Parallel lines have so much in common...

it's a shame that they'll never meet.

## Agenda:

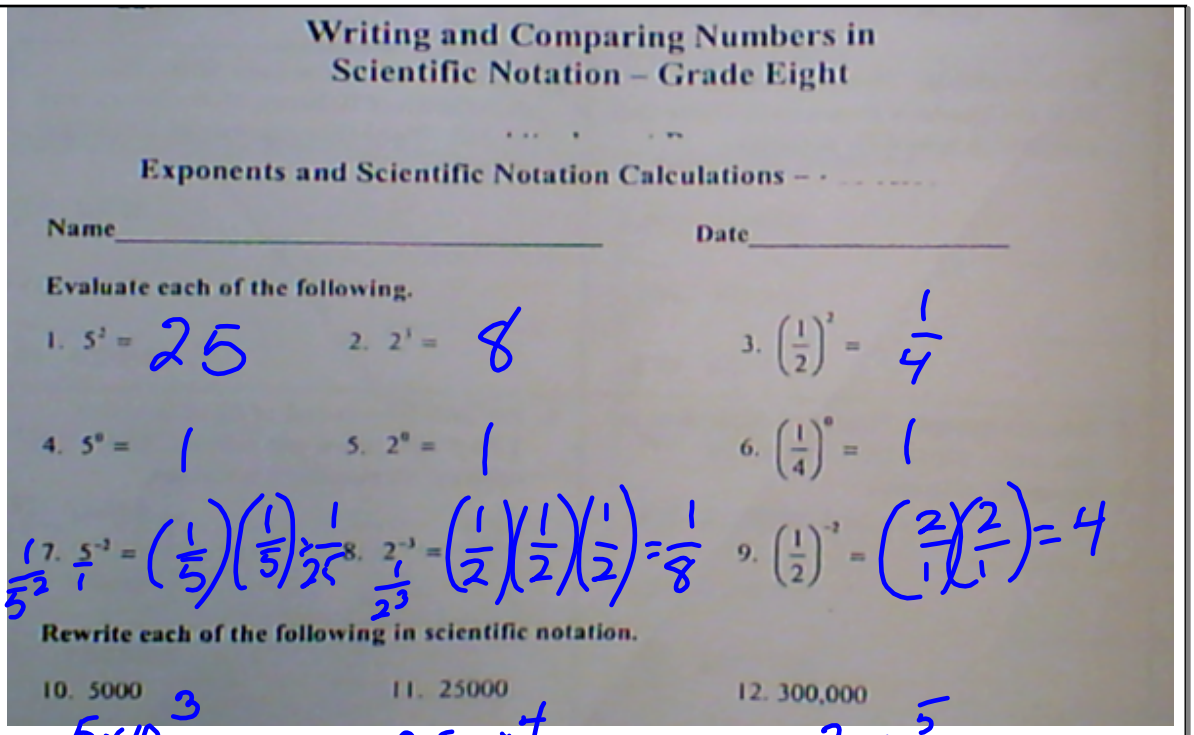
1) Bell Ringer: scientific notation puzzle with 5:00 buddy

2) Lesson: Comparing Numbers in Scientific Notation

3) Homework: pages 12, 14, 17 in booklet

4) Problem Set #3 due Today, PS #4 due 10/6

Sep 10-9:19 AM



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. $5^{-2} = \frac{1}{5^2} = \left(\frac{1}{5}\right)\left(\frac{1}{5}\right) = \frac{1}{25}$ 8. $2^{-3} = \frac{1}{2^3} = \left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right) = \frac{1}{8}$ 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 $5\times10^3$ 11. 25000 $2.5\times10^4$ 12. 300,000 $3\times10^5$

Sep 30-11:23 AM

**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. $10^0$

Sep 30-11:23 AM

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

p 11

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

$4.90 \times 10^{-5}$

$4.93 \times 10^{-5}$ * larger

Sep 30-11:25 AM

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

1. $\cancel{1.6}\times10^{5}$ $\underline{>}$ $\cancel{2.3}\times10^{3}$ $10^5 > 10^3$

2. $9.21\times10^{-2}$ $\underline{>}$ $2.02\times10^{-3}$ $10^{-2} > 10^{-3}$

3. $\underline{2.59}\times10^{-5}$ $\underline{<}$ $\underline{3.6}\times10^{-5}$ $2.59 < 3.6$

4. $5.1\times10^{-10}$ $\underline{<}$ $7.0\times10^{-8}$

5. Order the following numbers from least to greatest: $3.2\times10^{6}$, $\cancel{5.1\times10^{-2}}$, $\cancel{9.88\times10^{0}}$, $3.21\times10^{6}$

1. $5.1\times10^{-2}$
2. $9.88\times10^{0}$
3. $3.2\times10^{6}$
4. $3.21\times10^{6}$

Sep 30-11:25 AM

Writing and Comparing N...

Name: _____

Rewrite in scientific notation.

1) 0.000357 $3.57\times10^{-4}$ 2) 0.00127 $1.27\times10^{-3}$

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

3) 5.100 $\underline{=}$ $5.1\times10^{1}$ $5.1\times10^{3}$

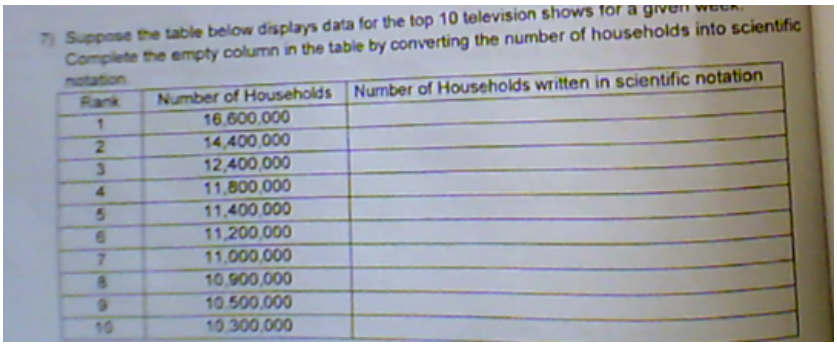
4) $4.3\times\cancel{10^{-4}}$ $\underline{<}$ $4.32\times\cancel{10^{-4}}$ 4.30 4.32

5) $7.8\times10^{-7}$ ___ $7.8\times10^{-8}$

6) $3.2\times10^{-10}$ ___ $3.2\times10^{10}$

for a given week

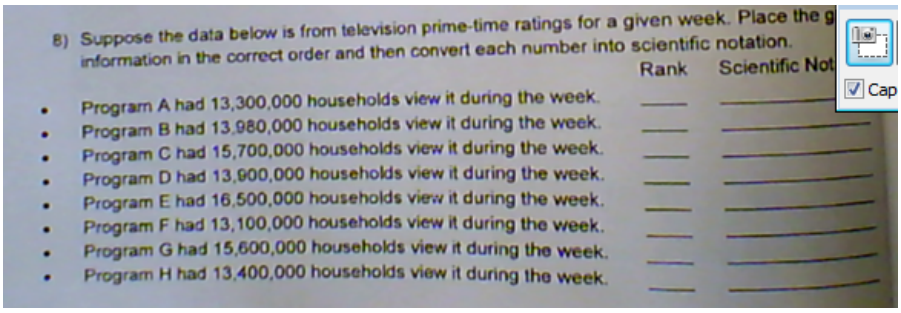
Sep 29-10:30 AM



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 | |

Sep 29-10:30 AM



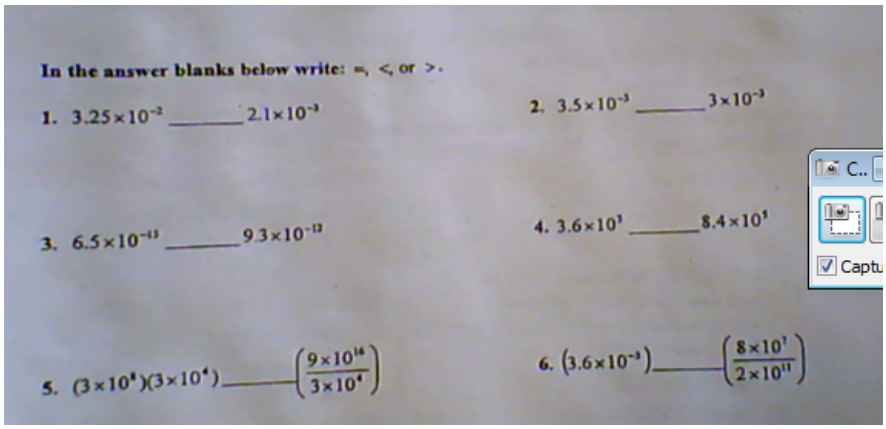
8) Suppose the data below is from television prime-time ratings for a given week. Place the g information in the correct order and then convert each number into scientific notation.

Rank Scientific Not

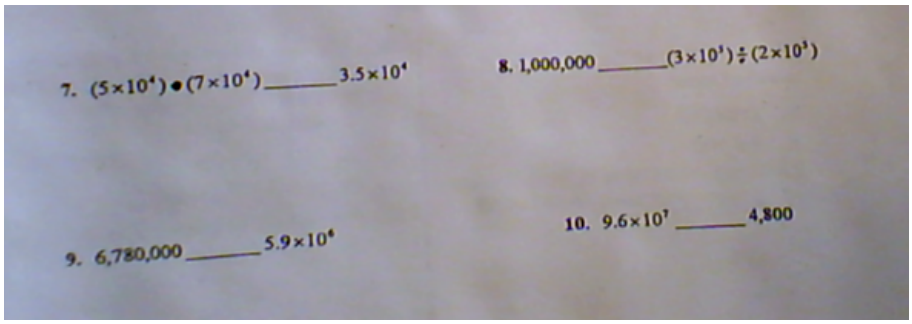
- Program A had 13,300,000 households view it during the week. ____ _____
- Program B had 13,980,000 households view it during the week. ____ _____
- Program C had 15,700,000 households view it during the week. ____ _____
- Program D had 13,900,000 households view it during the week. ____ _____
- Program 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. ____ _____

Cap

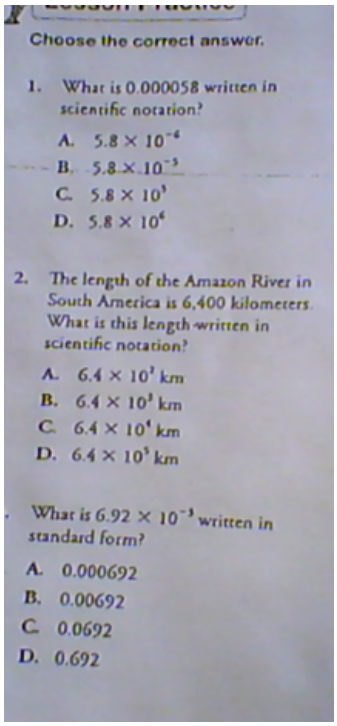
Sep 29-10:31 AM




Sep 29-10:31 AM




Sep 29-10:33 AM



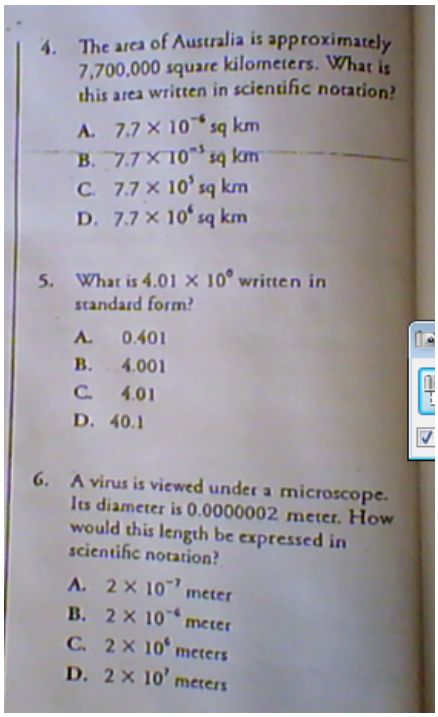
Choose the correct answer.

1. What is 0.000058 written in scientific notation?
   A. $5.8 \times 10^{-6}$
   B. $5.8 \times 10^{-5}$
   C. $5.8 \times 10^{5}$
   D. $5.8 \times 10^{6}$

2. The length of the Amazon River in South America is 6,400 kilometers. What is this length written in scientific notation?
   A. $6.4 \times 10^{2}$ km
   B. $6.4 \times 10^{3}$ km
   C. $6.4 \times 10^{4}$ km
   D. $6.4 \times 10^{5}$ km

3. What is $6.92 \times 10^{-3}$ written in standard form?
   A. 0.000692
   B. 0.00692
   C. 0.0692
   D. 0.692

Sep 29-10:33 AM



4. The area of Australia is approximately 7,700,000 square kilometers. What is this area written in scientific notation?
   A. $7.7 \times 10^{-6}$ sq km
   B. $7.7 \times 10^{-5}$ sq km
   C. $7.7 \times 10^{5}$ sq km
   D. $7.7 \times 10^{6}$ sq km

5. What is $4.01 \times 10^{0}$ written in standard form?
   A. 0.401
   B. 4.001
   C. 4.01
   D. 40.1

6. A virus is viewed under a microscope. Its diameter is 0.0000002 meter. How would this length be expressed in scientific notation?
   A. $2 \times 10^{-7}$ meter
   B. $2 \times 10^{-6}$ meter
   C. $2 \times 10^{6}$ meters
   D. $2 \times 10^{7}$ meters

Sep 29-10:33 AM

1. Divide the larger value by the smaller value
2. Round to the nearest thousanth (.001)
3. Place answers in standard form

Sep 29-10:34 AM

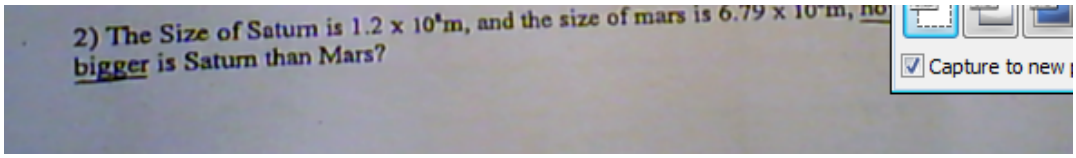
1) Madison Square Garden can hold approximately $1.9 \times 10^4$ for a Rangers game, and The Utica Auditorium can hold approximately $4.2 \times 10^3$. How many times more can MSG hold more than the AUD?

1.) $\frac{\text{larger \#}}{\text{smaller \#}} = \frac{\text{MSG}}{\text{utica}} = \frac{1.9 \times 10^4}{4.2 \times 10^3} = \frac{1.9}{4.2} \times 10^{4-3} = .452 \times 10$

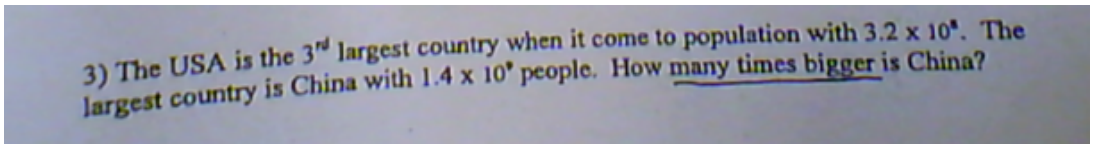
$4.52$

MSG can hold 4.52 times more than the Utica Aud.

Sep 29-10:34 AM




Sep 29-10:34 AM




Sep 29-10:34 AM

## 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 | |

Sep 30-11:25 AM

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 | |

Sep 30-11:25 AM

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

$7.8 \times 10^6$, $5.1 \times 10^4$, $1.25 \times 10^5$, $4.09 \times 10^4$

_____

2. Which of the following numbers is the least?

a. $7 \times 10^8$ b. $7 \times 10^9$
c. $7.1 \times 10^8$ d. $7.1 \times 10^9$

3. Which number is the greatest?

a. $5.25 \times 10^5$ b. $5.55 \times 10^5$
c. $2.55 \times 10^5$ d. $5 \times 10^5$

Sep 30-11:26 AM

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

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

5. Order the following from greatest to least:

$5 \times 10^3$, $3.2 \times 10^8$, $1.2 \times 10^8$, $7 \times 10^5$

_____

Sep 30-11:26 AM

6. Which of these numbers is the least?

a. $3.5 \times 10^7$ b. $3 \times 10^7$
c. $5 \times 10^7$ d. $5.5 \times 10^7$

7. Which of these numbers is the greatest?

a. $9 \times 10^9$ b. $9 \times 10^8$
c. $8 \times 10^9$ d. $8 \times 10^8$

8. Order the following from least to greatest:

$6.8 \times 10^6$, $6 \times 10^6$, $6.6 \times 10^6$, $6.1 \times 10^6$

_____

9. Which of these numbers is the greatest?

a. $5.406 \times 10^8$ b. $5.604 \times 10^9$
c. $5.504 \times 10^7$ d. $6.504 \times 10^8$

Sep 30-11:26 AM

9. Which of these numbers is the greatest?

a. $5.406 \times 10^8$ b. $5.604 \times 10^9$
c. $5.504 \times 10^7$ d. $6.504 \times 10^8$

10. Which of these numbers is the least?

a. $9 \times 10^4$ b. $1.2 \times 10^5$
c. $3.01 \times 10^9$ d. $1.901 \times 10^4$

Sep 30-11:26 AM

Mrs. Bennett Math 8

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 _____.

Oct 8-11:44 AM

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.

Oct 8-11:44 AM

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 |

Oct 8-11:45 AM

| | | | |
|---|---|---|---|
| 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 |

Oct 8-11:45 AM

## EARTH FACTS

**HIGHEST MOUNTAIN?**

Kilimanjaro (Tazmania) : 5,895 m

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

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

**BIGGEST SEA?**

South China Sea : $3.68 \times 106$ km$^2$

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

Caribbean Sea : 2,750,000 km$^2$

Oct 8-11:45 AM

How do you compare numbers in scientific notation?

$-1 > -5$

$2 \times 10^{-1}$

$3 \times 10^{-5}$

1) Compare exponents

2) If exponents are the same, compare numbers.

$3 \times 10^5$

$4 \times 10^5$

Oct 5-11:51 AM

p. 25

## 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 | $2.67 \times 10^7$ |
| 2 | $19,400,000 | $1.94 \times 10^7$ |
| 3 | $11,500,000 | $1.15 \times 10^7$ |
| 4 | $10,400,000 | $1.04 \times 10^7$ |
| 5 | $9,300,000 | $9.3 \times 10^6$ |
| 6 | $8,400,000 | $8.4 \times 10^6$ |
| 7 | $8,200,000 | $8.2 \times 10^6$ |
| 8 | $6,000,000 | $6 \times 10^6$ |
| 9 | $4,200,000 | $4.2 \times 10^6$ |
| 10 | $1,600,000 | $1.6 \times 10^6$ |

Oct 5-9:15 AM

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 | $2.5 \times 10^6$ |
| 3 | B | $16,000,000 | $1.6 \times 10^7$ |
| 5 | C | $8,000,000 | |
| 10 | D | $2,010,000 | |
| 1 | E | $32,100,000 | $3.21 \times 10^7$ |
| 4 | F | $11,900,000 | |
| 9 | G | $2,020,000 | |
| 2 | H | $18,200,000 | |
| 6 | I | $5,400,000 | |
| 7 | J | $3,100,000 | |

Oct 5-9:15 AM

p. 23

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 ____ $5.1\times10^{3}$ 4) $4.3\times10^{-4}$ ____ $4.32\times10^{-4}$

5) $7.8\times10^{-7}$ ____ $7.8\times10^{-8}$ 6) $3.2\times10^{-10}$ _ _ $3.2\times10^{10}$

Oct 5-9:14 AM

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 | |

Oct 5-9:14 AM

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. | ____ | _____ |

(23)

Oct 5-9:14 AM

Oct 5-9:12 AM