

Objective

The student will be able to:

express numbers in scientific and decimal notation.

Big Ideas:

- Scientific Notation helps us express really big numbers in a more manageable way
- You can use scientific notation everywhere
- Have you used it somewhere before?

Notes: Scientific Notation

A number is expressed in scientific notation when it is in the form

$$\mathbf{a} \times 10^n$$

where **a** is between 1 and 10
and **n** is an integer

Part I: Writing numbers in Scientific

Notation: How wide is our universe?

210,000,000,000,000,000,000,000 miles
(22 zeros)

This number is written in decimal notation. When numbers get this large, it is easier to write them in scientific notation.

2.10,000,000,000,000,000,000,000.



How many decimal places did you move the decimal?

23

When the original number is more than 1,
the exponent is positive.

The answer in scientific notation is

2.1×10^{23}

1) Express 0.0000000902 in scientific notation.

Where would the decimal go to make the number be between 1 and 10?

9.02

The decimal was moved how many places?

8

When the original number is less than 1, the exponent is negative.

9.02×10^{-8}

Write 28750.9 in scientific notation.

1. 2.87509×10^{-5}

2. 2.87509×10^{-4}

3. 2.87509×10^4

 4. 2.87509×10^5

Part 2: Writing in Decimal Notation

2) Express 1.8×10^{-4} in decimal notation.

0.00018

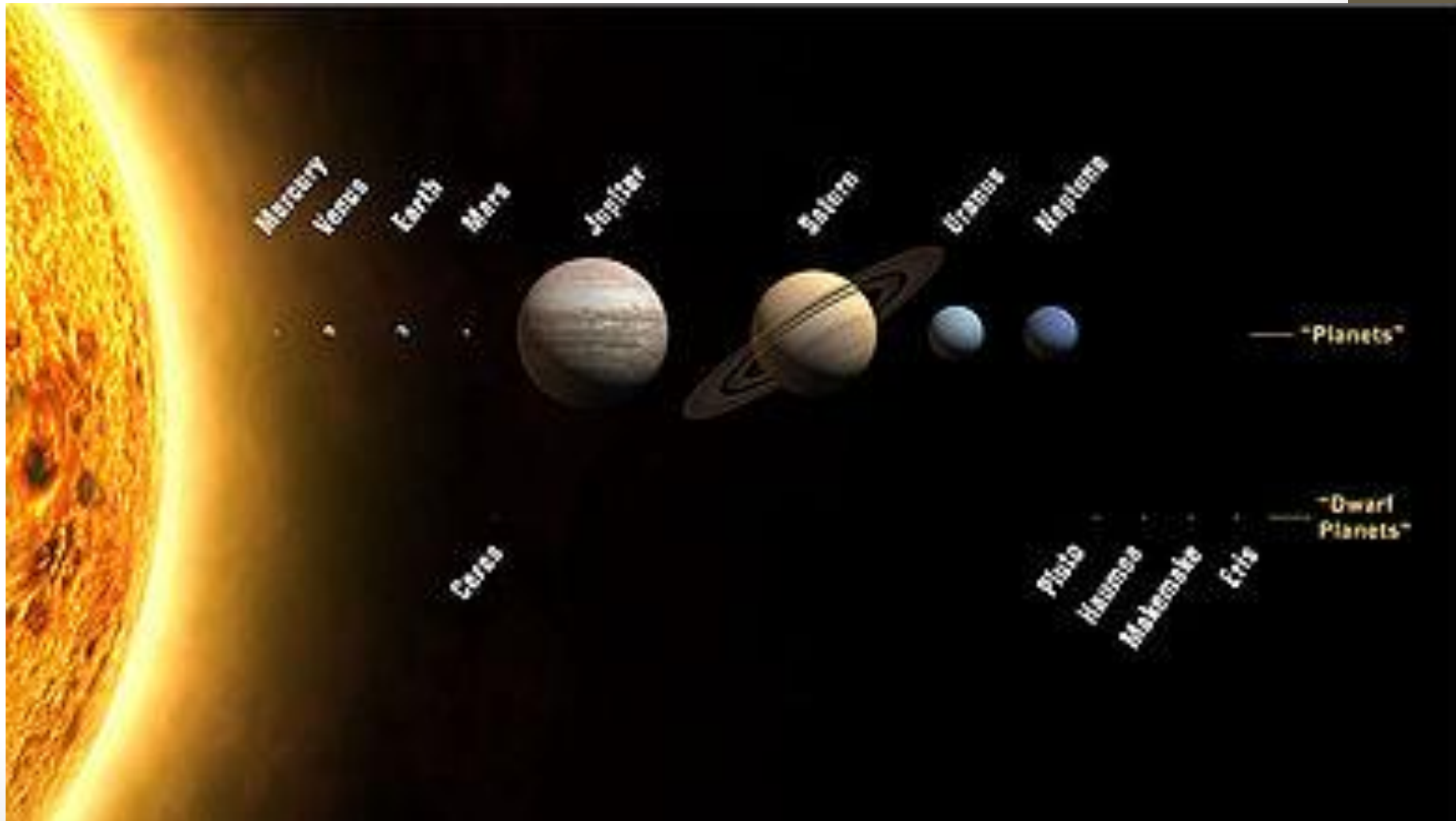
3) Express 4.58×10^6 in decimal notation.

4,580,000

Classwork:

- Now, we're going to examine how we apply scientific notation in our daily lives.

Our solar system:



Your task:

- On the back of your notes, rewrite the distance between the sun and the planets in scientific notation.
- Then, you're going to compare them to distances between Arlington and other cities around the world. (Choose three.)
- How do these numbers compare? Report back to me when you have finished.

During group work time:

- Work as quickly and quietly as possible
- If you have a question, first, ask a lab partner, then, if your group still does not know, ask me by raising your hand.
- You will return this assignment to me by the end of class for a grade.

Summary:

- Why is scientific notation important?
- How can you apply scientific notation in your daily life?

4) Use a calculator to evaluate:

$$\frac{4.5 \times 10^{-5}}{1.6 \times 10^{-2}}$$

You must include parentheses if you don't use those buttons!!

(4.5 x 10 **EXP** -5) **÷** (1.6 x 10 **EXP** -2) 4.5E-5÷1.6E-2

0.0028125

Write in scientific notation.

2.8125×10^{-3}

5) Use a calculator to evaluate:

$$\frac{7.2 \times 10^{-9}}{1.2 \times 10^2}$$

On the calculator, the answer is:

6.E -11

The answer in scientific notation is

6×10^{-11}

The answer in decimal notation is

0.000000000006

6) Use a calculator to evaluate
 $(0.0042)(330,000)$.

On the calculator, the answer is

1386.

The answer in decimal notation is

1386

The answer in scientific notation is

1.386×10^3

7) Use a calculator to evaluate $(3,600,000,000)(23)$.

On the calculator, the answer is:

8.28 E +10

The answer in scientific notation is

8.28×10^{10}


The answer in decimal notation is

82,800,000,000

Write $(2.8 \times 10^3)(5.1 \times 10^{-7})$ in scientific notation.

1. 14.28×10^{-4}

2. 1.428×10^{-3}

 3. 14.28×10^{10}

4. 1.428×10^{11}

Write in **PROPER** scientific notation

(Notice the number is not between 1 and 10)

8) 234.6×10^9

2.346×10^{11}

9) 0.0642×10^4

on calculator: 642

6.42×10^2

Write 531.42×10^5 in scientific notation.

1. $.53142 \times 10^2$
2. 5.3142×10^3
3. 53.142×10^4
4. 531.42×10^5
5. 53.142×10^6
6. 5.3142×10^7
7. $.53142 \times 10^8$

