



Lesson 1.1 – Introduction to a Design Process

Concepts

1. There are many design processes that guide professionals in developing solutions to problems.
2. A design process most used by engineers includes defining a problem, brainstorming, researching, identifying requirements, exploring possibilities, selecting an approach, developing a design proposal, making a model or prototype, testing, refining, making, and communicating results.
3. Design teams use brainstorming techniques to generate large numbers of ideas in short time periods.
4. Engineers conduct research to develop their knowledge base, stimulate creative ideas, and make informed decisions.
5. A designer uses an engineer's notebook to chronologically document all aspects of a design project.

Performance Objectives

It is expected that students will:

- Apply engineering notebook standards and protocols when documenting their work during the school year.
- Identify and apply group brainstorming techniques and the rules associated with brainstorming.
- Research a product's history, develop a PowerPoint presentation, list chronologically the major innovations to a product, and present findings to a group.
- Use online and published works to research aspects of design problems.
- Identify the design process steps used in given scenarios and be able to list the steps, if any are missing.

Essential Questions

1. What is the design process and how is it used?
2. Why is brainstorming important when modifying or improving a product?
3. What is meant by constraints and criteria?
4. What are common constraints put on a product?
5. What comes to mind when you hear the words evolution of a product?
6. What kinds of situations might keep a designer from moving sequentially through a

design process?

7. What is an engineer's notebook and how is it used?
8. Why do engineers use graphics to record and communicate information?

Key Terms

Assessment	Brainstorming	Client
Constraint	Design	Design Brief
Design Process	Designer	Engineer
Engineer's Notebook	Evolution	Innovation
Invention	Iterative	Problem Identification
Process	Product	Research
Sequential	Solution	Standard
Target Consumer	Time Line Chart	

Instructional Resources

PowerPoint® Presentations

[Engineer's Notebook](#)
[Engineer's Notebook long version](#)
[Rules for Brainstorming](#)
[Evolution of Product Design](#)
[Introduction to Research](#)
[Design Process Overview](#)

Word Documents

[Activity 1.1.1 Beverage Container](#)
[Activity 1.1.2 Product Evolution](#)
[Activity 1.1.3 Gossamer Condor Design Brief](#)
[Activity 1.1.2 Product Evolution Rubric](#)
[Sample Engineering Notebook Entries](#)
[Example Design Process](#)
[Lesson 1.1 Key Terms and definitions in Excel](#)
[Isometric graph paper](#)
[Orthographic graph paper](#)

Reference Sources

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