

# *Industrial Technology*

## **Standard**

### **IT.1**

**Industrial Technology Standard 1: The student will recognize the fundamental concepts of industrial technology that leads to life long learning.**

---

#### **Benchmark**

**ID=IT.1. 1 Cat1=Industrial Technology Cat2=Industrial Technology:** Understand the impact of high technology in our daily lives.

---

#### **Benchmark**

**ID=IT.1. 2 Cat1=Industrial Technology Cat2=Industrial Technology:** Use and be adaptable to new technology in technical drafting.

---

#### **Benchmark**

**ID=IT.1. 3 Cat1=Industrial Technology Cat2=Industrial Technology:** Express ideas and relay information through graphic communication.

---

#### **Benchmark**

**ID=IT.1. 4 Cat1=Industrial Technology Cat2=Industrial Technology:** Identify and describe the application of the six basic machines.

---

#### **Benchmark**

**ID=IT.1. 5 Cat1=Industrial Technology Cat2=Industrial Technology:** Explain the basic operation of a two cycle engine.

---

#### **Benchmark**

**ID=IT.1. 6 Cat1=Industrial Technology Cat2=Industrial Technology:** Explain the basic operation of a four cycle engine.

---

#### **Benchmark**

**ID=IT.1. 7 Cat1=Industrial Technology Cat2=Industrial Technology:** Identify and describe the operation of the basic systems of an engine.

---

#### **Benchmark**

**ID=IT.1. 8 Cat1=Industrial Technology Cat2=Industrial Technology:** Become a more knowledgeable operator of an automobile.

---

#### **Benchmark**

**ID=IT.1. 9 Cat1=Industrial Technology Cat2=Industrial Technology:** Identify and describe the basic components of a circuit.

---

**Benchmark**

**ID=IT.1.10 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Demonstrate an understanding of the concepts used in a house wiring system.

---

**Benchmark**

**ID=IT.1.11 Cat1=Industrial Technology Cat2=Industrial Technology:** Use and maintain basic drafting equipment and machines.

---

**Benchmark**

**ID=IT.1.12 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Describe basic types of metal and their uses.

---

**Benchmark**

**ID=IT.1.13 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Identify forms of metals that are used in manufacturing and fabrication process.

---

**Benchmark**

**ID=IT.1.14 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Explain basic AC and DC principles.

---

**Benchmark**

**ID=IT.1.15 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Explain the difference between single phase and multiphase circuits.

---

**Benchmark**

**ID=IT.1.16 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Identify types of lumber and lumber products.

---

**Benchmark**

**ID=IT.1.17 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Interpret a materials list.

---

**Benchmark**

**ID=IT.1.18 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Identify parts or materials using a supplier's or manufacturer's catalog or manual.

---

**Benchmark**

**ID=IT.1.19 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Explain the importance of preventive maintenance and recording repair activities.

# Standard

## IT.2

**Industrial Technology Standard 2: The student will be competent in the application of tools, materials, and processes related to industrial technology.**

---

### **Benchmark**

**ID=IT.2. 1 Cat1=Industrial Technology Cat2=Industrial Technology:** Use and demonstrate basic CAD operations.

---

### **Benchmark**

**ID=IT.2. 2 Cat1=Industrial Technology Cat2=Industrial Technology:** Construct frame model of a simple house design.

---

### **Benchmark**

**ID=IT.2. 3 Cat1=Industrial Technology Cat2=Industrial Technology:** Disassemble, evaluate, repair and assemble a small air cooled engine.

---

### **Benchmark**

**ID=IT.2. 4 Cat1=Industrial Technology Cat2=Industrial Technology:** Identify, test remove and replace small engine fuel system components.

---

### **Benchmark**

**ID=IT.2. 5 Cat1=Industrial Technology Cat2=Industrial Technology:** Identify, test, remove and replace small engine ignition system components.

---

### **Benchmark**

**ID=IT.2. 6 Cat1=Industrial Technology Cat2=Industrial Technology:** Determine proper maintenance procedures using technical manuals.

---

### **Benchmark**

**ID=IT.2. 7 Cat1=Industrial Technology Cat2=Industrial Technology:** Properly maintain and use hand power tools related to small engine mechanics.

---

### **Benchmark**

**ID=IT.2. 8 Cat1=Industrial Technology Cat2=Industrial Technology:** Identify various body, engine and underbody parts of the automobile.

---

### **Benchmark**

**ID=IT.2. 9 Cat1=Industrial Technology Cat2=Industrial Technology:** Check and change fluids and filters per specifications.

---

**Benchmark**

**ID=IT.2.10 Cat1=Industrial Technology Cat2=Industrial Technology:**

Explain the importance of preventive maintenance and the recording of repair activities.

---

**Benchmark**

**ID=IT.2.11 Cat1=Industrial Technology Cat2=Industrial Technology:**

Identify, remove and replace worn or damaged belts and hoses.

---

**Benchmark**

**ID=IT.2.12 Cat1=Industrial Technology Cat2=Industrial Technology:**

Complete a service check on an automobile.

---

**Benchmark**

**ID=IT.2.13 Cat1=Industrial Technology Cat2=Industrial Technology:**

Identify parts and materials using suppliers' and manufacturers' catalogs and/or manuals.

---

**Benchmark**

**ID=IT.2.14 Cat1=Industrial Technology Cat2=Industrial Technology:**

Properly maintain and use basic hand and power tools related to automotive field.

---

**Benchmark**

**ID=IT.2.15 Cat1=Industrial Technology Cat2=Industrial Technology:**

Disassemble, evaluate and reassemble an engine.

---

**Benchmark**

**ID=IT.2.16 Cat1=Industrial Technology Cat2=Industrial Technology:**

Inspect, remove and replace brake system components.

---

**Benchmark**

**ID=IT.2.17 Cat1=Industrial Technology Cat2=Industrial Technology:**

Demonstrate proper use of voltmeters, ammeters, and ohmmeters in electrical circuits.

---

**Benchmark**

**ID=IT.2.18 Cat1=Industrial Technology Cat2=Industrial Technology:** Wire a series of circuits commonly used in a house wiring system.

---

**Benchmark**

**ID=IT.2.19 Cat1=Industrial Technology Cat2=Industrial Technology:**

Perform basic geometric constructions.

---

**Benchmark**

**ID=IT.2.20 Cat1=Industrial Technology Cat2=Industrial Technology:** Draw orthographic views and transfer features.

---

**Benchmark**

**ID=IT.2.21 Cat1=Industrial Technology Cat2=Industrial Technology:**

Construct sectional views.

---

**Benchmark**

**ID=IT.2.22 Cat1=Industrial Technology Cat2=Industrial Technology:** Apply

basic dimensioning techniques.

---

**Benchmark**

**ID=IT.2.23 Cat1=Industrial Technology Cat2=Industrial Technology:**

Demonstrate correct lettering techniques.

---

**Benchmark**

**ID=IT.2.24 Cat1=Industrial Technology Cat2=Industrial Technology:**

Freehand sketch orthographic and pictorial views.

---

**Benchmark**

**ID=IT.2.25 Cat1=Industrial Technology Cat2=Industrial Technology:**

Demonstrate basic CAD operations.

---

**Benchmark**

**ID=IT.2.26 Cat1=Industrial Technology Cat2=Industrial Technology:**

Demonstrate proficiency in creating two-dimensional drawings.

---

**Benchmark**

**ID=IT.2.27 Cat1=Industrial Technology Cat2=Industrial Technology:**

Demonstrate proficiency in creating three-dimensional drawings.

---

**Benchmark**

**ID=IT.2.28 Cat1=Industrial Technology Cat2=Industrial Technology:**

Construct working drawings.

---

**Benchmark**

**ID=IT.2.29 Cat1=Industrial Technology Cat2=Industrial Technology:** Cut material to specified dimensions and shape.

---

**Benchmark**

**ID=IT.2.30 Cat1=Industrial Technology Cat2=Industrial Technology:** Install and remove fasteners properly.

---

**Benchmark**

**ID=IT.2.31 Cat1=Industrial Technology Cat2=Industrial Technology:**

Measure, cut, fit and assemble wood or metal projects.

---

**Benchmark**

**ID=IT.2.32 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Demonstrate the procedure for preparing a surface for finishing and select a proper finish.

---

**Benchmark**

**ID=IT.2.33 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Diagram and wire selected household circuits.

---

**Benchmark**

**ID=IT.2.34 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Identify types and sizes of electrical wire, boxes, conduit, fasteners and tools.

---

**Benchmark**

**ID=IT.2.35 Cat1=Industrial Technology Cat2=Industrial Technology:** Set up and use power saws.

---

**Benchmark**

**ID=IT.2.36 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Properly use hand tools.

---

**Benchmark**

**ID=IT.2.37 Cat1=Industrial Technology Cat2=Industrial Technology:** Apply and/or construct jigs and fixtures for machine operations.

---

**Benchmark**

**ID=IT.2.38 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Process materials with portable power tools.

---

**Benchmark**

**ID=IT.2.39 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Recognize when tools, bits, blades and chisels need sharpened or repaired.

---

**Benchmark**

**ID=IT.2.40 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Demonstrate material fabrication.

---

**Benchmark**

**ID=IT.2.41 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Identify schematic symbols and read or interpret a schematic diagram.

---

**Benchmark**

**ID=IT.2.42 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Disassemble, fit, straighten, and reassemble parts.

---

**Benchmark**

**ID=IT.2.43 Cat1=Industrial Technology Cat2=Industrial Technology:** Identify, remove and replace worn or damaged belts.

---

**Benchmark**

**ID=IT.2.44 Cat1=Industrial Technology Cat2=Industrial Technology:** Service the cooling system.

---

**Benchmark**

**ID=IT.2.45 Cat1=Industrial Technology Cat2=Industrial Technology:** Check and/or change all fluids and filters per specifications.

---

**Benchmark**

**ID=IT.2.46 Cat1=Industrial Technology Cat2=Industrial Technology:** Check and/or service the brake system.

---

**Benchmark**

**ID=IT.2.47 Cat1=Industrial Technology Cat2=Industrial Technology:** Check, remove and replace exhaust system components.

---

**Benchmark**

**ID=IT.2.48 Cat1=Industrial Technology Cat2=Industrial Technology:** Disassemble, evaluate and reassemble an engine.

---

**Benchmark**

**ID=IT.2.49 Cat1=Industrial Technology Cat2=Industrial Technology:** Cut threads with taps and dies and remove broken fasteners.

---

## **Standard**

### **IT.3**

**Industrial Technology Standard 3: The student will solve problems as an individual and in groups through the use of critical thinking skills.**

---

**Benchmark**

**ID=IT.3. 1 Cat1=Industrial Technology Cat2=Industrial Technology:** Interpret and construct correct developments of flat planes to three and two dimensional objects.

---

**Benchmark**

**ID=IT.3. 2 Cat1=Industrial Technology Cat2=Industrial Technology:** Effectively improve employability skills.

---

**Benchmark**

**ID=IT.3. 3 Cat1=Industrial Technology Cat2=Industrial Technology:**

Understand the procedure that a technical drafter would follow in solving a design problem.

---

**Benchmark**

**ID=IT.3. 4 Cat1=Industrial Technology Cat2=Industrial Technology:**

Solve technical problems through teamwork activities.

---

**Benchmark**

**ID=IT.3. 5 Cat1=Industrial Technology Cat2=Industrial Technology:**

Troubleshoot and diagnose a malfunctioning small air cooled gas engine.

---

**Benchmark**

**ID=IT.3. 6 Cat1=Industrial Technology Cat2=Industrial Technology:**

Solve problems in series, parallel and series-parallel circuits using Ohm's Law and the Power Formula.

---

**Benchmark**

**ID=IT.3. 7 Cat1=Industrial Technology Cat2=Industrial Technology:**

Demonstrate the ability to diagnose problems in electrical circuits.

---

**Benchmark**

**ID=IT.3. 8 Cat1=Industrial Technology Cat2=Industrial Technology:**

Troubleshoot an engine that will not start.

---

**Benchmark**

**ID=IT.3. 9 Cat1=Industrial Technology Cat2=Industrial Technology:**

Diagnose malfunctions of simple electrical circuits using a multimeter.

---

**Benchmark**

**ID=IT.3.10 Cat1=Industrial Technology Cat2=Industrial Technology:**

Develop a bill of materials.

---

**Benchmark**

**ID=IT.3.11 Cat1=Industrial Technology Cat2=Industrial Technology:**

Develop a plan of procedure to map out production.

---

**Benchmark**

**ID=IT.3.12 Cat1=Industrial Technology Cat2=Industrial Technology:**

Design jugs or fixtures, to aid production.

---

**Benchmark**

**ID=IT.3.13 Cat1=Industrial Technology Cat2=Industrial Technology:**

Interpret drawings, blueprints, or sketches.

---



**Benchmark**

**ID=IT.3.14 Cat1=Industrial Technology Cat2=Industrial Technology:** Alter plans to accommodate a different design.

## **Standard**

### **IT.4**

**Industrial Technology Standard 4: The student will apply basic math, science and communication skills to industrial technology.**

---

**Benchmark**

**ID=IT.4. 1 Cat1=Industrial Technology Cat2=Industrial Technology:** Convert metric to English.

---

**Benchmark**

**ID=IT.4. 2 Cat1=Industrial Technology Cat2=Industrial Technology:** Use mathematics to solve technical drawing problems.

---

**Benchmark**

**ID=IT.4. 3 Cat1=Industrial Technology Cat2=Industrial Technology:** Calculate and describe the effects of mechanical advantage.

---

**Benchmark**

**ID=IT.4. 4 Cat1=Industrial Technology Cat2=Industrial Technology:** Demonstrate the proper use and care of precision measuring devices.

---

**Benchmark**

**ID=IT.4. 5 Cat1=Industrial Technology Cat2=Industrial Technology:** Calculate compression ratio and engine displacement.

---

**Benchmark**

**ID=IT.4. 6 Cat1=Industrial Technology Cat2=Industrial Technology:** Calculate amp loads for household circuits when planning branch circuits.

---

**Benchmark**

**ID=IT.4. 7 Cat1=Industrial Technology Cat2=Industrial Technology:** Use architectural, metric and mechanical engineer's scales and demonstrate scaling techniques.

---

**Benchmark**

**ID=IT.4. 8 Cat1=Industrial Technology Cat2=Industrial Technology:** Solve mathematical problems related to drafting (e.g. conversion of units).

---

**Benchmark**

**ID=IT.4. 9 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Measure and compute using decimals and fractions.

---

**Benchmark**

**ID=IT.4.10 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Compute the quantity of materials needed for a job.

---

**Benchmark**

**ID=IT.4.11 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Estimate the cost of building a project.

---

**Benchmark**

**ID=IT.4.12 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Explain Ohm's law.

---

**Benchmark**

**ID=IT.4.13 Cat1=Industrial Technology Cat2=Industrial Technology:**  
Explain the Power Formula.

## **Standard**

### **IT.5**

**Industrial Technology Standard 5: The student will apply the technical and interpersonal skills necessary to be employable.**

---

**Benchmark**

**ID=IT.5. 9 Cat1=Industrial Technology Cat2=Industrial Technology:** Comply with shop and equipment safety rules.

---

**Benchmark**

**ID=IT.5. 1 Cat1=Industrial Technology Cat2=Industrial Technology:** Save and organize CAD drawings into a portfolio.

---

**Benchmark**

**ID=IT.5. 2 Cat1=Industrial Technology Cat2=Industrial Technology:** Becomes aware of careers in small engine repair.

---

**Benchmark**

**ID=IT.5. 3 Cat1=Industrial Technology Cat2=Industrial Technology:** Identify career opportunities related to automotive field.

---

**Benchmark**

**ID=IT.5. 4 Cat1=Industrial Technology Cat2=Industrial Technology:** Keep a daily log of lab activities.

---

**Benchmark**

**ID=IT.5. 5 Cat1=Industrial Technology Cat2=Industrial Technology:** Differentiate between AC and DC characteristics and applications.

---

**Benchmark**

**ID=IT.5. 6 Cat1=Industrial Technology Cat2=Industrial Technology:** Identify educational requirements that exist for a career in CAD technology.

---

**Benchmark**

**ID=IT.5. 7 Cat1=Industrial Technology Cat2=Industrial Technology:** Improve the quality of work completed on CAD system.

---

**Benchmark**

**ID=IT.5. 8 Cat1=Industrial Technology Cat2=Industrial Technology:** Produce quality work that reflects responsible and productive thinking.

---

**Benchmark**

**ID=IT.5.10 Cat1=Industrial Technology Cat2=Industrial Technology:** Identify and report unsafe shop conditions.

---

**Benchmark**

**ID=IT.5.11 Cat1=Industrial Technology Cat2=Industrial Technology:** Explain the importance of a business reputation and business ethics.

---

**Benchmark**

**ID=IT.5.12 Cat1=Industrial Technology Cat2=Industrial Technology:** Demonstrate proper care and storage of tools.

---

**Benchmark**

**ID=IT.5.13 Cat1=Industrial Technology Cat2=Industrial Technology:** Keep a clean working environment.

---

**Benchmark**

**ID=IT.5.14 Cat1=Industrial Technology Cat2=Industrial Technology:** Comply with school district rules.

---

**Benchmark**

**ID=IT.5.15 Cat1=Industrial Technology Cat2=Industrial Technology:** Perform maintenance procedures on equipment.