty nine

Five million,

seventy six

THINK…

What do you think is the most common mistakes students will make when converting a number from words to standard form?

Standard Form - Decimals

When we read numbers that have a decimal point, we read the whole number, then the decimal point as “and”, and finally the decimal.

For example, the number 805.45 is read “eight hundred five and forty five hundredths”. Students are tempted to say “point” instead of “and” so watch out for that! It’s not wrong, just tacky!

Try “reading” these numbers!

35,463.7

2,888,888,109

1,234,535.5

See if you can write these numbers in standard form!

Two hundred seventy

Seventy five and fifty eight and one

Four hundred and seven hundred thirty three and five thousandths thousandths

Expanded Form

Expanded Form means writing a number as the sum of the value of its digits.

Basically, you split the number up into the separate value of each digit and connect them with addition.

Let's Take a Look…It's easier than it sounds!

342 in expanded form is:

300 + 40 + 2

23,405 in expanded form is:

20,000 + 3,000 + 400 + 5

Notice in this example, there is a zero in the "tens" place, so we can just leave it out of our expanded notation!

607,094 in expanded form is:

600,000 + 7,000 + 90 + 4

Ready to try some on your own?

Try “expanding” these numbers!

35,765

THINK…

What are some “tricks” for breaking a number into expanded form without making any careless mistakes?

Expanded Form with Decimals

Expanded Form means writing a number as the sum of the value of its digits.

You handle expanded form with decimals the exact same way you do with whole number—break apart each digit's value and connect them with addition!

Let's Try a Few…

13.875 in expanded form is:

10 + 3 + .8 + .07 + .005

23.405 in expanded form is:

20 + 3 + .4 + .005

Notice in this example, there is a zero in the "hundredths" place, so we can just leave it out of our expanded notation!

607.094 in expanded form is:

600 + 7 + .09 + .004

Ready to try some on your own?

Try “expanding” these numbers!

Comparing Numbers

Putting numbers in order from greatest to least or least to greatest is a skill you are guaranteed to use for the rest of your life.

Just think: One day you might have to say "Wow! Last year I made $15,023,932 and this year I made $15,203,932!" It's important to be able to rank and compare numbers.

Let's Explore…

How to Compare Numbers

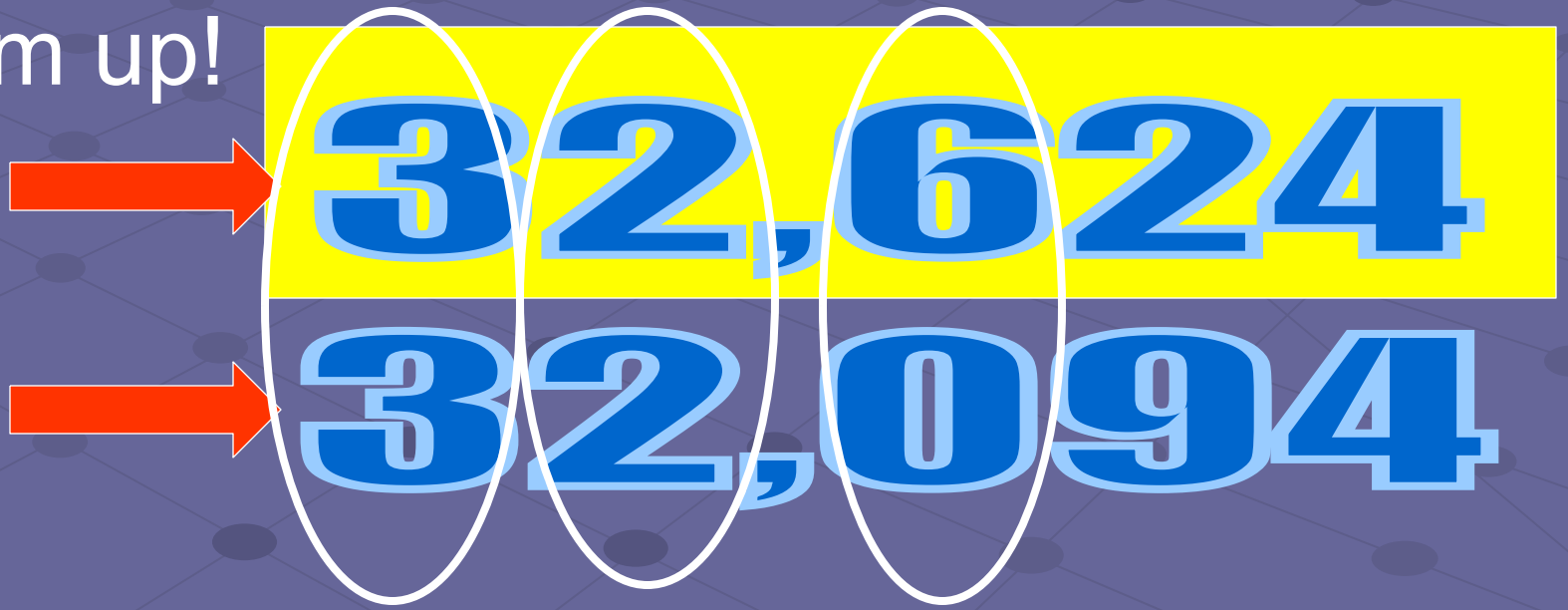
- First, remember the symbols we use to compare numbers: < less than, > greater than, = equal to

What "tricks" did you use in the younger grades to remember these?

- When we compare and order numbers, we always start from the digit on the left and move to the right—just like we read!

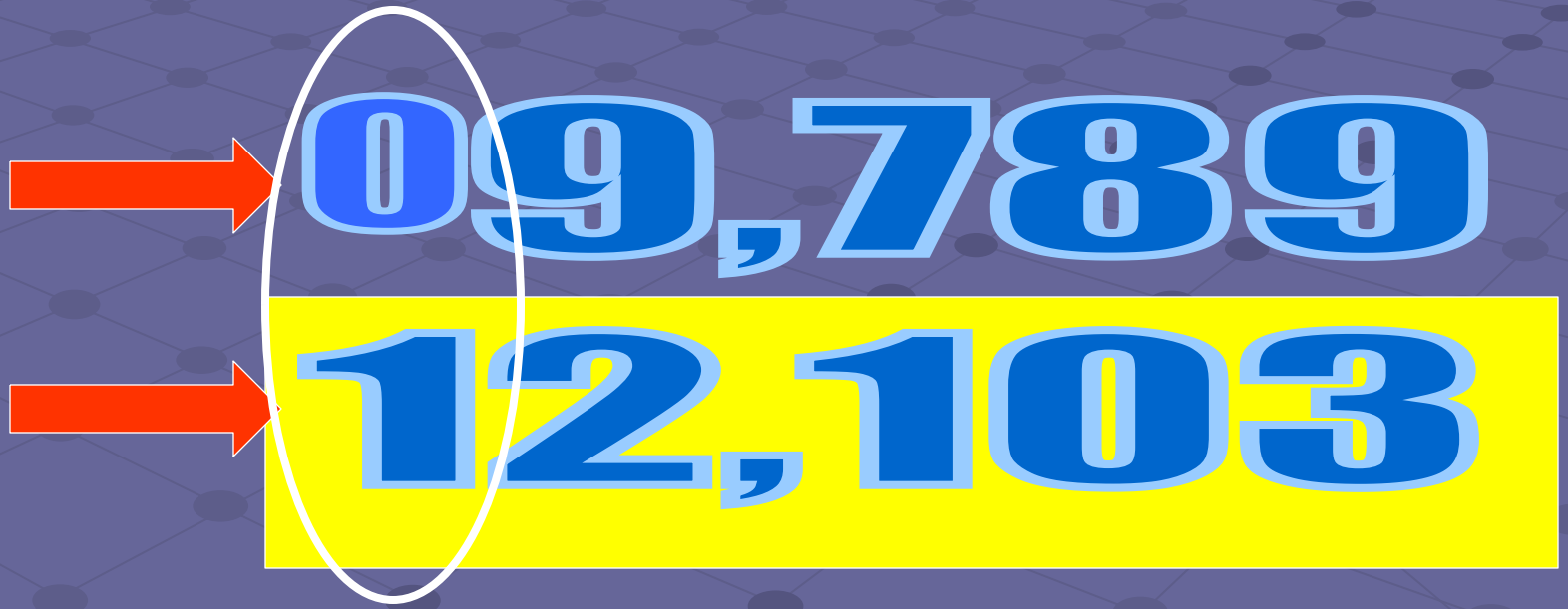
Memorize the "RULE" for place value:
Line Up, Or Mess Up!

If we were comparing the numbers 32,624 and 32,094 first we would line them up!



Next, start from the left and compare each digit!

If we you are comparing 2 numbers that don't have the same number of digits, you can always add a place holder zero if that makes it easier!



Remember: Line them up, then start from the left and compare each digit!

$6{,}927 > 6{,}899$

$31{,}203 < 300{,}102$

$200{,}300 > 200{,}030$

Put these numbers in order from Least to Greatest!

Before we even begin to tackle this, what do you think is the MOST common mistake students make on this type of problem?

53,602 8,602 152,300

Put these numbers in order from Greatest to Least!

245,505

245,955

244,955

Comparing Decimals

- When we compare and order decimals we do it just like we do with whole numbers: we always start from the digit on the left and move to the right—just like the direction you read!
- Don’t forget the golden rule of place value work: Line Up, or…

MESS UP!!!

Remember, if the numbers you are comparing don't don't have the same number of digits, you can always add a zero as a place holder!

Remember: Line them up, then start from the left and compare each digit!

$.809 < .810$

$41.203 < 400.102$

$6.320 > 6.317$

Put these numbers in order from Least to Greatest!

Remember: The most common mistake st[illegible]make is reversing the order of least to gr[illegible]atest and vice vers[illegible]'t fall in that trap! Check and re-check yourself!

Put these numbers in order from Greatest to Least!

745.505

545.955

Decimal

A decimal number is a number that has a whole number part and a fractional whole number part. In general, the numbers to the left of the decimal point make up the whole part of the number, and the numbers to the right of the decimal point make up the fractional whole part of the number

For example, the decimal number 658.125 has a whole part of 658 and a fractional whole part of 125.

Decimal Point

A dot written in a number that separates the whole number from the fractional part; it is read as “and”

Expanded Form

Numbers broken up into their individual place values.

(ie: 234 = 200 + 30 + 4)

Greater

The number that is bigger in quantity or amount

Integer

A member of the set of whole numbers and their opposites; Positive and negative whole numbers and zero; NOT fractions, decimals or mixed numbers

… -3, -2, -1, 0, 1, 2, 3…

Less

The number that is smaller in amount or quantity

Place Value

The value given to the space a digit holds because of its place in the numeral

Rounding

Replacing a number with an estimate of that number to a given place value

Standard Form

A number written using digits

Whole Number

A positive number without a fraction or decimal part

Decimal

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The number that is smaller in amount or quantity

Place Value

The value given to the space a digit holds because of its place in the numeral

Rounding

Replacing a number with an estimate of that number to a given place value

Standard Form

A number written using digits

Whole Number

A positive number without a fraction or decimal part

Rounding

When you “round” numbers, you are replacing the number with an estimate to a given place value.

Rounding can help you simplify a problem in order to do mental math or get an estimate of your final answer.

There are 3 simple steps…

Step 1

Underline the place to which you want to round.

A word of caution: These steps might seem too “easy”, once you get used to rounding, but do them anyways! It will ensure that you don’t make a careless mistake!

Step 2

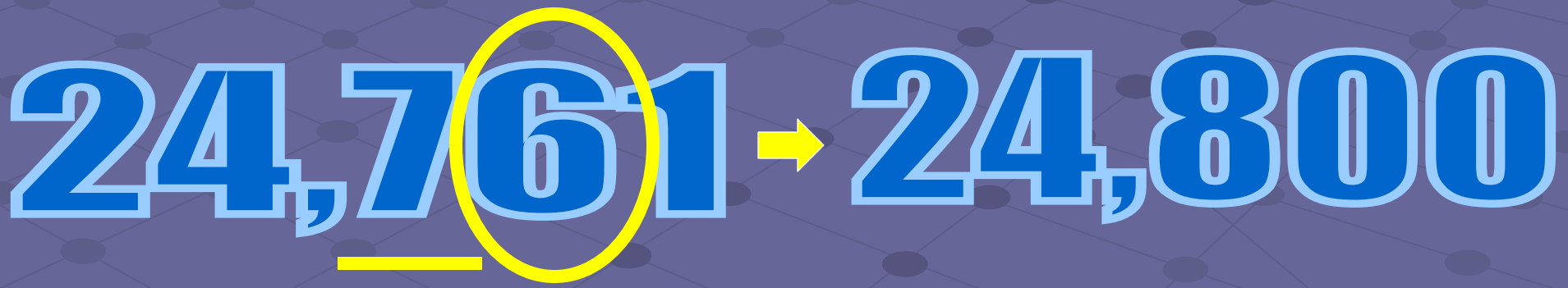
Circle the digit to the right of the underlined digit.

Think of the circled number as a telescope directing you where to go next in the problem!

Step 3

If your circled digit is 0 – 4 the underlined number will stay the same.

If the circled digit is 5 – 9 then the underlined number will go up one!



All of the numbers to the right of the underlined number will turn to zeros!

Let's Practice a Few!

935 → 940

Round to the Tens Place

1,348 → 1,300

Round to the Hundreds Place

Let's Practice a Few!

6,608 → 6,610

Round to the Tens Place

472 → 500

Round to the Hundreds Place

Now, Your Turn!

782

Round to the Tens Place

93

Round to the Hundreds Place

14,762

Round to the Thousands Place

185,112

Round to the Ten Thousands Place

Rounding with Decimals

Rounding with decimals is done exactly the same way you do it with whole numbers.

Notice as we practice these next problems how important it is to know your places!

Step 1

Underline the place to which you want to round.

57.146

Step 2

Circle the digit to the right of the underlined digit.

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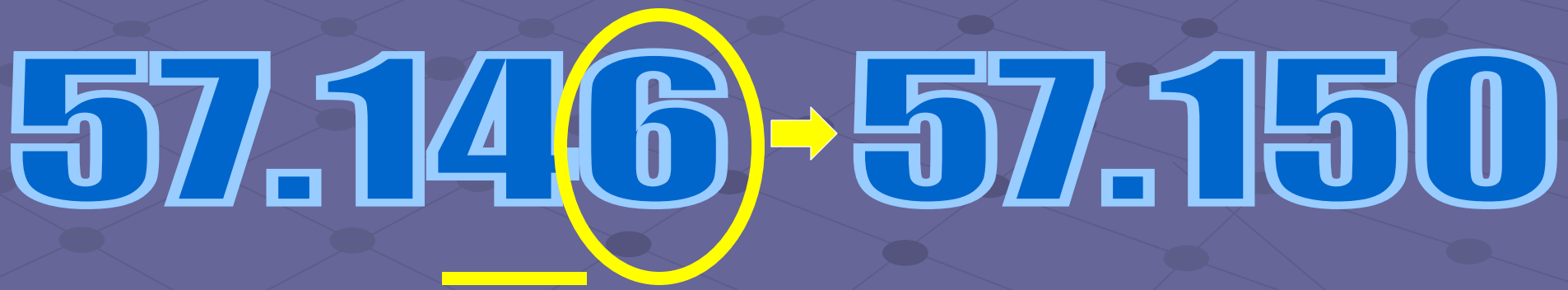

All of the numbers to the right of the underlined number will turn to zeros!

Let's Practice a Few!

8.452 → 8.500

Round to the Tenths Place

.728 → .730

Round to the Hundredths Place

Let's Practice a Few!

3.49 → 3.00

Round to the Ones Place

9.351 → 9.400

Round to the Tenths Place

Now, Your Turn!

.068

Round to the Tenths Place

5.517

Round to the Hundredths Place

14.762

Round to the Ones Place

392.503

Round to the Tenths Place

Which number has 4 in the hundred thousands place?

4,034,004

3,408,073

4,046,488

Which number has 6 in the thousandths place?

5.603

6.600

6.536

Which of the following shows thirty-two million, five hundred thirty-two thousand?

32,000,532

32,005,320

32,532,000

Which of the following shows eighty-nine and seventy-two hundredths?

89.72

897.2

89.072

Which number has 8 in the thousands place?

253,080,923

280,825,808

28,438,088

Which shows the numbers in order from least to greatest?

131,303 113,003 313,011

103,010 100,333 330,001

31,010 111,303 301,033

Which number is read seventy-one and eighteen hundredths?

71.018

71.18

7.118

Which of the following is true?

89,909 > 89,099

200,200 > 202,000

52,010 < 4,999

Which of the following is true?

0.105 > 0.15

0.05 < 0.015

.005 < .100

How is the number 412,030 read?

four hundred twelve thousand, three

four hundred thousand, twelve, thirty

four hundred twelve thousand, thirty

What is 35.042 rounded to the nearest ten?

40.000

35.000

30.000

What is 5.892 rounded to the nearest tenth?

5.890

5.900

6.000

What is 253.765 rounded to the nearest hundredth?

300.000

253.770

253.800