What Makes Water Hard?

Rain water, is a result of evaporation of seawater / lakes etc. As with most evaporative processes, impurities originally contained in the source water are left behind. In the atmosphere clouds and rain are exposed to airborne pollutants. Rain is also subjected to carbon dioxide, present in the atmosphere. Rain water has a tendency to absorb carbon dioxide. This affects the pH of the water and tends to make rain water acidic. Rain water falls to earth, it moves through the ground and flows over rock on its journey to the sea (rivers and streams). As rain water comes into contact with rock the acidic nature of the rain water dissolves minerals such as calcium and magnesium and carries these impurities in suspension. Rivers are a major source of Water to be used by industry and municipalities (to provide drinking water to homes). Water is a good solvent and gathers impurities easily. Dissolved calcium and magnesium in water are the most common causes of hard water. The level of hardness increases as the magnesium and calcium increases.

Most countries carry out water analysis and identify water as “hard” or “soft”. This is used as an indicator when considering what can happen when water comes into contact with, in the case of households, appliances, and boilers etc. In industry this information also applies to water bearing pipes and appliances but may also have an impact on the production process itself (food processing, pharmaceuticals, cosmetics etc).

The degree of hardness is defined as the number of parts by weight of calcium carbonate hardness per particular number of parts of water, depending upon the unit employed (source: wiki answers)

Water hardness is measured in degrees, ppm (parts per million) or mg /L (milligrams per liter). Milligrams per liter and ppm values are the same (100 mg / L = 100 ppm).

In Germany water hardness is referred to by values ranging from “Soft” to “Very hard”. One German degree (dH) of carbonate hardness is equivalent to about 17.848 milligrams of calcium carbonate ($CaCO_3$) per liter of water (17.848 ppm).
(Source: wikipedia)

British Standard 7593:

Designation	***Hardness Concentration mg/Liter (as CaCo3)***
Soft	*0-50*
Moderately Soft	*50-100*
Slightly Hard	*100-150*
Moderately Hard	*150-200*
Hard	*200-300*
Very Hard	*Over 300*

German values:

Designation	***Hardness Concentration (1 degree = 17.848 mg / L (as CaCo3))***
Very Soft	*0.0° - 3.0°*
Moderately Soft	*3.1° - 7.0°*
Slightly Hard	*7.1° - 14.0°*
Moderately Hard	*14.1° – 21.0°*
Very Hard	*21.1°>*