

The Engineering Design Process

Engineers use a structured, iterative process to solve problems. YES organizes students' work within an age-appropriate, cyclical Engineering Design Process. Naming design phases helps students understand the goal of the activity.

This is not a rigid process. As students engineer, they move back and forth among phases. After proceeding through the basic phases, students improve their design by repeating the cycle.

Elementary students engage with a simple, five-phase process.



Ask: Students define the problem, then identify the requirements for the design (criteria) and how their choices may be limited (constraints). This includes considering the needs of users and implications of the solution. They explore materials and consider which are best suited to the challenge.

Imagine: Students creatively brainstorm ways to solve the problem.

Plan: Students share and select their best ideas to generate one design. They sketch their plan and list the materials it uses.

Create: Students work in groups to make the solution they designed.

Test: Each group tests its solution against the performance criteria. Groups share and analyze data to determine where they can improve.

Improve Cycle: Groups improve their designs by going through another iteration of the process.