

Core Concept: Safety

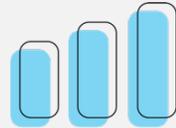
Engineering Literacy Dimension: Engineering Practices

Practice: Material Processing

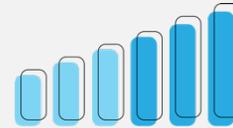
Overview: *Safety* is the process of reducing the chance of injury or harm through thoughtful action and, in engineering settings, includes knowledge related to (a) *laboratory guidelines and standards*, (b) *machine and tool safety*, and (c) *personal protective equipment and attire*. This core concept is important to the practice of Material Processing as life is full of many hazards, which can be particularly true in engineering-related environments or facilities where machines and materials are being used by people. Furthermore, engineering professionals apply an understanding of safety principles and guidelines to inform their decisions when developing a design and performing the related operations toward improving their work environment.

Performance Goal for High School Learners

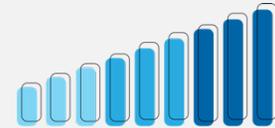
I can safely, responsibly, and efficiently process materials within a working environment without the cause of harm or injury to myself or others.



Basic



Proficient



Advanced

LABORATORY GUIDELINES & STANDARDS

I can identify common principles and guidelines for safely operating and managing a laboratory.

I can evaluate a certain situation of operating and managing a laboratory in terms of safety.

I can develop or improve plans and rules for safely operating and managing a laboratory.

MACHINE & TOOL SAFETY

I can identify common principles and guidelines for safely using and managing a variety of machines used in manufacturing products.

I can evaluate a certain situation of using and managing a variety of machines in terms of safety.

I can develop or improve plans and rules for safely using and managing a variety of machines.

PERSONAL PROTECTIVE EQUIPMENT & ATTIRE

I can identify common principles and guidelines for safely using and managing the attire and equipment used in manufacturing products.

I can evaluate a certain situation of using and managing attire and equipment in terms of safety.

I can develop or improve plans and rules for safely using and managing attire and equipment used in manufacturing products.

COLUMN & BEAM ANALYSIS

I can describe the functions of columns and beams in architecture structures.

I can describe the basic factors influencing deflections or deformations of columns and beams (e.g. compressive, tensile, and shear stresses).

I can analyze the required forces of columns and beams for my design through column and beam analysis.