

Name Kay  
Mrs. Roubos

Date \_\_\_\_\_  
8R Period \_\_\_\_\_

Comparing two numbers written  
in Scientific Notation

I. Steps:

1) Compare the powers of ten, the number with the greater power of ten is the greater number.

2) If the powers of ten are the same, compare the values between one and ten (coefficients)

\*\* If the exponents are negative, the smaller exponent is the larger number

Look at exponents first

$-3 < -2$      $-6 > -12$

II Examples: Compare the following

1)  $2.7 \times 10^{13} > 2.7 \times 10^7$

$13 > 7$

2)  $3.98 \times 10^{22} > 2.52 \times 10^{22}$

$3.98 > 2.52$

3)  $4.2 \times 10^7 > 4.2 \times 10^4$

$7 > 4$

4)  $1.2 \times 10^7 < 1.4 \times 10^7$

$1.2 < 1.4$

5)  $1.1 \times 10^7 < 3.3 \times 10^6$

$7 < 8$

6)  $8.2 \times 10^{-2} > 3.2 \times 10^{-2}$

$8.2 > 3.2$

$.082 > .032$

7)  $4.5 \times 10^{-3} > 5.6 \times 10^{-5}$

$-3 > -5$

8)  $2.3 \times 10^{-8} < 3.1 \times 10^{-6}$

$-8 < -6$

9)  $8.8 \times 10^2 < 890$

*Must be in the same form to compare*  
 $880 < 890$   
 OR  
 $8.8 \times 10^2 < 8.9 \times 10^2$   
 (Note: 890 is written as 890 with a 53 next to it, and 8.9 is circled with 'FL0'. The second comparison has '53' and 'SC1' written next to it.)

10)  $9.8 \times 10^9 < 9.9 \times 10^9$

$9.8 < 9.9$

11)  $1.2 \times 10^7 > 6,800,000$

$12,000,000 > 6,800,000$   
 OR  
 $1.2 \times 10^7 > 6.8 \times 10^6$

12)  $5.2 \times 10^{-2} = 5.2 \times 10^{-2}$

$5.2 = 5.2$

Put the numbers in order from least to greatest  $\rightarrow$  Compare Exponents 1st  $\rightarrow$

1)  ~~$4.63 \times 10^4$~~ ,  ~~$7.2 \times 10^{-3}$~~ ,  ~~$8 \times 10^{-4}$~~ ,  $2.53 \times 10^5$

$8 \times 10^{-4}$ ,  $7.2 \times 10^{-3}$ ,  $4.63 \times 10^4$ ,  $2.53 \times 10^5$

2)  ~~$5.6 \times 10^3$~~ ,  $4.2 \times 10^5$ ,  ~~$5.6 \times 10^{-2}$~~ ,  ~~$6.3 \times 10^3$~~

$5.6 \times 10^{-2}$ ,  $5.6 \times 10^3$ ,  $6.3 \times 10^3$ ,  $4.2 \times 10^5$

### Comparing Numbers in Scientific Notation

The approximate weight of a whale shark is  $4 \times 10^4$  pounds. The approximate weight of a common dolphin is  $2 \times 10^2$  pounds. **How many times as great as the weight of the whale shark is the weight of the dolphin?**

means to Divide

First: Compare the values between 1 and 10

The 4 in  $4 \times 10^4$  is 2 times as great as the 2 in  $2 \times 10^2$

Next: Compare the powers of 10

$10^4$  is  $10^2$  times as great as  $10^2$

Circle: The most reasonable answer

The weight of the whale shark is  $2/20/200/2,000$  times as great as the weight of the dolphin

Answers are in standard form (FLO)

More Examples:

1)  $8 \times 10^5$  is how many times as great as  $4 \times 10^2$ ?  $2/20/200/2,000$  times?

$$(8 \times 10^5) \div (4 \times 10^2) = \boxed{2,000}$$

2)  $9 \times 10^{10}$  is how many times as great as  $3 \times 10^7$ ?  $30/300/3,000/30,000$  times?

$$(9 \times 10^{10}) \div (3 \times 10^7) = \boxed{3,000}$$

3)  $4 \times 10^{-5}$  is how many times as great as  $2 \times 10^{-4}$ ?  $0.02/0.2/2/20$  times?

$$(4 \times 10^{-5}) \div (2 \times 10^{-4}) = \boxed{0.2}$$

4)  $4 \times 10^{-12}$  is how many times as great as  $4 \times 10^{-8}$ ?  $0.00001/0.0001/10/1000$  times?

$$(4 \times 10^{-12}) \div (4 \times 10^{-8}) = \boxed{0.0001}$$

\* order matters with division so the # that comes 1st in the problem you must put 1st in your work + in the calc  
\* #'s should be in parentheses

4.

