

Read the following article and answer the questions:

The Metric System (<http://www.unc.edu/~rowlett/units/metric.html>)

Designed during the French Revolution of the 1790's, the metric system brought order out of the conflicting and confusing traditional systems of weights and measures then being used in Europe. Prior to the introduction of the metric system, it was common for units of length, land area, and weight to vary, not just from one country to another but from one region to another within the same country. As the modern nations were gradually assembled from smaller kingdoms and principalities, confusion simply multiplied. Merchants, scientists, and educated people throughout Europe realized that a uniform system was needed, but it was only in the climate of a complete political upheaval that such a radical change could actually be considered.

Why was a new measuring system needed? _____

The metric system replaces all the traditional units, except the units of time and of angle measure, with units satisfying three conditions:

- (1) One fundamental unit is defined for each quantity. These units are now defined precisely in the International System of Units.
- (2) Multiples and fractions of these fundamental units are created by adding prefixes to the names of the defined units. These prefixes denote powers of ten, so that metric units are always divided into tens, hundreds, thousands, etc. The original prefixes included milli- for 1/1000, centi- for 1/100, deci- for 1/10, deka- for 10, hecto- for 100, and kilo- for 1000.
- (3) The fundamental units are defined rationally and are related to each other in a rational fashion.

What are prefixes used for in the metric system? _____

The metric units were defined in an elegant way unlike any traditional units of measure. The Earth itself was selected as the measuring stick. The meter was defined to be one ten-millionth of the distance from the Equator to the North Pole. The liter was to be the volume of one cubic decimeter, and the kilogram was to be the mass of a liter of pure water. It didn't turn out quite like this, because the scientific methods of the time were not quite up to the task of measuring these quantities precisely, but the actual metric units come very close to the design.

How were the original metric units defined? _____

The metric system was first proposed in 1791. It was adopted by the French revolutionary assembly in 1795, and the first metric standards (a standard meter bar and kilogram bar) were adopted in 1799. There was considerable resistance to the system at first, and its use was not made compulsory in France until 1837. The first countries to actually require use of the metric system were Belgium, the Netherlands, and Luxembourg, in 1820.

About how old is the metric system? _____

In what country did the metric system begin? _____

Around 1850 a strong movement began among scientists, engineers, and businessmen in favor of an international system of weights and measures. The scientific and technical revolution was well underway and a global economy was developing. The need for uniformity in measurement was becoming obvious. Furthermore, the metric system was the only real choice available. The only possible competitor, the British Imperial system, was so closely tied to the British Empire it was not even acceptable to the Americans, let alone to non-English speakers.

What are two reasons a world-wide measuring system was needed? _____

Why wasn't the British Imperial system chosen as the world-wide measuring system? _____

Between 1850 and 1900 the metric system made rapid progress. It was adopted throughout continental Europe, in Latin America, and in many countries elsewhere. It became firmly established as a key part of the language of science.

Since 1875 the eventual triumph of the metric system in science and international commerce has been assured, despite continuing popular opposition in Britain and the United States. In fact, the metric system has met popular opposition in every country at the time of its adoption. People don't want to change their customary units, which are part of how they see and control the world. It is naturally disturbing to do so. This opposition has been largely overcome everywhere, except in the U.S., by economic necessity: the need to participate fully in the global economic system. Even in the U.S., economic needs assure the continued creeping adoption of the system in one area and then another.

Those Americans opposing adoption of metric units often argue that the metric system is abstract and intellectual or that its use would embroil us in calculations. This is not true. The metric system has been the customary measurement system in France for almost two centuries, in the rest of continental Europe for at least one century, and in the rest of the world for at least a generation or two. Most people in the world know exactly how long a kilometer is, how large a liter is, how much a kilogram weighs, and how warm 25 °C is, because they use these units every day of their lives in the same way Americans use miles, gallons, and pounds.

Outside Britain and the United States there is almost no need to convert metric units into something else. In fact, the way to avoid conversion formulas is to adopt the metric system. As long as Britons and Americans continue to use traditional units, they will have to remember how these units relate to the metric units.

What are two reasons some Americans don't want to change to the metric system? _____
