ASE 2020 – Energy and Forces

Energy Stores
- Chemical
- Kinetic
- Gravitational Potential
- Elastic Potential
- Thermal
- Nuclear
- Magnetic
- Electrostatic

Energy Transfers
- Heating
- Electrical
- Radiation
- Mechanical

Energy Processes

Start Store Transfer Store End
Force Misconceptions*

- Anything that is moving has an unbalanced force acting on it
- Unbalanced forces always make things go faster
- Stationary objects have no forces acting on them
- Objects must be touching to exert a force
- An object that has balanced forces acting on it must be stationary
- A force used to start an object moving continues to act throughout the whole time the object is moving
- Gravity accelerates heavy objects more than light ones
- Weight and mass are the same things
- There is no gravity in space
- Friction is only to do with solids

Refutation

1. State the misconception  
   Many people believe that...
2. Explicitly state that this is incorrect  
   However...
3. State the accepted scientific viewpoint  
   Scientists state that...

Force Arrow Circus

- Generates discussion
- Freebody diagrams on mini whiteboards

*based on ‘Teach Better KS3 Physics, Hodder and Stoughton 2013
<table>
<thead>
<tr>
<th>Balanced Forces</th>
<th>Stationary</th>
<th>Unbalanced Forces</th>
<th>Stationary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balanced Forces</td>
<td>Moving</td>
<td>Unbalanced Forces</td>
<td>Moving</td>
</tr>
</tbody>
</table>
Newton’s Laws

Whenever two objects interact, the forces they exert on each other are equal and opposite.

AQA

Recall and apply Newton’s third law to equilibrium situations.

Apply Newton’s third law to collision interactions and relate it to the conservation of momentum in collisions.

Edexcel

Newton III Template

The ______ force of ________ on ________ is equal and opposite to

the ______ force of ________ on ________ .