

Avon High school

Engineering Design Process

The engineering design process involves a series of steps that lead to the development of a new product or system. In this design challenge, students are to complete each step and document their work as they develop their product. The students will be responsible for the following:

STEP 1: Identify the Problem - Students should state the challenge problem in their own words with a simple declarative statement.

STEP 2: Identify Criteria and Constraints - Students should specify all the design requirements (criteria).

STEP 3: Brainstorm Possible Solutions - Each student in the group should participate by voicing his/her own ideas as the group discusses ways to solve the problem. Sketches should be quick and brief only used to convey ideas.

STEP 4: Evaluate the Ideas and Develop a Viable Solution- In this step, each student should choose a design and develop it more thoroughly. Students should create new drawings that are orthographic projections (multiple views showing the top, front and one side) and isometric drawings (three-dimensional depiction). These are to be 3-D modeled and placed in a virtual surrounding. Parts and measurements should be labeled clearly as dictated by drafting standards.

STEP 5: Construct and test a Prototype - Students should work in teams and identify the design that appears to solve the problem the best. Students will Laser-cut, Mill or 3-Print the solution and test against the initial problem. Students will hand in paper drawings for other students to construct the product.

STEP 6: Refine the Design - Students will examine and evaluate their prototypes or designs based on the criteria and constraints. Groups may enlist students from other groups to review the solution and help identify changes that need to be made. Based on criteria and constraints, teams must identify any problems and proposed solutions.