

Name: _____

Physical Science Midterm Application

Show all work on a separate sheet of paper and put units on all numbers. Box your final answer. You may round to the nearest tenth.

For the following problems use the formula $w = (9.81 \text{ N/kg})m$ to find the mass or weight. If you need to convert, remember there are 1000 grams in 1 kg.

1. What is the weight of a box of marbles if its mass is 0.25 kg?
2. Find the mass in kg of a dog that has a weight of 225 N.
3. If a car has a mass of 1,500 kg; what is its weight?
4. Find the mass in kg of a computer weighing 7.16 N and then convert it to grams.

For the following problems use the formula $F = ma$ to find force, mass, or acceleration.

1. How much force is needed to accelerate a 66 kg skier at 2 m/s^2 ?
2. What is the force on a 1000 kg elevator that is falling freely at 9.8 m/s^2 ?
3. What is the acceleration of a 50 kg object pushed with a force of 500 newtons?

Speed Problems use the formula $v = d/t$.

1. Calculate the speed for a car that went a distance of 100 kilometers in 2 hours time.
2. A baseball is thrown a distance of 80 meters. What is its speed if it takes 1.5 seconds to cover the distance?
3. How much time does it take for a bird flying at a speed of 22 kilometers per hour to travel a distance of 440 kilometers?
4. A comet is cruising through the solar system at a speed of 65,000 kilometers per hour for 3 hours time. What is the total distance traveled by the comet during this time?
5. If Steve throws the football 40 meters in 2 seconds, what is the average speed (velocity) of the football?

Fill in the blank with the appropriate word or words.

1. Zeros at the end of a number without a decimal in the number are _____.
2. Zeros at the beginning of a number are _____.
3. Counted numbers and definitions are not _____.
4. Zeros between nonzero numbers are _____.
5. All nonzero numbers are _____.

Write the following numbers in standard scientific notation.

1. 500,000 mm
2. 0.000 000 000 560 kg
3. 301,000,000 cL
4. 45,000 dg
5. 0.000 231 hm
6. 790,000,000 mm
7. 0.000 020 kg
8. 61,000,000 cL
9. 300 dg

Put a check mark over the numbers that are significant or write NA if it is not applicable.

1. 0.0080 mL
2. 10,500 g
3. 5.0 L
4. 70 cats
5. 140 mm
6. 705 km
7. 200,000 dg
8. 0.000 000 50 hg
9. 1,000. cm
10. 0.08040 dag

Physical Science Conversion Problems

Use the following conversion factors to solve the problems:

1 base unit = 10 deci- base units
1 base unit = 100 centi- base units
1 base unit = 1000 milli- base units

1 deka- base unit = 10 base units
1 hecto- base unit = 100 base units
1 kilo- base unit = 1000 base units

The three main base units:
Meter for length (m)
Liter for volume (l) or (L)
Gram for mass (g)

You must write these on a piece of paper and follow the steps we learned in class.

Remember that we put the given number and unit over 1 then multiply by the conversion factor. The conversion factor has the given unit at the bottom and the wanted unit at the top. The wanted unit will be the unit on the answer. Box the answer.

When the number 1 is on the bottom of the conversion factor, then you multiply. That makes a larger number moving the decimal to the right. (Count the zeros and that is how many times you move the decimal.)

When the number 1 is on the top of the conversion factor, then you divide. That makes a smaller number moving the decimal to the left.

1. 0.983 kg to g
2. 1,371 mL to L
3. 87 m to dm
4. 70.59 hg to g