Student Name: Points: 50 Period:____

Date:

Due:

PLTW | Engineering

Problem 7.7 Product Enhancement

Introduction

Reverse engineering is performed for many different reasons – to document a product design, to understand important aspects of a product for academic reasons or to design for interoperability, to investigate the reasons for the success or failure of a device or system, or to improve or redesign the product.

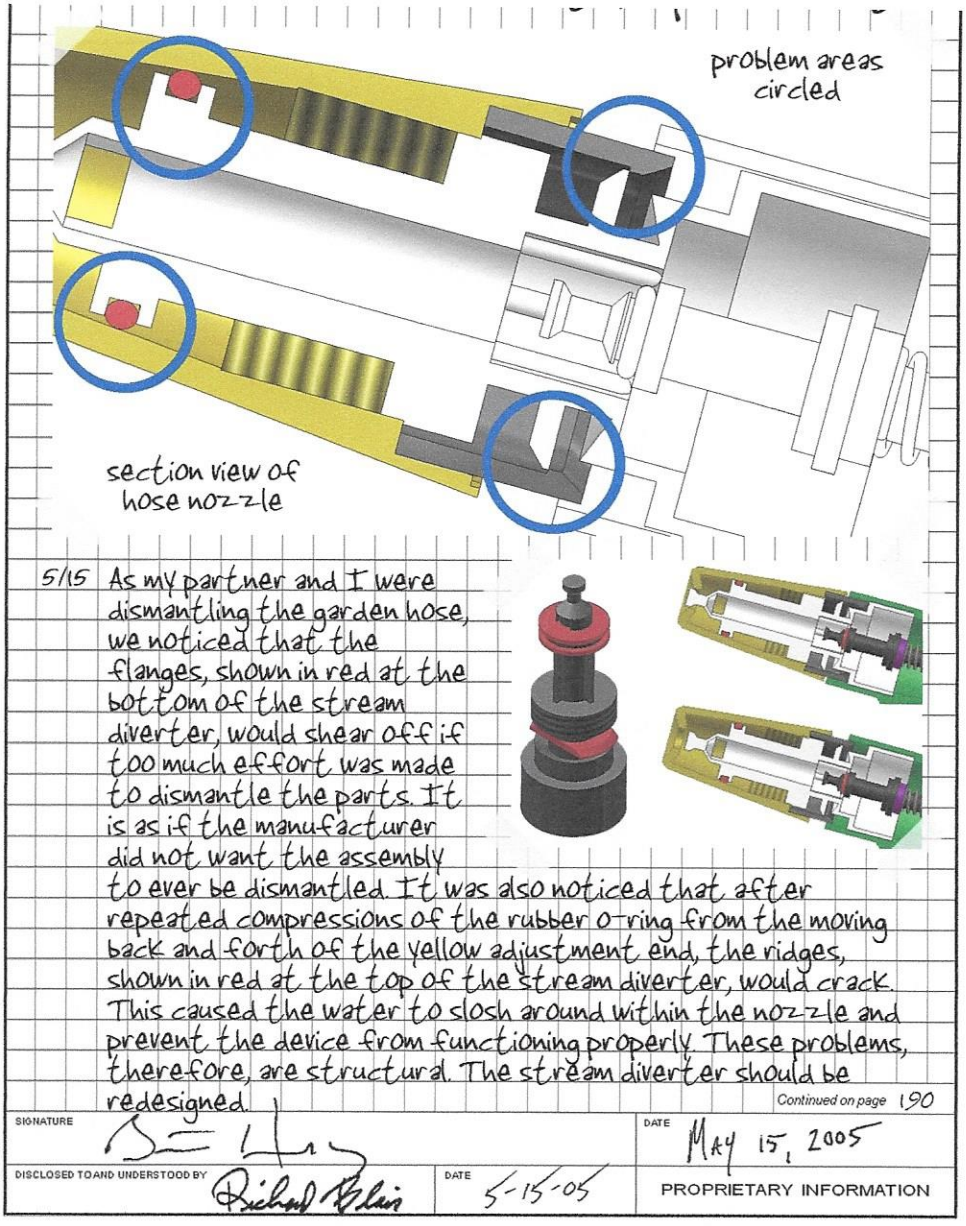
In this activity your team will design an enhancement or accessory to an Automoblox toy vehicle that can be sold separately or that can be marketed to Automoblox as an additional line of products. The accessory or enhancement must somehow attach to the vehicle and can include anything that would appeal to the target market.

Equipment

- Engineering notebook
- Pencil
- Digital camera
- Graph paper
- All related CAD models from your reverse-engineered product
- CAD solid modeling software
- Internet access
- Library access
- Printer
- **Product Improvement Design Brief Template**
- **Decision Matrix Template**

Procedure

1. In this activity your team will identify an enhancement to the Automoblox vehicle that you have reverse-engineered. Begin the process by recording any visual, structural, or functional design issues in your engineering notebook.



2. As a team you will write a design brief that explains the problem, identifies the solution expectations and the degree to which that solution will be realized, and lists any appropriate project constraints.
3. Generate enhancement ideas through brainstorming. Be sure to document every idea. You and your partner will then conduct whatever research may be necessary and expand on the ideas. Narrow down the number of plausible ideas to a few of the most promising ideas.
4. Your team will then develop and use a decision matrix to help select a solution path to pursue.

5. Once an idea has been selected, you and your partner will develop it into a solution using a 3D CAD solid modeling program. You will produce technical drawings to document your design.
6. (Optional) If possible, create a prototype of your design solution as directed by your instructor.
7. Add documentation of your design process and final solution to your project portfolio (begun in Activity 7.5). Be sure to review the design process flow chart. Include a discussion and documentation of **each** step of your design process.

Conclusion

1. What factors must be considered when changing or enhancing a design?

2. Why it is important to document the brainstorming process?

3. What is the purpose of sketching your ideas?