Chapter 2: Study Guide

Fill in the blanks as you study the chapter.

2.1 THE MEASURE OF SCIENCE

The Metric System

In the metric system, units of different sizes are related by_____. The initials _____stand for the International System of Units. The three fundamental units measure the quantities_____,_____, and_____. The meter is the SI unit of _____. The second is the SI unit of _____.The kilogram is the SI unit of-.Other units are called derived units because they are_____ of fundamental units.

Scientific Notaton

Scientific notation is based on _____ notation. In scientific notation, a measurement is expressed as a number between _____ and _____ multiplied by a whole-number _____of ten. When numbers are converted to scientific notation, the decimal point is moved until there is one _____ digit to the _____ of the decimal point. The number of places the decimal point is moved is used as the of ten. If the decimal point is moved to the- ,the exponent becomes larger. If the decimal point is moved to the _____,the exponent becomes smaller.

Prefixes Used with SI Units

SI units are changed by powers of _____ by the use of prefixes. The prefix for one tenth is _____. The prefix for one thousandth is _____.The prefix that changes a unit by one thousand is All metric units use _____ prefixes.

Arithmetic Operations in Scientific Notation

When numbers are in scientific notation, they may be added or subtracted if the numbers have the same _____. After the numbers are added, the exponent is _____. If the powers of ten are not the same, the _____ must be moved, and the _____ must be changed before the numbers can be added. For multiplying numbers in scientific notation, the _____ do not have to be the same. After the numbers are multiplied, the exponents are _____ and the units are _____.

2.2 NOT ALL IS CERTAIN

Uncertainties of Measurements

A common source of error in making measurements comes from the _____ at which the instrument is read. Parallax is the apparent change in _____ of an object when it is seen from different _____. Reading instruments at _____ level and _____ reduces error due to parallax.

Accuracy and Precision

Precision is the degree of _____ to which the measurement of a quantity can be _____. The precision of a measuring device is determined by the _____ division on its scale. Accuracy is the extent to which a measured value agrees with the _____ value of a quantity. Accuracy can be affected by changes in the _____ used to make the measurement Uncertainties in measurement affect _____ but not _____.

Significant Digits

In making measurements, there is a limit to the number of _____ that are valid. This limitation is caused by the _____ of the instrument used. The digits that are valid are called _____ digits. The last signifcant digit in a measurement is a(n) _____, so it is_____. All _____ digits are considered to be significant. All final zeros-the decimal point are significant. Zeroes between two other significant digits _____ significant. Zeros used for spacing between significant digits and the decimal point _____ significant.

Operations Using Significant Digits

The result of a mathematical operation with measurements cannot be more precise than the _____ precise measurement. When numbers are added or subtracted, the operation is performed first, and the answer is rounded off to correspond to the _____ value involved. When numbers are multi-plied or divided, the operation is performed first, and then the answer is rounded off to _____ number of significant digits as the factor wish the-number of significant digits. Significant digits are used when calculating with _____, but not when _____.

2.3 DISPLAYING DATA

Graphing Data

When data are analyzed, the variable that is_____ is the independent variable. The dependent variables are the _____ of the independent variable. The _____ variable is plotted on the horizontal axis and the _____ variable is plotted on the vertical axis. After the dependent and independent variables have been identified, the _____ of each variable must be determined. It must be determined if the _____ is a valid data point. Each axis should be _____ and _____. Then the _____ are plotted and the is drown. Finally, the graph should be given a(n) _____.

Linear, Quadratic, and Inverse Relationships

The graph of a linear relationship is a(n) _____. The equation for such a relationship is_____. In this equation, m represents the _____ and b represents the _____. When one variable varies directly with the square of the other, the curve is in the shape of a(n)
The equation for such a curve is called a(n) _____ equation, and is written as _____. In this equation, k represents a(n) _____. In an inverse relationship, the curve is a(n)

2.4 MANIPULATING EQUATIONS

Solving Equations Using Algebra

In manipulating equations, the relationship must not be _____. If one side of the equation is divided by a variable, the other side of the equation should be _____ by that variable. Any operation performed on one side of the equation must be _____ the operation performed on the other side of the equation. It the equation for density**,** D = m/V, is solved for m, the correct equation is _____.

Units in Equations

Before mathematical operations are carried out, all terms in the equation must have _____ units. When an answer is written, it must include both the numerical _____and the _____. If a term has several units, they are treated like any other mathematical _____.