ENGINEERING TECHNOLOGY BLUEPRINT

This Blueprint contains the subject matter content of this Skill Connect Assessment. This Blueprint does **NOT** contain the information one would need to fully prepare for a SkillsUSA Championships contest. Please refer to the *SkillsUSA Championships Technical Standards* CD-ROM for the current year or purchase and download the relevant "Contest Singles." Both are available through *www.skillsusa.org* > Shop > Educational Materials Catalog.

Standards and Competencies

Demonstrate knowledge of engineering & technology principles using STEM

- Utilize Science Principles to solve engineering & technology problems
    - Apply knowledge of physical principles such as force, friction & energy
    - Analyze the relationship between weight & mass
    - Apply knowledge of laws of gravity
- Utilize Technology to solve engineering & technology problems
    - Apply knowledge of mass production
    - Apply knowledge of innovation
    - Apply knowledge of continuous improvement and optimization
    - Apply knowledge of the relationship & interchangeability among components of systems
- Utilize Engineering principles to solve engineering & technology problems
    - Apply knowledge of appropriate trade-offs within design requirements
- Use Mathematical formulas and techniques to solve engineering & technology problems
    - Add, Subtract, Multiply and Divide with whole numbers, decimals, and percents
    - Utilize measurement tools, methods, and conversions
    - Calculate geometric sizes and shapes
    - Solve simple algebraic equations

Engineering Design

- Utilize the Engineering Design Cycle
    - Identify the problem or opportunity
    - Identify possible solutions through problem solving skills
        - Apply brainstorming techniques
        - Collect and analyze data effectively
        - Explain cause and effect relationships
    - Select optimum specifications and create models & prototypes
    - Test solutions in a controlled environment
    - Redesign based on the evaluation of the models & prototypes
    - Implement and monitor for future improvements
- Utilize troubleshooting & quality control methods for diagnosis

Individual & Team Project Planning

- Identify project requirements & estimate resources
- Create an effective project plan
    - Prioritize tasks
    - Define milestones
- Anticipate project constraints and create alternative plans
- Evaluate and report on the results of the project

Teamwork Skills

- Define team roles & responsibilities

- Demonstrate effective communication skills
- Demonstrate positive group dynamics

Engineering and technological impacts on the Environment
- Recognize sustainability methods and materials
- Recognize the impact of engineering & technology on the environment

Safety
- Comply with safety procedures & proper ways to perform work
- Select the right tool for the job & use tools safely
- Utilize resources to understand how things safely work

Employability
- Communicate in a brief and complete manner
- Utilize basic computer technology skills effectively
- Show willingness to learn new assignments, procedures & technologies
- Maintain a professional and ethical attitude