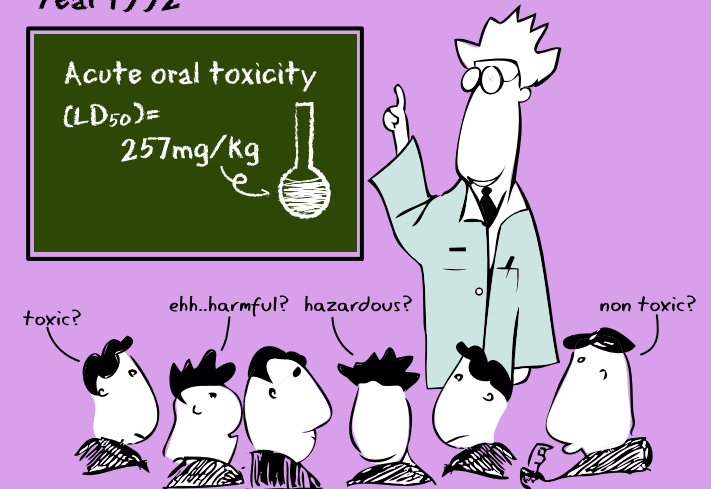
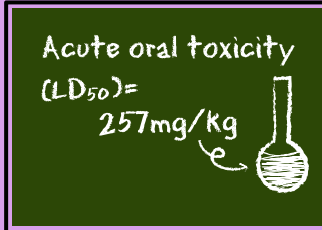


# An Introduction to Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

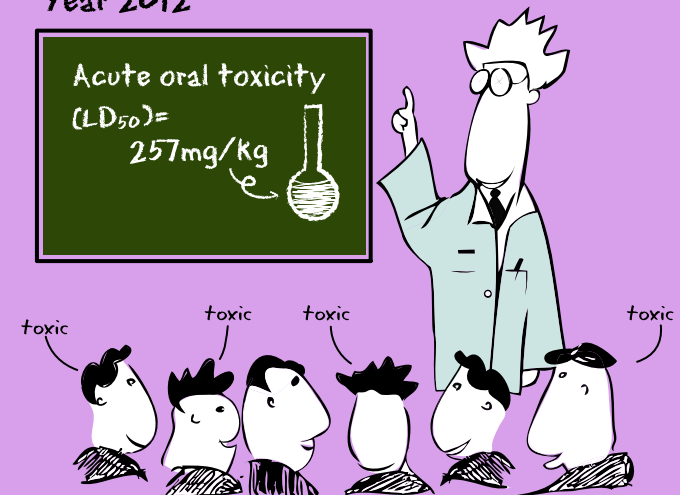
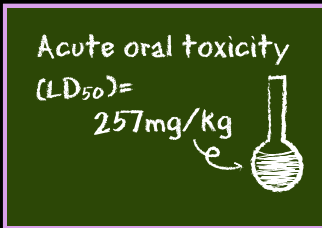
Year 1992

Acute oral toxicity  
(LD<sub>50</sub>) =  
257mg/Kg



Year 2012

Acute oral toxicity  
(LD<sub>50</sub>) =  
257mg/Kg



An Introduction to  
**Globally Harmonized System**  
of Classification and Labelling of Chemicals  
**(GHS)**

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**unitar**

United Nations Institute for Training and Research

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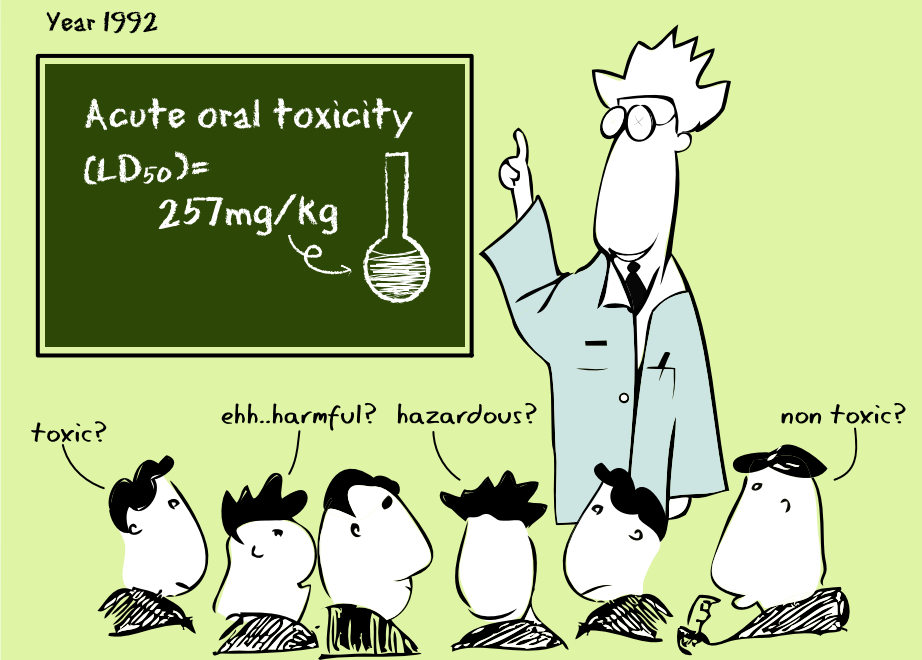


MyCRO via their administrative supports

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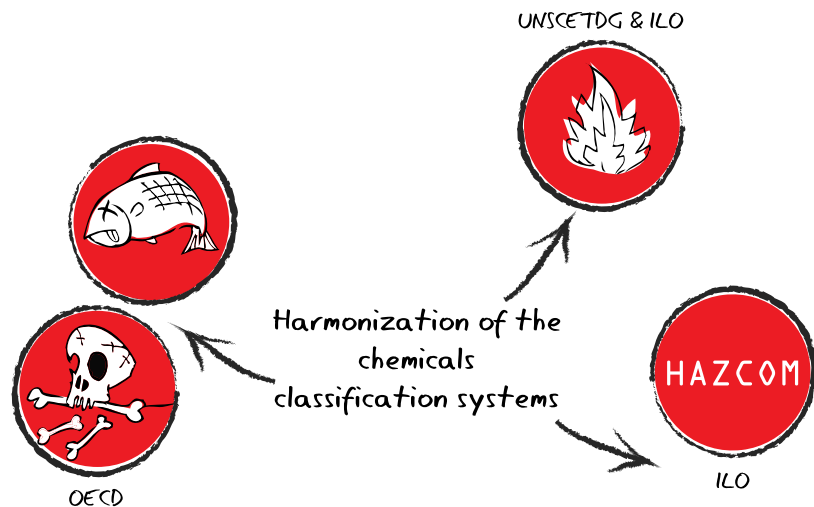
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# GHS Background



Before the hazards of a particular chemical can be communicated to the public, different degrees of hazards should be classified based on specific cut-off values (such as acute oral toxicity, LD50) and many countries already have their own systems and requirements for classifying chemicals. However, although these requirements may be similar from one country to another, they are usually not the same due to different cut-off values.

(Note: LD50 means the amount of a chemical, given all at once, which causes 50 % death in the test population (e.g. mice, rats))

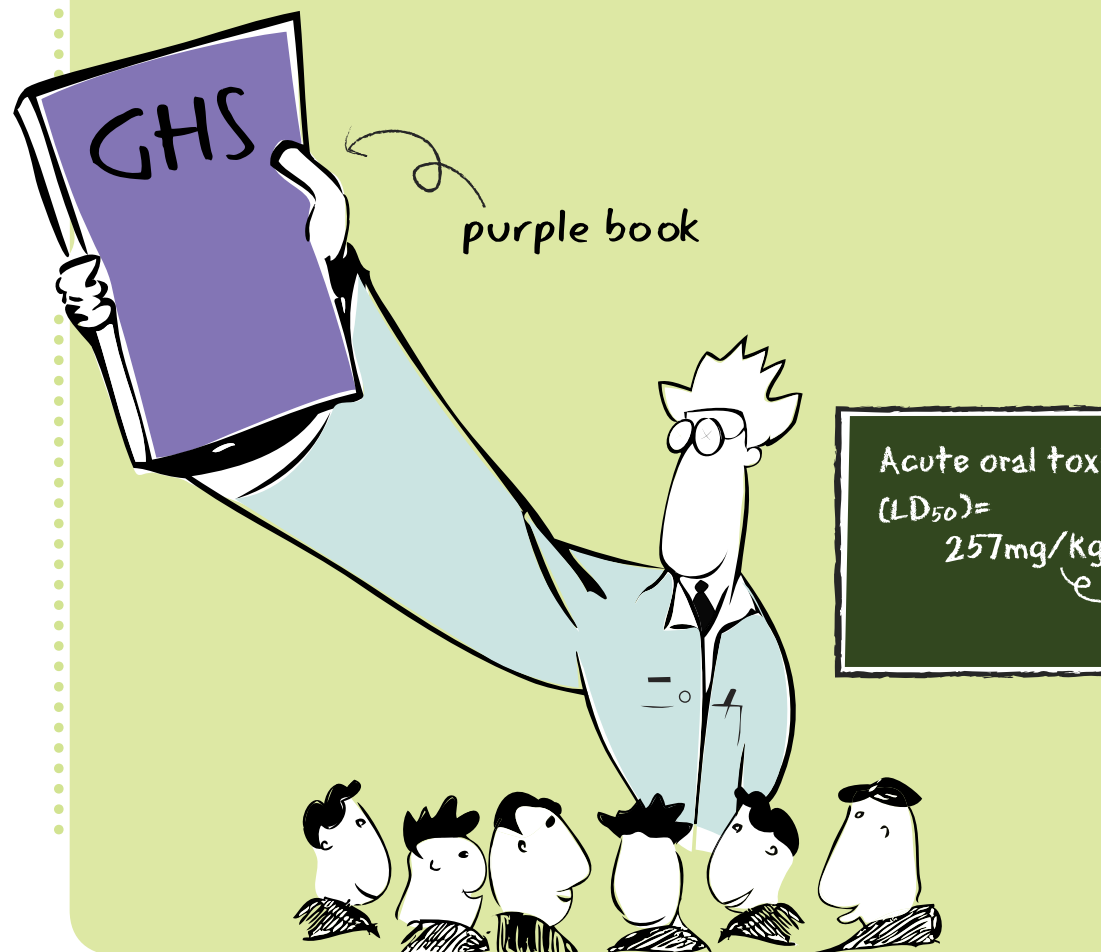


In 1992, the Coordinating Group for the Harmonisation of the Chemical Classification Systems (CG/HCCS) was established under the umbrella of the International Programme on Chemical Safety (IPCS). Various working groups had been selected to carry out specific tasks to develop harmonized chemical classification systems:

**Organisation for Economic Cooperation and Development (OECD):**  
Classification of health and environment hazards;

**UNSCETDG (United Nations Economic and Social Council's Subcommittee of Experts on the Transport of Dangerous Goods) UNSCEGHS and International Labour Organization (ILO):**  
Classification of physical hazards;

**ILO:**  
Hazard communication (Hazcom)



With the culmination of more than a decade of work by multidisciplinary experts, the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) was developed and adopted in 2002 by the United Nations Economic and Social Council's Subcommittee of Experts on the GHS (UNSCEGHS) and endorsed by United Nations Economic and Social Council (ECOSOC) in July 2003. The GHS document is also known as the 'purple book'.



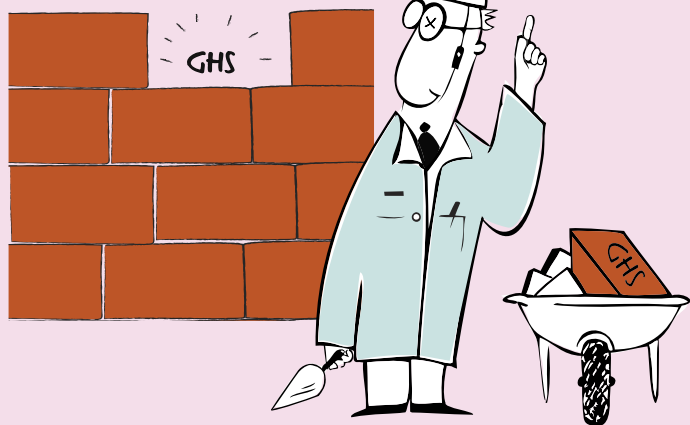
# GHS Objectives

Enhance the protection of human health and the environment by providing an internationally comprehensive system for hazard communication.



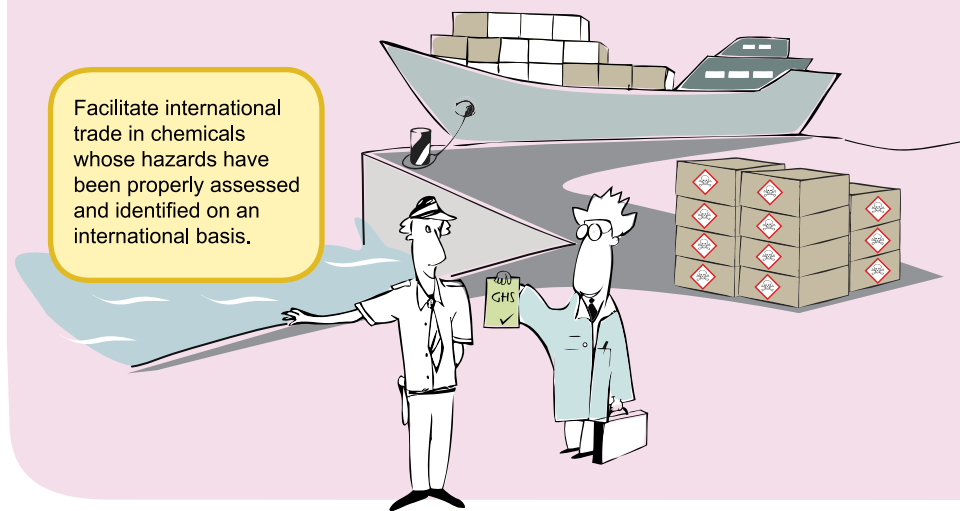
Provide a recognised framework for those countries without an existing system.

Safe use of chemicals



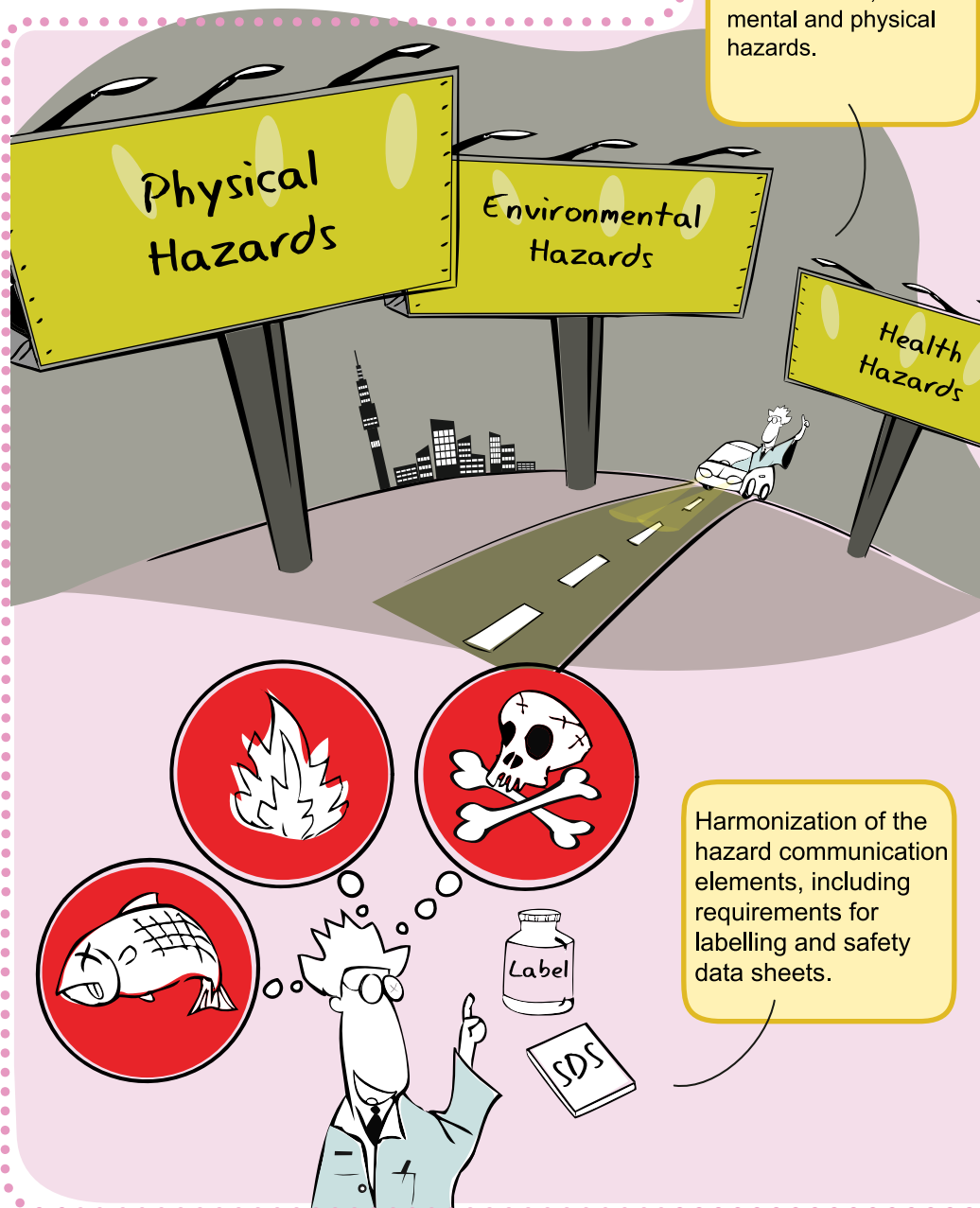
Reduced the need for testing and evaluation of chemicals.

Facilitate international trade in chemicals whose hazards have been properly assessed and identified on an international basis.



# Scope of GHS

Harmonized criteria for classifying substances and mixtures according to their health, environmental and physical hazards.



# GHS Classification

Three types of hazards were identified, i.e. physical hazards, health hazards and environmental hazards. In each type, various hazard classes have been assigned:

## GHS Classification (4th Revised Edition in 2011)

### Physical Hazards:

- 1) Explosives
- 2) Flammable gases (including chemically unstable gases)
- 3) Aerosols
- 4) Oxidising gases
- 5) Gases under pressure
- 6) Flammable liquids
- 7) Flammable solids
- 8) Self-reactive substances and mixtures
- 9) Pyrophoric liquids
- 10) Pyrophoric solids
- 11) Self-heating substances and mixtures
- 12) Substances and mixtures which, in contact with water, emit flammable gases
- 13) Oxidising liquids
- 14) Oxidising solids
- 15) Organic peroxides
- 16) Corrosive to metals

### Health Hazards:

- 1) Acute toxicity
- 2) Skin corrosion/irritation
- 3) Serious eye damage/eye irritation
- 4) Respiratory or skin sensitization
- 5) Germ cell mutagenicity
- 6) Carcinogenicity
- 7) Reproductive toxicity
- 8) Specific target organ toxicity -single exposure
- 9) Specific target organ toxicity -repeated exposure
- 10) Aspiration hazard

### Environmental Hazards:

- 1) Hazardous to the aquatic environment (acute and chronic)
- 2) Hazardous to the ozone layer

# GHS Pictograms



**Flammable**

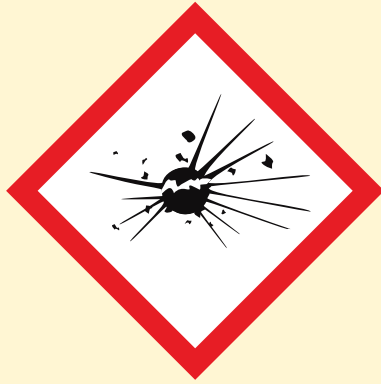
Pictogram means a graphical composition that may include a symbol plus other graphic elements, that is intended to convey specific information. There are nine (9) GHS pictograms.



**Environmental Hazard**



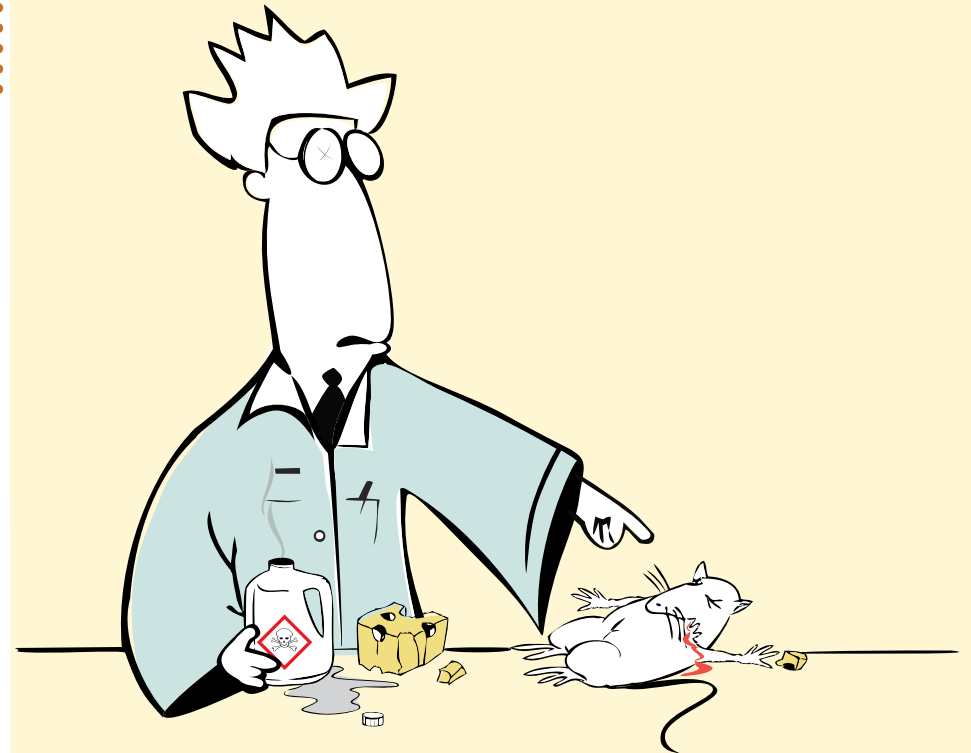




**Explosive**

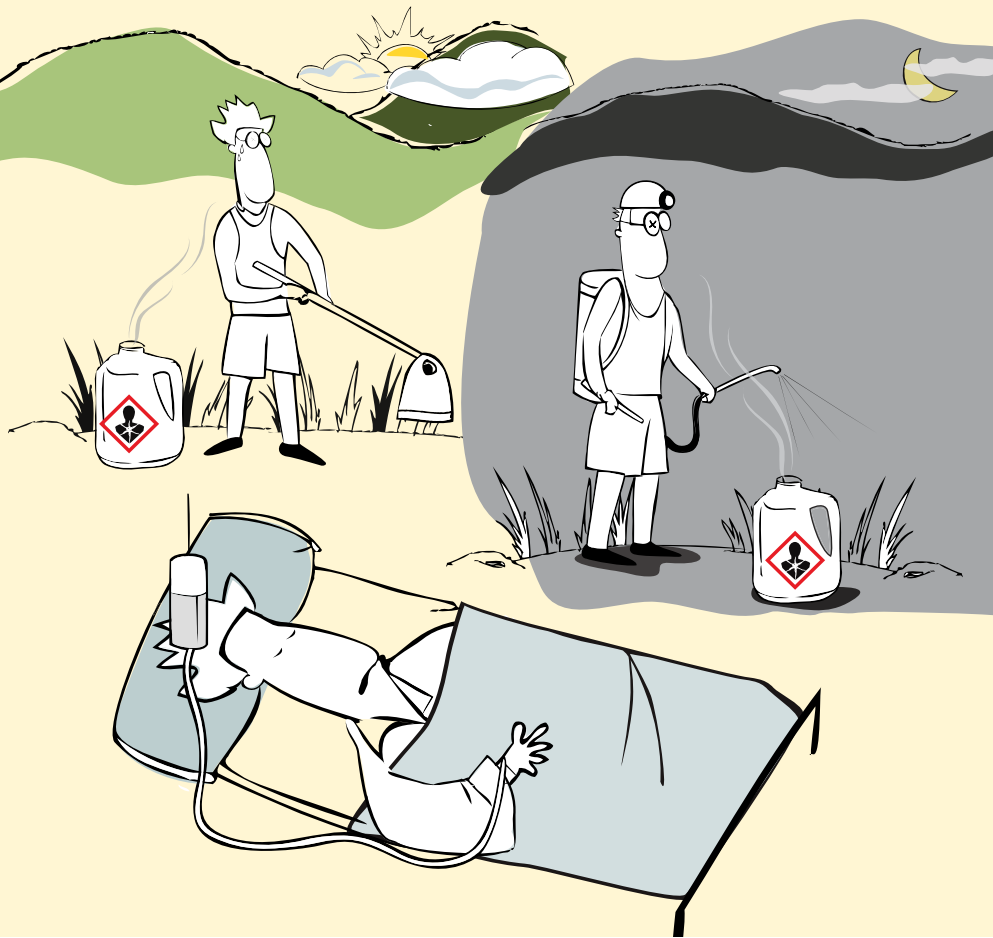


**Toxic**

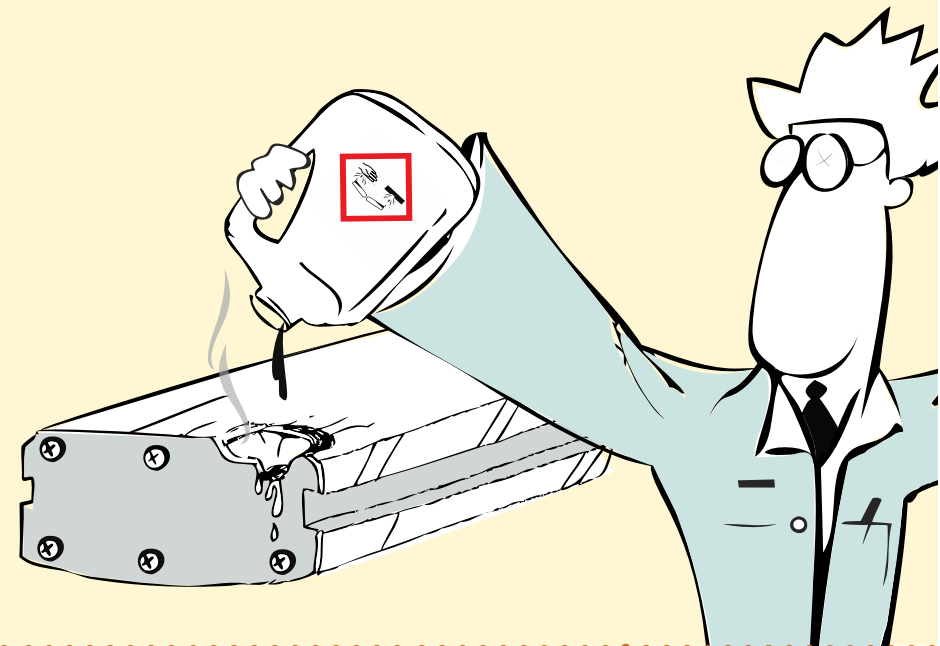




**Health Hazards**



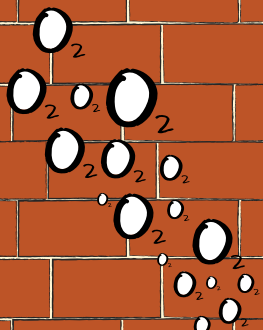
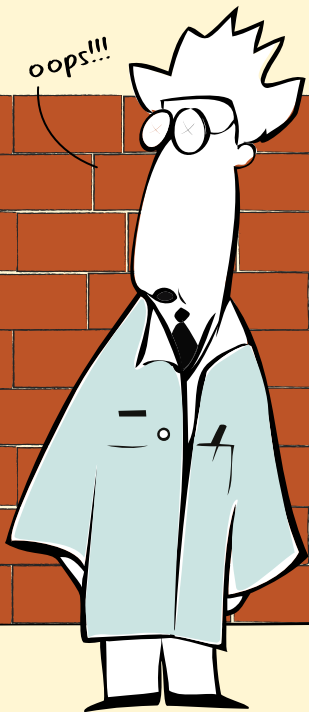
**Corrosive**





Oxidising

oops!!!

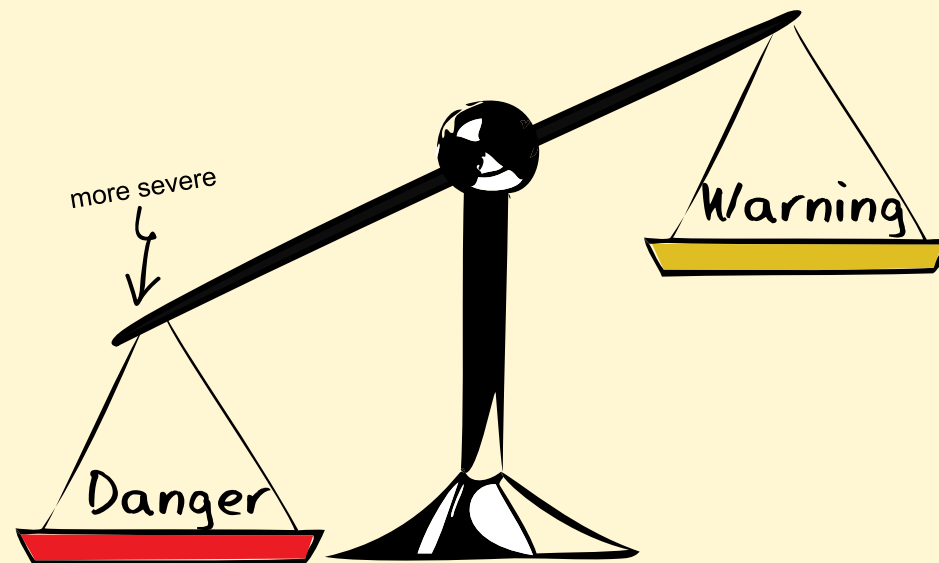


Gas Under Pressure





Harmful



The signal words used in the GHS are “Danger” and “Warning”, where “Danger” is used for more severe hazards, while “Warning” is used for less severe. Hazard statements describe the nature of the hazards of a hazardous product, for example: extremely flammable gas. Whereas precautionary statements means a phrase that describes recommended measures that should be taken to minimise or prevent adverse effects resulting from exposure to a hazardous product, or improper storage and handling of a hazardous product, for example: do not allow contact with water.

# Safety Data Sheet

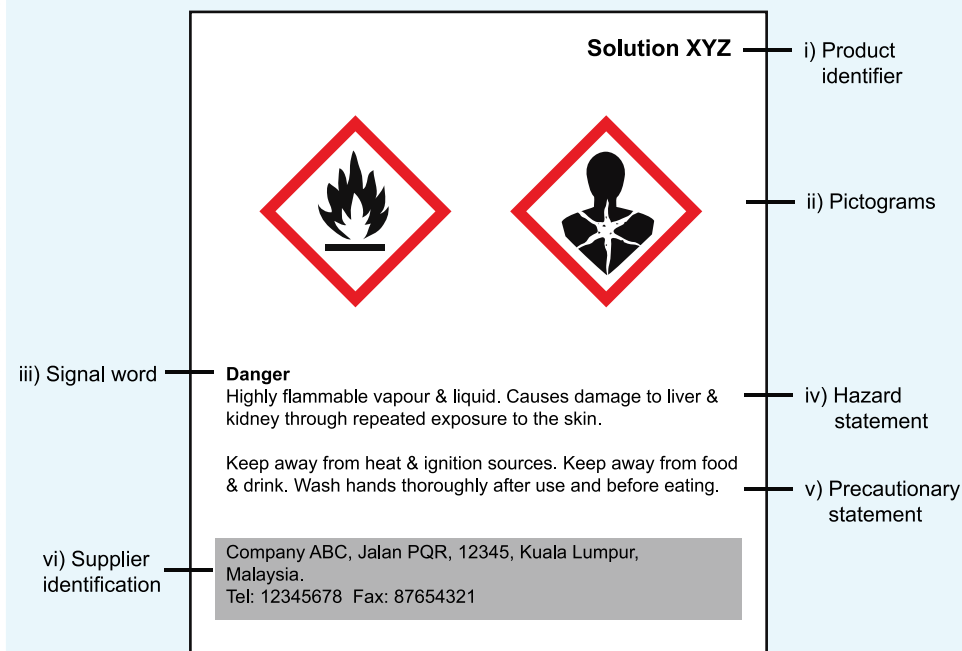
There are 16 items required for a Safety Data Sheet (SDS) :

## No Items

1. Product and company identification
2. Hazards identification
3. Composition information on ingredient
4. First aid measures
5. Fire fighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure controls, personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

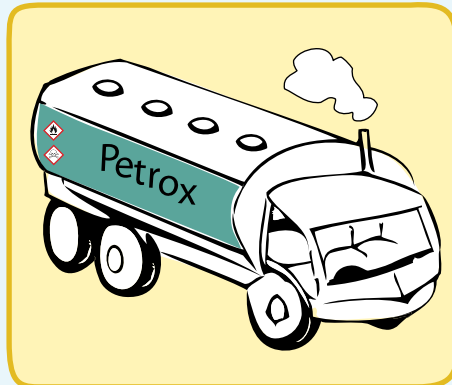
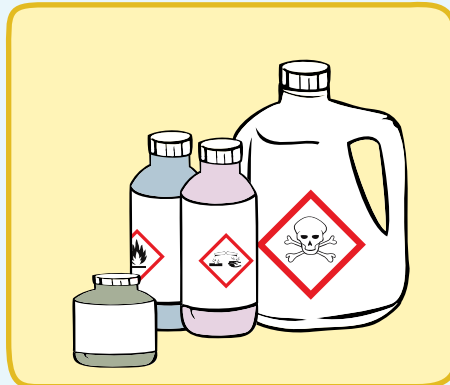
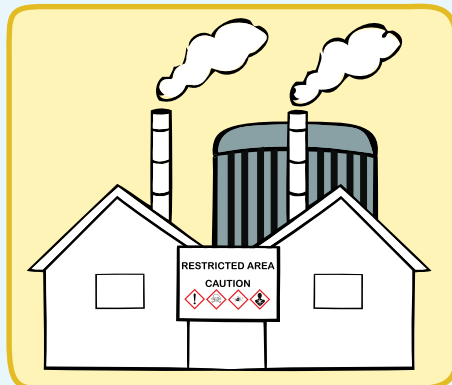
# GHS Label

The GHS requires various pieces of information to be depicted on the chemical label, i.e. (i) product identifier; (ii) pictograms; (iii) signal word; (iv) hazard statements; (v) precautionary statements; and (vi) supplier identification. Signal word, hazard statements and precautionary statements should be located together on label.



# GHS Implementation

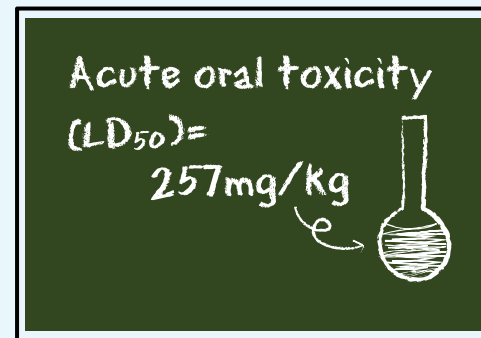
In general, four key sectors have been identified for GHS implementation at the national level: (i) industrial workplace, (ii) agriculture, (iii) transport and (iv) consumer chemicals.



# Conclusion

We hope that one day GHS will be implemented by all countries hence hazardous properties of chemicals will be classified and labeled in comprehensive, standard, and consistent manners.

Year 2012



# References

United Nations. 2011. Globally Harmonized System of Classification and Labelling of Chemicals (GHS). Fourth Revised Edition.

UNITAR, ILO & IOMC. 2010. Understanding the Globally Harmonized System of Classification and Labelling of Chemicals (GHS): A companion guide to the GHS purple book.