

Introduction to Systems Engineering

Decomposing a System into Subsystems Activity

Introduction

The purpose of this activity is to gauge your current systems thinking skills, with a focus on decomposing a system into subsystems. A relatively simple consumer product has been chosen for this activity, to keep the extent of the activity manageable.

Caution!

You will be working to disassemble an electromechanical device in this activity. Please ensure the following as you work through the activity:

- At least two persons are present at all times while the product is being disassembled.
- You have taken the appropriate lab safety training and know how to use each of the required tools.
- You are wearing gloves and eye protection.
- The product remains unplugged at all times.
- You are aware and careful of any sharp edges on the components of the product.
- You consult with the course instructor if you are not sure how to do a particular step of the disassembly process.

Items Needed

To carry out the activity you will need the following:

- Product that you are going to disassemble.
- Disassembly instructions.
- Appropriate safety equipment.
- Tools required to disassemble the product: screwdrivers, long nose pliers, scissors, small hacksaw, etc.
- Resealable plastic bags.

Instructions

This activity will be conducted in teams. The product is to be disassembled according to the instructions that are given as a series of pictures in a separate document.

- 1) Perform the disassembly in the same order as the images. Pay attention to any explanatory text in the images.

- 2) Examine the components as they are coming off the product and think about their function or functions and interactions with other components.
- 3) After the product has been disassembled according to the instructions, you are asked to do the following:
 - Determine what subsystems the product was composed of.
 - Determine what components each subsystem consisted of.
 - For each subsystem you have identified, put the components into a resealable bag and label the bag with the subsystem name.
- 4) At the end you should have a disassembled product with components grouped into subsystems. Each resealable bag should represent (and be labeled) as a subsystem.
- 5) Using as a template the first table presented in the next page, document each subsystem you identified. Come up with a short descriptive name for the subsystem, indicate how many components are in the subsystem, and list each one of those components.
- 6) Using as a template the second table presented in the next page, document all the interactions between the different subsystems that you identified. Make sure to describe the nature of those interactions.
- 7) Ensure all bags are well sealed and place them into the big bag/box that was provided and return to the instructor by the due date. Also provide by the due date a formal report that includes the two requested tables.

**Template for the Table to Document the Subsystems Identified by the Team
(Include as many rows as needed)**

Subsystem	Number of Components	List of Components
<i>Provide a short descriptive name for the subsystem</i>	<i>Indicate how many components are in the subsystem</i>	<i>List each of the components that are part of the subsystem.</i>

**Template for the Table to Document the Interactions between Subsystems
(Include as many rows as needed)**

Interacting Subsystems	Interaction(s)
<i>Indicate the subsystems under consideration</i>	<i>Describe the nature of the interaction(s) between the subsystems under consideration</i>