



Lesson 3.4 – Product Improvement By Design

Concepts

1. Engineers analyze designs to identify shortcomings and opportunities for innovation.
2. Design teams use brainstorming techniques to generate large numbers of ideas in short time periods.
3. Engineers use decision matrices to help make design decisions that are based on analysis and logic.
4. Engineers spend a great deal of time writing technical reports to explain project information to various audiences.

Performance Objectives

It is expected that students will:

- Write design briefs that focus on product innovation.
- Identify group brainstorming techniques and the rules associated with brainstorming.
- Use decision matrices to make design decisions.
- Explain the difference between invention and innovation.

Essential Questions

1. What is the purpose of reverse engineering a product?
2. What practices are associated with group brainstorming?
3. Why is brainstorming as a team important when modifying or improving a product?
4. What are some factors to consider when enhancing an existing product?
5. What function does the design brief serve in the design process?
6. What are the elements of a technical report?

Key Terms

[Appendix](#)

[Bias](#)

[Brainstorming](#)

[Criteria](#)

[Decision Matrix](#)

[Descriptive Abstract](#)

[Executive Summary](#)

[Innovation](#)

[Invention](#)

Product**Purpose****Technical Report**

Instructional Resources

PowerPoint® Presentations

[Writing a Design Brief](#)

[The Deep Dive](#)

[Technical Report Elements](#)

Word Documents

[Activity 3.4.1 Writing a Design Brief](#)

[Activity 3.4.1a Child Toy Design Brief](#)

[Activity 3.4.2 The Deep Dive](#)

[Problem 3.4.3 Product Improvement](#)

[Activity 3.4.1b Design Brief Template](#)

[Problem 3.4.3a Decision Matrix Template](#)

[Problem 3.4.3b Product Improvement Design Brief Template](#)

[Lesson 3.4 Key Terms and definitions in Excel](#)

Reference Sources

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