End-of-Course Assessment Blueprint

Engineering Essentials

PLTW offers summative End-of-Course (EoC) Assessments that measure both subject-matter knowledge and the real-world transportable skills students need to thrive, no matter which college and career paths they choose.

These assessments are designed to measure knowledge and skills covered in the course curriculum. The content for each EoC assessment is based on an assessment blueprint specifying the extent to which course content will be represented in the assessment. Assessment blueprints were thoughtfully designed by a panel of industry experts, faculty from higher education institutions, PLTW Teachers, and PLTW Curriculum and Assessment Team Members.

Skill clusters were developed for each blueprint to guide the assessment creation process. Skill clusters represent an overarching category of related course objectives measured by the assessment. Table 1 articulates the alignment between the skill clusters and course objectives. In addition, each skill cluster was assigned a weight to determine the degree to which course objectives are addressed in the assessment.

Table 1: Assessment Blueprint – Engineering Essentials

Skill Cluster	Framework Objectives	% Weight by Skill Cluster
Global Engineering Concepts	**CAR-A:** Demonstrate awareness of the education and skills required for professional practice in an engineering field. **CAR-B:** Analyze the role of engineering professionals in society. **CAR-C:** Develop a professional understanding of the need for multidisciplinary solutions to increasingly complex and persistent global challenges. **ERM-A:** Apply personal and professional ethical standards as they relate to the habits and characteristics of an engineering professional. **ERM-B:** Consider the impact of potential engineering solutions on future generations to inform the development of sustainable solutions. **CCP-D:** Make judgments and decisions based on evidence. **CCP-J:** Apply systems thinking to consider how an engineering problem and its solution may be thought of as containing subsystems and as being a subsystem of a larger system. **CCP-K:** Assess the sustainability of an engineering solution based on the impacts (within the system or interrelated systems) that result from implementation of the solution.	**25–35%**

Engineering Design Principles	**AAP-B:** Use algorithms to create a solution with or without the use of a computer program. **AAP-C:** Formulate solutions that use automation and programming to solve a problem. **FMS-A:** Measure quantities related to an electrical circuit. **FMS-C:** Calculate quantities associated with an electrical circuit. **MOD-A:** Develop models and simulations to represent information, processes, and/or objects to an appropriate level of abstraction for the intended purpose. **MOD-E:** Create and interpret geospatial representations to identify important information, gather evidence, form conclusions, and solve problems.	**25–35%**
Critical and Creative Problem Solving	**CCP-E:** Formulate a plan to solve an engineering problem or exploit an opportunity. **CCP-F:** Apply an iterative design process to creatively address a need or solve a problem. **CCP-G:** Design an experimental protocol that includes a testable hypothesis to investigate a phenomenon and gain knowledge. **CCP-H:** Perform an experiment to collect and analyze data to draw conclusions. **CCP-I:** Accurately represent experimental data using appropriate visualization techniques or statistical models. **AAP-A:** Apply problem decomposition skills to break down data, problems, and processes into manageable parts. **AAP-E:** Apply abstraction to generalize problems and solutions.	**35–45%**