Name: Key Date: _____ Period: _____

5.5 Scientific Notation DAY TWO CYU

☑ Use when you get it right all by yourself

S Use when you did it all by yourself, but made a silly mistake

H Use when you could do it alone with a little help from teacher or peer

G Use when you completed the problem in a group

X Use when a question was attempted but wrong (get help)

N Use when a question was not even attempted

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Scientific Notation to Standard Decimal	9 - 14	21	
Standard Decimal to Scientific Notation	1 - 8	19, 20	
Real-World Application		19 - 22	
Operations with Scientific Notation		15 - 18	

Write each number in scientific notation. Show work to earn full credit.

1. 78,000 7.8×10^{4}

2. 9,3000,000,000 $9.3\cdot10^{9}$

3. 0.00000167 1.67×10^{-6}

4. 0.00000017 1.7×10^{-7}

5. 0.00635 $6.35\cdot10^{-3}$

6. 0.00194 1.94×10^{-3}

7. 1,160,000 $1.16\cdot10^{6}$

8. 700,000 7×10^{5}

Write each number in standard notation. Show work to earn full credit.

9. (8.673×10^{-10}) 0.000000000008673

10. (9.056×10^{-4}) 0.0009056

11. (3.3×10^{-2}) 0.033

12. (4.8×10^{-6}) 0.00000048

13. (2.032×10^{4}) 20,320

14. (9.07×10^{10}) 90,700,000,000

Evaluate each expression using exponential rules, Law of Exponents. Write each result in standard notation. Show all work for full credit.

15. $(1.2 \times 10^{-3})(3 \times 10^{-2})$ 0.000036

16. $(2.5 \times 10^{6})(2 \times 10^{-6})$ 5

17. $\frac{(8\times10^{-1})}{16\times10^{5}}$ 0.0000005

18. $\frac{(0.4\times10^{5})}{0.2\times10^{11}}$ 0.000002

19. The temperature at the interior of the Earth is 20,000,000 degrees Celsius. Write 20,000,000 in scientific notation.

2×10^7

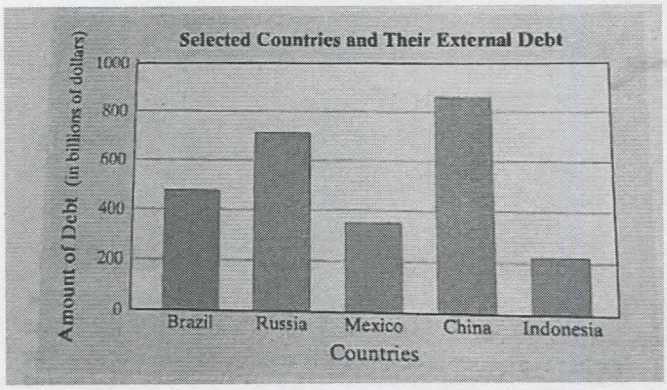
20. In March 2004, the European Space Agency launched the Rosetta spacecraft, whose mission was to deliver the Philae lander to explore comet 67P/Churyumov-Gerasimenko. The lander finally arrived on the comet in late 2014. This comet is currently more than 320,000,000 miles from Earth. Write 320,000,000 in scientific notation. (*Source:* European Space Agency)

3.2×10^8

21. In chemistry, Avogadro's number is the number of atoms in one mole of an element. Avogadro's number is $6.02214199 \times 10^{23}$. Write this number in standard notation. (*Source:* National Institute of Standards and Technology)

602,214,199,000,000,000,000,000

To the right are some interesting facts about selected countries' external debts at a certain time. These are public and private debts owed to nonresidents of that country. If a number is written in standard form, write it in scientific notation. If a number is written in scientific notation, write it in standard form. (*Source:* CIA World Factbook)



22. The external debt of Russia at a certain time was \$714,000,000,000.

$\$7.14 \times 10^{11}$

23. At a certain time, China's eternal debt was $\$8.63 \times 10^{11}$.

\$863,000,000,000

24. At a certain time, the external debt of the United States was $\$1.5 \times 10^{13}$.

\$15,000,000,000,000

25. The amount by which Russia's debt was greater than Mexico's debt was \$359,000,000,000,000.

$\$3.59 \cdot 10^{11}$

26. At a certain time, the estimated per person share of the United States external debt was $\$4.7 \times 10^4$.

\$47,000

27. The bar graph shows the external debt of five countries. Estimate the height of the tallest bar and the shortest bar in standard notation. Then write each number in scientific notation.

China: \$860,000,000,000 → $\$8.6 \times 10^{11}$

Indonesia: \$225,000,000,000 → $\$2.25 \times 10^{11}$

CYU Reflection: *How far can you go: basic, intermediate, or advanced?*

Rate your mastery level!

How confident are you with the skills this CYU covered? Circle the score you would give yours elf.