= Long and short scales =

The long and short scales are two of several large @-@ number naming systems for integer powers of ten , that use the same words with different meanings :

Long scale

Every new term greater than million is one million times larger than the previous term . Thus , billion means a million millions (1012) , trillion means a million billions (1018) , and so on .

Short scale

Every new term greater than million is one thousand times larger than the previous term . Thus , billion means a thousand millions (109) , trillion means a thousand billions (1012) , and so on .

For whole numbers less than a thousand million (< 109) the two scales are identical . From a thousand million up (? 109) the two scales diverge , using the same words for different numbers ; this can cause misunderstanding .

Countries where the long scale is currently used include most countries in continental Europe and most French @-@ speaking , Spanish @-@ speaking , and Portuguese @-@ speaking countries except Brazil . The short scale is now used in most English @-@ speaking and Arabic @-@ speaking countries , in Brazil , and several other countries . Number names are rendered in the language of the country , but are similar everywhere due to shared etymology (e.g. , billion is billón in Spanish) . Some languages , particularly in East Asia and South Asia , have large number naming systems that are different from both the long and short scales , for example the Indian numbering system .

For most of the 19th and 20th centuries , the United Kingdom largely used the long scale , whereas the United States used the short scale , so that the two systems were often referred to as British and American in the English language . After several decades of increasing informal British usage of the short scale , in 1974 the government of the UK adopted it , and it is used for all purposes including official . With very few exceptions , the British usage and American usage are now identical .

The first recorded use of the terms short scale (French : échelle courte) and long scale (French : échelle longue) was by the French mathematician Geneviève Guitel in 1975 .

= = Comparison = =

At and above a thousand million (? 109) the same names are used to refer to numbers differing by a factor of an integer power of 1 @,@ 000 .

Each scale has a logical justification to explain the use of each such differing numerical name and value within that scale . The short @-@ scale logic is based on powers of one thousand , whereas the long @-@ scale logic is based on powers of one million . In both scales , the prefix bi- refers to 2 and tri- refers to 3 , etc . However only in the long scale do the prefixes beyond one million indicate the actual power or exponent (of 1 @,@ 000 @,@ 000) . In the short scale , the prefixes refer to one less than the exponent (of 1 @,@ 000) .

The relationship between the numeric values and the corresponding names in the two scales can be described as :

The relationship between the names and the corresponding numeric values in the two scales can be described as :

The root mil in million does not refer to the numeral , 1 . The word , million , derives from the Old French , milion , from the earlier Old Italian , milione , an intensification of the Latin word , mille , a thousand . That is , a million is a big thousand , much as a great gross is a dozen gross or 12 × 144 = 1728 .

The word , milliard , or its translation , is found in many European languages and is used in those languages for 109 . However , it is unknown in American English , which uses billion , and not used in British English , which preferred to use thousand million before the current usage of billion . The financial term , yard , which derives from milliard , is used on financial markets , as , unlike the term , billion , it is internationally unambiguous and phonetically distinct from million . Likewise , many long scale countries use the word billiard (or similar) for one thousand long scale billions (i.e. , 1015) ,

and the word trilliard (or similar) for one thousand long scale trillions (i.e. , 1021) , etc .

= = History = =

The existence of the different scales means that care must be taken when comparing large numbers between languages or countries , or when interpreting old documents in countries where the dominant scale has changed over time . For example , British English , French , and Italian historical documents can refer to either the short or long scale , depending on the date of the document , since each of the three countries has used both systems at various times in its history . Today , the United Kingdom officially uses the short scale , but France and Italy use the long scale .
The pre @-@ 1974 former British English word billion , post @-@ 1961 current French word billion , post @-@ 1994 current Italian word bilione , German Billion ; Dutch biljoen ; Swedish biljon ; Finnish biljoona ; Danish billion ; Polish bilion , Spanish billón ; Slovenian bilijon and the European Portuguese word bilião (with a different spelling to the Brazilian Portuguese variant , but in Brazil referring to short scale) all refer to 1012 , being long @-@ scale terms . Therefore , each of these words translates to the American English or post @-@ 1974 British English word : trillion (1012 in the short scale) , and not billion (109 in the short scale) .
On the other hand , the pre @-@ 1961 former French word billion , pre @-@ 1994 former Italian word bilione , Brazilian Portuguese word bilhão and the Welsh word biliwn all refer to 109 , being short scale terms . Each of these words translates to the American English or post @-@ 1974 British English word billion (109 in the short scale) .
The terms billion and milliard both originally meant 1012 when introduced .
In long scale countries , milliard was redefined down to its current value of 109 , leaving billion at its original 1012 value and so on for the larger numbers . Some of these countries , but not all , introduced new words billiard , trilliard , etc. as intermediate terms .
In some short scale countries , milliard was redefined down to 109 and billion dropped altogether , with trillion redefined down to 1012 and so on for the larger numbers .
In many short scale countries , milliard was dropped altogether and billion was redefined down to 109 , adjusting downwards the value of trillion and all the larger numbers .
Timeline

= = Current usage = =

= = = Short scale users = = =

= = = = English @-@ speaking = = = =

106 , one million ; 109 , one billion ; 1012 , one trillion ; etc .
Most English @-@ language countries and regions use the short scale with 109 being billion . For example :

= = = = Arabic @-@ speaking = = = =

106 , ????????? malyoon : 109 , ???????? milyar ; 1012 , ??????????? trilyoon ; etc .
Most Arabic @-@ language countries and regions use the short scale with 109 being ????? milyar . For example :

= = = = Other short scale = = = =

106 , one million ; 109 , one milliard or one billion ; 1012 , one trillion ; etc .
Other countries also use a word similar to trillion to mean 1012 , etc . Whilst a few of these

countries like English use a word similar to billion to mean 109 , most like Arabic have kept a traditional long scale word similar to milliard for 109 . Some examples of short scale use , and the words used for 109 and 1012 , are

= = = Long scale users = = =

The traditional long scale is used by most Continental European countries and by most other countries whose languages derive from Continental Europe (with the notable exceptions of Albania , Greece , Romania , and Brazil) . These countries use a word similar to billion to mean 1012 . Some use a word similar to milliard to mean 109 , while others use a word or phrase equivalent to thousand millions .

= = = = Spanish @-@ speaking = = = =

106 , millón ; 109 , mil millones or millardo ; 1012 , billón ; etc .
Most Spanish @-@ language countries and regions use the long scale with 109 = mil millones , for example :

= = = = French @-@ speaking = = = =

106 , million ; 109 , milliard ; 1012 , billion ; etc .
Most French @-@ language countries and regions use the long scale , for example :

= = = = Portuguese @-@ speaking = = = =

106 , milhão ; 109 , mil milhões or milhar de milhões ; 1012 , bilião ;
With the notable exception of Brazil , a short scale country , most Portuguese @-@ language countries and regions use the long scale , for example :

= = = = Dutch @-@ speaking = = = =

106 , miljoen ; 109 , miljard ; 1012 , biljoen ;
Most Dutch @-@ language countries and regions use the long scale , for example :

= = = = Other long scale = = = =

106 , one million ; 109 , one milliard or one thousand million ; 1012 , one billion ; 1015 , one billiard or one thousand billion ; 1018 , one trillion ; etc .
Some examples of long scale use , and the words used for 109 and 1012 , are

= = = Using both = = =

Some countries use either the short or long scales , depending on the internal language being used or the context .