



FROM IDEA TO PRODUCTION – TRANSPORTATION DESIGN GRADES 9-12 STUDENT PACKET



Donald Hood (American, 1934–2018). '71 Barracuda Front End Facelift Concept, 1968. Crayon, gouache, ink, felt marker, prisma-color, pastel on vellum; 20 1/4 × 26 7/8 inches (51.4 × 68.3 cm). Collection of Robert L. Edwards and Julie Hyde-Edwards.

This packet supports the special exhibition *Detroit Style: Car Design in the Motor City, 1950–2020*.

GLOSSARY

PROTOTYPE: a first, typical, or preliminary model of something, especially a machine, from which other forms of art are developed or copied.

AERODYNAMICS: the branch of mechanics that deals with the motion of air and other gasses and with the effects of such motion on bodies in the medium.

TARGET AUDIENCE: the intended audience or readership of a publication, advertisement, or other message. In Marketing and Advertising, it is a particular group of consumers within the predetermined target market, identified as the targets or recipients for a particular advertisement or message.

DESIGN THINKING: a non-linear, repetitive process that teams use to understand users, challenge assumptions, redefine problems and create innovative solutions to prototype and test. It involves five phases: Empathize, Define, Ideate, Prototype and Test-it is most useful to tackle problems that are ill-defined or unknown.

FORM: external appearance of a clearly defined area, as distinguished from color or material.

FUNCTION: the purpose for which something is designed or exists.

TEXTURE: the visual and especially tactile quality of a surface.

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MATERIALS

Gather the following materials to create your base model car:

| | |
|--|--------------------|
| 2 Pencils | 5 #14 Rubber bands |
| 1 Paper Towel Roll | Single Hole Punch |
| 2 3” Diameter Cardboard Circles (for wheels) | Masking Tape |
| 3 Old CD’s | Scissors |

STEP 1: CREATE A TEAM

In a formal work setting, it is common to work in a team. Think about the strengths of your team members and assign work accordingly. This is a great way to bounce ideas off each other!

Team Member Names:

1. _____
2. _____
3. _____
4. _____

STEP 2: IDENTIFY THE PROBLEM

Your job is to create a functional *prototype* car that will be marketed for its trendy design. Not only does it have to work, but it must be beautiful, too! By experiencing the Engineering Design Process, you will consider many aspects of car design. Be prepared to use your Growth Mindset to adapt your design throughout the process to make it better.

STEP 3: BUILD YOUR PROTOTYPE

Create a functional base model or *prototype* by using the step-by-step instructional document available, titled “**How to Create A Base Model Rubber Band Car.**”

STEP 4: CALCULATING SPEED AND RECORDING DATA

After you have made your car and have figured out how it can “go,” your team will calculate the car’s speed, distance, and the class average. Use the worksheet and tables below to record information.

Your car will have three trial runs. To calculate speed, use the following equation:

$$\text{Speed} = \frac{\text{total distance (cm)}}{\text{total time (seconds)}}$$

To calculate the Average Speed, add the three final speed results together and then divide by 3. For the Class Average Speed, add the calculated speeds together and divide by the number of groups.

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GROUP DATA TABLE

| Trial | Distance (cm) | Time (Seconds) | Speed (cm/s) |
|---------------|---------------|----------------|--------------|
| Trial 1 | | | |
| Trial 2 | | | |
| Trial 3 | | | |
| Average Speed | | | |

CLASS DATA TABLE

| Group | Speed (cm/s) | Rank |
|---------------------|--------------|------|
| Group 1 | | |
| Group 2 | | |
| Group 3 | | |
| Group 4 | | |
| Group 5 | | |
| Group 6 | | |
| Group 7 | | |
| Group 8 | | |
| Class Average Speed | | |

After you complete the chart above, take some time to reflect with your design team.

1. How did your car perform against the Class Average Speed?
2. What could you change or adapt to make it go faster?
3. What could you add to the outer design to make it more appealing to your *target audience*?

STEP 5: CONNECT, EXTEND CHALLENGE SELF-GUIDED EXPERIENCE

Using the **Detroit Style Presentation** and at least one exhibition video, explore *Detroit Style: Car Design in the Motor City, 1950–2020* before completing the **Connect, Extend, Challenge** graphic organizer. If able, visit the exhibition in person

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STEP 6: DEFINE THE NEW PROBLEM, IDEATE, AND ADAPT

It's time to gather your creative minds!

Collaborate with your group and discuss new design ideas inspired by your exploration of the ***Detroit Style Presentation*** and exhibition videos! Review each other's ideas and decide on which design will be the most successful. You will be racing them again and you will be judged by a team of experts!

1. How did Transportation Design change through the decades 1950-2020?
2. Choose a time period that inspires you. What decade is your favorite? How will you incorporate that into your design?
3. What will you add to make your car more beautiful? Consider color, texture, and shape.

Define the Problem to Solve

1. Will the items that you add make the car go faster or slower? How will it impact the *function* of the vehicle?
2. Does the color and style you choose appeal to your *target audience*?

Sketch an adapted design below that is inspired by the decade you chose. Take time to reflect on your current model and use *Design Thinking* to adapt your design to make it more functional and more marketable and appealing.

Sketch your final ideas here

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STEP 7: ADAPTABLE DATA

Now that you have designed a newer and more beautiful vehicle, let's see how it performs. We are going to re-evaluate our data and test our vehicles with their new changes!

GROUP DATA TABLE

| Trial | Distance (cm) | Time (Seconds) | Speed (cm/s) |
|---------------|---------------|----------------|--------------|
| Trial 1 | | | |
| Trial 2 | | | |
| Trial 3 | | | |
| Average Speed | | | |

CLASS DATA TABLE

| Group | Speed (cm/s) | Rank |
|---------|--------------|------|
| Group 1 | | |
| Group 2 | | |
| Group 3 | | |
| Group 4 | | |
| Group 5 | | |
| Group 6 | | |
| Group 7 | | |
| Group 8 | | |

1. Did the results come out as expected?
2. What could you have done differently?
3. How did the individual style of your team members and dynamics contribute to the project?

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STEP 8: MARKET YOUR VEHICLE

1. What makes your vehicle stand out from the rest? What are the appealing and marketable features?
2. Does your color and style follow current or future trends? Is your new car an adapted idea with historical background (i.e. a “Throwback” trend)
3. Would you buy your vehicle? Why or why not?

Many Graphic Designers work hard to advertise for the Automotive Industry. Think about the ads you have seen about cars. Why is one car more appealing to you than another? Do they have different *functions*? Does the style appeal to you?

Use this information to create an advertisement for your vehicle. Canva.com or Photoshop are both great options for creating an 11x18 poster.

Where will you place the ad? Will it be appealing in its’ environment?

Include the following items:

- The name of your vehicle
- Three appealing features that make your car “special”
- Two Elements of Art in your poster design: Line, Space, Color, Shape, *Form*, Value, *Texture*. Hint: Most of these elements have been considered throughout this lesson
- Wording that will appeal to your *target audience*.

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STEP 9: REFLECTION

1. How do you feel about your vehicle’s overall performance?

2. If you could change your vehicle, what would you change?

3. Identify two examples of decisions that were made during collaboration. Did your ideas improve due to the teamwork environment?

4. Identify the role *Design Thinking* played in the entire process.

5. Describe how your group used “brainstorming” to develop your idea.

6. Describe how your group used *Design Thinking* and editing to adapt your idea to improve the final concept.

7. Make connections. Describe two connections you made about this design process. How does the information you learned connect to our world?

8. How does the information you learned connect to a career pathway in Transportation Design?