**Unit 1.1: Mechanisms**

1. **Define Unit 1.1 Vocabulary**

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| **Key Term** | **Definition** |
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1. **Know the six simple machines, their attributes, and components.**
   1. Lever
   2. Wheel and Axel
   3. Pulley
   4. Inclined Place
   5. Wedge
   6. Screw
2. **Know the equations to solve for mechanical advantage, work, and power.**
   1. Mechanical Advantage
   2. Work
   3. Power
3. **Know the machines created with gears, pulleys, and sprockets, their attributes, and components.**
   1. Gears
   2. Pulleys
   3. Sprockets
   4. Belts
   5. Chains
4. **Understand how to determine efficiency in a mechanical system.**
5. **Understand how to design, create, test, and evaluate a compound machine designs.**

**Unit 1.2: Energy Sources**

1. **Define Unit 1.2 Vocabulary**

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| **Key Term** | **Definition** |
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1. **Describe the characteristics of various sources of energy.**
   1. **Coal**
   2. **Oil**
   3. **Natural gas**
   4. **Nuclear**
   5. **Solar**
   6. **Biomass**
   7. **Hydroelectric**
   8. **Geothermal**
   9. **Wind**
   10. **Other**
2. **Know types of nonrenewable, renewable, and inexhaustible energy sources.**

1. **Know the equations for work and power.**

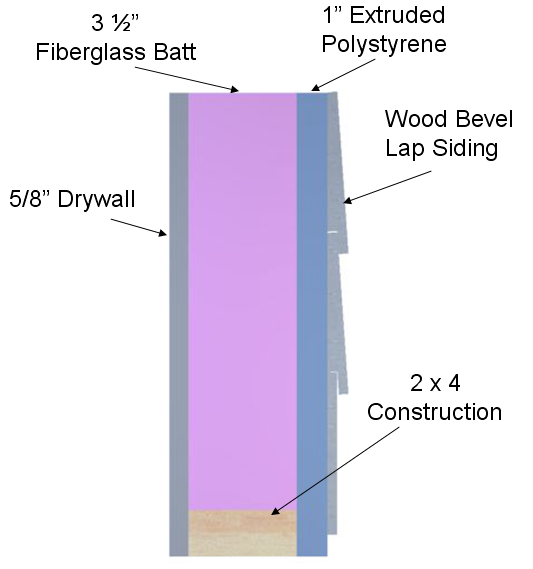
1. **Know the equation for calculation the efficiency of a system**
2. **Know the equations related to describing the characteristics of simple circuits**
   1. Ohms Law
   2. Kirchhoff’s Voltage Law
   3. Kirchhoffs Current Law
3. **Compare and contrast the behaviors of series and parallel circuit designs**
   1. Parallel Circuits
   2. Series Circuits
4. **Understand the tools used to design, build, evaluate and test simple circuits?**
   1. Multimeters
   2. Breadboards
   3. Schematics
   4. Components

**Unit 1.3: Energy Application**

1. **Define Unit 1.3 Vocabulary**

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| **Key Terms** | **Definition** |
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1. **Explain how Energy systems can include multiple energy sources that can be combined to convert energy into useful forms:**
2. **Compare and contrast convection, conduction, and radiation as processes for transferring thermal energy, and will describe each process.**
   1. Convection
   2. Conduction
   3. Radiation
3. **Using a** **R-value chart and the illustration below to calculate the R-value of the wall cavity and the R-value at the stud location.**

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1. **Solve:** **A 1.00 kg piece of aluminum metal at 90.0 °C is placed in 4.00 liters (= 4.00 kg) of water at 25.0 °C.  Determine the final temperature (Tf).**
   1. **List all known values**
   2. **List all unknown values**
   3. **Select Equations**
   4. **Apply known values**
   5. **Solve**
2. **Define Stefan’s Law.**
3. **Understand the flow of heat energy in a system is related to material properties and system design, and by considering the thermodynamics of a system, an engineer can predict and manipulate the amount of energy transferred.**
4. **Find an example of a thermodynamics problem that requires the use of combined equations to find the desired solution. For example, an unknown variable in one equation is satisfied though the use of a second, different equation**