

# Manufacturing (Grades 9-12)

## Manufacturing

### A Manufacturing MAN

- 1 Employ engineering design process to achieve desired outcomes MAN.01
  - a Describe the process of interpreting and preparing technical drawings and rough drawings and sketches MAN.01.01
  - b Demonstrate the process for interpreting technical drawings to extrapolate information from a set of plans using appropriate mathematical functions MAN.01.02
  - c Apply accepted design principals of text and graphics to the layout of printed and electronically published materials MAN.01.03
- 2 Identify and use appropriate engineering materials MAN.02
  - a Identify and describe the four major types of engineering materials; metallic, Polymeric, ceramic and fibrous. MAN.02.01
  - b Identify and describe seven major types of material properties MAN.02.02
  - c Select materials based on properties required by the project MAN.02.03
  - d Describe the relationship between materials and manufacturing MAN.02.04
- 3 Demonstrate the methods involved in turning raw materials into usable products MAN.03
  - a Identify and describe the primary processes for obtaining raw materials MAN.03.01
  - b Demonstrate the safe and accurate secondary process to create a finished product; forming; separating; combining; assembly; finishing MAN.03.02
  - c Apply a variety of manufacturing techniques and processes to create a usable product MAN.03.03
  - d Distinguish between organic and inorganic materials MAN.03.04
  - e Experiment with the alteration of material characteristic MAN.03.05
  - f Differentiate between natural and artificial materials MAN.03.06