# Mechanical Systems Summary & Review

What do we use machines to do work and to transfer energy?
How can we design and use machines efficiently and responsibly?
How have machines changed over time?

<table>
<thead>
<tr>
<th>Key Concepts</th>
<th>Guiding Questions and Activities to Help you Study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Science Focus 8</strong>&lt;br&gt;(({Unit At A Glance p. 356})</td>
<td></td>
</tr>
<tr>
<td><strong>Guiding Questions and Activities to Help you Study</strong></td>
<td></td>
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</tbody>
</table>
| **Topic 1**<br>Levers and Inclined Planes | - Describe the various types of simple machines.  
- Explain the differences between the three different class levers.  
- Know the scientific meaning of Work and how to calculate it.  
- How do machines make work easier?  |
| **Topic 2**<br>The Wheel and Axle, Gears, and Pulleys | - What is Mechanical Advantage and how is it calculated?  
- Explain how machines can be designed and adapted to meet the specific needs of people.  
- Describe what a winch is.  
- Illustrate different gear ratios and combinations of gears.  
- Describe how pulleys are used to change the direction of motion when objects are lifted.  
- Illustrate different kinds of pulleys and practical applications for each.  |
| **Topic 3**<br>Energy, Friction and Efficiency | - Describe the difference between potential and kinetic energy.  
- How do machines transfer energy?  
- What does friction do to efficiency in a machine?  |
| **Topic 4**<br>Force, Pressure and Area | - What happens when you change the area over which force is applied?  
- Provide some practical applications, which use the principle of ‘spreading force over a larger area’, to reduce the pressure.  
- Describe Pascal’s law and give practical examples, which apply the law.  |
| **Topic 5**<br>Hydraulics and Pneumatics | - Explain the difference between hydraulics and pneumatics.  
- Create a comparison chart that illustrates the similarities and differences between open (pneumatic) and closed (hydraulic) systems. Identify practical everyday situations in which hydraulics and pneumatics are used to make work easier.  
- Describe where hydraulics and pneumatics can be found in your body.  |
| **Topic 6**<br>Combining Systems | - Describe how large machines (systems), are created by combining simple machines (subsystems).  |
| **Topic 7**<br>Machines throughout History | - Illustrate a timeline of transportation machines throughout history  |
| **Topic 8**<br>People and Machines | - How does society change the way machines are developed and used?  
- What impacts do machines have on people and the environment  
- What reasons are there to develop better machines by using science and technology?  
- What is the science of ergonomics?  |

Design a Concept Map linking the ideas introduced and reinforced in this Unit on Mechanical Systems

Try some of the Practice Quizzes to see how much you have recalled from this Unit