YEAR 7/8 SCIENCE
Forces and Energy
- Unit Outline -

Course Description:
In this unit students will be first introduced to the basic concepts of force, types of forces, energy and the transformation of energy. The students will be learning about Newton’s first three laws, balanced and unbalanced forces as well as gravity. Following on from this, students will then be introduced to the basic concepts of energy, energy transformation and how this can cause changes to objects and/or systems.

Course Outcomes:
By the end of this unit you should be able to:
- Describe the effects of applying different forces to familiar objects.
- Identify situations where balanced (stationary) and unbalanced (falling/moving) forces are acting.
- Describe a simple machine such as a lever or pulley system.
- Describe the effect of gravity on objects on the surface of the Earth as well as gravity in relation to the Sun and other planets.
- Understand the law of ‘conservation of energy’.*
- Recognise that all objects possess either potential (stored) or kinetic (moving) energy.
- Identify that heat is a common by-product of energy transformation.*
- Describe the different forms energy and their potential effects on other objects and/or systems.*
- Draw a flow diagram to show how energy changes forms.*
  *Only for yr8’s

Course Organisation:
The organisation of the unit will be:

- The students are presented with both theoretical and practical work, in conjunction with the ‘Science by Doing’ web-based program, to develop their knowledge and skills.

Student’s activities will include:

- Developing a knowledge base using notes, questions, bookwork/worksheets.
- Conduct practical activities to explore and visualise theoretical concepts.
- Practice using terminology and language in oral and written activities.

Course Timeline:

<table>
<thead>
<tr>
<th>Wk</th>
<th>Activity</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>Types of Forces</td>
<td>Quiz at the end of Wk 3</td>
</tr>
<tr>
<td></td>
<td>• What is a force</td>
<td>Test at the end of week 4</td>
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<tr>
<td></td>
<td>• Types of forces</td>
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<tr>
<td></td>
<td>• Definitions of terms</td>
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<tr>
<td></td>
<td>• Contact vs non-contact forces</td>
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</tr>
<tr>
<td>5-7</td>
<td>Energy</td>
<td>Quiz or assignment</td>
</tr>
<tr>
<td></td>
<td>• What is energy</td>
<td></td>
</tr>
</tbody>
</table>
- Types of energy
- Energy and work
- Kinetic and potential energy
- Energy transformation

<table>
<thead>
<tr>
<th>8-10</th>
<th>Simple Machines</th>
<th>Revision and quiz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>What is a machine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Levers</td>
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<tr>
<td></td>
<td>Pulleys</td>
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</tbody>
</table>

Course Vocabulary:
- Force
- Weight
- Mass
- Newton
- Push
- Pull
- Twist
- Contact
- Non-contact
- Energy
- Kinetic
- Potential
- Transformation
- Heat
- Electrical
- Radiant/radiation
- Work
- Balanced
- Unbalanced

- Assessment Outline -

Course Assessment:

<table>
<thead>
<tr>
<th>Wk</th>
<th>Assessment type</th>
<th>Weighting</th>
<th>Marks achieved</th>
<th>Your Total</th>
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<tbody>
<tr>
<td>4</td>
<td>Test</td>
<td>40%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Test or assignment</td>
<td>40%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - 9</td>
<td>General class participation</td>
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</tbody>
</table>

*specific marks to be advised

Specific Equipment required for each lesson:
- File/book to write in
- Pens, ruler, calculator