

BI-WEEKLY COMMENTS ON SI

Comment 1

QUANTITIES, UNITS AND SYMBOLS

1.1 SI quantities

The term “physical quantity”, or simply “quantity”, means any physical property or object that can be measured. Length, time, force and pressure are examples of some of the 400 quantities that describe our physical world.

The magnitude of a quantity is always composed of two parts: a numerical value and a unit. For example, “five kilograms” is a quantity whose numerical value is five and whose unit is kilogram. Similarly, a speed of “sixty meters per second” is a quantity whose numerical value is sixty and whose unit is meter per second.

1.2 Quantities and symbols

The magnitude of a quantity is usually presented in symbolic form because the symbols are shorter, and easier to read. Symbolic forms are also much easier to manipulate when they appear in equations and mathematical expressions.

The SI unit symbol for kilogram is “kg”. Consequently, we can express “five kilograms” in the symbolic form “5 kg”.

Similarly, the SI unit symbol for meter is “m” and the SI symbol for second is “s” (not “sec”). Consequently, we can express “sixty meters per second” in the neat symbolic form “60 m/s”.

Clearly, quantities expressed in symbolic form are simple and easy to read.

The Wildi SI Charts display the many SI unit symbols that are used in expressing various quantities. For example, if you look it up in the SI Chart on ⊗LENGTH, the unit symbol for “kilometer” is “km”. Also, in the category ⊗VOLUME AND LIQUID CAPACITY the unit symbol for “milliliter” is “mL”.

1.3 Important rules

Please remember the following important rules:

Rule 1: When expressing the magnitude of a quantity in symbolic form, always leave a single space between the numerical value and the unit. Thus, in writing 5 kg, note the single space between the numerical value “5” and the unit “kg”. We can consider the space to represent a multiplication sign.

Rule 2: Symbols of units are NEVER pluralized. Thus, the correct symbol for 550 kilograms is 550 kg, NOT 550 kgs.

1.4 What is a unit?

A unit is simply a quantity that has a specific, defined magnitude. For example, the kilogram, unit of mass, is housed under a special glass dome at the International Bureau of Weights and Measures (Bureau International des Poids et Mesures) at the outskirts of Paris, in France. Similar kilogram masses are kept in National Research Laboratories throughout the world.

Other SI units, such as the meter (unit of length), are defined in precise scientific terms. For example, 1 meter is defined as the length of the path travelled by light in vacuum during the time interval of $1/299\,792\,458$ of a second.

1.5 Just for fun - try this SI quiz

Referring to the Wildi SI Charts, express the following quantities in symbolic form:

	A	B	C	D	E
1	12 joules	42 newtons	16 pascals	24 watts	36 coulombs
2	12 teslas	350 moles	14 radians	37 ohms	15 siemens
3	0.34 farads	321 henries	15 grays	15 seconds	13 kilometers
4	0.056 webers	275 kelvins	120 volts	25.4 millimeters	0.65 becquerels

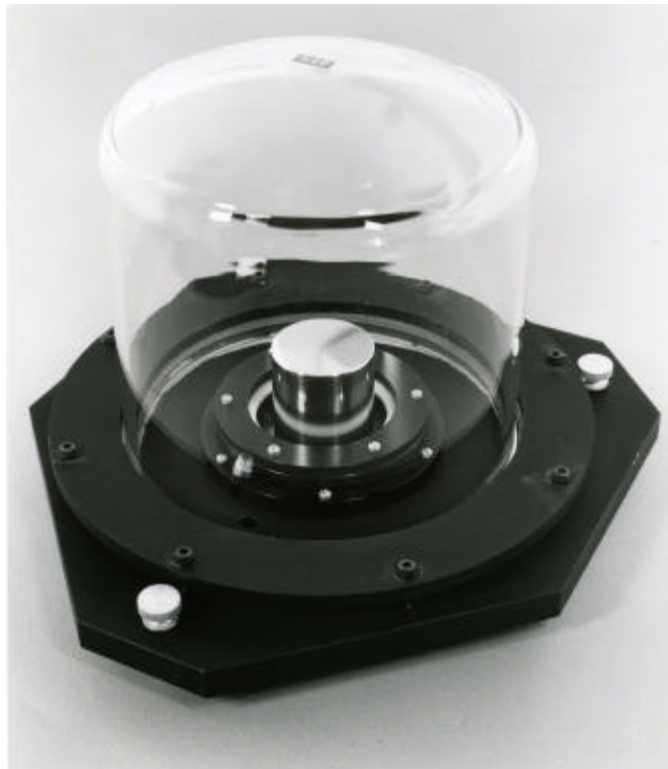
The A1 to E4 solutions are given by clicking on the SOLUTIONS box below. For example, the solution to B3 is 321 H. But don't look until you've tried to discover the

appropriate quantity symbols by yourself.

⊗ SOLUTIONS

THAT'S ALL FOR NOW, FOLKS !

SEE YOU IN TWO WEEKS !



Primary platinum-iridium kilogram standard, traceable to the kilogram standard of the BIPM.
(*Courtesy NIST, National Institute of Standards and Technology*)

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