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# Lesson Plan: The Automotive Architect - Redesigning a Classic

## Materials Needed:

- A computer or tablet with internet access
- A printer (optional, but helpful for a hands-on approach)
- Paper (if printing)
- Colored pens, pencils, or markers
- A digital drawing app (like Procreate, Sketchbook, or even MS Paint) can be used as an alternative to printing.
- A notebook or document for taking notes

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## Lesson Overview

Welcome, Heathereblen! Today, we're moving beyond simply reading car diagrams and stepping into the role of an automotive designer. Instead of just identifying parts, you'll be creatively re-engineering a classic car for the 21st century. This project is all about imagination, problem-solving, and understanding how a car's systems work together.

## Learning Objectives

By the end of this lesson, you will be able to:

1. Interpret the primary systems (engine, drivetrain, suspension) on a standard automotive diagram.
2. Creatively synthesize ideas by combining classic car designs with modern technology.
3. Clearly explain the function and purpose of your design modifications using correct terminology.

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## Lesson Activities (Approx. 90 minutes)

### Part 1: The Blueprint Briefing (10 minutes)

Let's quickly review the tools of our trade. Car diagrams come in a few main types. We'll focus on two today:

- **Cutaway Diagram:** This is like slicing a car in half to see how everything fits together on the inside. It's great for understanding the spatial relationship between parts.
- **Exploded-View Diagram:** This shows components spread out from each other, as if a small, controlled explosion happened. It's perfect for seeing every single part of a system, like a transmission or a brake assembly.

**Your Task:** Do a quick image search for "car cutaway diagram" and "car engine exploded view." Just spend a few minutes looking at them to get a feel for how they communicate information differently.

## Part 2: The Mission - Future-Proofing a Classic (15 minutes)

Here's your creative challenge! You are a top designer at a "resto-mod" shop (a place that restores and modifies old cars). A client has brought you their beloved classic car and wants to upgrade it with modern performance, safety, and comfort, without losing its vintage soul.

### Your Task:

1. **Choose Your Classic:** Pick a classic car that you find interesting. It could be anything from a 1969 Ford Mustang to a 1985 Volkswagen Golf GTI. The choice is yours!
2. **Find Your Blueprints:** Search online for diagrams of your chosen car. Good search terms are "[Your Car's Year and Model] cutaway diagram," "[Your Car's Year and Model] engine diagram," or "[Your Car's Year and Model] chassis diagram." Find one or two clear diagrams that show the major components. You can print these out or save them to your tablet.

*Teacher Tip: Websites for old car manuals or enthusiast forums are great places to find high-quality diagrams.*

## Part 3: The Creative Workshop (45 minutes)

This is where you become the architect. Using your chosen diagrams as a base, you will redesign the car. You can draw directly on the printout or use a new layer in your digital art app.

**Your Task:** Choose **at least three** of the following systems to modernize. Sketch your new components onto the diagram and label them clearly.

- **The Powertrain:**
  - Swap the old V8 for a modern, compact turbocharged engine.
  - Go electric! Remove the engine, fuel tank, and exhaust. Draw in a battery pack (where would it fit best for weight distribution?) and one or more electric motors.
- **The Suspension & Brakes:**
  - Replace the old leaf-spring suspension with a modern independent multi-link system for better handling.
  - Upgrade the drum brakes to modern disc brakes with ABS (Anti-lock Braking System). Where would the ABS module go?
- **The Interior & Electronics:**
  - Integrate a modern infotainment touchscreen into the dashboard. How would you make it fit with the classic aesthetic?
  - Add modern safety features, like backup cameras or blind-spot sensors. Where would you place the sensors on the car's body?

Next to each modification, write a 1-2 sentence "Designer's Note" explaining **why** you made that change and what **benefit** it provides (e.g., "*Designer's Note: Replaced the carburetor with a modern fuel injection system to improve fuel efficiency and reliability.*").

## Part 4: The Design Presentation (20 minutes)

Time to present your masterpiece! Share your annotated diagram and walk me through your design choices.

**Your Task:** Explain your creation. Be ready to discuss:

- Which classic car you chose and why.
- The three (or more) upgrades you engineered.
- Why you chose those specific upgrades.
- One potential challenge you might face in making your design a reality. (For example, "Fitting

the large battery pack required removing the spare tire well and reinforcing the frame.")

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## Assessment & Feedback

Your project will be assessed based on the creativity of your ideas, the clarity of your diagram annotations, and how well you explain the function of your upgrades during the presentation. This isn't about being a professional engineer; it's about creatively applying your understanding of how cars work.

## Extension & Further Learning (Optional)

If you loved this, try one of these next!

- **The "What Broke?" Challenge:** Find a diagram of a single system (like a cooling system). Write a short story about what would happen if one specific part failed (e.g., the thermostat gets stuck closed).
- **Build it in 3D:** If you're familiar with 3D modeling software like Blender or TinkerCAD, try building a simplified model of one of the systems you redesigned.

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