



Agenda:

- 1) Bell Ringer: p. 88
- 2) Lesson: Comparing Numbers in Scientific Notation
- 3) Homework: page 91-92 in booklet
- 4) Project- Due 10/15

Writing and Comparing Numbers in Scientific Notation – Grade Eight

Exponents and Scientific Notation Calculations –

Name _____

Date _____

Evaluate each of the following.

1. $5^2 = 25$

2. $2^3 = 8$

3. $\left(\frac{1}{2}\right)^2 = \frac{1}{4}$

4. $5^0 = 1$

5. $2^0 = 1$

6. $\left(\frac{1}{4}\right)^0 = 1$

7. $5^{-2} = \left(\frac{1}{5}\right)\left(\frac{1}{5}\right) = \frac{1}{25}$

8. $2^{-3} = \left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right) = \frac{1}{8}$

9. $\left(\frac{1}{2}\right)^{-2} = \left(\frac{2}{1}\right)\left(\frac{2}{1}\right) = 4$

Rewrite each of the following in scientific notation.

10. 5000 5×10^3

11. 25000 2.5×10^4

12. 300,000 3×10^5

Answer each of the following.

13. In the number 324,157.98 what number is in the tens place? 5
14. In the number 324,157.98 what number is in the ones place? 7
15. In the number 324,157.98 what number is in the tenths place? 9
16. In the number 324,157.98 what number is in the hundreds place? 1
17. In the number 324,157.98 what number is in the hundredths place? 8
18. Write a number that has a 4 in the thousands place. 4321
19. Write a number that has a 4 in the thousandths place. .004
20. Write 1,000 as a power of 10. 10^3
21. Write 0.1 as a power of 10. $\frac{1}{10} = 10^{-1}$
22. Write 1 as a power of 10. 10^0



p.90

- I can:
- ✓ Convert numbers to scientific notation
 - ✓ Compare numbers written in scientific notation

Sometimes you may need to compare numbers written in scientific notation.

Steps to follow:

- 1) First compare exponents, the larger the exponent, the larger the number
- 2) If the exponents are the same, compare digits using place value.

The symbols below will help you to compare:

1. $<$ less than
2. $>$ greater than
3. $=$ equal to

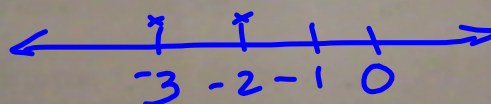
Examples: Determine which symbol ($<$, $>$, $=$) makes each sentence true.

1. 1.6×10^5 $>$ 2.3×10^3

160,000

2,300

2. 9.21×10^{-2} $>$ 2.02×10^{-3}



3. 2.59×10^{-5} $<$ 3.6×10^{-5}

4. 5.1×10^{-10} $<$ 7.0×10^{-8}

5. Order the following numbers from least to greatest: 3.2×10^6 , 5.1×10^{-2} , 9.88×10^0 , 3.21×10^4

3 1 2 4
320 3.21

Attachment L
Movie Earnings

Name _____ Date _____

Directions: Suppose the table below shows data for the earnings of the top ten ranked movies for a given week in the year. Complete the empty column in the table by converting the number of households into scientific notation.

Rank	Earnings Data	Earnings Data (written in scientific notation)
1	\$26,700,000	
2	\$19,400,000	
3	\$11,500,000	
4	\$10,400,000	
5	\$9,300,000	
6	\$8,400,000	
7	\$8,200,000	
8	\$6,000,000	
9	\$4,200,000	
10	\$1,600,000	

Suppose the data below is movie earnings data for a given week during the year. Compare the amounts in the table below. Then convert the numbers into scientific notation and rank the earnings from greatest to least.

Rank	Movie Name	Amount Earned	Amount Earned in Scientific Notation
	A	\$2,500,000	
	B	\$16,000,000	
	C	\$8,000,000	
	D	\$2,010,000	
	E	\$32,100,000	
	F	\$11,900,000	
	G	\$2,020,000	
	H	\$18,200,000	
	I	\$5,400,000	
	J	\$3,100,000	

1. Place the following numbers in order from least to greatest:

7.8×10^6 , 5.1×10^4 , 1.25×10^5 , 4.09×10^4

2. Which of the following numbers is the least?

- | | |
|----------------------|----------------------|
| a. 7×10^8 | b. 7×10^9 |
| c. 7.1×10^8 | d. 7.1×10^9 |

3. Which number is the greatest?

- | | |
|-----------------------|-----------------------|
| a. 5.25×10^5 | b. 5.55×10^5 |
| c. 2.55×10^5 | d. 5×10^5 |

4. The diameter of the planet Mercury is 4.87×10^3 kilometers. The diameter of the planet Venus is 1.21×10^4 kilometers. The diameter of Earth is 1.28×10^4 kilometers. The diameter of Mars is 6.79×10^3 kilometers. Which planet has the smallest diameter?

- | | |
|------------|----------|
| a. Mercury | b. Venus |
| c. Earth | d. Mars |

5. Order the following from greatest to least:

5×10^3 , 3.2×10^8 , 1.2×10^8 , 7×10^5

6. Which of these numbers is the least?

- | | |
|----------------------|----------------------|
| a. 3.5×10^7 | b. 3×10^7 |
| c. 5×10^7 | d. 5.5×10^7 |

7. Which of these numbers is the greatest?

- | | |
|--------------------|--------------------|
| a. 9×10^9 | b. 9×10^8 |
| c. 8×10^9 | d. 8×10^8 |

8. Order the following from least to greatest:

6.8×10^6 , 6×10^6 , 6.6×10^6 , 6.1×10^6

9. Which of these numbers is the greatest?

- | | |
|------------------------|------------------------|
| a. 5.406×10^8 | b. 5.604×10^9 |
| c. 5.504×10^7 | d. 6.504×10^8 |

9. Which of these numbers is the greatest?

- | | |
|------------------------|------------------------|
| a. 5.406×10^8 | b. 5.604×10^9 |
| c. 5.504×10^7 | d. 6.504×10^8 |

10. Which of these numbers is the least?

- | | |
|-----------------------|------------------------|
| a. 9×10^4 | b. 1.2×10^5 |
| c. 3.01×10^9 | d. 1.901×10^4 |

Mrs. Bennett

main c

Student Task Sheet

In the powers and roots unit we have been studying, you have learned to convert between standard notation and scientific notation. You have also learned to compare numbers in scientific notation.

In this assignment I am asking you to create a poster to compare a measurement of six different items. You will choose what you are going to compare. You may use either the internet or a book. You must cite the source of your data. Your poster must include a title which clearly states what you are comparing. For each item you must include a picture, label, and proper scientific notation. The items must be placed on your poster from smallest to largest. The poster is due 2 on _____.

You will be graded on:

Completion:

- Compare 6 different items

Mathematical Concepts:

- Measurements are in proper scientific notation
- Items are ordered correctly (placed from smallest to largest)

Presentation:

- Title states what you are comparing (i.e. mass, weight, volume, distance to the sun)
- Picture of each item
- Label for each item
- Source(s) is cited

Timeliness:

- Due date __/__/__

Please refer to the attached rubric as you complete your poster.

Rubric for Scientific Notation Poster

	Outstanding 10	Acceptable 6	Needs Work 2
Completion	Poster includes measurements for 6 different items.	Poster includes measurements for 4-5 different items.	Poster includes measurements for 3 or less items.
Mathematical Concepts- Scientific Notation	All items are in proper scientific notation.	Poster contains 1-2 errors, either with scientific notation or placement of items.	Poster contains 3 or more errors, either with scientific notation or placement of items.
Mathematical Concepts- Comparing Numbers in Scientific Notation	All items are in correct order, from smallest scientific notation to largest.	One to two errors in ordering data.	Three or more errors in ordering data.

Presentation	Poster contains title, pictures and label for all 6 items, and source is cited.	Poster is lacking 1-2 elements (title, pictures, labels, or source).	Poster is lacking 3 or more elements (title, pictures, labels, or source).
Timeliness	Poster is handed in on time.	Poster is handed in 1 class day late.	Poster is handed in more than 1 class day late.

EARTH FACTS

BIGGEST SEA?

South China Sea : $3.68 \times 10^6 \text{ km}^2$

Coral Sea : $479 \times 10^4 \text{ km}^2$

Caribbean Sea : $2,750,000 \text{ km}^2$

HIGHEST MOUNTAIN?

Kilimanjaro (Tazmania) : 5,895 m

Mont Blanc (France) : $0.481 \times 10^4 \text{ m}$

Elbrus (USSR) : $5.63 \times 10^3 \text{ m}$



How do you compare numbers in scientific notation?

$$\begin{array}{r} -1 > -5 \\ 2 \times 10^{-1} \\ 3 \times 10^{-5} \end{array}$$

1) Compare exponents

2) If exponents are the same,

compare numbers.

$$\begin{array}{r} 3 \times 10^5 \\ 4 \times 10^5 \end{array}$$

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Writing and Comparing Numbers in Scientific Notation – Grade Eight

Attachment L Movie Earnings

Name _____ Date _____

Directions: Suppose the table below shows data for the earnings of the top ten ranked movies for a given week in the year. Complete the empty column in the table by converting the number of households into scientific notation.

Rank	Earnings Data	Earnings Data (written in scientific notation)
1	\$26,700,000	2.67×10^7
2	\$19,400,000	1.94×10^7
3	\$11,500,000	1.15×10^7
4	\$10,400,000	1.04×10^7
5	\$9,300,000	9.3×10^6
6	\$8,400,000	8.4×10^6
7	\$8,200,000	8.2×10^6
8	\$6,000,000	6×10^6
9	\$4,200,000	4.2×10^6
10	\$1,600,000	1.6×10^6

Suppose the data below is movie earnings data for a given week during the year. Compare the amounts in the table below. Then convert the numbers into scientific notation and rank the earnings from greatest to least.

Rank	Movie Name	Amount Earned	Amount Earned in Scientific Notation
8	A	\$2,500,000	2.5×10^6
3	B	\$16,000,000	1.6×10^7
5	C	\$8,000,000	
10	D	\$2,010,000	
1	E	\$32,100,000	3.21×10^7
4	F	\$11,900,000	
9	G	\$2,020,000	
6	H	\$18,200,000	
2	I	\$5,400,000	
7	J	\$3,100,000	

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Writing and Comparing Numbers in Scientific Notation (8.EE.3)

Name: _____

Rewrite in scientific notation.

1) 0.000357 _____ 2) 0.00127 _____

For each problem below, place the proper sign (<, >, =) in the space provided.

3) 5,100 _____ 5.1×10^3 4) 4.3×10^{-4} _____ 4.32×10^{-4}

5) 7.8×10^{-7} _____ 7.8×10^{-8} 6) 3.2×10^{-10} _____ 3.2×10^{10}

- 7) Suppose the table below displays data for the top 10 television shows for a given week. Complete the empty column in the table by converting the number of households into scientific notation.

Rank	Number of Households	Number of Households written in scientific notation
1	16,600,000	
2	14,400,000	
3	12,400,000	
4	11,800,000	
5	11,400,000	
6	11,200,000	
7	11,000,000	
8	10,900,000	
9	10,500,000	
10	10,300,000	

8) Suppose the data below is from television prime-time ratings for a given week. Place the given information in the correct order and then convert each number into scientific notation.

	Rank	Scientific Notation
• Program A had 13,300,000 households view it during the week.	_____	_____
• Program B had 13,980,000 households view it during the week.	_____	_____
• Program C had 15,700,000 households view it during the week.	_____	_____
• Program D had 13,900,000 households view it during the week.	_____	_____
• Program E had 16,500,000 households view it during the week.	_____	_____
• Program F had 13,100,000 households view it during the week.	_____	_____
• Program G had 15,600,000 households view it during the week.	_____	_____
• Program H had 13,400,000 households view it during the week.	_____	_____

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