Handout #1
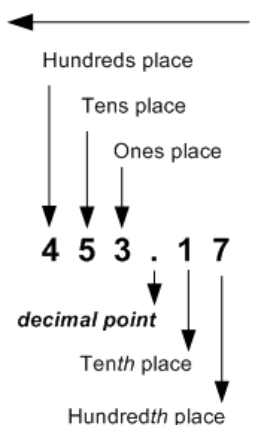
Rocio, let's look at a number with its *place value* labeled:

As you go left, each place value gets **10 times bigger**

Hundreds place

Tens place

Ones place

4 5 3 . 1 7

decimal point

Tenth place

Hundredth place

As you go right, each place value gets **10 times smaller**

The different **place values** represent different numbers.

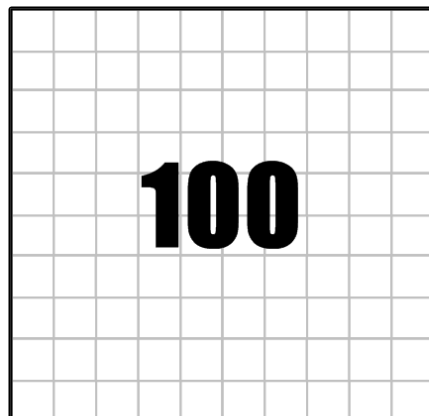Let's look at the place values **left of the decimal point**:

hundred = 100 | ten = 10 | one = 1

Let's look at the place values **right of the decimal point**:

$ten\textbf{th} = \dfrac{1}{10} = 0.1$ | $hundred\textbf{th} = \dfrac{1}{100} = 0.01$

Let's draw out the **place values** to the left of the decimal:

100
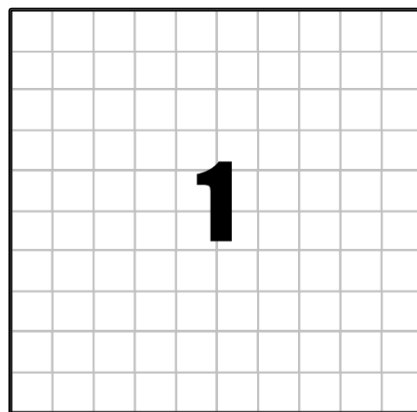
Hundreds place

10

Tens place

1

Ones place

As you can see **the hundreds place is 10 times bigger than the tens place** and **the tens place is 10 times bigger than the ones place**.

Let's draw out the **place values** to the right of the decimal. We are going to have to **resize the ones place** so we can **see the hundredth place**:

1

Ones place

0.1

Tenth place

0.01

Hundredth place

We can think of a number as **composed** of these base place values:

Example 1:

$$936 = 9 \times 100 + 3 \times 10 + 6 \times 1 = 900 + 30 + 6 = 936$$

Example 2:

$$0.82 = 0 \times 1 + 8 \times 0.1 + 2 \times 0.01 = 0 + 0.8 + 0.02 = 0.82$$

Example 3:

$$4.55 = 4 \times 1 + 5 \times 0.1 + 5 \times 0.01 = 4 + 0.5 + 0.05 = 4.55$$

Example 4:

$$304.9 = 3 \times 100 + 0 \times 10 + 4 \times 1 + 9 \times 0.1 = 300 + 0 + 4 + 0.9 = 304.9$$

① Zero Hundred Dollars

Let's look at a number: **09**

Do we need that extra '0' in front?

Let's find out:

09 = 0 × 10 + 9 × 1 = 0 + 9 = 9

So:

09 = 9

Let's look at a number: **0.30**

Do we need that extra '0' one the end?

Let's find out:

0.30 = 3 × 0.1 + 0 × 0.01 = 0.3 + 0 = 0.3

So:

0.30 = 0.3

Remember!

Extra zeros on either the front or end of a number **are not needed!**

Example 1:

00323 = 23

Example 2:

00454.9900 = 454.99

But zeros **in the middle of nonzero numbers are needed!**

For example, 320.02 is **not equal** to 32.2.

That is,

320.02 ≠ 32.2

Get some **hundred, ten, one cutouts and do the following problems with your tutor:**

Q1   Show the place value composition of **325** using the cutouts and addition:

Q2   Show the place value composition of **277** using the cutouts and addition:

Get some **one, tenth and hundredth cutouts and do the following problems with your tutor:**

Q3   Show the place value composition of **2.40** using the cutouts and addition:

Q4   Show the place value composition of **2.4** using the cutouts and addition:

Q5   Show the place value composition of **0.9** using the cutouts and addition:

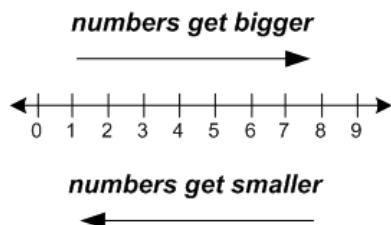Q6   Show the place value composition of **0.11** using the cutouts and addition:

Fill in **< or > or =** for the following. If you get stuck, use your cutouts:

#		
1	200	200
2	2.0	0.2
3	0.11	0.2
4	7.0	0.7
5	3.0	0.3
6	15.0	15
7	0.9	0.22
8	008	8
9	0.7	0.70
10	12.30	12.3
11	52.92	53
12	0.72	0.8
13	0.6	0.59
14	5.00	5
15	0.2	0.19

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2   **I Walk the Line**

Let's take a look at a number line:

numbers get bigger

numbers get smaller
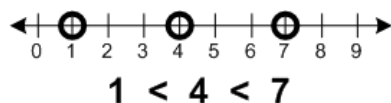
We can use a number line to **order numbers from least to greatest**. The key is that

1   **As you go to the right, numbers get bigger**

2   **As you go to the left, numbers get smaller**
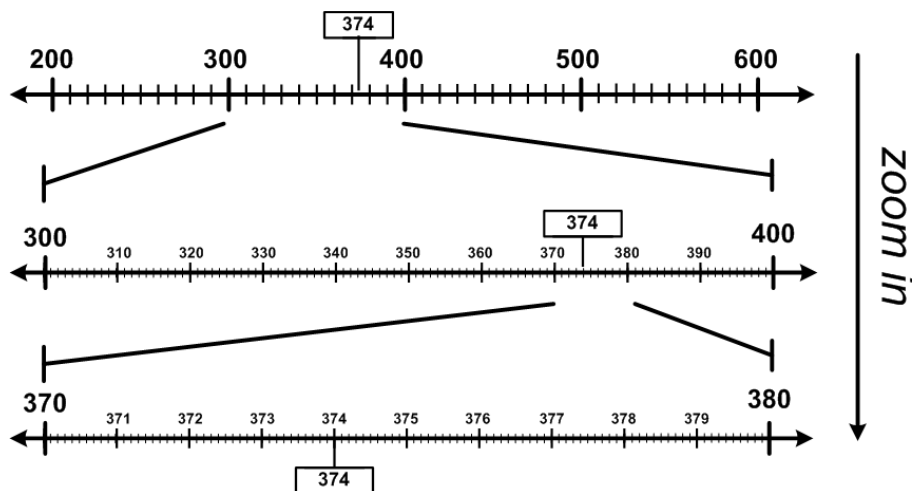
So, let's **order** the numbers 1, 4, and 7 on a number line:

$$1 < 4 < 7$$

Remember, the **divisions** or **tick marks** on a number line **do not have to be in units of 1**. We can use tens, hundreds, or **any uniform division**.

With that in mind, let's order the numbers 200, 400, and 700 on a number line:
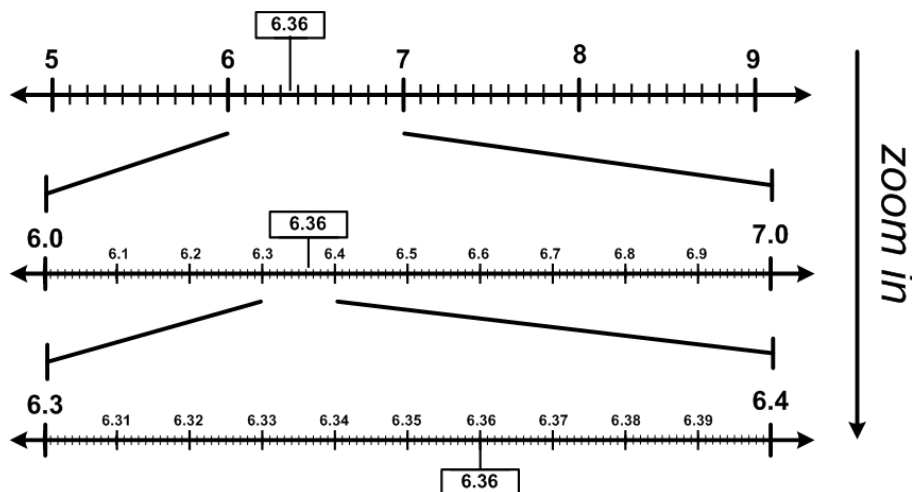
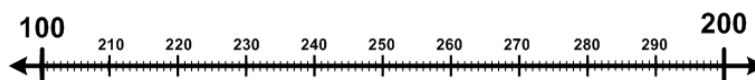$$200 < 400 < 700$$
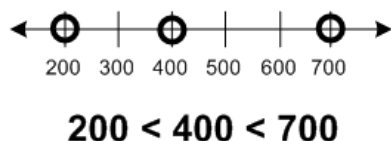
Let's put 374 on a number line:

You see, between every **place value** there are **10** smaller place values. So you start big (with divisions of hundreds) and then you can **zoom in** to see more detail.
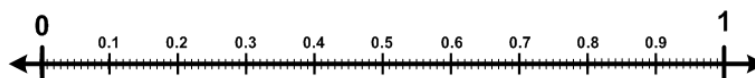
So let's try with a decimal number 6.36:

zoom in

Use the number line below to order 270, 225, 259, 213 and 205:

Use the number line below to order 0.9, 0.0, 0.11, 0.62 and 0.7:

? Questions

For the questions below, you need to fill in the appropriate divisions or "tick marks". Then order the numbers.
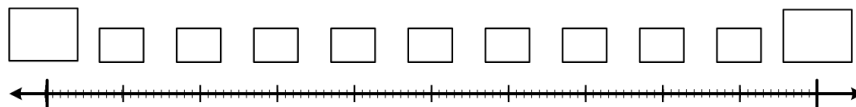
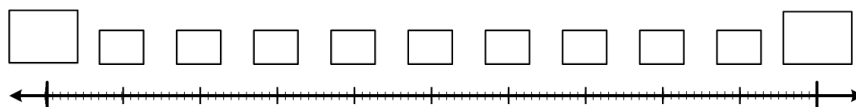Q7   Order the numbers 215, 285, 290, 205, and 259:

Q8   Order the numbers 0.25, 0.9, 0.11, 1.0, and 0.66:

Q9   Order the numbers 3.14, 3.0, 3.45, 3.54, and 3.20:

Q10 Order the numbers 14.2, 10.6, 19.9, 19.90, and 13.9:

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-- scratch paper --