

Developing Conceptual Understanding of Number

Set B: Comparing Numbers

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Comparing Numbers 1

Vocabulary

- less than ($<$)
- equal ($=$)
- greater than ($>$)
- mathematical statements

Notes

- In 1c), discuss the fact that more digits does not necessarily mean greater than.

Answers

- a) $<$
 - b) $>$
 - c) $=$
 - d) $>$
- a) 2.7, 27, 270
 - b) 7.96, 8.4, 9
3. $2 < 5 < 8$

Comparing Numbers 1

1. Use $<$, $=$, or $>$ to make each statement true.

a) 28 _____ 30

b) 280.1 _____ 279.9

c) 37 _____ 37.0

d) 4.3 _____ 4.2

2. Arrange the following numbers in order from smallest to largest.

a) 27
 270
 2.7

b) 9 , 8.4 , 7.96

3. Write a correct mathematical statement using the symbol $<$ or $>$ to show the numbers 2 , 8 , 5 arranged from smallest to largest.

Comparing Numbers 2

Vocabulary

- descending order

Notes

- For #3, emphasize estimating over calculating.
- For #4, discuss why the numbers should not be repeated.

Answers

1. $8 > 5 > 2$
2. a) 6, 1.87, 1.8
b) 3657, 3656.9, 3569
3. You get less than \$7.00 in change.
Possible Answers:
 - Since $10 - 3 = 7$ and 3.45 is more than 3, $10 - 3.45$ will be less than 7.
 - $10 - 7 = 3$ but you paid 3.45, so you get less than \$7.00
 - $7 + 3.45 = 10.45$ which is greater than 10. Therefore you get less than \$7.00 in change.
 - ...
4. 87

Comparing Numbers 2

1. Write a correct mathematical statement using the symbol $<$ or $>$ to show the numbers 2, 8, 5 arranged from largest to smallest.
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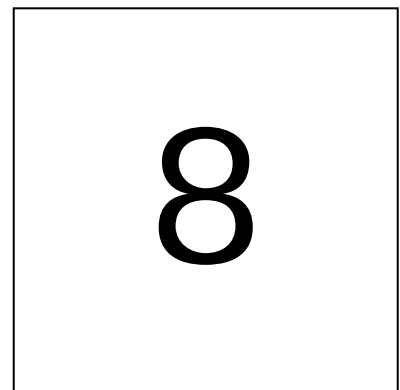
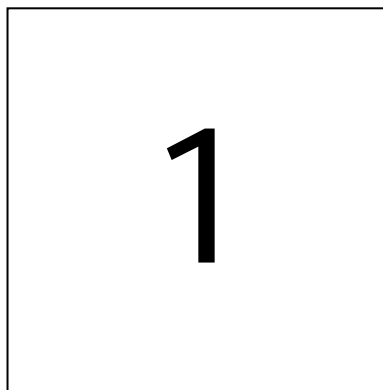
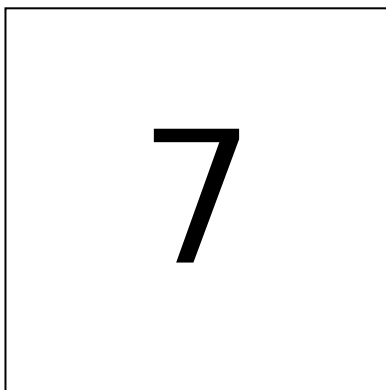
2. Arrange the following numbers in descending order.

a) 1.8 6 1.87

b) 3657 3569 3656.9

3. You paid for a \$3.45 purchase with a \$10 bill. Will you get more than or less than \$7.00 in change? How do you know?
-

4. You have only three cards with numbers as shown.



What is the largest number that can be made using only 2 cards?

Comparing Numbers 3

Vocabulary

- words
- phrases
- symbols

Notes

- For #2, an equally spaced number line is important. The numbers should be put in relatively correct positions.

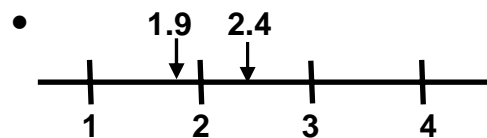
Answers

1. Possible Answers:

- more than
- larger
- >
- bigger
- descending
- ...
- increases
- exceeds
- extra

2. Possible Answers:

- $1.9 < 2 < 2.4$
- 2 is between 1.9 and 2.4
- $2.4 > 2 > 1.9$



- 1.9 is less than 2 which is less than 2.4
- ...

Comparing Numbers 3

1. List words, phrases or symbols meaning “greater than”.

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2. Use symbols, words or a number line to show the numbers 2, 1.9, 2.4 arranged in order. Show your answer in three different ways.

Comparing Numbers 4

Vocabulary

- ascending
- even

Notes

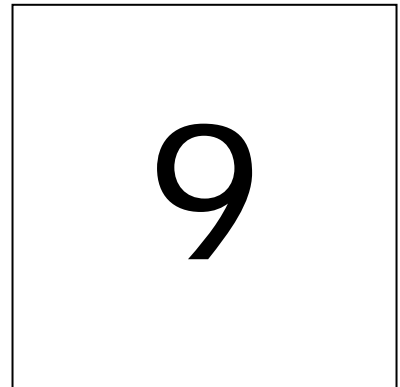
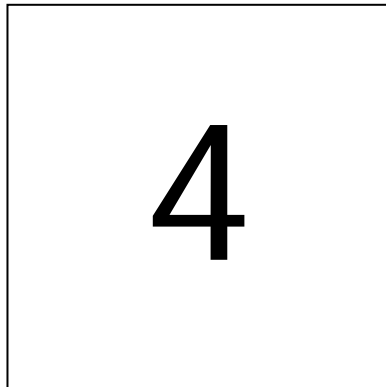
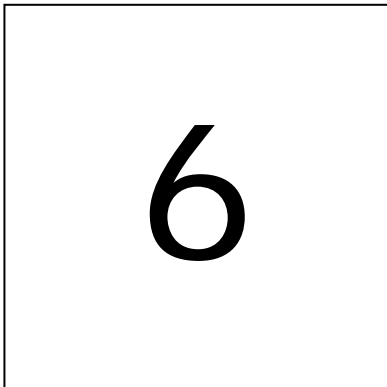
- For #3, have students discuss the restrictions that are placed on the number if it is even.

Answers

1. Arrange numbers from smallest to largest.
2. a) 67, 76, 78
b) 4.98, 29.1, 43, 50
3. a) 496, 694, 946, 964
b) 496
c) 96

Comparing Numbers 4

1. If descending means arranging numbers from largest to smallest what do you think ascending means?
2. Arrange the following numbers in ascending order:
 - a) 78, 67, 76
 - b) 43, 4.98, 50, 29.1
3. You have only three cards with numbers as shown.



- a) Write all the 3-digit even numbers that can be made using the cards.
- b) What is the smallest even number that can be made using all 3 cards?
- c) What is the largest even number that can be made using 2 cards?

Comparing Numbers 5

Vocabulary

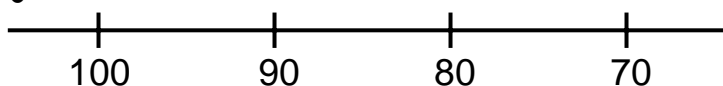
Notes

- For #4, 99.41 is larger than 99.4 because of place value and not because there are more digits. Students should think of 99.4 as 99.40 to do the comparison.

Answers

1. Possible Answers:

- Descending order means from largest to smallest
- Largest, next largest remaining, ...
-



- largest, ..., smallest
- $10.0 > 9.0 > 8.0 > 7.0$
- ...

2. a) $<$
b) $>$

3. $38 > 4.2 > 3.8$

4. Possible Answers:

- 99.4, 99.41, 109, 129
- $99.4 < 99.41 < 109 < 129$
- ...

5. a) Betty, Anika, Cal
b) 88 cm

Comparing Numbers 5

1. Use words, symbols or a number line to explain the meaning of “descending order”. Give 2 examples.
2. Use $<$, $=$, or $>$ to make each statement true.
 - a) 854 _____ 855
 - b) 855 _____ 854
3. Write a correct mathematical statement using the symbol $<$ or $>$ to show the numbers 3.8, 38, 4.2 arranged from largest to smallest.
4. Arrange the following numbers in order from smallest to largest.
109, 129, 99.4, 99.41
5. Anika is 6 cm taller than Betty. Cal is 4 cm taller than Anika.
 - a) Arrange the three students in order from shortest to tallest.
 - b) If Anika is 84 cm tall, how tall is Cal?

Comparing Numbers 6

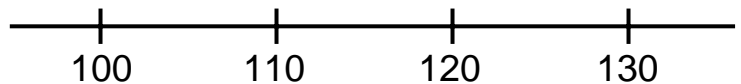
Vocabulary

Notes

- For #4, have students discuss the restrictions that are placed on the number if it is even.
- For #4, there are two 1's available so a number like 114 is permitted.

Answers

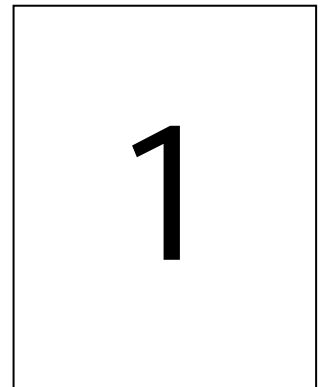
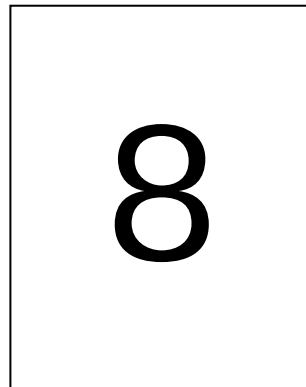
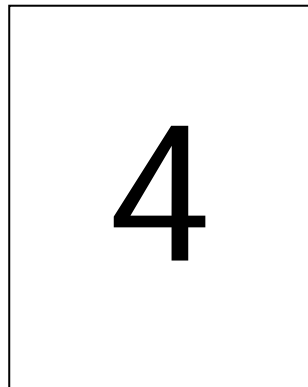
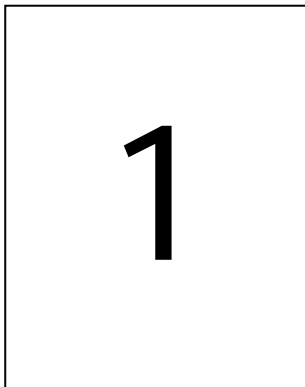
1. Possible Answers:
- Ascending order means from smallest to largest
 - Smallest, next smallest remaining, ...



- smallest, ..., largest
 - $3.2 < 4.8 < 5 < 5.5$
 - ...
2. a) 8.8, 8.77, 8.769, 8.75
b) 11.0, 1.1, 0.11, 0.011
3. Pedro, Frank, Harry
4. a) 114, 118, 148, 184, 418, 814
b) 814

Comparing Numbers 6

1. Use words, symbols, or a number line to explain the meaning of “ascending order”. Give 2 examples.
2. Arrange the following numbers in descending order:
 - c) 8.77 8.75 8.8 8.769
 - d) 0.11 0.011 11.0 1.1
3. Pedro lives 1527 metres from the school. Harry lives 1487 metres from the school. Frank lives 1498 metres from the school. Arrange the boys in descending order of their distance from the school.
4. You have only four cards with the numbers shown.



- a) Write all the different 3-digit even numbers that can be made using these cards.
- b) What is the largest even number that can be made using 3 of the cards?

Comparing Numbers 7

Vocabulary

Notes

- This is the first time that fractions have appeared.
- In 4a), the denominators are equal so students need only compare the numerators.
- In 4b), the numerators are equal so students need only compare the denominators. Students should realize that a larger denominator implies the whole has been divided into more pieces. So, the larger the denominator, the smaller the fraction. A discussion of equivalent fractions is not necessary.

Answers

1. Possible Answers:
 - Ascending is smallest to largest while descending is largest to smallest
 - $2 < 4 < 10$ is ascending while $10 > 4 > 2$ is descending
 - ...
2. a) $>$
b) $<$
3. $1.71 > 1.701 > 1.7$
4. a) $\frac{1}{9}, \frac{4}{9}, \frac{7}{9}$ b) $\frac{1}{7}, \frac{1}{5}, \frac{1}{3}, \frac{1}{2}$
5. $\frac{1}{4}, \frac{3}{8}$
Possible Answers:
 - Change $\frac{1}{4}$ to $\frac{2}{8}$ so it is easier to compare to $\frac{3}{8}$. Since $\frac{2}{8}$ is only 2 parts of 8 and $\frac{3}{8}$ is 3 parts of 8, $\frac{3}{8}$ is bigger.
 - Draw a picture of a rectangle and split it into 4 equal parts. Color one part. Draw a picture of a second rectangle the same size and split it into 8 equal parts. Color 3 parts. Compare the size of the colored areas.
 - ...

Comparing Numbers 7

1. Use words, symbols or a number line to explain the difference between ascending and descending order.
2. Use $<$, $=$, or $>$ to make each statement true.

a) 227 _____ 219

b) $\frac{1}{8}$ _____ $\frac{3}{8}$

3. Write a correct mathematical statement using the symbol $<$ or $>$ to show the numbers 1.7, 1.71, and 1.701 arranged from largest to smallest.
4. Arrange the following numbers in ascending order.

a) $\frac{4}{9}$, $\frac{7}{9}$, $\frac{1}{9}$

b) $\frac{1}{3}$, $\frac{1}{5}$, $\frac{1}{2}$, $\frac{1}{7}$

5. Arrange the numbers $\frac{1}{4}$ and $\frac{3}{8}$ from smallest to largest.
Show two different ways to work it out.