Scientific Notation	Name	
Practice	Period I	Date
1. Scientists have estimated that the area of Earth covered by wa	tter is 70.98 percent, o	or 1
362 031 100 km ² . Express this value in scientific notation.	L A	
2. Mount Everest, an eastern Himalayan peak on the Tibet-Nepa	l border, was discove	ered to 2
be the world's highest mountain in March 1856. The Survey I	Department of the	
Government of India computed its height to be 29 002 ft. Exp	ress this height in sci	entific
notation.		
3. The Great Barrier Reef, off Queensland, northeastern Australi	a, is actually not a sir	ngle 3
reef but consists of thousands of separate reefs. Together, the	y stretch for a length	of
2 027 / 73 m. Express this distance in scientific notation.		
4. The material cost of world war 11 has been estimated at \$1.5	o trillion. In May 1959	9, the 4
total cost to the Soviet Union was estimated at 2 500 000 000	000 rubles. Express t	unis
5. The speed of light in outer space is about $300,000,000$ m/s. Ex	vnress this speed in so	cientific 5
notation	spices this speed in se	
6 In 1981 the IBM Zurich research laboratory invented the scan	ning tunneling micro	scope 6.
(STM). It has a magnifying ability of 100 million with resolut	tion capability down t	to
0.000 000 0002 m, about the diameter of a sulfur atom. Expre	ess the value 0.000 00	0 0002
m in scientific notation.		
7. One of the smallest of all free-living organisms, Mycoplasma	laidlawii, was first	7
discovered in sewage in 1936. During its early existence, its c	liameter can be as sm	all as
only 0.000 0001 m. Express this diameter in scientific notatio	n.	
8. The mass of the smallest bacterium is about 0.000 000 000 000	0 002 g. Express this	value 8
in scientific notation.		
9. The speed with which the shutter of a camera opens and shuts	can be changed on co	ertain 9
models of cameras. On most 35 mm cameras, the fastest shuft	er speed is 0.001 s. E	Express
this time in scientific notation.	. 11 1	
10. The heaviest commonly used United States coin is the half d	ollar, which has a ma	Penert
the sum of these masses in scientific notation	as a mass of 2.200 g.	Report
11. The adult house fly lives for only about 1 month or 8 x 10^{-2}	v. The oldest recorde	dage 11
of a tortoise was 1 8800 x 10^2 y What is the difference betwee	y. The oldest recorde en these two ages?	a age 111
Sample Problem	en mese two ages.	
The Friends of St. Catherine's Hospice, from Crawley, United K	ingdom, made a blan	ket that measured 4.5 x 10^3 cm by
7.7×10^3 cm. It was later split into more than 1450 smaller bl	ankets, which were do	onated to charity. What was the
overall area of the original blanket in square centimeters (cm2	2)?	-
1. List the given and unknown values.		
Given: dimensions of blanket: $1 = 4.5 \times 10^{-10}$	$w = 7.7 \text{ x } 10^{3} \text{ cm}$	0^3 cm
Unknown: area of blanket: $A = ? cm^2$		
2. Write the equation for area.		
A=l x w		
3. Insert the known values into the equation, and so (4.5 ± 10^3)	olve.	
$A = (4.5 \times 10^{\circ} \text{ cm})(/./ \times 10^{\circ} \text{ cm})$		
Regroup the values and units as follows. $A = (4.5 \times 7.7)(10^3 \times 10^3)(am \times am)$		
$A = (4.3 \times 1.7)(10 \times 10)(000 \times 000)$		

When multiplying, add the powers of 10. $A = (4.5 \text{ x } 7.7)(10^{3+3})(\text{cm x cm})$ $A = 25 = 10^{6} \text{ cm}^{2}$

$$A = 35 \times 10^{\circ} \text{ cm}^2$$

 $A = 3.5 \times 10^7 \text{ cm}^2$

12. The Republic of China presented one of the world's largest flags to the city of Kaohsiung in 1989. The flag of the Republic of China measured 1.26 x 10⁴ cm by 8.40 x 10³ cm. What is the area of this flag in square centimeters?

- 13. One of the greatest meteor showers ever recorded occurred on the night of November 17, 1966. The Leonid meteors, so called because they appear to originate in the constellation Leo, were visible from western North America to eastern Russia. Scientists calculated that meteors passed over Arizona at a rate of 1.38×10^1 per hour for 3.33×10^{-1} hours. Calculate how many meteors passed over Arizona that night.
- 14. The moon is Earth's closest neighbor in space and its only natural satellite. The moon has an average orbital speed of 1.03×10^3 m/s. If the mass of the moon is 7.35×10^{22} kg, calculate its momentum using the equation momentum = mass x speed.

Sample Problem

Gold, one of the densest elements, is so dense that 1.0 cm^3 of the element has a mass of $1.93 \times 10^1 \text{ g}$. If you have a sample of gold with a mass of $2.54 \times 10^2 \text{ g}$, what is its volume?

1. List the given and unknown values.

Given: mass,
$$m = 2.54 \times 10^2 \text{ g}$$
 density, $D = 1.93 \times 10^1 \text{ g/cm}^3$
Unknown: volume: $V = ? \text{ cm}^3$

2. Write the equation for volume.

V=m/D

V

3. Insert the known values into the equation, and solve.

$$V = \frac{2.54 \text{ x } 10^2 \text{ g}}{1.93 \text{ x } 10^1 \text{ g/cm}^3}$$

When dividing, subtract the denominator's power of 10 from the numerator's power of 10.

$$= \frac{2.54}{1.93} \times (10^{2-1}) \text{ g/(g/cm^3)}$$

$$V = 1.32 \times 10^1 \text{ cm}^3$$

8. Use the equation speed = distance/time to find the speed of a freight train that travels 3.7×10^6 m in 3.13×10^5 s.

- 9. On November 1, 1965, the first high-speed Japanese bullet trains, called Shinkansen, provided regular scheduled service at speeds averaging over 45 m/s Calculate the average speed of a Shinkansen that traveled between the Japanese cities of Tokyo and Osaka, a distance of 5.17 x 10⁵ m, in 1.14 x 10⁴ s.
- 10. One of the longest nonstop delivery flights by a commercial jet occurred August 16-17,1989, when a Boeing 747-400 jet flew 1.81×10^7 m from London, England, to Sydney, Australia. The average speed of the jet was 2.49 x 102 m/s Calculate how long it took this commercial airliner to reach its destination, using the equation time = distance/speed.
- 11. Any long piece of wire, rope, or cable that is made of an unchanging substance and has a uniform thickness is said to have a constant linear density. Linear density is measured in units of mass per unit length. Suppose you have a copper wire that has a linear density of 1.75×10^2 g/m. If the mass of the wire is 4.85×10^3 g, how long is the wire? (Hint: Use the equation length = mass/linear density.)