

20109-11 PreAP Linear Motion 1

Scientific notation is how we write very large or very small numbers. It is faster to write and is easier to read.

$$0.000000045 = 4.5 \times 10^{-8}$$

Hard to read. *Easy to read.*

Reading

Positive exponents are for large numbers. Negative exponents are for small numbers.

Positive exponents tell you how many zeros to add to the right of the number.

$$1.2 \times 10^3 = 1.2 \times 1000 = 1,200$$

Read as: "1.2 times 10 to the third"

Negative exponents tell you how many times to move the decimal to the left.

$$6.1 \times 10^{-3} = 6.1 \times \frac{1}{1000} = \frac{6.1}{1000} = 0.0061$$

Read as: "6.1 times 10 to the negative third"

Writing

When writing scientific notation, only one digit is on the left of the decimal. Any other significant numbers are to the right of the decimal.

$$541,022 \text{ becomes } 5.41022 \times 10^5$$

34.5×10^4	3.45×10^5
WRONG!	CORRECT!

- Write the following numbers in scientific notation.

A. 12,756 km (<i>diameter of the earth</i>) =	B. 0.082 =
C. 702,000,000 =	D. 0.0000000000000000000000000000266 = (<i>mass of an oxygen atom</i>) [thus why we like scientific notation]
- Write out these numbers in standard notation.

A. 5.902×10^{-4} =	B. 3×10^8 m/s (<i>the speed of light</i>) =
C. 9.11×10^{-31} kg (<i>the mass of an electron</i>) =	
- Someone writes 18.3×10^4 . Correct them.

Study the following example.

$$8 \left(\frac{4}{2} \right) = \frac{8}{1} \left(\frac{4}{2} \right) = 8 \times 4 \div 2$$

$$\frac{8}{1} \left(\frac{4}{2} \right) = \frac{32}{2} = 16$$

$$\text{OR } \frac{8}{1} \left(\frac{4}{2} \right) = \frac{8}{2} \left(\frac{4}{1} \right) = 4(4) = 16$$

- Given:

	A. Which one or ones are in the multiplication position: 6, 5, or 2?
	B. Which one or ones are in the division position: 6, 5, or 2?
	C. Do the math (solve).
$6 \left(\frac{5}{2} \right) =$	$6 \left(\frac{5}{2} \right) =$

From the "Conversion" Notes:

- | | | | |
|--------------------|----------------------|------------------------------------|---------------------------------|
| A. $\frac{6}{6} =$ | B. $\frac{15}{15} =$ | C. $\frac{\text{km}}{\text{km}} =$ | D. Anything divided by itself = |
|--------------------|----------------------|------------------------------------|---------------------------------|
- | | |
|---|--|
| A. Will this work right? $\frac{16 \text{ m}}{1 \text{ sec}} \left(\frac{1 \text{ m}}{3.3 \text{ ft}} \right) =$ | B. Justify your answer (why or why not)? |
|---|--|
- Following the notes EXACTLY: Convert 15 cm to inches. (Must show work.)

3.3 ft = 1 m	5280 ft = 1 mi
12 in = 1 ft	2.54 cm = 1 in.
I assume you know about seconds, mins, etc	

8. Convert 120 m/sec to m/min. (Follow the steps)

3.3 ft = 1 m	5280 ft = 1 mi
12 in = 1 ft	2.54 cm = 1 in.
I assume you know about seconds, mins, etc	

From the “Metrics” Notes:

- 9. How many years in a century?
- 10. How many cents in a dollar?
- 11. How many centimeters in a meter?
- 12. How many years in a millennium?
- 13. How many millimeters in a meter?
- 14. Convert the following to meters:

- A. 50 cm =
- B. 20 cm =
- C. 5 cm =
- D. 43 cm =
- E. 900 mm =
- F. 100 mm =
- G. 45 mm =

(So don't forget this stuff.)

- 15. Example: How many centimeters are in 85 Gigameters?
- A. First convert 85 gigameters to meters:

B. Now convert meters to centimeters from part A.

*m/s means meters per second. Mph means miles per hour.
Any other time we mean miles we will use mi.*

16. A car is moving 30 m/s. How fast is that in mph?

From the “Linear Equations” Notes:

Again, follow the notes EXACTLY!

- 17. Use the graph at the right to answer the following:
 - A. How many “good points” are there?
 - B. Calculate the slope of the line, including units. *(Study Help available)*
 - C. What is the y-intercept for this line?
 - D. Write the linear equation for this line.

