Scientific Notation Practice

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Reflection and Self-Assessment

Part 1: Circle the statement that best describes how you completed the practice:

- I answered all questions without using the online solutions. I checked my answers against the key at the back of the practice and was able to determine my mistakes and correct them without referring to the online solutions.
- I answered most questions correctly without using the online solutions. I used the online solutions to help me with some questions and was able, with help from the online solutions, to understand every question and answer them correctly.
- I used the online solutions to help me with most of the questions. I was able, with help from the online solutions, to understand each question and answer them correctly.
- Even using the online solutions, I was not able to fully understand the solution to some problems. The questions I had trouble with were:

• I did not attempt all the questions on the practice.

Part 2: Circle the statement that best describes your confidence in answering questions of this type in the future.

- I am confident I can answer nearly any question of this type correctly without using notes or other assistance.
- I am confident I can answer **MOST** questions of this type correctly without using notes or other assistance.
- I am NOT confident I can answer most questions of this type correctly without using notes or other assistance.

- 1. Explain why each of the following is **NOT** in scientific notation:
 - a. 5.95
 - b. 653×10^{35}
 - c. 0.23×10^{-5}
 - d. 5.23×12^3
- 2. Write each of the following in scientific notation:
 - a. 456 000
 - b. 0.000535
 - c. 1 042 000
 - d. 0.02199
 - e. Five million
 - f. Six trillion

3. Write each of the following in standard notation.

a.
$$4.6 \times 10^3$$

b.
$$2.11 \times 10^4$$

c.
$$1.34 \times 10^{-4}$$

d.
$$2.1 \times 10^5$$

e.
$$6.62 \times 10^{-1}$$

f.
$$5.1 \times 10^{-7}$$

g.
$$1.02 \times 10^6$$

h.
$$7.15 \times 10^{-2}$$

4. Simplify, write answer in scientific notation if it is greater than 1000, or less than 0.01 and standard notation otherwise.

a.
$$1.3 \times 10^4 + 2.9 \times 10^6$$

b.
$$(4.993 \times 10^4)^2$$

c.
$$(8.34 \times 10^{-4})(3.62 \times 10^5)$$

d.
$$(4.14 \times 10^{-3}) - (2.62 \times 10^{-4})$$

e.
$$(9.4 \times 10^{16}) + (2 \times 10^{15})$$

f.
$$\frac{5 \times 10^{19}}{3 \times 10^4}$$

5. In each line circle the largest number

a.
$$5.3 \times 10^{24}$$

$$5.3 \times 10^{19}$$

$$5.3\times10^{15}$$

b.
$$1.3 \times 10^{24}$$

$$6.3 \times 10^{24}$$

$$9.3 \times 10^{24}$$

c.
$$6.3 \times 10^{-5}$$

$$6.3 \times 10^{-9}$$

$$6.3\times10^{-16}$$

d.
$$2.9 \times 10^{-3}$$

$$2.8 \times 10^{-3}$$

$$2.7 \times 10^{-3}$$

e.
$$7.9 \times 10^{11}$$

$$9.8 \times 10^{12}$$

$$5.7 \times 10^{13}$$

6. Write three different numbers between 5×10^6 and 5×10^7

- 7. Write in scientific notation
 - a. 659×10^3

b. 0.013×10^{-4}

- c. 520 billion
- d. 64.25 million
- e. 659×10^9
- f. 0.0013×10^{-4}
- g. 659×10^{-1}

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Problems 8-10 taken from Janice McGovern at King Phillips Regional Middle School.

Give answers in scientific notation if they are below 0.01 or above 1000 and in standard form otherwise.

8. In June 2016, Snapchat had 1.52×10^8 daily active users. Twitter had 1.41×10^8 daily active users. How many more people were actively using Snapchat than Twitter in June 2016?

9. The biggest bowl of mashed potatoes ever made weighed 4.56×10^4 pounds and was created at the Iowa State Fair in 2005. The biggest deep dish pizza ever made was in Chicago in 1998. It weighed a whopping 1.23×10^5 pounds. How many more pounds did the pizza weigh than the bowl of mashed potatoes?

10. The state of Colorado covers about 1.04×10^5 square miles. The Indian Ocean covers about 2.808×10^7 square miles. How many times bigger than Colorado is the Indian Ocean?

11. The half-life of uranium-238 is 4.5×10^9 years. The half-life of uranium-234 is 2.5×10^5 years. How many times greater is the half-life of uranium-238 than that of uranium-234?

12. The mass of a hydrogen atom is approximately 1.67×10^{-24} grams. The mass of an oxygen atom is approximately 2.66×10^{-24} grams. There are 6.69×10^{24} water molecules (which each consist of 2 hydrogen and 1 oxygen atoms) in a glass of water. Based on this, how much will the water in the glass weigh?

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13. The Earth is approximately 4.5 billion years old. There are 3.1536×10^7 seconds in a year. How old is the Earth in seconds?

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Answer Key

1a) No power of 10	1b)653 is bigger than 10	1c) 0.23 is less than 1	1d) Power of 12, not 10	2a) 4.56 × 10 ⁵
2b) 5. 35 × 10 ⁻⁴	2c) 1.042× 10 ⁶	2d) 2.199× 10 ⁻²	2e) 5 × 10 ⁶	2f) 6 × 10 ¹²
3a) 4600	3b) 21100	3c) 0.000134	3d) 210000	3e) 0.662
3f) 0.00000051	3g) 1020000	3h) 0.0715	4a) 2.913× 10 ⁶	4b) 2.493× 10 ⁹
4c) 301.908	4d) 3.876×10^{-3}	4e) 9.6 × 10 ¹⁶	4f) 1.6667× 10 ¹⁵	5a) 5.3 × 10 ²⁴
5b) 9. 3 × 10 ²⁴	5c) 6.3×10^{-5}	5d) 2.9× 10 ⁻³	5e) 5.7 × 10 ¹³	6) Various possible
7a) 6.59× 10 ⁵	7b) 1.3× 10 ⁻⁶	7c) 5.2× 10 ¹¹	7d) 6.425× 10 ⁷	7e) 6.59× 10 ¹¹
7f) 1.3× 10 ⁻⁷	7g) 6.59× 10 ¹	8) 1.1×10^7 people	9) 7.74× 10 ⁴ pounds	10) 270 times bigger
11) 1.8×10^4 times greater	12) 40.14 grams	13) 1.41912 × 10 ¹⁷ seconds		