



**Tomah Area School District**  
*High Quality Student Learning*  
*Every Child. Every Day.*

**Essential Learning**

**Grade/Course: HS Car Care**

**Essential Knowledge:**

The student demonstrates professional standards/employability skills as required by business and industry.

The student demonstrates appropriate personal and communication skills.

The student understands the technical knowledge and skills of basic automotive systems.

The student knows the functions and applications of the tools, equipment, technologies, and materials used in automotive services.

The student applies technical knowledge and skills in simulated or actual work situations.

**Essential Questions:**

1. Can I demonstrate knowledge of the technical knowledge and skills related to health and safety in the workplace such as wearing safety glasses and other personal protective equipment (PPE) and maintaining safety data sheets (SDS)?
2. Can I demonstrate the principles of group participation, team concept, and leadership related to citizenship and career preparation?
3. Can I demonstrate effective written and oral communication skills and employ effective listening skills?
4. Can I describe the eight major vehicle systems? Can I demonstrate the proper way to safely use hand and power tools and equipment commonly employed in the maintenance and repair of vehicles?
5. Can I explain the proper handling and disposal of environmentally hazardous materials used in servicing vehicles?
6. Can I demonstrate an understanding of the operation theory of internal combustion engines?
7. Can I identify brake system components, including drum, disc, power assist, and anti-lock braking system (ABS)?
8. Can I demonstrate an understanding of basic concepts related to hydraulic brakes systems, including Pascal's Theory of Hydraulics?
9. Can I demonstrate an understanding of basic concepts related to electrical and electronic systems such as Ohm's law, voltage drop, resistance, amperage, voltage, and wiring diagram symbols?
10. Can I inspect and identify chassis and power train components and systems?
11. Can I identify cooling and lubrication system components?
12. Can I identify steering and suspension components, including power steering?
13. Can I identify and interpret tire sidewall data information such as Department of Transportation (DOT) production date information, tire load capacity, inflation pressures, sizing description, and speed rating?
14. Can I compare the preventative maintenance schedules for a variety of vehicles based on their use?
15. Can I perform a preventative maintenance inspection?
16. Can I perform a "jump-start" of a vehicle using jumper cables and a booster battery or an auxiliary power supply according to manufacturer recommended procedures?

## Units:

1. Introduction and How Cars Work
2. Buying an Automobile
3. Automotive Expenses
4. Repair Facilities
5. Safety Around the Automobile
6. Tools and Equipment
7. Auto Care and Cleaning
8. Fluid Level Check
9. Electrical System
10. Lubrication System
11. Fuel System
12. Cooling System and Climate Control
13. Ignition System
14. Suspension, Steering, and Tires
15. Braking System
16. Drivetrain
17. Exhaust and Emission System
18. Alternative Fuels and Designs
19. Automotive Accessories
20. Common Problems and Roadside Emergencies





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**Essential Learning**

**Grade/Course: HS Computer Integrated Metals**

**Essential Knowledge:**

The student applies software skills to manufacturing.

The student learns skills in production and programming of computer numerical control (CNC) operations.

**Essential Questions:**

1. Can I use computer-aided design (CAD) software to complete a design?
2. Can I analyze the results of product testing in a simulated modeling environment?
3. Can I fabricate a prototype design of a mechanical part?
4. Can I design a product using CAM software for production on a CNC router?
5. Can I produce a product on the CNC mill or a simulation?

**Units:**

1. Safety
2. Introduction to 3d modeling
3. CNC basics
4. CNC plasma cutting
5. CNC Laser engraving
6. Introduction to 3D printing
7. Casting and foundry processes



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**Essential Learning**

**Grade/Course: MS Design and Modeling PLTW - GTT**

**Essential Knowledge:**

Students will develop an understanding of the core concepts of technology

Students will develop the abilities to apply the design process.

Students will develop an understanding of and be able to select and use information and communication technologies.

Students will develop an understanding of the core concepts of technology.

Students will develop an understanding of the attributes of design.

Students will develop the abilities to apply the design process.

Students will develop an understanding of the cultural, social, economic, and political effects of technology.

**Essential Questions:**

1. How is a design process used to effectively develop a design solution that solves a problem or addresses a design opportunity?
2. Why are accurate measurement, precise dimensioning, and thorough documenting necessary for both mechanical dissection and creative problem solving?
3. How is a design process used to effectively develop a design solution that solves a problem or addresses a design opportunity?
4. How is design testing data used to improve design solutions?
5. Why is it important for an engineer to be aware of the criteria and the constraints when designing a project?
6. How does documentation play a critical role in each step of the design process?
7. Why is it important to engage stakeholders during the design process?
8. Why are teams of people more successful than an individual when solving problems?
9. Why is brainstorming, research, and testing important when creating, modifying, or improving a design solution?

**Units:**

1. Introduction to Design
2. Modeling and Statistical Analysis
3. Design Challenge