

**Unit Conversions and Dimensional Analysis**      Name \_\_\_\_\_

The following is today's currency exchange rates for U.S. dollars (USD) and Canadian dollars (CAD):      1 CAD = 0.93 USD

I plan to travel to Montreal for the Thanksgiving holiday and have been advised to convert my U.S. dollars into Canadian dollars. If I exchange 150 USD after crossing the border, how many CAD will I get?

$$(150 \text{ USD}) \times (1 \text{ CAD} / 0.93 \text{ USD}) = (150 \text{ USD}) \times (1 \text{ CAD} / 0.93 \text{ USD}) = (150 / 0.93) \text{ CAD} = 161.29 \text{ CAD}$$

Three nights in a Montreal hotel cost 375 CAD. If I decide to pay the bill in USD how much will it cost me?

$$(375 \text{ CAD}) \times (0.93 \text{ USD} / 1 \text{ CAD}) = (375 \text{ CAD}) \times (0.93 \text{ USD} / 1 \text{ CAD}) = (375 \times 0.93) \text{ USD} = 325.50 \text{ USD}$$

Here are several more currency exchange rates posted today:

- 1 BPD (British Pound) = 1.66 USD
- 1 EURO = 1.48 USD
- 1 MXP (Mexican Peso) = 0.074 USD

**Perform the following calculations:**

1. Exchange 150 USD for EUROS. How many EUROS will you get?
2. An airline ticket from Boston to London on British Airways cost 275 BPD. How much will it cost you if you pay in U.S. dollars?
3. A handwoven blanket sell in a market in Oxaca, Mexico for 1000MXP, how much will it cost if you pay for it in U.S. dollars?
4. A three night stay in a Parisian hotel costs 465 EUROS. What will it cost in U.S. Dollars?
5. A U.S, visitor to Cancun converted 250 USD into Pesos. How many MXP did she get in exchange?
6. A professor visiting UMass Boston from London bought lunch in the cafeteria. Her bill came to \$6.25. If she paid in British pounds, how many BPD would it cost her?
7. A visitor from Mexico City got on Boston bus. He only has Peso's in his pocket to pay the \$0.90 bus fare. How many MXP should he p



1 mile = 1.609 kilometers  
1 kilometer = 1000 meter

1 foot = .305 meters  
100 centimeters = 1 meter

**Simple unit conversions:**

- a) 68 inches is the same as how many feet?
- b) How many feet are there in 13 yards?
- c) 357 cm equals how many meters?
- d) 186 meters is how many km?
- e) If Worcester is 46 miles from Boston, how many kilometers is it?
- f) The radius of the moon is  $1.92 \times 10^6$  yds. What is it's radius in meters?
- g) One US Dollar is equal to 105 Japanese Yen. A computer that costs 93,975 Yen would cost how much in US Dollars?

**2. Multistep conversions:**

- a) How many inches are there in 7 yards?
- b) .025km is equivalent to how many cm?
- c) How many feet are there in 14 km?

**3. Dimensional Analysis:**

- a) Common speed limits in the US are 30mph (miles per hour), 55mph and 65 mph. If 1 mile = 1.609 kilometers (km), convert these speed limits to kilometers per hour (kmph).

30 mi/hr

55 mi/hr

65 mi/hr

- b) If the speed of light is 186,000 mi/sec how many miles will light travel in one year (a light year)?
- c) How many km will light travel in one year?

