

Vistathink Engineering Design Process (EDP) Steps - General and Specific - Cheatsheet

General (Shorter Lesson)	Specific (Longer Lesson)
<p>• A - Analyze a Need</p> <p>Read and review the engineering design process scenario (GRASPS) to determine the what, who, and why of the problem to be solved.</p>	<p>A.1 - Ask and Empathize Read the scenario (GRASPS). Promote Q&A about the audience's needs, student's role as the boat builder, and the problem. Consider Facebook's ad targeting demographics categories, Plutchik's Wheel of Emotions, and character traits lists to deepen the discussion. Practice 3D product sketching.</p> <p>A.2 - Investigate and Research the Problem <u>Research</u> the problem through focused web searches: How shall the boatbuilder make a watercraft prototype from a 5-inch square of aluminum foil to hold as many pennies as possible? <u>Investigate</u> the problem with a hands-on rapid prototype of the test using a smaller square of foil. Practice 3D product sketching.</p> <p>A.3 - Define the Problem Summarize the essence of the project-based learning scenario (e.g., written statement, Flipgrid video, slideshow): 1. What is the problem to be solved? 2) Who will benefit from the solution? 3) Why is the problem being solved? Practice 3D product sketching.</p>
<p>• B - Develop Ideas</p> <p>Brainstorm ideas to meet the goal. Sketch and annotate the best idea.</p>	<p>B.1 - Imagine Possibilities Brainstorm solution ideas that support an anything-goes approach. E.g.: Quick pencil sketches of the watercrafts then a gallery walk to share is one way to grow ideas.</p> <p>B.2 - Specify Requirements Write design specifications to be as explicit as possible and organized into logical chunks. Teacher provides some representative examples for students.</p> <p>B.3 - Represent the Best Idea Sketch and annotate the best idea to solve the problem. Consider both 2D and 3D sketches, and 3D modeling.</p>
<p>• C - Create a Prototype</p> <p>Discuss how to build the prototype, build it, and reflect on what went well (or did not) in the building process.</p>	<p>C.1 - Plan the Build (and Maybe the Test) Create a step-by-step logical plan to build a prototype of the best idea to solve the problem. Possibly create a testing plan as well. The plan(s) may incorporate visuals or just text.</p> <p>C.2 - Create and Document the Process Follow the plan to build the prototype. Document the building steps with extensive photos.</p> <p>C.3 - Justify Changes to the Plan Note all the changes to the plan. E.g.: step sequence, time for each step, material amounts, tools used, etc.</p>
<p>• D - Test and Evaluate</p> <p>Test the watercraft prototypes and evaluate the results. Determine what worked, what didn't, and reflect on how to improve the design.</p>	<p>D.1 - Test the Prototype Review the GRASPS. Test the prototype according to the established success criteria.</p> <p>D.2 - Evaluate the Results Review the design specifications. Evaluate the results against the established success criteria. Use statistical measures to investigate the relationships between the design characteristics and the test results.</p> <p>D.3 - Reflect to Improve the Design Identify which prototype characteristics should be modified to better achieve the goal. Use the design specifications for guidance. Explain thinking.</p>