



Lesson 3.2 – Functional Analysis

Concepts

1. Engineers perform reverse engineering on products to study their visual, functional, and structural qualities.
2. Through observation and analysis, a product's function can be divided into a sequence of operations.
3. Products operate as systems, with identifiable inputs and outputs.

Performance Objectives

It is expected that students will:

- Identify the reasons why engineers perform reverse engineering on products.
- Describe the function of a given manufactured object as a sequence of operations through visual analysis and inspection (prior to dissection).

Essential Questions

1. What is the purpose of reverse engineering?
2. What is the difference between a product's visual and functional qualities?

Key Terms

Black Box Model

Function

Hypothesis

Input

Mechanism

Observation

Output

Process

Reverse Engineering

System

Instructional Resources

PowerPoint® Presentations

[Reverse Engineering and Functional Analysis](#)

Word Documents

[Activity 3.2.1 Product Observation](#)

[Activity 3.2.1a Example Product Observation](#)

Lesson 3.2 Key Terms and definitions in Excel

Reference Sources

- Amazon.com. (2006). *The films of Charles and Ray Eames – Volume 4*.
- Eames, C., Eames, R. (Producers). (1972). *SX-70*. [Motion Picture]. United States: The Eames Office
- International Technology Education Association, (2000). *Standards for technological literacy*. Reston, VA: ITEA
- Macaulay, D., (1988). *The way things work*. Boston, MA: Houghton Mifflin Company.
- Madsen D. A., Folkestad, J., Schertz, K. A., Shumaker, T. M., Stark, C., & Turpin, J. L. (2004). *Engineering drawing and design (3rd ed.)*. Albany, NY: Thomson Delmar Learning.
- Merriam-Webster Online. (n.d.) *Merriam Webster online dictionary*. Retrieved June 15, 2006 from <http://www.webster.com>
- National Council of Teachers of English (NCTE) and International Reading Association (IRA) (1996). *Standards for English language arts*.
- National Council of Teachers of Mathematics (NCTM). (2000). *Principles and standards for school mathematics*. Reston, VA: Author.
- National Research Council (NRC). (1996). *National science education standards*. Washington, D. C.: National Academy Press.
- Otto, K. N., & Wood, K. L. (2001). *Product design*. Upper Saddle River, NJ: Prentice Hall, Inc.
- Wikipedia Online. (n.d.) Wikipedia online encyclopedia. Retrieved June 15, 2006 from <http://en.wikipedia.org/wiki/>