



1.3 SI Unit Conversion—Extra Practice

READ


Science is about exploring and understanding the universe, from the tiniest subatomic particles to the mind-boggling expanses of interstellar space. We gain understanding by asking questions, observing, measuring, and sharing results with others. You will use SI (metric) measuring tools for this purpose throughout the year. This skill sheet will help you become familiar with the SI prefixes you will use to measure length, mass, and volume.

Here are the prefixes you will use to report measurements:

Prefix	kilo-	hecto-	deka-	Basic unit (no prefix)	deci-	centi-	milli-
Symbol	k	h	da	m, g, l	d	c	m
Multiplication Factor or Place-Value	1,000	100	10	1	0.1	0.01	0.001

EXAMPLE


1. How many centimeters are there in 24 meters?

a. Restate the question: 24 meters = _____ centimeters.

b. Use the place value chart above to determine the multiplication factor, and solve.

Count the number of places on the chart it takes to move from meters (the ones place) to centimeters (the hundredths place). Since it takes 2 moves to the right, the multiplication factor is 100. Move the decimal two places to the right.

$$24.00 \times 100 = 24.0.0. = 2,400$$

move decimal two
places to the right

Solution: multiply $24 \times 100 = 2,400$.

Answer: There are 2,400 centimeters in 24 meters.

PRACTICE


Use the chart above to help you answer the following questions.

Part A: Distance conversions

1. Earth's diameter is 12,756 kilometers. How many meters is this?
2. The diameter of Earth's moon is 3,476 kilometers. Express this distance in centimeters.
3. The average distance between Earth and its moon is 384,000,000 meters. Express this distance in kilometers.
4. A billion years ago, Earth and its moon were just 200,000 kilometers apart. Express this distance in meters.



Page 2 of 2

5. Earth's moon is covered with impact craters. These craters form when an asteroid, comet, or meteorite crashes into the moon's surface. The largest impact crater, called Clavius, is 160 kilometers across. How many centimeters is this?
6. A crater known as Aristarchus is 3.6 kilometers deep. What is this distance in millimeters?
7. Another feature of the moon's surface is long, narrow valleys called Rilles. The Hadley Rille is 125 kilometers long, 0.4 kilometers deep, and 1.5 kilometers wide at its widest point. Express these distances in meters.
8. To escape Earth's gravitational pull, an object must reach a speed of 11,180 meters per second. How fast is this in kilometers per second?

Part B: Mass conversions

9. The largest land mammal is the African Elephant. The average adult has a mass of 5,400 kilograms. Express this mass in grams.
10. One of the smallest mammals is the bumblebee bat, with a mass of about 0.002 kilograms. Express this mass in grams.
11. A pygmy shrew is another tiny mammal, with a mass ranging from 1.2 grams to 2.7 grams. Express these measurements in milligrams.
12. The largest mammal ever found on Earth was a female blue whale with a mass of more than 158,000,000 grams. Express this mass in kilograms.
13. A blue whale's heart is so large that a person could crawl through its largest blood vessel (the aorta). The heart has a mass of about 450 kg. Express this mass in milligrams.
14. A baby blue whale will drink between 23 and 90 kilograms of milk each day. Express these masses in grams.

Part C: Volume conversions

15. A mature sugar maple tree produces about 40 liters of sap each season. How many milliliters is this?
16. After the sap is collected, extra water in it must be boiled off. Forty liters of sap is boiled down to produce one liter of maple syrup. How many milliliters of syrup are in one liter?
17. Canada is the world's largest commercial producer of maple syrup. In 2005, Canada produced about 26,600,000 liters of maple syrup. How many kiloliters is this?
18. Vermont is the United States' largest commercial producer of maple syrup. Vermont produced about 1,558 kiloliters of maple syrup in 2005. How many liters is this?
19. One serving of maple syrup is $\frac{1}{4}$ cup, or 0.06 liters. How many milliliters of syrup is this?
20. A jug of maple syrup contains 947 milliliters. Express this volume in liters.