

BE-1B WEDNESDAY 10-18-06

WELCOME BACK! TODAY = Q2 DAY 1

PLEASE: HAVE ALL SUPPLIES BY MONDAY

① Express as a decimal number AND AS A FRACTION:

Ⓐ 10^2

Ⓑ 10^{-2}

② Multiply EACH number by 10

Ⓐ 3842

Ⓑ 0.0261

③ Divide EACH number by 10

Ⓐ 968

Ⓑ 0.214

①

Multiplying by 10 (or $\div$ by 10) is EASY. WHEN COMBINED WITH THE ABILITY OF EXPONENTS TO SHOW VERY LARGE (or small) numbers in a very small space you get the following:

Since 345,000,000 is the same as 3.45 times 10 eight times we can write it as

$$3.45 \times 10^8$$

THIS IS CALLED SCIENTIFIC NOTATION

$$a \times 10^n$$

a is between 1 and 10, 1 is OK, 10 is NOT

$$1 \leq a < 10$$

n is an integer, IT MAY BE POSITIVE OR NEGATIVE.

2.

CONVERTING "large" numbers to SCIENTIFIC NOTATION

$$64500 = 6.45 \times 10^4$$

1 2 3 4

COUNT FROM
IMAGINARY DECIMAL
UNTIL YOU REACH A NUMBER
BETWEEN 1 AND 10

$$60000 = 6.0 \times 10^4$$

OR
 6×10^4

$$60002 = 6.0002 \times 10^4$$

↑
YOU CANNOT DROP ZEROS THAT ARE
BETWEEN NUMBERS.

$$8650 = 8.65 \times 10^3$$

↑
MAKING
SMALLER

↑
MULTIPLYING BY
A BIG NUMBER
(POSITIVE EXPONENT)
 $10^3 = 1000$

WHAT ABOUT SMALL numbers? ③

0.0000006



COUNT TO GET
a number between
1 and 10, in this
case 6

since 6.0 is bigger, the
power of 10 you multiply it
by must make it smaller

$$10^{-1} = \frac{1}{10}, 10^{-2} = \frac{1}{100}, \text{etc}$$

$$6.0 \times 10^{-7}$$

$$0.003 = 3 \times 10^{-3}$$

$$0.00045 = 4.5 \times 10^{-4}$$

$$0.000000000000123 = 1.23 \times 10^{-12}$$

REGULAR DECIMALS ARE CALLED
"STANDARD NOTATION"

How do you go from SCIENTIFIC
NOTATION BACK TO STANDARD?

EX) 3.84×10^3

MULTIPLY BY 10 three times, MOVE
the DECIMAL POINT TO right 3
times. Each time you move it
to the right the decimal gets
bigger by 10 and the EXPONENT
gets smaller by 1

$$3.84 \times 10^3$$

$$= 38.4 \times 10^2$$

$$= 384 \times 10^1$$

$$= \boxed{3840}$$

ADD ZEROS AS
NEEDED

Ex)

$$8.034 \times 10^6$$
$$= 8034000$$

5

Ex)

$$5.3 \times 10^{-4}$$
$$=$$
$$.53 \times 10^{-3}$$
$$.053 \times 10^{-2}$$
$$.0053 \times 10^{-1}$$
$$.00053 \times 10^0$$
$$= \boxed{.00053}$$

TRY CONVERTING TO STANDARD NOTATION

(a) 2.45×10^8

(b) 3×10^{-5}

TRY CONVERTING TO SCIENTIFIC NOTATION

(a) 30,500,000

(b) 0.000781

EX 1 AND 2 Pg 426

⑥

More EXAMPLES:

Pg 428 # 4-11

HW: Read Ch 8-3
