



---

# Unit 4 – Design Problems

---

## Preface

This unit is designed to combine the knowledge and information learned in the previous units to an open ended design problem. You will apply the design process to create a solution to a problem that currently exists. You will also learn that by-products are created as a result of the solution, and what impacts they have on the environment and society. You will learn how to affectively market a product and create a virtual team to complete the tasks needed to solve real world problems.

## Concepts

1. Market research and demographics provide useful information to companies for developing effective product advertising strategies.
2. Graphic designers are concerned with developing visual messages that make people in a target audience respond in a predictable and favorable manner.
3. The material of a product, how the material is prepared for use, its durability, and ease of recycling all impact a product's design, marketability, and life expectancy.
4. A conscious effort by product designers and engineers to investigate the recyclable uses of materials will play a vital role in the future of landfills and the environment.
5. Design teams establish group norms through brainstorming and consensus to regulate proper and acceptable behavior by and between team members.
6. Virtual teams rely on communications other than face-to-face contact to work effectively to solve problems.

## Essential Questions

### Lesson 4.1 Engineering Design Ethics

1. What is meant by engineering design ethics?
2. What is ethics?
3. Why is it important to understand ethics and how it relates to product design?
4. Why is it important to study a product's lifecycle?
5. What factors influence the selection of materials to make a product?
6. What do you think of when you hear the word *impact*?
7. How can a manufacturing process impact an environment?
8. How do ethics impact the production of products?
9. What global and human impacts must be considered by all involved with the design, manufacture and distribution of products?

10. Why is it important to have clear, accurate, and detailed communication among all involved in the design, manufacture and distribution process?
11. What laws exist in the United States to protect humans and the environment?

### Lesson 4.2 Design Teams

1. Why are teams of people used to solve problems?
2. What are group norms?
3. What does *consensus* mean, and how do teams use it to make decisions?
4. What is the purpose of a Gantt chart?
5. What types of communication methods do virtual teams rely on in the absence of face-to-face contact?
6. How do teams deal with individual team members' weaknesses?
7. What methods do teams use to formally address conflict between team members?

## Lessons

[Lesson 4.1 Engineering Design Ethics](#)

[Lesson 4.2 Design Teams](#)