Warm-Up

Which number is 4000 + 80 + 5?

A 458

B 485

C 4085

D 4805

When you are done, write expanded form for each of the answer choices.

y

Review: Grade 3

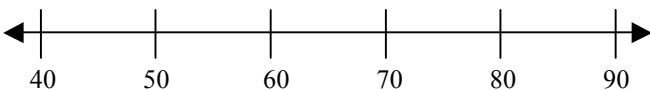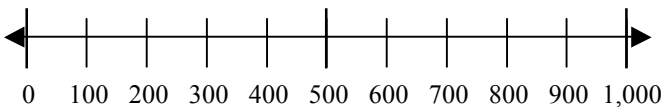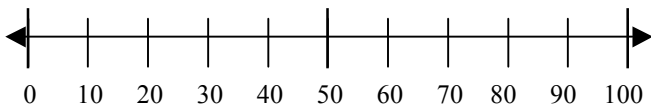Compare. Write <, >, or =.

3,501 ◯ **3,051**

Prove your answer using a *place value chart* and *expanded form*.

Place Value Chart

Expanded Form

x

Current: Grade Grade 3

Plot ⦅45⦆and ⦅82⦆ on **each** of the following number lines. Put a star * by the number line that was the easiest to use.

| 0   10   20   30   40   50   60   70   80   90   100 |

| 0   100   200   300   400   500   600   700   800   900   1,000 |

| 40   50   60   70   80   90 |

Other: Grade 3

Make as many different 4 digit numbers as you can using these 4 digits:

3, 6, 5, 7

When done: Put 3 of the numbers that you made in order from least to greatest.

_____   _____   _____

Quad II: CST/CAHSEE Grade 3

Which number is 4000 + 80 + 5?

A 458

B 485

C 4085

D 4805

A 400 + 50 + 8

B 400 + 80 + 5

C 4,000 + 80 + 5

D 4,000 + 800 + 5

When you are done, write expanded form for each of the answer choices.

Debrief: Take a survey of which answer students chose. Test out each answer chosen, proving that C is correct. Ask, "How did you check your work?" Have 1 or 2 students share their strategies (Rereading, checking place value). Another option is to ask, "Can you explain why someone might choose A or D?" Think Pair Share, then have a student or 2 share out.

Quad I: Review: Grade 3

Compare. Write <, >, or =.

$$3,501 \, \boxed{>} \, 3,051$$

Prove your answer using a *place value chart* and *expanded form*.

Place Value Chart

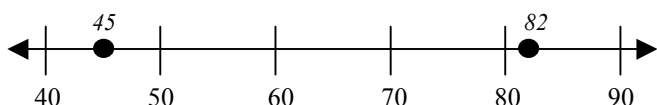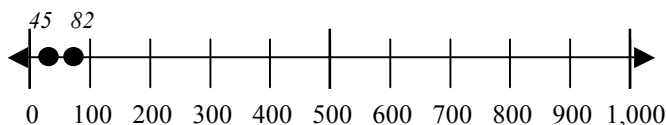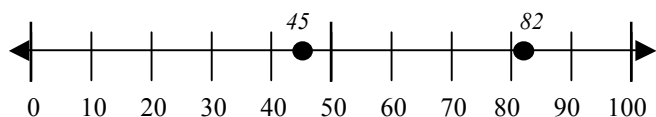| TH	H	T	O
3	5	0	1
3	0	5	1

Expanded Form

3,000 + 500 + 0 + 1

3,000 + 0 + 50 + 1

Debrief: Have a student share his/her work on the document reader. He/she may need prompting this early in the year. Any time a student debriefs a problem, it's a chance to develop math vocabulary. When the student is done, you can ask a probing question such as, "3,051 has 5 tens and 3,501 has no tens. How come 3,501 is greater?

Quad III: Current Grade 3

Plot 45 and 82 on **each** of the following number lines. Put a star * by the number line that was the easiest to use.

45 ... 82

0 10 20 30 40 50 60 70 80 90 100

45 82

0 100 200 300 400 500 600 700 800 900 1,000

45 ... 82

40 50 60 70 80 90

Debrief: Either have a student share his/her work on the document reader,(or) run your pencil under each number line, and ask them to raise their hands when you reach 45 and 82.Plot each point until all are done. Take a survey as to which number line they chose. Ask a student to explain his/her choice. Have students explain their choices to their partners.

Quad IV: Other Grade 3

Make as many different 4 digit numbers as you can using these 4 digits:

3, 6, 5, 7

Examples:

3,657	6,573	7,653	5,376
3,576	6,735	7,356	5,673
3,765	6,357	7,635	5,763

When done: Put 3 of the numbers that you made in order from least to greatest. *Example:*

L 3,567   3,657   3,765 **G**

Debrief: Have students share with their neighbors what they numbers they came up with. As the students are sharing, notice who understood the directions and who needs clarification next time. Take 3 examples and order them from least to greatest, talking through your reasoning (or) have a student share how he/she ordered their numbers.

Comparing Greater Numbers on a Number Line: Grade 3

After the Warm Up….

Let's start with a story… *(Put the story on the overhead. Usually I substitute with my own name or names of other teachers at the school.)*

> Mrs. Smith and Ms. Williams were playing a really cool video game. Mrs. Smith scored 9,334 points, and Ms. Williams scored 2,999 points.
>
> Who scored more points?
> What's the difference between the two scores?

Raise your hand if you know who scored more points? (hands)
Thumbs up for Mrs. Smith. (note response)
Thumbs up for Ms. Williams. (note response)

You have compared a lot of numbers lately using a place value chart and expanded form, so you know that 9,334 is greater than 2,999.

Today you are going to compare those numbers on a number line.

Title your page, Comparing Numbers on a Number Line.

Write, *Compare 9,334 and 2,999.*

We agree that 9,334 is greater than 2,999. Skip a line and write "I think 9,334 >2,999." What if the numbers were switched? What would we write? Share with your neighbor. (Give a few minutes) I need a quiet hand to share out.
(2,999 < 9,334)

Below that, you need to write "My Proof." Mathematicians are always asking "Where's the proof?" Well you can say, "Here it is!"

For more difficult problems, (such as 3,605 and 3,281), the students can save the "I think" for last. The number line is then used to figure out the problem.
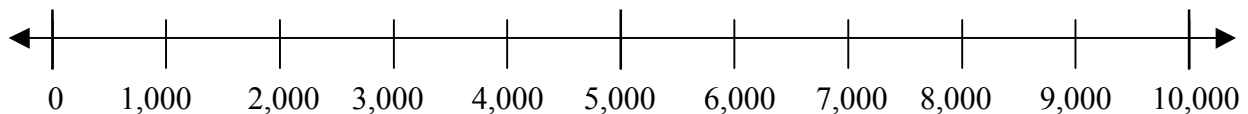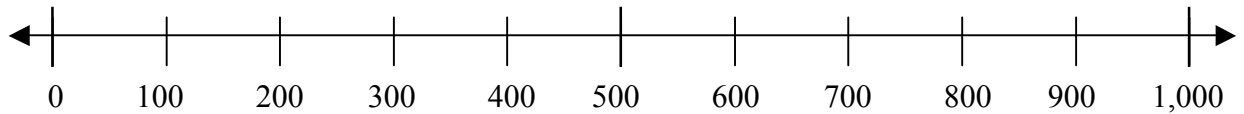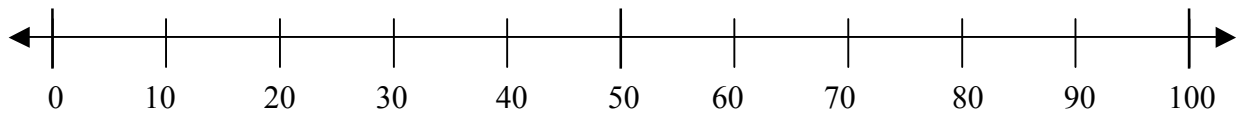
Student notes so far:

> **Compare 9,334 and 2,999.**
>
> I think: 9,334 > 2,999   2,999 < 9,334
>
> My Proof :

Now we need to choose a number line to plot our points on. Here are some number lines we've used before. *(Show pre-drawn number lines.)*

Point to each number line as you ask… If we are going to plot 9,334 and 2,999, which number line should we use? Thumbs up for the top one. Thumbs up for the middle one….etc.

Yes, we should use the one from 0 to 10,000 because there's a place for both numbers on it.

Raise your hand if you remember how to draw your own number line.
Remember to use your ruler to make a straight line all the way across the page.
(The ruler is used as a straight edge, __not__ as a way to measure the distance between tic marks.)
Then mark the halfway point. What is the halfway point between 0 and 10,000? (5,000) Then write all the tic marks and numbers in between. (Circulate to check for accuracy.)

Now that we have our number line, plot 9,334 and 2,999 on the line.
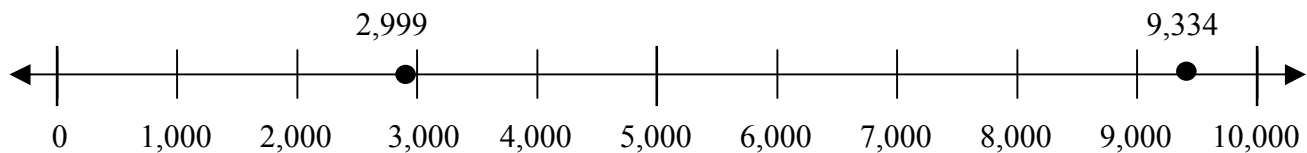
It's very clear on your number lines that 9,334 is definitely greater than 2,999 because 9,334 is on the right, and 2,999 is on the left. Let's take it even further
.
(Highlight with a colored pencil or marker.) See this area between 2,999 and 9,334? This is called the difference. **The difference is the distance between two numbers on a number line.**

You have 30 seconds to get one colored pencil out…..
Now color in only the space **between** 2,999 and 9,334. Don't color the outside, only the inside.
Now draw a big hump with your regular pencil and write "difference" to remind you what that is.

By they way, is this a *really big* difference or a *small* difference? Share with your partner what you think. (share) Thumbs up for small difference/big difference. Let's add in that it's a big (or really big) difference. This adds to our proof.

really big **difference**

2,999   9,334

0   1,000   2,000   3,000   4,000   5,000   6,000   7,000   8,000   9,000   10,000

How much is each section worth? (or)
How much is one jump?
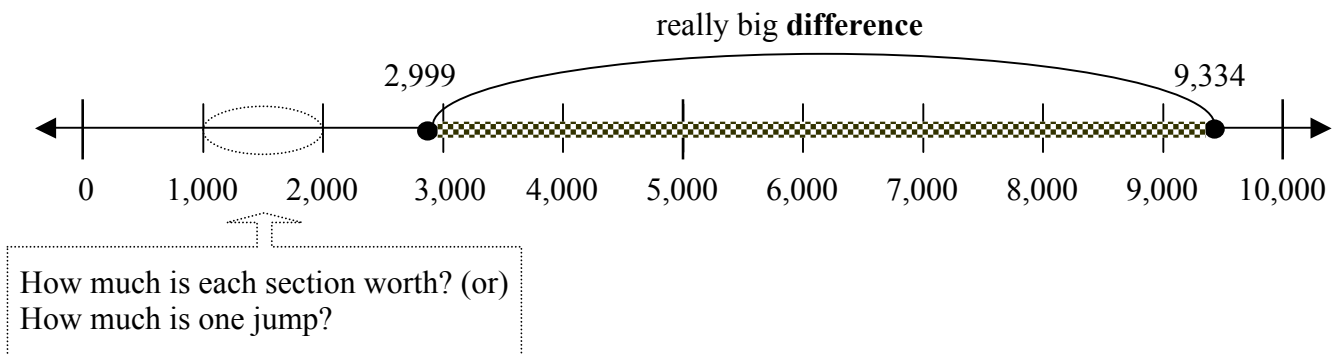
Since you are doing so well, we are going to add more detail. Let's find out about how much of a difference there is. How much is each section worth on this number line? 10? 100? 1,000? Share with your neighbor. Thumbs up if you know. Okay. Hands up for 10. Hands up if you think it's 100. Hands up for 1,000. Okay, 1,000.

Watch and count as I circle each section between the two numbers. (1 section, 2 sections,….. 6 sections) So that's 1,000, 2,000……6,000. The difference is about 6,000.

Now *you* circle the 6 sections on your number line. Remember only the sections on the highlighted part.

Now add your final note under your number line: ***Difference is about 6,000.*** *(Other ideas to develop as the class is ready…9,334 is about 6,000 more than 2.999 (or) 2,999 is about 6,000 less than 9,334.)*

Students' Final Notes for First Example:

We Do: Compare 9,334 and 2,999.

I think: 9,334 > 2,999   2,999 < 9,334

My Proof

really big **difference**

2,999   9,334

0   1,000   2,000   3,000   4,000   5,000   6,000   7,000   8,000   9,000   10,000
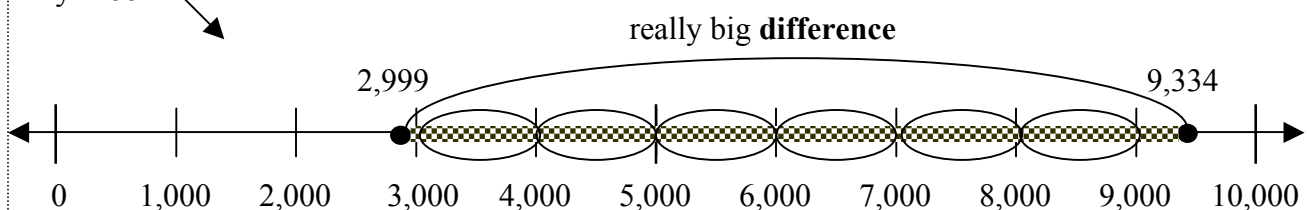
*Difference is about 6,000.

Raise your hand if you could do all of this on your own. Thumbs up if….
…you can write the *I think* part.
…you can write, *My Proof.*
…you can draw your number line and plot the points.
…you can highlight the difference and label the difference like the one we just did.
…you can to circle the sections and write about how much the difference is. That part is bonus.

Okay, here is your You Try:

You Try#1: Compare 1,675 and 4,201.
If you finish early, check your work with your neighbor's work. Then do a second You Try.
Don't copy the second You Try until the first one is done.
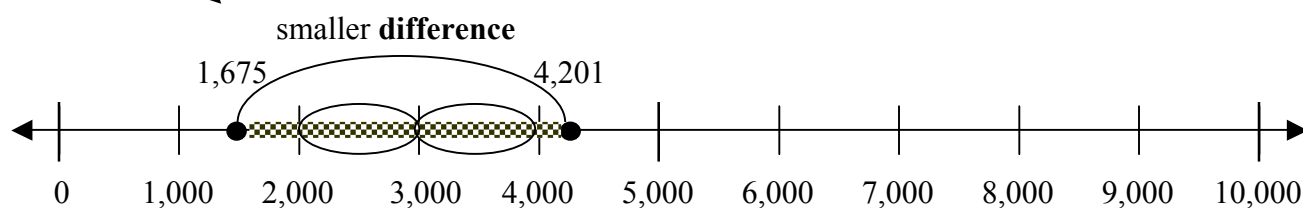

You Try #2: Compare 5,001 and 945.
If you finish the second You Try, check your work again with a neighbor. Then make up your own numbers and compare them on a number line. (You are never *done* because you can always make up a new set of numbers.)

Debrief for You Tries (Best to have a student come up, show, and explain his/her work. You will most likely need to guide them at first. Some students will have only one you try completed. Others will have more. Both situations are okay.)

You Try #1: Compare 1,675 and 4,201.

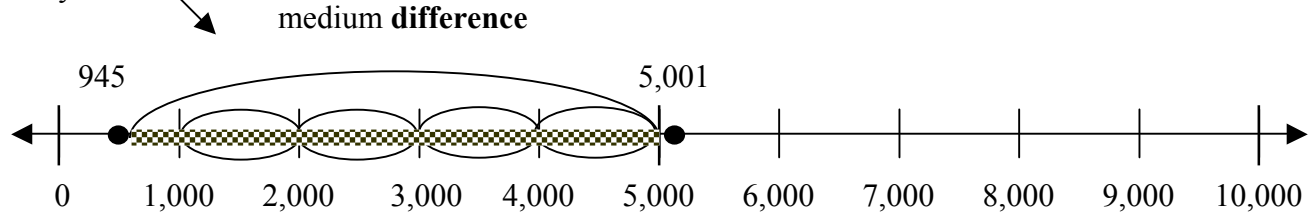I think: 1,675 < 4,201   4,201 > 1,675

My Proof

smaller **difference**

1,675   4,201

| | | | | | | | | | |
0   1,000   2,000   3,000   4,000   5,000   6,000   7,000   8,000   9,000   10,000

*Difference is about 2,000.

You Try #2: Compare 5,001 and 947.

I think: 5,001 > 947   947 < 5,001

My Proof

medium **difference**

945   5,001

0   1,000   2,000   3,000   4,000   5,000   6,000   7,000   8,000   9,000   10,000

*Difference is about 4,000.

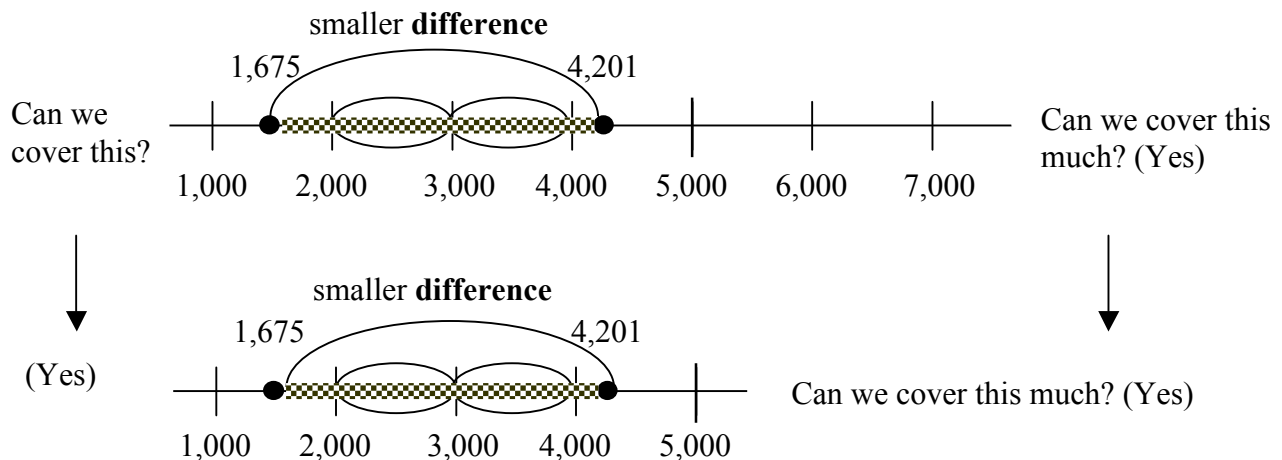*Wrap Up:* Show me with your arms about how big the difference is between….

2,999 and 9,334   4,197 and 1,675   947 and 5,001

Raise your hand if you learned something new today. Great job! *(End of Lesson)*

- -

Next Steps: In future lessons, you can …

1) Develop flexibility with the number line. Take a second look at the first You Try. Do we need the whole number line?

smaller **difference**

1,675   4,201

Can we
cover this?

1,000   2,000   3,000   4,000   5,000   6,000   7,000

Can we cover this much? (Yes)

(Yes)

smaller **difference**

1,675   4,201

1,000   2,000   3,000   4,000   5,000

Can we cover this much? (Yes)

So…all we need is from 1,000 to 5,000 (See Side By Side Multiple Methods 4,201 and 1,675.)

2) Try more complex comparisons such as 3,605 and 3,281. (See Side by Side Multiple Methods for 3,605 and 3,281.)

3) Have the students compare numbers using multiple methods. The worksheet might be a helpful organizer, or just have them write in their notebooks.

Side by Side Multiple Methods: Compare 4,201 and 1,675
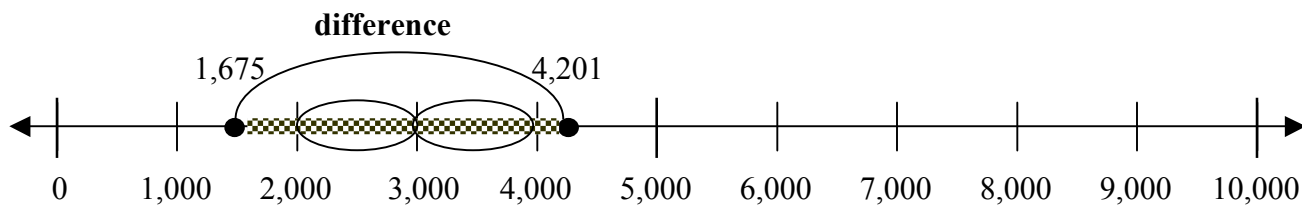
> **Proof that 4,201 > 1,675 and 1,675 < 4,201**

Place Value Chart

TH	H	T	O
4	2	0	1
1	6	7	5

Expanded Form

TH	H	T	O
4,000 +	200 +	0 +	1
1,000 +	600 +	70 +	5

Possible Number Lines

difference

1,675 ⌒ 4,201

⟵ | | ●▨▨▨⬭⬭| ● | | | | | | | ⟶

0   1,000   2,000   3,000   4,000   5,000   6,000   7,000   8,000   9,000   10,000

***Difference is about 2,000.**

difference

1,675   4,201

⟵ | ●▨⬭⬭● | | | | | ⟶

0   5,000   10,000

difference

1,675   4,201

⟵ | ●▨▨⬭⬭▨▨● | ⟶

1,000   2,000   3,000   4,000   5,000
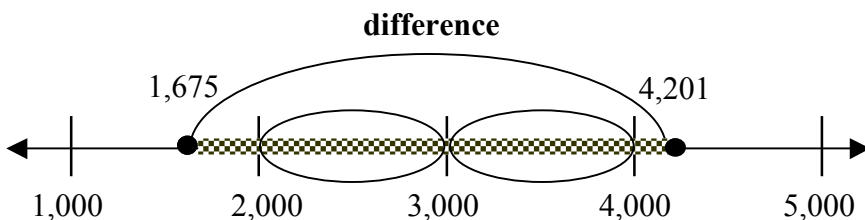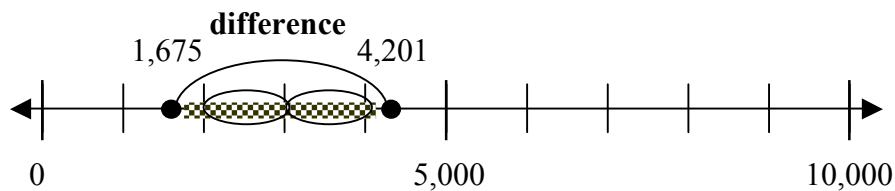
Possible "In Your Own Words" Explanations

4,201 has 4 thousands, and 1,675 has only 1 thousand.

4,201 has a 4 in the thousands place, and 1,675 has a 1 in the thousands place.

1,675 is about 2,000 less than 4,201 (or) 4,201 is over 2,000 more than 1,675.

Side By Side Multiple Methods: Compare 3,605 and 3,281
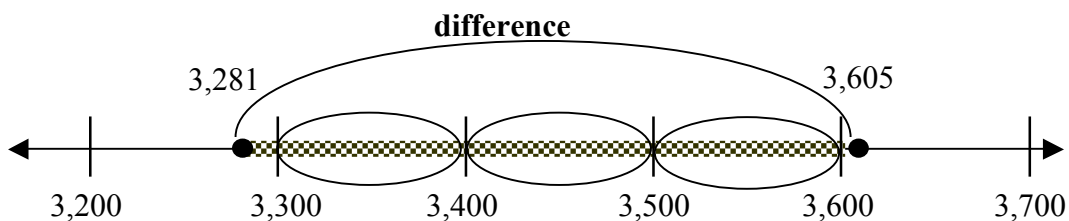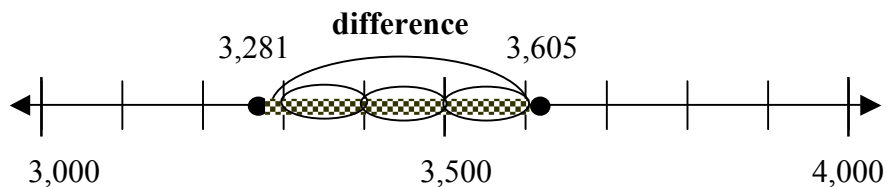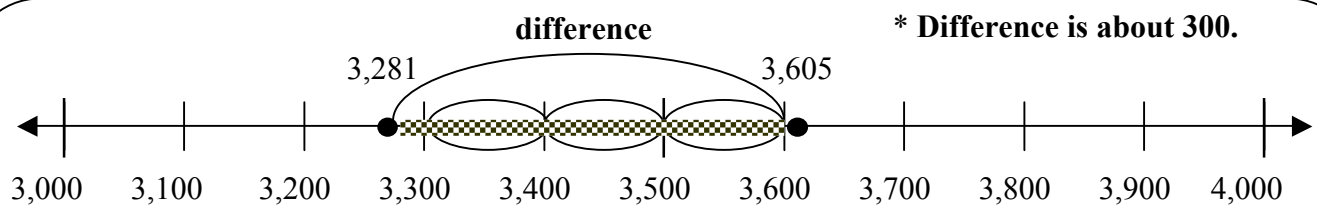
> **Proof that 3,605 > 3,281 and 3,281 < 3,605**

Place Value Chart		Expanded Form

Place Value Chart

TH	H	T	O
3	2	8	1
3	6	0	5

Expanded Form

TH	H	T	O
3,000 +	200 +	80 +	1
3,000 +	600 +	0 +	5

Possible Number Lines

difference   *** Difference is about 300.**

3,281   3,605

3,000   3,100   3,200   3,300   3,400   3,500   3,600   3,700   3,800   3,900   4,000

difference

3,281   3,605

3,000   3,500   4,000

difference

3,281   3,605

3,200   3,300   3,400   3,500   3,600   3,700

Possible "In Your Own Words" Explanations

3,281 has 200, and 3,605 has 600.

3,281 has only 2 hundreds, and 3,605 has 6 hundreds.

3,605 is about 300 more than 3,605.

Comparing and Ordering Worksheet

Compare (or) order these numbers: _____

I Think:

Compare: Order:

_____ ◯ _____   Least_____Greatest

_____ ◯ _____   Greatest_____ Least

My Proof:

Place Value Chart

Expanded Form

Number Line

⟵──────────────────────────────────⟶

Estimate the difference: _____

In My Own Words: _____

_____

_____

Helpful Words: greater than   more   digits   thousands   tens
                 less than   fewer   place value   hundreds   ones

MCC@WCCUSD

03/04/13