



MATH for SCIENCE

Scientific Notation ~ Lesson Plan

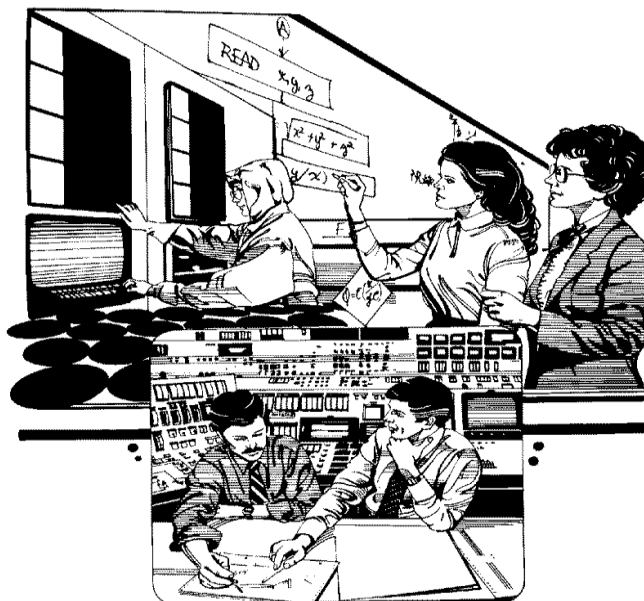
- I. Topic: Scientific Notation ~
- II. Goals/Objectives:
- A. Students will understand why scientific notation is helpful.
 - B. Students will learn to convert large and small numbers in decimal format into scientific notation format.
 - C. Students will learn to convert numbers in scientific notation format to decimal format.
- III. National Education Standards:
- A. Mathematics
 1. NM-NUM.9-12.1
Understand numbers, ways of representing numbers, relationships among numbers, and number systems.
 2. NM-ALG.9-12.3
Use mathematical models to represent and understand quantitative relationships.
 3. NM-ALG.9-12.4
Analyze change in various contexts.
 4. NM-PROB.PK-12.1
Build new math knowledge through problem solving.
 5. NM-PROB.PK-12.3
Apply and adapt a variety of appropriate strategies to solve problems.
 6. NM-PROB.COMM.PK-12.
Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
 7. NM-PROB.COMM.PK-12.3
Analyze and evaluate the mathematical thinking and strategies of others.
 8. NM-PROB.CONN.PK-12.3
Recognize and apply mathematical contexts outside of mathematics.
 - B. Science

Standard 9	Level III – Benchmarks 4,7,8,9
	Level IV – Benchmarks 3,6,7
- IV. Materials:
- A. Blackboard with colored chalk or whiteboard with colored markers.
 - B. Overhead projector.
 - C. Clear projection sheets to make overhead sheets of the “Presentation Notes.”
 - D. “Student Notes” copied for each student.
 - E. Pencils, colored pencils, & calculators.
 - F. Scientific Notation Worksheets.
- V. Presentation Outline:
- A. Why and how Scientific Notation is used.
 - B. Mechanics of converting Decimal-formatted numbers to Scientific Notation format.
 1. Converting numbers greater than one.
 - a. Rules and mechanics.



- b. Examples.
 2. Converting numbers less than one.
 - a. Rules and mechanics.
 - b. Examples.
 - C. Mechanics of converting Scientific Notation-formatted numbers to Decimal format.
 1. Converting numbers with “+n.”
 - a. Rules and mechanics.
 - b. Examples.
 2. Converting numbers with “- n.”
 - a. Rules and mechanics.
 - b. Examples.
 - D. Computations with Scientific Notation-formatted numbers.
 1. Multiplication.
 2. Division.
 3. Addition and Subtraction.
- VI. Presentation:
 - A. Use the presentation notes on an overhead projector, or
 - B. Use the power point presentation.
- VII. Scientific Notation Presentation: Student Notes ~
 - A. Students are to fill in the blank spaces in their notes during the presentation.
- VIII. Independent Practice: Scientific Notation Worksheet ~
 - A. Homework: #s 1 – 36.
 - B. Due the next day.
- IX. Evaluation/Assessment: Scientific Notation Quiz ~

Have students take this quiz the next day after going over any questions about the homework.



MATH for SCIENCE Scientific Notation

I. Scientists ~

1. Deal with:

1. Some very large numbers
2. Some extremely small numbers

These numbers can be quite cumbersome to work with. To make it easier scientists frequently use "Scientific Notation."

2. Scientific Notation:

1. A numerical shorthand frequently used for writing very large and extremely small numbers.

3. Converting Decimal format to Scientific Notation format:

1. Scientific Notation sets up numbers with:

- a. Only the leading, non-zero digit/number to the left of the decimal point in the units place.
- b. All the remaining numbers are placed to the right of the decimal point.
- c. Then that number is multiplied by 10^n .
- d. The power/exponent "n" will correspond to:
 - i. the number of places.
 - ii. the direction in which the decimal point was moved.
- e. The power "n" is:
 - i. positive (+) when the original number is greater than 1.
 - ii. negative (-) when the original number is less than 1.
- f. For numbers greater than 1:
 - i. count the number of places the decimal point was moved to the left until you have only one non-zero number/digit to the left of the decimal point.
 - ii. that number becomes the power/exponent that goes to the upper right of the 10^n .



g. Examples:

#	Moving the Decimal Pt.	Answer
i. 98765	9.8765 4 3 2 1	9.8765 x 10 ⁴
ii. 123	1.23 2 1	1.23 x 10 ²
iii. 4680	4.680 3 2 1	4.680 x 10 ³

h. For numbers less than 1:

- i. count the number of places the decimal point was moved to the **right** until you have only one non-zero number/digit to the left of the decimal point.
- ii. the **negative** of that number becomes the **power/exponent** that goes to the upper right of the 10ⁿ.

i. Examples:

#	Moving the Decimal Pt.	Answer
i. 0.00012	0.0001.2 1 2 3 4	1.2 x 10 ⁻⁴
ii. 0.0000000345	0.00000003.45 1 2 3 4 5 6 7 8	3.45 x 10 ⁻⁸
iii. 0.067	0.06.7 1 2	6.7 x 10 ⁻²

D. Converting Scientific Notation format to Decimal format:

1. For numbers with 10⁺ⁿ :
 - a. Move the decimal point to the **right** to make the number bigger (greater than 1).
 - b. When you move the decimal point and there are no numbers left, fill the counting loops in with zeros.

2. Examples:

#	Moving the Decimal Pt.	Answer
i. 7.43 x 10 ⁵	7.43000. 1 2 3 4 5	743,000.
ii. 2.153 x 10 ²	2.15.3 1 2	215.3
iii. 6.8 x 10 ⁴	6.8000. 1 2 3 4	68,000.

3. For numbers with 10⁻ⁿ :

- a. Move the decimal point to the **left** to make the number smaller (less than 1).

4. Examples:

#	Moving the Decimal Pt.	Answer
i. 3.75 x 10 ⁻²	.03.75 2 1	0.0375
ii. 8.4 x 10 ⁻⁵	.00008.4 5 4 3 2 1	0.000084
iii. 1.26 x 10 ⁻³	.001.26 3 2 1	0.00126



II. Computations with Scientific Notation ~

When multiplying or dividing with two or more numbers in Scientific Notation format, the process is done in two stages.

A. Multiplication:

1. Stage 1 has 2 steps:

- a. Step 1: Multiply the two leading numbers together.
- b. Step 2: Multiply the base 10 numbers together. (Remember, this means you just add the powers/exponents.)
- c. Example:

$$(2.5 \times 10^3) (5.0 \times 10^2)$$

$$(2.5 \times 5.0) (10^3 \times 10^2)$$

$$12.5 \times 10^5$$

2. Stage 2 has 2 steps:

These two steps are determined by which format, decimal or Scientific Notation, is required for the answer.

Decimal Format

- a. Step 3: Move the decimal point the number of places and the direction indicated by the $\times 10^n$ exponent.
- b. Step 4: Fill in the blank loops/spaces with zeros.

$$12.5 \times 10^5$$

$$12.50000.$$

1 2 3 4 5

$$1,250,000.$$

Scientific Notation Format

- Step 3: Take the decimally formatted first number and change it to Scientific Notation.
- Step 4: Multiply the number from step 3 with the base 10 number from step 2

$$12.5 \times 10^5$$

$$(1.25 \times 10^1) (10^5)$$

$$1.25 \times 10^6$$

B. Examples:

1. $(3.3 \times 10^{-2}) (4.5 \times 10^5)$
 $(3.3 \times 4.5) (10^{-2} \times 10^5)$
 14.85×10^3

Decimal Format

$$14.85 \times 10^3$$

$$14.850.$$

1 2 3

$$14,850.$$

Scientific Notation Format

$$14.85 \times 10^3$$

$$(1.485 \times 10^1) (10^3)$$

$$1.485 \times 10^4$$

2. $(8.2 \times 10^{-3}) (3.6 \times 10^{-2})$
 $(8.2 \times 3.6) (10^{-3} \times 10^{-2})$
 29.52×10^{-5}

Decimal Format

$$29.52 \times 10^{-5}$$

$$.00029.52$$

5 4 3 2 1

$$0.0002952$$

Scientific Notation Format

$$29.52 \times 10^{-5}$$

$$(2.952 \times 10^1) (10^{-5})$$

$$2.952 \times 10^{-4}$$

3. $(6.95 \times 10^4) (2.3 \times 10^{-7})$
 $(6.95 \times 2.3) (10^4 \times 10^{-7})$
 15.985×10^{-3}

Decimal Format

$$15.985 \times 10^{-3}$$

Scientific Notation Format

$$15.985 \times 10^{-3}$$



$$\begin{array}{r} .015.985 \\ 3 2 1 \\ \hline 0.015985 \end{array}$$

$$(1.5985 \times 10^1) (10^{-3})$$

$$1.5985 \times 10^{-2}$$

C. Division:

1. Stage 1 has 2 steps:
 - a. Step 1: Divide the two leading numbers, then
 - b. Step 2: Divide the base 10 numbers. (Remember, this means you just subtract the exponents/powers.)
2. Stage 2: Convert the result of stage 1 to either or both decimal format &/or Scientific Notation.

D. Examples:

$$1. \frac{96.24 \times 10^{-3}}{1.2 \times 10^{-5}} \rightarrow \frac{96.24}{1.2} \times \frac{10^{-3}}{10^{-5}} \rightarrow 80.2 \times 10^{-3-(-5)} = 80.2 \times 10^2 = 8.02 \times 10^3 \text{ or } 8020$$

$$2. \frac{8.2 \times 10^5}{6.0 \times 10^2} \rightarrow \frac{8.2}{6.0} \times \frac{10^5}{10^2} \rightarrow 1.2 \times 10^3 \text{ or } 1,200$$

$$3. \frac{1.92 \times 10^4}{6.3 \times 10^{-3}} \rightarrow \frac{1.92}{6.3} \times \frac{10^4}{10^{-3}} \rightarrow 0.3048 \times 10^7 = (3.048 \times 10^{-1}) (10^7) = 3.048 \times 10^6 \text{ or } 3,048,000.$$

E. Addition & Subtraction:

1. To add or subtract any numbers in Scientific Notation, each number MUST:
 - a. Be converted back to decimal format.
 - b. Line up the decimal points.
 - c. Then, add or subtract the numbers.

F. Examples:

$$1. \begin{array}{r} 1.4 \times 10^3 + 3.0516 \times 10^4 + 9.723 \times 10^2 \\ 1.4 \times 10^3 \quad 1400. \\ 3.0516 \times 10^4 \quad 30516. \\ \underline{9.723 \times 10^2} \quad + \underline{972.3} \\ 32,888.3 \quad 3.28883 \times 10^4 \end{array}$$

$$2. \begin{array}{r} 4.0125 \times 10^3 - 6.375 \times 10^2 \\ 4.0125 \times 10^3 \quad 4012.5 \\ \underline{6.375 \times 10^2} \quad - \underline{637.5} \\ 3375.0 \quad 3.3750 \times 10^3 \end{array}$$

$$3. \begin{array}{r} 1.3842 \times 10^2 + 4.965 \times 10^1 + 8.6 \times 10^{-2} \\ 1.3842 \times 10^2 \quad 138.42 \\ 4.965 \times 10^1 \quad 49.65 \\ \underline{8.6 \times 10^{-2}} \quad + \underline{.086} \\ 188.156 \quad 1.88156 \times 10^2 \end{array}$$

$$4. \begin{array}{r} 7.385 \times 10^{-2} - 8.126 \times 10^{-3} \\ 7.385 \times 10^{-2} \quad 0.07386 \\ \underline{8.126 \times 10^{-3}} \quad - \underline{0.008126} \\ 0.065734 \quad 6.5734 \times 10^{-2} \end{array}$$



Note for Teachers:

The highlighted areas in the “Presentation” are the areas left blank in the “Student Notes.” These highlighted areas act as the grading “key” for the “Student Notes.” It is recommended that each word or numbers the student successfully records on his/her “Notes” sheets be given either one half (0.5) of a point or one point. Giving students points for recording important information encourages them to stay focused during class and helps to ensure that students have complete information to study.



Scientific Notation ~ Student Notes

Name: _____ Date: _____ Grade: _____

I Scientists ~

A. Deal with:

1. some very _____.
2. some extremely _____.

These numbers can be quite cumbersome to deal with. To make it easier scientists frequently use _____.

B. Scientific Notation:

1. _____

C. Converting Decimal format to Scientific Notation format:

1. Scientific Notation sets up numbers with:

- a. Only the _____ digit/number to the _____ of the _____ in the _____ place.
- b. All the _____ are placed to the _____ of the _____.
- c. Then that number is multiplied by 10^n .
- d. The power/exponent “n” will correspond to:
 - i. the _____.
 - ii. the _____ in which the _____ was moved.
- e. The power is:
 - i. _____ (+) when the _____ number is _____.
 - ii. _____ (-) when the _____ number is _____.
- f. For numbers greater than 1:
 - i. count the number of places the decimal point was moved to the _____ until you have only one non-zero number/digit to the left of the decimal point.





ii. that number becomes the _____ that goes to the upper right of the 10^n .

g. Examples:

#	Moving the Decimal Pt.	Answer
i. 98765	9.8765 4 3 2 1	_____
ii. 123	_____	_____
iii. 4680	_____	_____

h. For numbers less than 1:

- i. count the number of places the decimal point was moved to the _____ until you have only one non-zero number/digit to the left of the decimal point
- ii. the _____ of that number becomes the _____ that goes to the upper right of the 10^n .

i. Examples:

#	Moving the Decimal Pt.	Answer
i. 0.00012	0.0001.2 1 2 3 4	_____
ii. 0.0000000345	_____	_____
iii. 0.067	_____	_____

D. Converting Scientific Notation format to Decimal format

1. For numbers with 10^{+n} :

- a. Move the decimal point to the _____ to make the number bigger (greater than 1).
- b. When you move the decimal point and there are no numbers left, fill the counting loops in with zeros.

2. Examples:

#	Moving the Decimal Pt.	Answer
a. 7.43×10^5	7.43000. 1 2 3 4 5	_____
b. 2.153×10^2	_____	_____
c. 6.8×10^4	_____	_____

3. For numbers with 10^{-n} :

Move the decimal point to the _____ to make the number smaller (less than 1).



4. Examples:

#	Moving the Decimal Pt.	Answer
a. 3.75×10^{-2}	$.03.75$ 2 1	_____
b. 8.4×10^{-5}	_____	_____
c. 1.26×10^{-3}	_____	_____

II. Computations with Scientific Notation

When multiplying or dividing with two or more numbers in Scientific Notation format, the _____ stages.

A Multiplication:

1. Stage 1 has 2 steps:

- a. Step 1: Multiply the two _____ together.
- b. Step 2: Multiply the base 10 numbers together. (Remember: this means you just _____.)
- c, Example:

$$(2.5 \times 10^3) (5.0 \times 10^2)$$

$$(2.5 \times 5.0) (10^3 \times 10^2)$$

2. Stage 2 has 2 steps:

These two steps are determined by which format, decimal or Scientific Notation, is required for the answer.

Decimal Format

- a. Step 3: Move the decimal point the number of places and the direction indicated by the “ $\times 10^n$ ” exponent.
- b. Step 4: Fill in the blank loops/spaces with zeros.

c. Example: 12.5×10^5
 $12.50000.$
 1 2 3 4 5
 1,250,000.

Scientific Notation Format

- Step 3: Take the decimally formatted first number and change it to Scientific Notation.
- Step 4: Multiply the number from step 3 with the base 10 number from step 2.

12.5×10^5
 $(1.25 \times 10^1) (10^5)$

 1.25×10^6

B. Examples:

1. $(3.3 \times 10^{-2}) (4.5 \times 10^5)$

Decimal Format

Scientific Notation Format



Decimal Format

Scientific Notation Format

Decimal Format

Scientific Notation Format

- C. Division:
1. Stage 1 has 2 steps:
 - a. Step 1: Divide the two leading numbers, then
Step 2: Divide the base 10 numbers. (Remember: this means you just _____.)
 2. Stage 2: Convert the result of stage 1 to either or both decimal format &/or Scientific Notation.

D. Examples:

1. $\frac{96.24 \times 10^{-3}}{1.2 \times 10^{-5}} \rightarrow \frac{96.24}{1.2} \times \frac{10^{-3}}{10^{-5}} \rightarrow 80.2 \times 10^{-3-(-5)} = 80.2 \times 10^2 = 8.02 \times 10^3$ or 8020
2. $\frac{8.2 \times 10^5}{6.0 \times 10^2} \rightarrow$
3. $\frac{1.92 \times 10^4}{6.3 \times 10^{-3}} \rightarrow$





D. Addition & Subtraction

To add or subtract any number in Scientific Notation, each number MUST:

- Be converted _____ format.
- Line up the _____.
- Then, add or subtract the numbers.

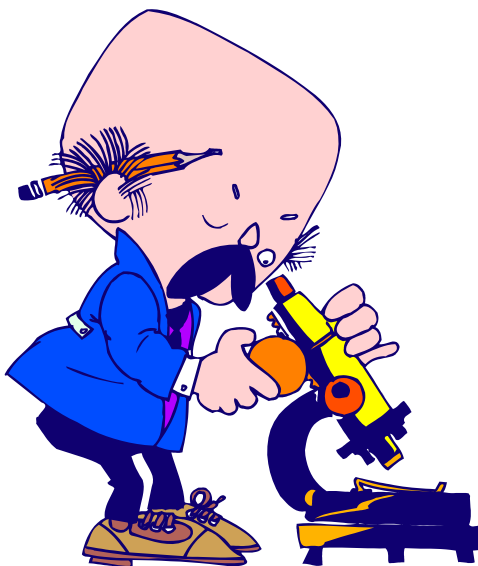
F. Examples:

$$\begin{array}{r}
 1.4 \times 10^3 + 3.0516 \times 10^4 + 9.723 \times 10^2 \\
 1.4 \times 10^3 \quad 1400. \\
 3.0516 \times 10^4 \quad 30516. \\
 \underline{9.723 \times 10^2} \quad + \underline{972.3} \\
 32,888.3 \quad 3.28883 \times 10^4
 \end{array}$$

$$\begin{array}{r}
 2. \quad 4.0125 \times 10^3 - 6.375 \times 10^2 \\
 4.0125 \times 10^3 \\
 \underline{6.375 \times 10^2} \quad \underline{\hspace{2cm}}
 \end{array}$$

$$\begin{array}{r}
 3. \quad 1.3842 \times 10^2 + 4.965 \times 10^1 + 8.6 \times 10^{-2} \\
 1.3842 \times 10^2 \\
 4.965 \times 10^1 \\
 \underline{8.6 \times 10^{-2}} \quad \underline{\hspace{2cm}}
 \end{array}$$

$$\begin{array}{r}
 4. \quad 7.385 \times 10^{-2} - 8.125 \times 10^{-3} \\
 7.385 \times 10^{-2} \\
 \underline{8.126 \times 10^{-3}} \quad \underline{\hspace{2cm}}
 \end{array}$$





Scientific Notation Worksheet

Name: _____ Date: _____ Grade: _____

A. Write the following decimal-formatted numbers in scientific notation.

- | | |
|------------------|-----------|
| 1. 3,475 | 1. _____ |
| 2. 48.5 | 2. _____ |
| 3. 1,463,000 | 3. _____ |
| 4. 858.61 | 4. _____ |
| 5. 21,000 | 5. _____ |
| 6. 0.00056 | 6. _____ |
| 7. 0.381 | 7. _____ |
| 8. 0.0000971 | 8. _____ |
| 9. 0.00649 | 9. _____ |
| 10. 0.0000000752 | 10. _____ |

B. Write the following scientific notation numbers in decimal format.

- | | |
|----------------------------|-----------|
| 11. 2.63×10^5 | 11. _____ |
| 12. 5.781×10^3 | 12. _____ |
| 13. 8.451×10^7 | 13. _____ |
| 14. 1.93×10^2 | 14. _____ |
| 15. 7.062×10^1 | 15. _____ |
| 16. 6.82×10^{-4} | 16. _____ |
| 17. 9.451×10^{-3} | 17. _____ |
| 18. 8.73×10^{-6} | 18. _____ |
| 19. 3.6×10^{-1} | 19. _____ |
| 20. 4.052×10^{-5} | 20. _____ |

C. Complete and give the answer in both decimal and scientific notation formats. Show all work.

- | | |
|---|-----------|
| 21. $(5 \times 10^3)(7 \times 10^{-2})$ | 21. _____ |
| 22. $(3.5 \times 10^2)(2.5 \times 10^3)$ | 22. _____ |
| 23. $(1.7 \times 10^{-3})(6.3 \times 10^{-4})$ | 23. _____ |
| 24. $(4.0 \times 10^5)(8.25 \times 10^{-3})$ | 24. _____ |
| 25. $(9.2 \times 10^2)(5.4 \times 10^{-4})$ | 25. _____ |
| 26. $\frac{6.3 \times 10^{-3}}{2.1 \times 10^{-5}}$ | 26. _____ |



27. $\frac{9.54 \times 10^2}{3.12 \times 10^4}$

27. _____

28. $\frac{4.18 \times 10^6}{1.6 \times 10^{-2}}$

28. _____

29. $\frac{1.05 \times 10^{11}}{1.4 \times 10^5}$

29. _____

30. $\frac{5.64 \times 10^6}{1.2 \times 10^3}$

30. _____

D. Compute the following addition and subtraction problems. Write the answers in both decimal and scientific notation. Show all work.

31. $8.6102 \times 10^4 + 3.0075 \times 10^2 + 5.9341 \times 10^3$

31. _____

32. $1.043 \times 10^{-2} - 8.156 \times 10^{-3}$

32. _____

33. $2.74 \times 10^0 + 4.691 \times 10^2 + 9.825 \times 10^{-1}$

33. _____

34. $6.341 \times 10^{-3} + 7.952 \times 10^{-2} + 1.482 \times 10^{-1}$

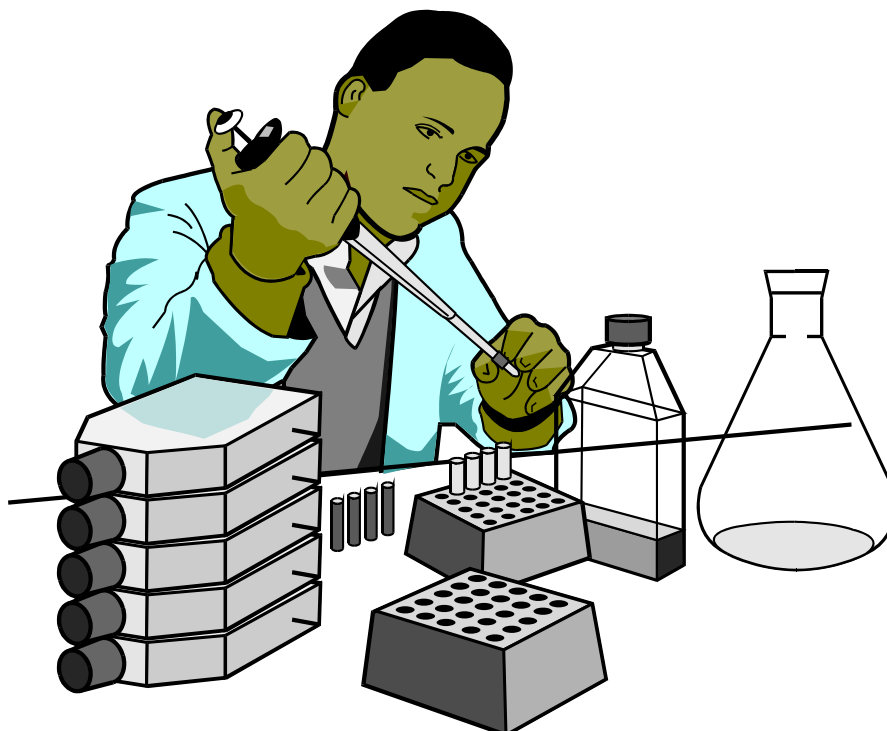
34. _____

35. $3.56 \times 10^4 - 8.72 \times 10^2$

35. _____

36. $4.837 \times 10^2 - 7.52 \times 10^{-1}$

36. _____





Scientific Notation Worksheet

Answer Key

A. Write the following decimal formatted numbers in scientific notation. Answers.

- | | | |
|-----------------------------|----------------------------|-----------------------------|
| 1. 3.475 x 10 ³ | 5. 2.1 x 10 ⁴ | 8. 9.71 x 10 ⁻⁵ |
| 2. 4.85 x 10 ¹ | 6. 5.6 x 10 ⁻⁴ | 9. 6.49 x 10 ⁻³ |
| 3. 1.463 x 10 ⁶ | 7. 3.81 x 10 ⁻¹ | 10. 7.52 x 10 ⁻⁸ |
| 4. 8.3861 x 10 ² | | |

B. Write the following scientific notation numbers in decimal form. Answers.

- | | | |
|----------------|--------------|----------------|
| 11. 263,000 | 15. 70.62 | 18. 0.00000873 |
| 12. 5781 | 16. 0.000682 | 19. 0.36 |
| 13. 84,510,000 | 17. 0.009451 | 20. 0.00004052 |
| 14. 193 | | |

C. Complete and give the answer in both decimal and scientific notation.

- | | | |
|---|---|--|
| 21. $(5 \times 10^3)(7 \times 10^{-2})$
$(5 \times 7)(10^3 \times 10^{-2})$
35×10^1
$3.5 \times 10^2 : 350$ | 22. $(3.5 \times 10^2)(2.5 \times 10^3)$
$(3.5 \times 2.5)(10^2 \times 10^3)$
8.75×10^5
$875,000$ | 23. $(1.7 \times 10^{-3})(6.3 \times 10^{-4})$
$(1.7 \times 6.3)(10^{-3} \times 10^{-4})$
10.71×10^{-7}
$1.071 \times 10^{-6} : 0.000001071$ |
| 24. $(4.0 \times 10^5)(8.25 \times 10^{-3})$
$(4.0 \times 8.25)(10^5 \times 10^{-3})$
33×10^2
$3.3 \times 10^3 : 3,300$ | 25. $(9.2 \times 10^2)(5.4 \times 10^{-4})$
$(9.2 \times 5.4)(10^2 \times 10^{-4})$
49.68×10^{-2}
$4.968 \times 10^{-1} : 0.4968$ | 26. $\frac{6.3 \times 10^{-3}}{2.1 \times 10^{-5}}$ $\frac{6.3}{2.1} \times \frac{10^{-3}}{10^{-5}}$
$3.0 \times 10^{-3-(-5)}$
$3.0 \times 10^2 : 300$ |
| 27. $\frac{9.54 \times 10^2}{3.12 \times 10^4}$
$3.0577 \times 10^{-2-4}$
$3.0577 \times 10^{-2} : 0.030577$ | 28. $\frac{4.8 \times 10^6}{1.6 \times 10^{-2}}$
$3.0 \times 10^{6-(-2)}$
$3.0 \times 10^8 : 300,000,000$ | 29. $\frac{1.05 \times 10^{11}}{1.4 \times 10^5}$
0.75×10^6
$7.5 \times 10^5 : 750,000$ |
| 30. $\frac{5.64 \times 10^6}{1.2 \times 10^3}$
$4.7 \times 10^3 : 4,700$ | | |

D. Compute and give the answers in both decimal and scientific notation formats.

- | | | | |
|--|---|--|--|
| 31. 8.6102×10^4
3.0075×10^2
5.9341×10^3
<hr style="width: 100%;"/> | 86102.
300.75
+5934.1
<hr style="width: 100%;"/> | 32. 1.043×10^{-2}
8.156×10^{-3}
<hr style="width: 100%;"/> | 0.01043
--0.008156
<hr style="width: 100%;"/> |
| | 92336.85 9.233685×10^4 | | 0.002274
2.274×10^{-3} |
| 33. 2.74×10^0
4.691×10^2
9.825×10^{-1}
<hr style="width: 100%;"/> | 2.74
469.1
+ 0.9825
<hr style="width: 100%;"/> | 34. 6.341×10^{-3}
7.952×10^{-2}
1.482×10^{-1}
<hr style="width: 100%;"/> | 0.006341
0.07952
+0.1482
<hr style="width: 100%;"/> |
| 4.728225×10^2 | 472.8225 | 2.34061×10^{-1} | 0.234061 |
| 35. 3.56×10^4
8.721×10^2
<hr style="width: 100%;"/> | 35600.0
-- 872.1
<hr style="width: 100%;"/> | 36. 4.837×10^2
7.52×10^{-1}
<hr style="width: 100%;"/> | 483.700
-- 0.752
<hr style="width: 100%;"/> |
| 3.47279×10^4 | 34727.9 | 4.82948×10^2 | 482.948 |



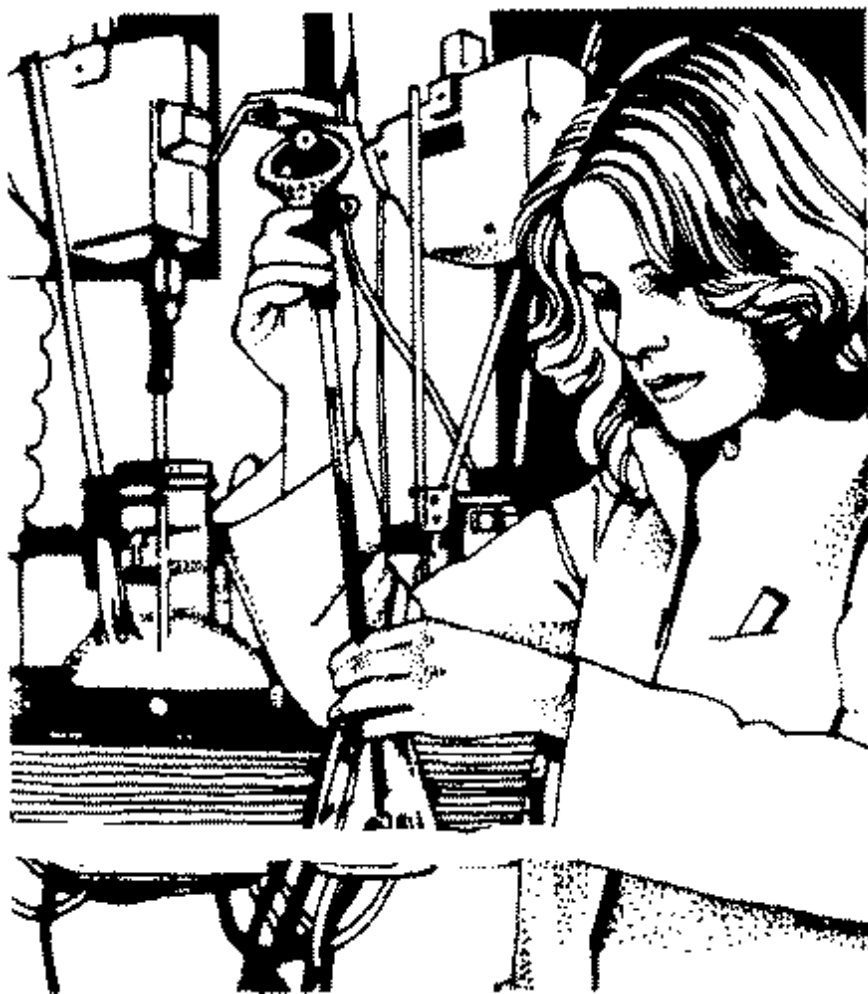
Worksheet Grading Rubric: 78/75 Points

Problems	Moving Decimal Pt Correct # of Places (1 pt each)	Correct Exponent (1 pt each)	Total Points (2 pts each) (40 pts Possible)
A 1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
B11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			

Problems	Correct Math. Action (0.5 pts each)	Correct Exponent Action (0.5 pts each)	Correct Decimal Format (0.5 pts each)	Correct Sci. Not. Format (0.5 pts each)	Total Points (2 pts each) (20 pts Possible)
C 21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					



Problems	Correct Math. Action (1 pt each)	Correct Exponent Action (1 pt each)	Correct Decimal Format (0.5 pts each)	Correct Sci. Not. Format (0.5 pts each)	Total Points (3 pts each) (18 pts Possible)
D 31.					
32.					
33.					
34.					
35.					
36.					





Scientific Notation Quiz

Name: _____ Date: _____ Grade: _____

1. _____ Scientific notation _____.
 - A. has only two (2) numbers.
 - B. makes it hard for scientists to use large numbers.
 - C. has only one nonzero digit to the left of the decimal point.
 - D. can only be used to convert very small numbers.

2. _____ When the “n” in 10^n is positive, the original number is _____.
 - A. less than zero.
 - B. more than one.
 - C. less than one.
 - D. equal to one.

3. _____ When the “n” in 10^n is negative the original number is _____.
 - A. less than zero.
 - B. more than one.
 - C. less than one.
 - D. equal to one.

4. _____ When converting numbers in scientific notation to decimal format, you move the decimal point to the _____.
 - A. right to make the number bigger.
 - B. right to make the number smaller.
 - C. left to make the number bigger.
 - D. left to make the number negative.

5. _____ When converting numbers in scientific notation to decimal format, you move the decimal point to the _____.
 - A. left to make the number bigger.
 - B. left to make the number smaller.
 - C. right to make the number smaller.
 - D. right to make the number negative.

6. _____ Convert 6,705 to scientific notation.
 - A. 6.705×10^3
 - B. 0.6705×10^4
 - C. 6.705×10^4
 - D. 6.705×10^{-3}

7. _____ Convert 0.000487 to scientific notation.
 - A. 0.487×10^3
 - B. 4.87×10^{-4}
 - C. 4.87×10^4
 - D. 4.87×10^{-5}



8. _____ Convert 89,300 to scientific notation.
- A. 89.300×10^2
 - B. 8.93×10^{-4}
 - C. 8.93×10^{-3}
 - D. 89.3×10^4
9. _____ Convert 6.45×10^{-5} to decimal format.
- A. 645,000
 - B. 6.45000
 - C. 0.0000645
 - D. 64.5000
10. _____ Convert 1.234×10^2 to decimal format.
- A. 12.3400
 - B. 123.4
 - C. 0.01234
 - D. 0.001234





Scientific Notation Quiz Answer Key

Name: _____ Date: _____ Grade: _____

1. C Scientific notation _____.
A. has only two (2) numbers.
B. makes it hard for scientists to use large numbers.
C. has only one nonzero digit to the left of the decimal point.
D. can only be used to convert very small numbers.
2. B When the “n” in 10^n is positive, the original number is _____.
A. less than zero.
B. more than one.
C. less than one.
D. equal to one.
3. C When the “n” in 10^n is negative the original number is _____.
A. less than zero.
B. more than one.
C. less than one.
D. equal to one.
4. A When converting numbers in scientific notation to decimal format, you move the decimal point to the _____.
A. right to make the number bigger.
B. right to make the number smaller.
C. left to make the number bigger.
D. left to make the number negative.
5. B When converting numbers in scientific notation to decimal format, you move the decimal point to the _____.
A. left to make the number bigger.
B. left to make the number smaller.
C. right to make the number smaller.
D. right to make the number negative.
6. A Convert 6,705 to scientific notation.
A. 6.705×10^3
B. 0.6705×10^4
C. 6.705×10^4
D. 6.705×10^{-3}
7. B Convert 0.000487 to scientific notation.
A. 0.487×10^3
B. 4.87×10^{-4}
C. 4.87×10^4
D. 4.87×10^{-5}



8. D Convert 89,300 to scientific notation.
 A. 89.300×10^2
 B. 8.93×10^{-4}
 C. 89.3×10^{-3}
 D. 8.93×10^4
9. C Convert 6.45×10^{-5} to decimal format.
 A. 645,000
 B. 6.45000
 C. 0.0000645
 D. 64.5000
10. B Convert 1.234×10^2 to decimal format.
 A. 12.3400
 B. 123.4
 C. 0.01234
 D. 0.001234

Quiz Grading Rubric: 15/15 Points

Problems	Correct Answer (1 pt each) (5 pts Possible)		Problems	Correct Answer (2 pts each) (10 pts Possible)
1.			6.	
2.			7.	
3.			8.	
4.			9.	
5.			10.	

